

SURA IT Program Update for SURA Board of Trustees April 7, 2005 Meeting

NLR – Southern Route Update

SURA and NLR have an MOU in place that provides SURA with representation on the NLR Board, a 1 Ge (Gigabit Ethernet) service between Tulsa, Houston, Baton Rouge, Jacksonville, Atlanta, Raleigh, Washington and NYC, as well as access to NLR wave services at member cost. In exchange, SURA has made 1000 miles of the AT&T NexGen dark fiber available to NLR for their use.

SURA had also agreed to contribute to the cost of implementing this dark fiber should NLR choose to utilize the AT&T fiber as part of the NLR backbone between Florida and Texas. In late

January, the NLR Board decided not to use the AT&T fiber for the Florida to Texas portion of their national backbone. This decision eliminates the need for SURA to provide any additional funding to support the implementation of this portion of the NLR backbone.

By leveraging the availability of

These commitments total to 3,620 miles of the 6,000 miles available under the SURA – AT&T GridFiber Agreement.

Contract negotiations and implementation plans are currently in progress with LEARN, LONI and NERO. LOTA and the Pacific Northwest Gigapop have not yet begun the implementation planning process.

On Monday, January 31, AT&T and SBC announced an agreement to merge their two companies. This merger will require both US and international regulatory approval and will likely not be finalized until well into 2006. While the SURA – AT&T GridFiber Agreement is structured to survive an event such as this, the internal restructuring that will take place as a result of this merger is likely to have unknown effects on our working relationships with current AT&T staff assigned to our project.

AT&T has named Brendan Floyd as the AT&T Executive Sponsor for the SURA – AT&T GridFiber Program. Brendan is the Mid-Atlantic Region Vice President for AT&T Business Services and has already proven helpful in contract discussions with LEARN.

SURA Grid Planning Group Status

Last Summer SURA formed the SURA Grid Planning group, co-chaired by Ed Seidel and Jed Diem. This group has been charged by the SURA IT Steering Group with formulating a strategy for developing a shared vision for a SURA regional Grid initiative in support of major regional e-science applications. The group has identified an overarching strategy to build a SURA Grid community and identity by engaging the Grid and High Performance Computing leaders in the SURA region in collaborative Grid development projects. This process of community involvement, targeted technology development and awareness/outreach activities is an incremental and evolutionary approach to developing a substantial and persistent Grids capability for the SURA region. Funding will be sought from government, industry and private organizations interested in supporting the development and deployment of Grid computing capabilities.

This planning group has approached this task by forming working groups to address four specific areas of development:

Awareness: This group augments the workshop planning group that planned and executed the successful SURA Grids Workshop held at Georgia State University early in January and is in the process of planning a SURA Grids workshop series. This series of regional workshops will include general workshops on Grid technologies, hands on workshops on deploying Grid technology and workshops targeted at specific scientific disciplines that can take advantage of Grid technologies. This group is also interested in developing a Grids Cookbook, modeled on other successful technology cookbook projects like the ViDe Videoconferencing Cookbook and the SURA Optical Networking Cookbook and a regional inventory of Grid resources and applications.

Infrastructure: This group has built on the work of the SURA Testbed Grid community and is focused on two core activities; expansion of a bridging Certificate Authority to facilitate cross certification among participating sites and the development of a SURA Grid Portal to act as a single point of entry to the resources available through the developing SURA Grid. The SURA

IT Steering Group has recently recommended that \$101,000 from the SURA IT Fund be used to support these activities while more substantial external funding is sought.

Applications: This group is working to identify research applications that could benefit from and demonstrate the capabilities of a SURA Grid environment. The Applications group is working with the Infrastructure group to ensure that the capabilities of the developing SURA Grid meet the needs of the region's emerging Grid applications.

Funding: The funding group is working closely with the awareness, infrastructure and applications groups to identify and assist in the pursuit of funding sources (government, industry and private) that are interested in supporting the development and deployment of Grid computing capabilities. This group is currently exploring funding opportunities in support of regional Grid development and educational workshops and the development of a Grid Technologies Cookbook.

SURAggrid

In September 2003, as part of the management of the NSF Middleware Initiative (NMI) Integration Testbed program, SURA formalized an inter-institutional grid effort called the NMI Testbed Grid. This provided a mechanism for Testbed sites to explore grid capability with researchers and faculty at their institutions, investigate cross-campus authentication issues and expand their evaluation and usage of NMI components, particularly those related to "plumbing" grid authentication to the campus enterprise infrastructure. With the end of the NMI Integration Testbed program, this project has become the SURAggrid, with over 18 institutions collaborating to date. Work from the January 2004 SURA "GridThink" working groups on recommendations for a regional CA and establishment of a collaborative grid-based teaching environment has also been brought into this effort. SURAggrid has received interim funding from the SURA IT Committee to sustain momentum and progress in key areas while external funding is being pursued. These areas include application development and documentation, institutional cross-certification through a Bridge CA, a SURAggrid portal, participation in relevant grid technology conferences and events, and the development of a formal funding plan. SURAggrid's core grid building activities are also serving as the initial foundation for the work of the SURA GridPlan Infrastructure Working Group, with additional intersections with the Grid Plan Application Working Group (fostering a set of regionally valuable applications) and the GridPlan Awareness Working Group (input to regional awareness & education).

