

America Connects to Europe (ACE) (SCI - 0962973) Annual Report 1-June-2010 thru 28-February-2011

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Summary

Most generally, the ACE project continued connectivity established by the previous IRNC1 project (SCI:IRNC:TransLight/StarLight). This ensured continuity of services while new ACE requirements for connectivity could be determined. The ACE Start-up and Technical Committees were formed, met and produced outcome reports. An ACE tender was prepared and sent to vendors. In addition, ACE project team members participated in various professional meetings including TERENA and DICE. Specific details follow:

The ACE project is operating within budget. See the Budget Summary section.

There was a formal announcement at Indiana University of the TP3 and ACE NSF awards. See: <http://internationalnetworking.indiana.edu/publications>

Indiana University hosted the IRNC Program Kickoff in Washington, DC. See: <http://irncworkshop.indiana.edu/>

International Networking at Indiana University has a new web site. See: <http://internationalnetworking.indiana.edu/>

Ron Milford, the ACE "Africa Engineer" attended the UbuntuNet-Connect 2010, Johannesburg, SA 18-19 November 2010. See: <http://www.ubuntunet.net/uc2010>

Williams and Hicks attended the DICE meeting in Ottawa, Canada. The principals as well as technical representatives met to discuss compatibility issues between perfSONAR PS and MDM as well as dynamic circuit compatibility between Asia, the US and Europe. Hicks will continue to participate in DICE technical discussions. Williams will participate in the DICE principal (directional) discussions.

Williams presented a talk about "International Networking at Indiana University" as a part of the Data 2 Information seminar series at Indiana University. See: <http://internationalnetworking.indiana.edu/publications>

Williams attended the GENI Engineering Conference 9 in Washington, DC.

Williams attended the Internet2 meeting in Atlanta and presented an ACE/TP3 update at the ACE/TP3 side meeting.

The Start-up and Technical Committees have completed their work and an ACE RFP is in development. We expect to have circuits in place on/about 1-August-2011. Further details follow in this AR.

Milestones and accomplishments

Williams attended the TERENA Networking Conference 2010 (TNC2010) in Vilnius, Lithuania and participated, by invitation, in the EU sponsored US-EU Trans-Atlantic Networking Meeting. The report from the Workshop was attached to the June-August QR.

Indiana University hosted the IRNC Program Kickoff in Washington, DC. All IRNC PIs attended and presented summaries of their planned activities. .See: <http://irncworkshop.indiana.edu/>

There was a formal announcement at Indiana University of the TP3 and ACE NSF awards. See: <http://internationalnetworking.indiana.edu/publications>

International Networking at Indiana University (IN@IU) has a new web site. This will be a permanent home for international activities and projects at Indiana University. See: <http://internationalnetworking.indiana.edu/>

Williams held a number of discussions with Eric Boyd of Internet2 regarding the Internet2 IRNC projects DyNES and IRIS and the MRI-R2 project DYNES. These projects will be important in both ACE and TP3 future operation. See the IN@IU web site for more details.

Hicks attended the SC10 measurement install fest in Ann Arbor and met with Internet2 staff to discussed DyGIR and IRIS.

Williams had a VC with Dany Vandrome and Sabine Jaume of Renater (the French national network) to discuss networking in West Africa. ACE hopes to work with the University of Oregon and the NSRC on a workshop in West Africa.

Ron Milford, the ACE "Africa Engineer" attended the UbuntuNet-Connect 2010, Johannesburg, SA 18-19 November 2010. See: <http://www.ubuntunet.net/uc2010>

The ACE Technical Committee, comprising representatives from DANTE, ESNet and IU, met on four occasions (11/22/2010, 12/6/2010, 12/15/2010 and 1/19/2011) over videoconference. The outcomes of the discussions were used to produce a Technical Committee report. This described the consensus view of the proposed ACE network architecture including recommendations concerning the circuit type and disposition, the equipment to which the circuits should connect and the methods by which the circuits would be integrated into the Exchange Points in the US and the GEANT network in Europe.

The ACE Start-up Committee reviewed the written report from the Technical Committee and approved its implementation. Work will now begin on a RFP for ACE circuits.

The circuit-switching equipment at the MANLAN Exchange point in New York City was replaced by engineers from the IU GRNOC and NYSErNet in mid-February 2011. The new device, a three-shelf Ciena CoreDirector, significantly increases the capacity of the MANLAN facility and also corrects a technical problem that affected the ability to pass jumbo (9 Kbyte) IP packets between the US R&E networks and GÉANT. The CoreDirector also greatly enhances our ability to monitor leased lines for quality of performance and adherence to carriers' Service Level Agreements (SLA).

