Annual Report
America Connects to Europe (ACE)
(SCI - 0962973)
1-March-2011 thru 29-February-2012

James G. Williams – Principal Investigator

Yearly Summary

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

ACE has been working closely with the LHCONE project to ensure that ACE resources meet the needs of the LHC project without compromising the fundamental ACE mission of broad science support.

ACE/TransPAC3 Gerald L. Bepko intern Eric Wittke finished his internship. His internship report accompanies this report.

There were significant activities in Engineering, Measurement during this reporting period. See Milestones, directly below, and separate sections of this report. Significant engineering time was spent on troubleshooting an AMS-NYC circuit problem. See the Network Engineering Section for further details.

Significant ACE and TransPAC3 effort was expended at the supercomputing conference, SC11.

Considerable resources have begun to be spent on OpenFlow and Software Defined Networking. We expect this to continue and expand as SDN becomes in greater use internationally. A SDN section has been added to the QRs and this AR.

Williams was a co-PI and attended the Security at the Cyberborder workshop in Indianapolis.

Quarterly Milestones and Accomplishments

Quarter 1
A Request for Proposals (RFP) was issued on 21 March 2011 to vendors for the supply of two 10G (STM64) SDH circuits connecting New York City to Amsterdam and Washington, DC to Frankfurt. The final date for responses was 18 April 2011. The successful bidder was Hibernia Atlantic which was awarded a 24-month contract for both circuits.

A suitable switch for the new ACE International Exchange Point in Washington DC was specified and purchased from Brocade. The device will have a capacity of sixteen 10G interfaces along with a spare chassis slot that could accommodate a 2-port 100G module in due course. This device is currently located in the Data Center at IU Bloomington and will be moved to Washington in mid-July.

Hicks attended DICE meeting in Cambridge, UK where he discussed active and passive measure plans with DICE partners. Hicks met with Internet2 and GRNOC staff to discuss ACE measurement and dynamic circuit plans. Hicks attended APAN32 in New Delhi and presented an ACE update.

Quarter 2
The circuit connecting New York City to Amsterdam was delivered by the service provider, Hibernia Atlantic, on 29 July 2011. Subsequently the GlobalNOC cooperated with colleagues from the GEANT2 NOC on verifying the circuit performance.

The circuit connecting Washington, DC to Frankfurt-am-Main was delivered by the service provider, Hibernia Atlantic, on 17 August 2009. The US-based termination equipment had not yet been installed and so a loop was placed on this side of the circuit to allow the GEANT2 NOC to perform some tests and to ensure that the local loop fibers were correctly patched in Europe.

New York – London circuit was tendered to provide direct (no intervening AS) connectivity between US and Africa.

Quarter 3
There were six major activities supported by ACE Engineering during this period. These are detailed in the Engineering Section. Simply by name there are:

- Aggregated 2×10G lines connecting GEANT to MANLAN
- New Internet Exchange Point in Washington DC
- Replacement of Ethernet switching equipment at MANLAN
- New transatlantic circuit connecting Frankfurt and Washington DC
- Replacement of circuit connecting London and New York City
- Activities at SC11 supported by IRNC:ACE

Quarter 4

Significant time was spent exploring sFlow and the Inmon product. See the Measurement Section.

Williams was a co-PI and attended the Security at the Cyberborder workshop in Indianapolis.

Monthly Operations Events and Activities

March 2011

The Service Desk has begun evaluation of different documentation environments to see which platform will suit the growing documentation needs of both customers and staff associated with the GlobalNOC. International networks, such as ACE and TransPAC3 will benefit from an interface which facilitates input from engineering, systems, and Service Desk staff as the network matures and changes over time. It is expected that a flexible documentation system would facilitate the timely updating of material for better support of both staff and customers' needs.

The Service Desk is investigating moving to a voice over IP phone system for both the Bloomington and IUPUI locations. With the move to any VoIP alternative, a backup system will be required to ensure business continuity in the event of an outage. An ATT CLAR system for backup and a workstation based call monitoring interface will be evaluated in the coming months.