SURA Cyberinfrastructure Workshop Series

SURA has begun the development of a series of workshops to provide education and community building in support of grid deployment. The first workshop on "Grid Application Planning & Implementation" was held January 2005 at Georgia State University and provided clear feedback that more and similar events are needed; also that industry partners are ready to support such efforts. The workshop was designed to expose attendees to a range of timely grid technology topics: concepts and perspectives about grid definitions, a broad range of applications benefiting from grids, recommendations and roadmaps for successful deployment, and access to expertise and peer support. (See: <http://www2.gsu.edu/~wwwacs/suragridconf/>) SURA is following up with the five industry sponsors of this event (AT&T, IBM, James River Technical/SGI, Sun, United Devices) to invite their detailed feedback and exploration of future sponsorship opportunities. Additional workshops are planned to expand on the range of topics covered, the depth of coverage in most critical areas and specific focus on events tailored to particular e-

science application communities. Two are underway for the coming year: 1) a second Grid Application Planning & Implementation workshop, August 2005, and 2) a Life Sciences grid workshop, January 2006. Planning and developing the series of workshops over a multi-year period will be an ongoing activity of the GridPlan Awareness Working Group.

SURA Joins Mid-Atlantic Terascale Partnership (MATP)

In early January, SURA executed an agreement to join the Mid-Atlantic Terascale Partnership (MATP). MATP is a consortium of research entities cooperating in the development of high performance network infrastructure and in sharing access rights to the National LambdaRail node in McLean, Virginia. As a member of MATP SURA has full access rights to the northern Virginia NLR Backbone node and is now positioned to provide cutting edge network connectivity in support of Jefferson Lab and the SURA Coastal Ocean Observing and Prediction program (SCOOP). Leveraging the AT&T dark fiber assets between Norfolk and McLean, SURA was able to work with a consortium of Virginia institutions in the Norfolk area (Jefferson Lab, NASA Langley, ODU, W&M, Hampton University) to assist in negotiating a 10Gbps managed service from Verizon that will extend connectivity from the NLR node in McLean to the Norfolk area.

International Peering in Support of JLab and the SURA Region

Atlantic Wave Project Update

AtlanticWave (A-Wave) represents a distributed exchange and peering fabric along the Atlantic coast of North and South America to facilitate exchange and peering services for the national and international networks that interconnect at international exchange and peering points at MANLAN in NYC, MAX in Washington DC, AMPATH in Miami, and the Sao Paulo Open Exchange (operated by the Academic Network of Sao Paulo - ANSP). The A-Wave service on the East Coast will also link to the PacificWave (P-Wave) service, led by CENIC and the PNWGP, which links the international peering points in LA, Seattle and Chicago. Options for trans-continental connectivity between the key international connections points include Abilene, NLR, and CANARIE in North America, and RedCLARA in South America.

FIU and CENIC, with support from SURA, described the concept and a commitment to the implementation of the A-Wave in their successful proposal to the NSF IRNC program. In particular, the FIU-CENIC led proposal describes the importance of establishing a 10G wave service between Miami, Washington DC, and New York, and having it interconnect with the NSF-funded link from Miami to Sao Paulo to enable a hybrid of scheduled temporary use and permanent use network services to support discipline-specific and general-purpose high performance computing and networking services between North and South America and Europe.

The map below shows the AtlanticWave as the dotted red segment between Miami and NYC. The AtlanticWave interconnects with the solid red segment that is already in service between MANLAN, StarLight and PacificWave; it also interconnects with the red segment from Miami to Sao Paulo.

The current A-Wave stakeholders consist of SURA, the Internet Educational Equal Access Foundation (IEEAF), MANLAN, Mid-Atlantic Crossroads (MAX), Southern Crossroads

(SoX)/Southern Light Rail (SLR), Florida Lambda Rail (FLR), AMPATH, the Academic Network of Sao Paulo (ANSP). The planned points of interconnection for the AtlanticWave are NYC/MANLAN, DC/MAX, SoX, AMPATH and ANSP/Sao Paulo, creating an open distributed exchange spanning the Atlantic Rim from NYC to Sao Paulo.

Estimated Project Cost

The estimated 5-year project is approximately \$1.5M. To launch A-Wave, SURA has committed a one-time investment of \$481,472 for the purchase of a 10G wave from the NLR between Jacksonville and New York City, plus possible additional equipment needed to be placed in New York City. The A-Wave partnership has committed the needed funds to implement and sustain the A-Wave as a 5-year project. Each partner organization will take care of local and operational costs for the exchange facilities, equipment maintenance and staff time that is required for the implementation of the A-Wave. Actual costs will be determined when the engineering committee completes its design and actual equipment and vendor/suppliers are identified.

Project Governance

A Governance Committee and an Engineering Committee provide project governance. The Governance Committee is comprised of a representative from each of the key stakeholders. The primary responsibility of the Governance Committee is to collectively make decisions about the A-Wave and to provide coordination with StarLight/TransLight, the P-Wave and other exchange-peering providers. The Governance Committee will establish policy on the usage of A-Wave for production and experimental usage.

Project Engineering Design

The Engineering Committee is comprised of network engineers from each of the partner organizations, as well as invited subject matter experts. The primary responsibility of the

Engineering Committee is to make technology, engineering and operational recommendations to the Governance Committee.

The Engineering Committee is performing proper due diligence and discussing a design to satisfy requirements for a distributed production exchange and peering service using a 10G LAN PHY wave or using an OC192 wave that can also support layer 1 “light path” services. Light path support is needed to enable participation in the Global Lambda Integrated Facility (GLIF - www.glif.is) and to support the larger traffic flows required for data-intensive research applications, such as from High-Energy Physics (HEP) and radio astronomy’s e-VLBI. The GLIF is a consortium of institutions, organizations, consortia and country National Research Networks who voluntarily share optical networking resources and expertise for the advancement of scientific collaboration and discovery.