Operations Events and Activities

The ACE project has formed a start-up group (SUG) to ensure smooth coordination of trans-Atlantic bandwidth allocations between the ACE project and the EU GÉANT project. The SUG has met via video 3 times and expects to hold 2 additional meetings in preparation for an RFP to be released by Indian University to procure the ACE circuits from the US to the EU.

To support the SUG, ACE has formed a Technical Advisory Committee (activities detailed below).

While an exact set of origination points, landing points and circuit services are being discussed between the US and the EU, the ACE project has contracted with SURFnet, the Dutch NREN, to continue the IRNC-1 set of services. When the ACE project has contracted and deployed IRNC-2 circuits, these IRNC-1 circuits will be terminated. Financial details for this arrangement are outlined in the Financial Reporting section of the June-August QR.

September 2010

The GlobalNOC completed a new GlobalNOC Change Management System. The system is a series of updated procedures and guidelines, along with a new web-form tool developed and incorporated into the GlobalNOC's ticketing system. Upon final approval of this system, network engineers may now quickly submit a change request adhering to pre-defined guidelines and scheduling timeframes. The new process ensures smooth and prepared changes, and allows for proper notification, pre-planning, and approval of any network changes.

October 2010

GlobalNOC began to assist the R&E community with reservations for use of the Tata Exchange for TelePresence conferences.

The new GlobalNOC Services and Support Team dedicated a project manager to the upgrade of TP3 and deployment of the ACE network. Project management methodologies will be used to schedule and track project tasks and resources.

On October 31, Steve Peck attended the International Update Sessions at the Fall Internet2 Members Meeting in Atlanta, GA.

November 2010

Steve Peck attended the ACE/TP3 update side meeting presented by Jim Williams at the Fall Internet2 Members Meeting.

After the ACT/TP3 update meeting, representatives of APAN, DANTE, and the GlobalNOC mutually recognized the need for a collaborative workshop to share operational procedures, discuss international networking, and form a closer working relationship between the three organizations.

The GlobalNOC began beta support for the U.S. governmental agency National Oceanic and Atmospheric Administration (NOAA). Support includes GlobalNOC engineering, Service Desk functions, and systems engineering support for their new research network N-Wave. N-Wave will initially be used to support their R&D HPCS program, connecting 17 NOAA sites to the network.

Steve Peck attended the TERENA 3rd E2E Workshop on Applications and Services via video conference link.

December, 2010

Preliminary discussions began on the development of a network procedure workflow tool. It would be used to help guide Service Desk technicians through various processes & procedures, identifying subtle differences between support procedures for various networks. It also would serve as a training tool.

January, 2011

Preparations are being made for the new office of the GlobalNOC Service Desk in the Cyber Infrastructure Building (CIB) being built in Bloomington. The current Bloomington Service Desk office does offer redundant support services in the event of an emergency or weather event. When the Bloomington Service Desk moves to the new office, it will feature additional phone and persistent video communications to aid in the coordination of day to day operations between offices as well as supporting the business continuity functions.

February, 2011

The city of Indianapolis was paralyzed by an ice storm from January 31st to February 3rd. The GlobalNOC continued to be operational in spite of severe transportation issues. GlobalNOC management considered this an excellent test of current business continuity planning. Staff worked on site and remotely to provide continuous service to all networks during this period. <http://www.indy.gov/icestorm/Pages/Home.aspx>

Steve Peck gave a presentation on GlobalNOC operations to the TERENA 2nd TF-NOC Meeting in Ljubljana, Slovenia using video conferencing. <http://www.terena.org/activities/tf-noc/meeting2/>

Testing has been completed on the Targeted Notification Tool that should increase the effectiveness of GlobalNOC notifications while decreasing the overall volume of messages. The tool is expected to go into production in early March.

Network Engineering

The ACE Technical Advisory Committee has discussed several new configurations for the operational network and is close to arriving at an initial design that will suffice for the interim period. The ACE Engineer is also considering a novel proposal that will require lab-based verification and testing before consideration for use on the Operational Network. This proposal it is hoped will accomplish superior balancing of traffic across multiple transatlantic circuits that converge at a single Exchange Point.

Ron Milford, the ACE "Africa Engineer" attended the UbuntuNet-Connect 2010, Johannesburg, SA 18-19 November 2010. See: <http://www.ubuntunet.net/uc2010>

Ron also attended several pre-conference events:

- AfricaConnect Preparatory Meeting - 15th November 2010
- CTO Capacity Building Workshop - 16th November 2010

At the CTO Capacity Building Workshop Ron presented "What is UbuntuNet's Role? How and Why to connect," in addition to a GRNOC Tools Demo.

The circuit that connects GÉANT to the NGIX-E Exchange Point in Washington was procured by our partner organization DANTE and so will not be further discussed in this report.