April 2011

Service Desk personnel and the Systems Engineering group begin creation of a workflow tool to assist both engineers and Service Desk staff with complex procedural tasks. The tool will be used for both training and service quality control. Once completed, ACE and TransPAC3 workflows will be included in the system.

The Service Desk and Systems Engineering are integrating monitoring tools to simplify the monitoring procedure. The AlertMON tool will now group alarms by network and give technicians the ability to drill down from the alarm itself to specific network elements. Grouping and sorting of alarms helps to identify or eliminate factors during initial troubleshooting, thereby reducing resolution time for Service Desk staff and network customers.

May 2011

Systems Engineering and Service Desk personnel will be migrating to new One Time Password security token system from the Safe Word Card system that has been in place. The new security token vendor will furnish less expensive tokens and a self-registration system for users. Working with this new vendor should reduce both administrative and inventory expenses while still providing an added layer of physical security for all accessed network elements.

The GlobalNOC Service Desk office in Bloomington, IN continues to plan for its move to the new Cyberinfrastructure Building (CIB) in Bloomington. The move is expected to take place in August. A Service Desk supervisor is organizing the move for Bloomington personnel. The CIB facility is intended to be energy efficient building and designed for collaborative working environments. The Service Desk facility will be viewable to guests in the building and will feature a video wall for network monitoring, displays of real time network traffic, and a maintain a persistent video connection to the IUPUI Service Desk. The Bloomington office provides the Service Desk with two redundant work spaces in case a Business Continuity/Disaster Recovery emergency would affect one of the two Service Desk offices.

July 2011

The workflow tool in development was released to the Service Desk for testing. The tool will assist both engineers and Service Desk staff with the complex procedural task and will be used for both training and quality control. Once completed, ACE workflows will be included in the system.

August 2011

The Service Desk deployed a VoIP system on several customer lines that included a product called Customer Interaction Center (CIC). This system will eventually be rolled out for all Service Desk lines including the ACE NOC.

A few benefits the Service Desk gains from the CIC implementation are:

- One general/shared queue to manage incoming phone calls
- Enhanced transfer and conferencing functions
- Primary and secondary (backup) servers for business continuity
- Call history logs provide improved quality assurance procedures
- Improved training functions (listen/coach/join call)
- Staff may access the system from remote locations, used during Disaster Recovery exercises
- Built in directory function assists with number look up and prevents misdialing

The AlertMON Tool was upgraded to include a feature to expand/collapse all acknowledged alerts and acknowledgement confirmation popup for internal alerts.

Turn-up of network operations for the America Connects to Europe (ACE) network continues. Systems Engineering and the Service Desk turned up the ticketing system for ACE, created an email account and public web page. ACE calendars, public ticket viewer, and notification tool were put into production to support the new ACE circuits.

September 2011

The GlobalNOC Service Desk completed their move into a new facility on the Indiana University Bloomington campus. The new facility maintains the same functionality as the Indianapolis Network Operations Center and also maintains staff around the clock. The new Cyberinfrastructure Building (CIB) features state-of-the-art sustainable technology environment for the Service Desk. Please see the following link for more information on the CIB: http://it.iu.edu/cib/.

The workflow tool development for the Service Desk continued and began testing internally with a projected production usage date of beginning in Q1 of 2012.

October 2011

Completed integration of ACE public notifications via the current Notification Tool and OPS listserv process.

November 2011

System Engineering began further development work on the Service Desk new “targeted notification tool.” Enhancements to the existing tool will allow the Service Desk to define a more focused “target” recipient group and provide notification on services to only those affected.

December 2012

The GlobalNOC Service Desk began the annual review of its Business Continuity Plan. As part of the IU Ready system, the Service Desk maintains a structured continuity plan and performs periodic testing to ensure ACE NOC viability in situations where physical or network accessibility is not available in the primary location. The service desk regularly exercises this plan throughout the year.

January 2012

The workflow tool development for the Service Desk was completed for a single network and was launched in this quarter for production testing. A controlled rollout for other networks, including ACE, will happen throughout the year in 2012.