For most of this reporting period, performance data concerning the IRNC-funded circuit that terminates in New York City were not available because the old circuit-switching equipment manufactured by Nortel was not capable of generating the figures. All future circuits, which are currently in the procurement process, will be terminated by Ciena CoreDirector equipment.

Once the new IRNC circuits have been delivered and are placed into service, we intend to report a Bit Error Rate (BER) measured over each quarterly reporting period for each such circuit and to compare that figure with the provider's target as agreed in the Service Level Agreement (SLA). Any deviations from the target values will be highlighted and the carrier's explanation will be sought.

IRNC related GENI activities

Williams had discussions with GENI GPO representatives and representatives of various GENI frameworks regarding the use of ACE and TP3 as a part of the ongoing efforts of GENI and their interaction with frameworks in Europe and Asia and collaborative experiments with projects such as the EU-based FIRE activity. Discussions will continue

Williams attended the GEC 9 meeting in Washington, DC and discussed possible GENI participation in the upcoming US-India Workshop and the APAN meeting which will be held in Hong Kong.

Williams attend the APAN meeting in Hong Kong where he co-chaired the Future Internet Testbed working group. See: <http://apan.net/meetings/HongKong2011/> Discussions in the FIT WG included developing network testbeds in both Asia and Europe.

Measurement Activities

ACE staff attended the DICE meeting in Ottawa. The principals as well as technical representatives met to discussed compatibility issues between perfSONAR PS and MDM as well as dynamic circuit compatibility between Asia, the US and Europe. The DICE perfSONAR WG goals include; defining what and how to deploy resources, what data to make available, integration, support and scalability. We will support these goals by working in concert with the DICE community and contributing to policy documents concerning perfSONAR and dynamic circuit software integration.

Hicks attended the NSF/Internet2 sponsored perfSONAR workshop in Arlington VA and discussed DyGIR and IRIS with Internet2.

Hicks attended the SC10 measurement install fest in Ann Arbor and discussed DyGIR and IRIS with Internet2.

Hicks is a member of the SCinet measurement team, providing network monitoring and measurement support to the annual supercomputing conference. This year the SC10 event provided exposure to the challenges of 100 Gbps.

ACE staff gave a talk at APAN 31 concerning perfSONAR and dynamic circuit implementation issues.

John Hicks had a number of conversations with DANTE concerning TEIN2/3 connectivity and monitoring issues in Asia.

John Hicks worked with DANTE & APAN engineers to establish a three continent dynamic layer 2 connection, with monitoring, for large data flows. This work involves finding resources, compatibility issues between different implementations of dynamic circuits (G-lambda, Autobahn, etc.), and minor issues between implementations of perfSONAR - PS-SP (perl) and PS-MDM (java). There will be further discussions concerning OSCARS & perfSONAR implementations at the upcoming DICE meeting in March 2011.

Security events and activities

ACE staff met with Doug Pearson, REN-ISAC Technical Director, and Tom Knoeller from Internet2 concerning the existing Arbor SP system. Tom Knoeller is a former Arbor employee and has some configuration options that should give more control of the system.

ACE Business Activity, 6/01/2010 thru 2/28/2011

This section purposely left blank. Indiana University does not collect this type of information for these particular circuits. During this transition time the circuit owner for the ACE circuits remains SURFnet. Following our ACE circuit implementation plan, ACE will begin to collect this data on/before 1-August-2011.

ACE Network Operations Report 6/01/2010 thru 2/28/2011

This section purposely left blank. Indiana University does not collect this type of information for these particular circuits. During this transition time the circuit owner for the ACE circuits remains SURFnet. Following our ACE circuit implementation plan, ACE will begin to collect this data on/before 1-August-2011.

Usage summary and performance 6/01/2010 thru 2/28/2011

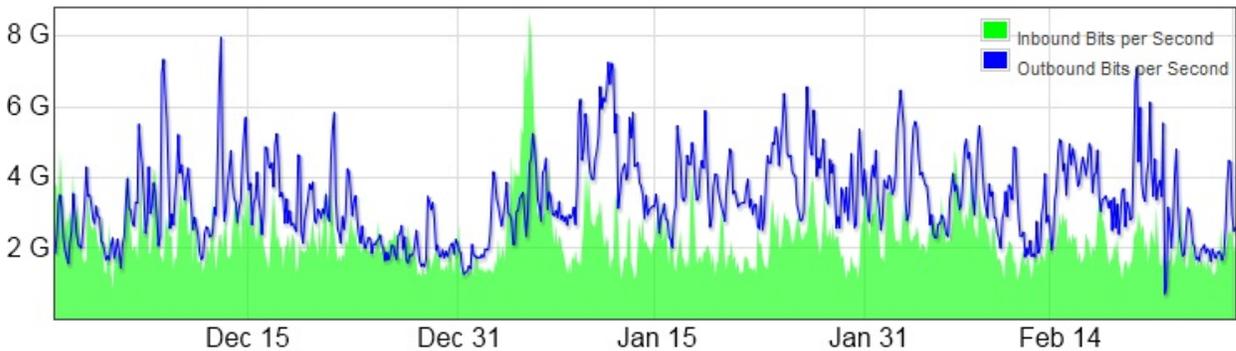
This section purposely left blank. Indiana University does not collect this type of information for these particular circuits. During this transition time the circuit owner for the ACE circuits remains SURFnet. Following our ACE circuit implementation plan, ACE will begin to collect this data on/before 1-August-2011.

Quarterly Usage Graphs 12/1/2010 thru 2/28/2011

Due to issues mentioned in the previous Network Engineering section, these graphs are only approximate, as is noted below.

The following graph shows the traffic levels recorded over the time period covering this report (12/1/2010 to 2/28/2011). Each data point used to construct both the inbound and outbound graphs represents a three-hour average. Therefore peak levels have been substantially attenuated and should be assumed to exceed the values implied by the Y-axis. The graph depicts traffic levels on the 10GE MANLAN switch interface dedicated to GÉANT and this is a fair representation of the usage of the transatlantic circuit. It is not possible to make these measurements directly from the OC192 interface that terminates the circuit itself as this is a continuous-transmission SONET interface that has no knowledge of packetized data.

Geant 10 G Interface on MANLAN Switch



Financial Reporting Details 06/01/2010 thru 2/28/

Spreadsheet accompanies this report with quarterly detail.

Summary report for this AR

Circuit service between the US and the EU continues using the IRNC-1 circuits supplied by SURFnet. The Start-up and Technical groups have completed their work. Activity has begun on development of an RFP for ACE circuits. We expect to have new circuits in place and operational on/before 1-August-2011.

ACE staff attended and presented at a number of national and international conferences and workshops. Details are available on the IN@IU web site:

<http://internationalnetworking.indiana.edu/>

Plans for 1-March-2011 thru 28-February-2012

1. Finalize RFP process, select vendor and implement circuits.
2. Attend and participate in DICE activities
3. Set up general advisory structure for ACE, when circuits are in place.
4. Work with Internet2, Stanford and involved international participants to implement OpenFlow across the ACE infrastructure.
5. Work with Internet2 & GRNOC engineers to implement measurement resources for the new circuits
6. Establish a three continent dynamic layer 2 connection, with monitoring, for large data flows
7. Develop specific science support cases for ACE
8. In cooperation with our partners, implement a new circuit between London and NYC to directly carry Africa (and UK) traffic to the US
9. Working with IRNC:SP projects to deploy, where deemed appropriate, new measurement and advanced service technologies developed in SP projects
10. Investigate capabilities to understand traffic characteristics mapped to NSF supported science applications, potentially including flow level mapping, measurement, and reporting
11. Work with NSF to provide greater insight into NSF-supported science projects and applications are directly supported and enabled by ACE connections and services.

ACE Financial Details 1-June-2010 thru 28-February-2011

ACE NSF, OCI-0962973				
Compensation	1st Quarter total(s)	2nd Quarter total(s)	3rd Quarter total(s)	Annual total(s)
Williams, James	1,936.58	2,904.87	3,079.14	7,920.59
Graham, John	13,848.78	15,894.57	16,209.21	45,952.56
Halstead, Patricia	0.00	2,449.99	1,106.67	3,556.66
Wittke, Eric	0.00	391.25	804.24	1,195.49
Wagner, Kimberly	0.00	0.00	530.69	530.69
IC on Compensation	619.70	6,925.02	6,953.58	14,498.30
Total Qtr Compensation	16,405.06	28,565.70	28,683.53	73,654.29
Other Expense				
Amazon.Com Expense	0.00	0.00	327.58	327.58
Travel-C. Small Hotel & Air	0.00	0.00	2,278.96	2,278.96
IC on Other Expense 32%	0.00	0.00	834.09	834.09
Total Qtr Other Expense	0.00	0.00	3,440.63	3,440.63
Circuit Expense				
Surfnet	36,000.00	74,674.80	25,005.60	135,680.40
NLR	5,726.00	8,650.88	2,863.00	17,239.88
Wire Transfer fee	20.00	140.00	40	200.00
Total Qtr Circuit Expense	41,746.00	83,465.68	27,908.60	153,120.28
Grand Total ACE Annual	58,151.06	112,031.38	60,032.76	230,215.20