Updates were made to existing notifications adding trouble-ticket impact status and further definition within the ticketing system for further clarity.

February 2012

System Engineering continued developmental work on the Service Desk “targeted notification tool” to enable us to further define a more focused “target” recipient group and provide notification on services to only those affected. As part of ACE NOC processes and procedures, network documentation was reviewed and updated accordingly, reflecting recent circuit and network redundancy updates.

An ACE escalation matrix was implemented to ensure timely awareness of any ongoing issues that may need outside awareness to be addressed.

Network Engineering

In early March, the provider of the current IRNC circuit replaced a hardware module on their network in the UK which eliminated the slow accumulation of errors we had noted on this circuit for several weeks prior. Since then, the circuit has operated reliably without any further sustained problems.

The circuit connecting New York City to Amsterdam was delivered by the service provider, Hibernia Atlantic, on 29 July 2011. Subsequently, the GlobalNOC cooperated with colleagues from the GEANT2 NOC on verifying the circuit performance.

The circuit connecting Washington, DC to Frankfurt-am-Main was delivered by the service provider, Hibernia Atlantic, on 17 August 2009. The US-based termination equipment had not yet been installed and so a loop was placed on this side of the circuit to allow the GEANT2 NOC to perform some tests. There were no incidents affecting the ACE connectivity between New York and Amsterdam.

We have renewed the entire stateside physical infrastructure that is used to connect *inter alia* GEANT2 to the R&E networks in the USA. Two new transatlantic circuits have been procured and installed and two existing circuits have been replaced.

1. **Aggregated 2×10G lines connecting GEANT to MANLAN**

   A 20Gbps connection between the GEANT2 router in Amsterdam and the MANLAN Internet Exchange Point (IXP) in New York City was built in early September. This connectivity uses a pair of new transatlantic circuits, one leased by DANTE and the other by the IRNC:ACE project. The circuit providers are Global Crossing and Hibernia Atlantic respectively. Both leased lines are SONET-framed OC192 and are terminated on a Ciena CoreDirector which additionally supports a matching pair of 10Gbps Ethernet lines facing the MANLAN Ethernet switch.

2. **New Internet Exchange Point in Washington DC**

   An entirely new IXP called the *Washington Internet Exchange* (WIX) was constructed within a dedicated suite in the building operated by Level3 Communications at McLean, VA. This is the same building that houses the Internet2 and ESnet core nodes for the mid-Atlantic region. Thus connection of these two major networks is straightforward. The equipment comprising the Exchange consists of:

   - Brocade MLXe-16 Ethernet switch
   - Ciena CoreDirector CI SONET/SDH multiplexor
   - Ancillary equipment for rack management and out-of-band access
   - Power rectifiers and active fuse switches

   The switch is provisioned with multiple 100Gbps interfaces for eventual connection to Internet2 and ESnet.

3. Replacement of Ethernet switching equipment at MANLAN

In late February, the circuit switching equipment at MANLAN was entirely replaced. We have now also replaced the Layer 2 switching equipment. The original Cisco 6513 has been decommissioned and a new Brocade MLXe-16 placed into service. This device offers a substantial increase in 10Gbps port density as well as 100Gbps capability. The ancillary equipment that provides in-band management and out-of-band emergency access has also been replaced.

4. New transatlantic circuit connecting Frankfurt and Washington DC

The IRNC-funded circuit connecting the GEANT router in Frankfurt, Germany to the WIX was brought into service. The matching circuit that is funded by DANTE has not yet been moved from the old exchange (NGIX-E) based at the University of Maryland campus. Consequently, the WIX is carrying traffic between Internet2 and GEANT while the NGIX-E equipment continues to support traffic between ESnet and GEANT.

The Frankfurt side of the IRNC circuit is connected directly to the GEANT router. This is in contrast to the connectivity at Amsterdam in which the transatlantic circuits are terminated on the GEANT packet-over-SONET equipment. At the WIX, we have therefore terminated the circuit directly on a 10Gbps interface on the Brocade switch. The GEANT and WIX equipment at both sides of the circuit is configured for *WAN-PHY* operation in which the ostensibly Ethernet interfaces generate SONET OC192 frames encapsulating Ethernet within an STS-192c payload structure.

Our original plan had been to cross-connect this client signal across a pair of OC192 interfaces on the Ciena CoreDirector; one terminating the transatlantic line and the other supporting a SONET line to the Brocade interface. A trial of this configuration revealed some unaccounted occasional CRC errors accumulating on the switch interface even though both SONET lines were clear of errors. We believe the CRC errors were the result of some timing inconsistencies between the two devices. Due to the restricted SONET capabilities of a 10Gbps Ethernet interface operating in WAN-PHY, we do not believe it will be possible to resolve the problems encountered.

For the present time, we do not therefore have the same extensive circuit monitoring capabilities as are in place at the MANLAN exchange. If we are able to negotiate a change in configuration with colleagues at DANTE, we hope to replicate the MANLAN configuration at the WIX in which the Ciena CoreDirector performs Ethernet-over-SONET adaptation. That would allow us to terminate the leased line on the CoreDirector and benefit from the inherently superior performance monitoring.

5. Replacement of circuit connecting London and New York City

The circuit connecting the MANLAN facility to the GEANT multiplexer in London was replaced. The original circuit was leased by Internet2 and provided by Level3 Communications. The new circuit is provided by Hibernia Atlantic. This line is carrying provisioning related to the following services:

- Greenstar Network connectivity between CANARIE and HEAnet, the Republic of Ireland's Research and Education network.
- Connectivity to extend JSTOR to European destinations over dedicated bandwidth. This provisioning is not yet fully completed due to lack of information regarding endpoints.

- The AtlantIC circuit providing 150Mbps of dedicated bandwidth between Imperial College and Georgia Tech.

6. Activities at SC11 supported by IRNC:ACE

The MANLAN facility was instrumental in supporting several demonstrations at the supercomputing conference, SC11, held in Seattle.

1. A demonstration by NTT of *Super Hi-Vision* (SHV) video transmission from the BBC in the United Kingdom to the show floor in Seattle. Dedicated bandwidth was provisioned between London and MANLAN while dedicated circuits were used elsewhere.
2. Dynamic Networking interoperability between the Internet2 ION service and GEANT AutoBAHN system was demonstrated. The SC11 demonstration included *Inter-Domain Controller Protocol* (IDCP) based multi-domain dynamic provisioning of services from the SC11 venue through Internet2 ION and into AutoBAHN locations in Poznan, Poland. The peering point between Internet2 ION and GEANT AutoBAHN is located in MANLAN. This demonstrated service interoperability between Internet2 ION and GEANT AutoBAHN along with the ability to dynamically set up dedicated resource network paths which spanned international links.
3. The Dutch science consortium was provided with a full 10Gbps complement of bandwidth to the show floor in Seattle. The entire bandwidth of the NLR-owned transatlantic circuit was between Amsterdam and New York. At MANLAN, the Ciena CoreDirector performed Ethernet-over SONET adaptations between the NLR circuit and an Ethernet line facing the Internet2 optical equipment. Onward transmission to Chicago and Seattle was provided on the Internet2 optical platforms.

New York (MANLAN) to Amsterdam network troubleshooting

Here we review troubleshooting and provisioning activities that occurred over the reported period of time. A substantial investigation was launched into reports of unidirectional packet loss from Amsterdam towards New York. Several new services were provisioned over the ACE circuit connecting London to New York. An experimental traffic analysis project was initiated at Internet2, based on the Traffic Sentinel software package from inMON Corporation.

1. Packet loss investigations

Reports were received from Internet2 that certain CMS and ATLAS sites based in the US were unable to sustain the expected data transfer rates to European destinations. Using an in-house developed tool called OWAMP, the Test and Measurement team at Internet2 detected packet loss from Amsterdam towards New York. The reverse

direction, in which traffic left the USA and was received by Europe, exhibited no losses.
We worked with colleagues at Internet2 in an attempt to isolate the issue to one of the two 10G paths. This was attempted by noting the one-way delay of each test. The undersea cable used by Hibernia is known to be longer than the AC-1 cable over which the Global Crossing circuit is provisioned. Tests exhibiting a one-way delay of 50 ms were assumed to have passed over the Hibernia circuit, while those with a delay of 38 ms were ascribed to the Global Crossing circuit. The early tests suggested the issue was restricted to the 'long' path, and so the initial investigations concentrated on the lines and hardware comprising this path. Subsequent tests that were conducted over longer timescales also found packet loss on the 'short' path.

There are just three possible causes of packet loss; a congested line, a line introducing transmission errors, or some equipment fault such as process switching or insufficiency of buffer memory. Traffic graphs were used to eliminate congestion. At MANLAN, every physical and logical interface in the path from Amsterdam was examined and no source of transmission errors could be found. We therefore concluded that an item of equipment was discarding packets that instead should have been transmitted on the connected line.

Two separate experiments were devised in order to determine whether the equipment at MANLAN was responsible for the packet loss. In the first experiment, a terminal loop was applied to the line-side Connection Termination Points (CTP) on the CoreDirector OC192 port facing the Hibernia Atlantic circuit. Additional configuration was required on the Juniper router and the Brocade switch so that traffic sent to the IP address of the GEANT test server in Amsterdam would be forwarded over the looped 10G path. All operational traffic was forwarded over the normal 10G path via the Global Crossing circuit which remained in service. The test server owned by Internet2 in New York was used to generate a stream of UDP packets (approximately 80Mbps) addressed to the test server located in Amsterdam.

Using a firewall rule on the Juniper router, packets were counted as they were forwarded towards the loop and counted again as they were returned by the loop. Once the traffic generation was stopped, the counts of egress and ingress packets were compared. In all cases, even on tests of several hours' duration, the two counts were found to be invariably equal and therefore it was concluded that no packet loss was being introduced by MANLAN.

The second test involved swapping the line-side termination of the two sets of cross-connects so that traffic entering from the Hibernia circuit traversed the other set of modules and lines across MANLAN. This was attempted because testing to-date had only indicated loss on the Hibernia-connected path, with no loss apparent on the Global Crossing path. If the loss were to cease following this change, then it would be reasonable to conclude that the original path across MANLAN taken by traffic received from the Hibernia circuit was the cause of the problem.

In that case, the cause could be narrowed down to either the Brocade module or the CoreDirector Ethernet module by swapping the 10G fibers connecting the two pairs of physical 10G ports on each device. If the loss were to resume after this second change, then the Brocade module in Slot 2 would be implicated while a continued absence of loss would implicate the Ethernet Services Line Module (ESLM) in Slot 5 of the CoreDirector. The following table shows the original connectivity path (A),

followed by that with the cross-connects swapped (B) and then with the fibers swapped (C).

Configuration	Brocade Interface	CoreDirector ESLM	Leased Line
A	1/1	1-C-1	Global Crossing
	2/1	1-C-5	Hibernia Atlantic
B	1/1	1-C-1	Hibernia Atlantic
	2/1	1-C-5	Global Crossing
C	2/1	1-C-1	Hibernia Atlantic
	1/1	1-C-5	Global Crossing

After swapping the cross-connects, the packet loss was still observed on the Hibernia path. A few tests also showed loss on the other path meaning that results from this test were not conclusive, but seemed to indicate some problem located in Amsterdam. Colleagues at the GEANT NOC eventually discovered some misconfiguration of their Alcatel MCC 1678 node. Changes to the amount of buffer memory allocated to the modules in this node substantially reduced the packet loss.

2. **Export of sFlow data**

Colleagues at Internet2 have begun a trial of the Traffic Sentinel product from InMON Corporation. The Brocade switches at MANLAN and WIX have been configured to export sFlow data to the Internet2 server. The data pertaining to the ACE circuits is being shared with the International Networks team at Indiana University.

3. **OFELIA connectivity**

A new circuit has been provisioned to facilitate direct connectivity between the University of Essex in the United Kingdom and the University of Sao Paolo in Brazil. This connection is related to the OFELIA (Open Flow in Europe: Linking Infrastructure and Applications) project. A static circuit of 1Gbps has been built at MANLAN and this occupies some bandwidth on the carrier circuit to London. The GEANT and JANET(UK) networks have extended the connectivity to the University of Essex. We coordinated the build-out of the connection through the Americas region, as it passes through multiple Layer 2 domains comprising Atlantic Wave (Washington), Southern Crossroads (Atlanta), AmPath (Miami) and RNP (Sao Paulo). At the time of writing, the connectivity from Essex through to the RNP switch has been confirmed. The extension to the University of Sao Paulo remains outstanding.

4. **JSTOR connectivity**

A new circuit to facilitate US-Europe connectivity for the JSTOR facility has been configured. Within the US, the Internet2 ION service is used to extend the connection

from MANLAN through to the ITHAKA offices in Ann Arbor MI. A static circuit occupying bandwidth on the bearer circuit to London has been provisioned at MANLAN. Colleagues at GEANT and JANET(UK) have extended to connection within the UK.

Software Defined Networking (SDN) Activities

Creation and development of wiki space to coordinate SDN activities among TransPAC, ACE, and Internet2 partners (see http://inddi.wikispaces.com/). Wiki space includes contributions from SDN stakeholders in the US, Europe, Asia, and South America.

A daylong OpenFlow workshop was conducted at the Joint Techs meeting in Baton Rouge LA. Johannes Trompert and Gerben Van Malenstein from SurfNET attended as registered students. Both requested that IU bring this workshop to a future TERENA event, as they thought it worthwhile and timely.

A static VLAN was created from the ION network to the InCNTRE OF lab at IUPUI. We can now connect a L2 circuit globally to Indiana University.

A Brocade switch was installed in SDN lab to evaluate potential OpenFlow switch capabilities. Brocade OpenFlow code is not due out until mid year.

Africa Activities

In collaboration with the NSRC, Ron Milford traveled to Nigeria to help conduct a weeklong workshop to train 35 network engineers from 20 Nigerian universities. The focus was on NREN & campus network development. Ron taught the BGP sessions, assisted with lab setup/configuration and assisted students during the labs.

Further information on the workshop including participants and presentations can be found at https://nsrc.org/workshops/2011/nsrc-ng-forum/wiki

Eventual future peering with the ACE network was discussed once the Nigerian NREN has been established and they are able to reach the peering exchanges in Europe.

Ron discussed IU's potential participation in one or two of these workshops per year in the future with Steve Huter and Dale Smith of the NSRC.

Progress was made on the US-Africa direct connection via London. Circuit is ready and peerings are being set up.

Measurement Activities

Hicks attended DICE meeting in Cambridge, UK where he discussed active and passive measurement plans with DICE partners. Specifically, DANTE agreed to provide active measurement hosts (currently 1G, plans but no dates for 10G) ‘near’ network end points. PerfSONAR resources will be made available, through DANTE, for the European side of the ACE network.

ACE staff met with Internet2 and GRNOC staff to discuss ACE measurement plans. It was decided the ACE will provide a 10G host for both US landing points (McLean, VA & MANLAN) for active testing. Resources at Indiana will handle the passive tests and web facilities. Further discussion is planned later this summer.

A request was sent to Internet2 to enable sFlow at MANLAN and WIX to collect ACE traffic.

The NSF has asked us to help build a database of science projects & collaboration (HEP - Atlas, CMS & “Tier-2 – Tier-3”, NIH, etc.) by tracking traffic profiles on TransPAC3 & ACE. The database would be used internally to look at traffic across the IRNC networks.

On the TransPAC3 side, we are collecting jflow and bgp information from the router and sFlow information from the switch. Using open source and Inmon software, we are able to partially satisfy this request.

On the ACE side, sFlow would give us the information needed to help with the NSF query. Alternative approaches may be impractical and unfeasible.

Here is what we propose (Similar to TransPAC3)

1. Turn on sFlow (ACE interfaces) and export to IU.
2. Raw samples analyzed to determine project/group membership.
3. Further analysis to see if a new group should be formed.
4. Raw data is kept for short time (similar to the Arbor system).
5. We hope to publish project information like "Project A used X amount of bandwidth or transferred X amount of data in a certain time frame".

sFlow is now being collected from the ACE circuit at WIX and MANLAN.

We are analyzing data for NSF project profiles.

A quote was requested for 1G and 10G measurement machines.

We prepared for perfSONAR implementation across ACE.

Security Events and Activities

Note: This information is duplicated in the TransPAC3 report, as activities are tightly linked.

Community Security Activity

Objective : Develop security information sharing relationships, and the means to proactively share security event and incident information, abetting security protection and response in and for the institutions in the respective research and education communities served by IRNC networks - US, EU, and AP.

On August 3, representatives of REN-ISAC and DANTE met to discuss progress and plans for security engagement. The representative from APAN for the TransPAC3 security activity was traveling overseas and unable to join the conference call, therefore the results of the conference call center on ACE deliverables - although some of the activities identified are pertinent to TransPAC3 as well.

Notes from that conference call are as follows:

IRNC Security Activity - Meeting Notes, 3 August 2011

Attending: Wayne Routly (DANTE), Gabe Iovino, Wes Young and Doug Pearson (REN-ISAC); Regrets: Yasuichi Kitamura (APAN)

Event and incident information sharing in REN-ISAC is supported by SES/CIF: http://www.ren-isac.net/ses.

In order for REN-ISAC to be prepared to start sharing security event information in the IRNC partner context, need to:

1. Develop scheme and incorporate support (programming) for marking data within/submitted to SES/CIF (e.g. okay to share with trusted partners, ...law enforcement, ...mitigation partners, ...remediation partners, etc.)

2. Develop scheme and incorporate support (programming) for support of groups

3. Communicate marking and sharing expectations and practices to REN-ISAC members

4. Have SES/CIF API discussions with IRNC sharing partners

In addition, REN-ISAC, DANTE, and APAN must develop an inter-federation sharing agreement. Doug will start work on the agreement.

Event and incident information sharing in DANTE is supported by NSHaRP: http://www.terena.org/activities/tf-csirt/meeting33/routly-nsharp.pdf

In order for DANTE to be prepared to start sharing security event and incident information in the IRNC partner context, need to:

1. Seek consent from DANTE members (NREN CERTs) for sharing data outside the DANTE project

2. Seek legal guidance regarding the more restrictive privacy laws of the Nordic countries and Switzerland, concerning Internet element identifiers (IP address, e-mail address, etc.); Wes mentioned that sharing conducted in European APWG context might serve as a model/guide for how to legally structure the sharing.

3. Depending on result of #2, possibly develop filters

Wes will provide Wayne with access to the ShadowSever instance of CIF so that Wayne can get a feel for the tool and capabilities.

DANTE is developing a project to bring multiple silos of security data into a unified interface. CIF might be a helpful guide. DANTE and REN-ISAC can work toward a common framework.

NSHaRP utilizes x-arf for input and output. Wes to look at writing x-arf-to-CIF and x-arf-to-RT modules.

November 2011 Routly (DANTE), Kitamura and Kasahara (APAN), and Iovino and Pearson (REN-ISAC) conference to discuss progress and action items

Kitamura reported that they will establish a SES/CIF instance based on REN-ISAC code. They are in process of acquiring the necessary hardware.

The instance will initially be an APAN Tokyo exchange point-specific implementation. They will need to give consideration regarding how to incorporate other components of the APAN community. Routly reported that progress is being made regarding his investigation of European data privacy considerations, and that there's positive outlook for a being able to construct a policy framework for sharing certain incident information. REN-ISAC reported progress on the programmatic support for marking data with SES/CIF for inter-federation sharing (e.g. okay to share with trusted partners).

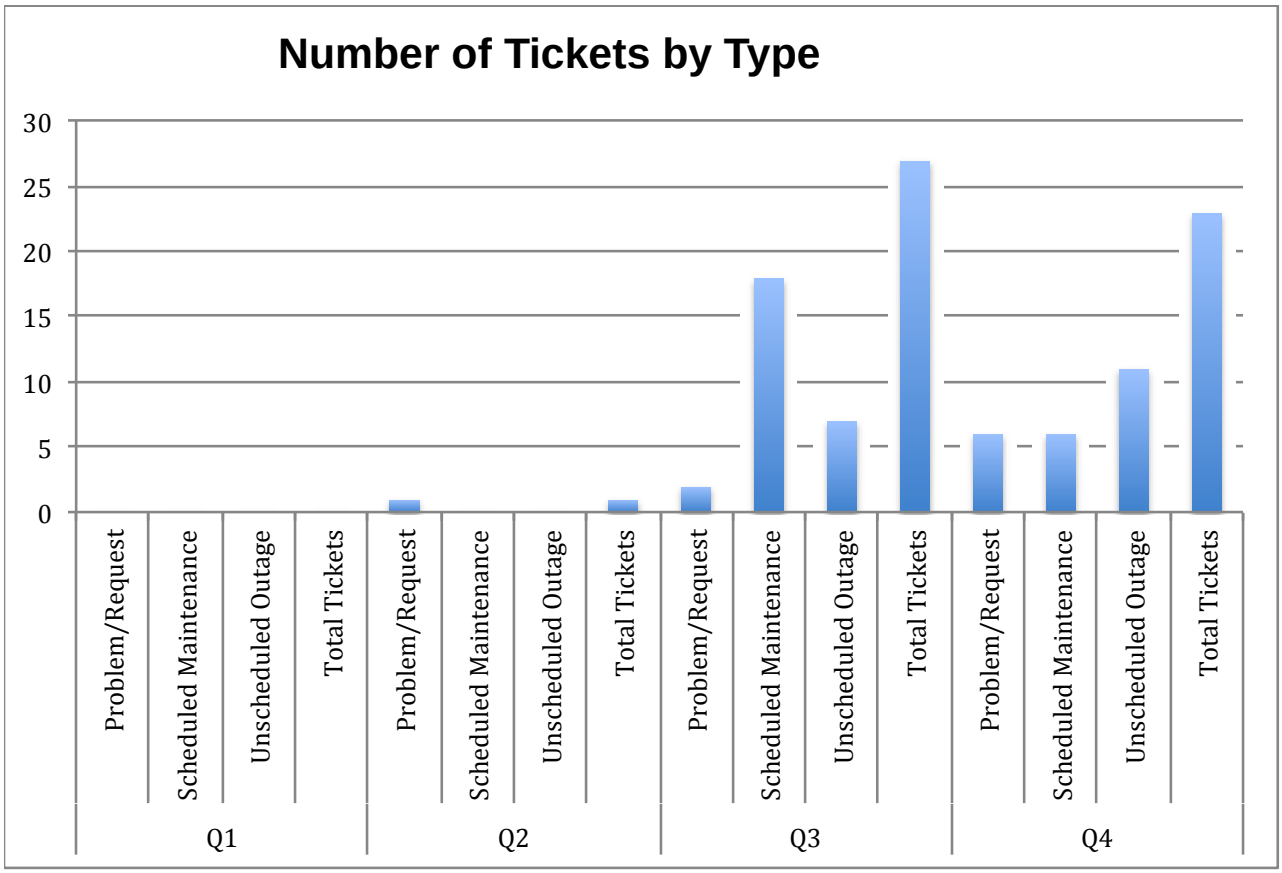
In the next quarter, we will expect to see progress on the APAN installation, a draft information sharing agreement, and progress on the X-ARF to CIF translation (for DANTE<->US sharing).

Hicks attended the NSF-sponsored Security at the Cyberborder workshop in Indianapolis, IN.

APAN (Kitamura, et al) has acquired hardware and begun implementation of a test instance of the SES system.

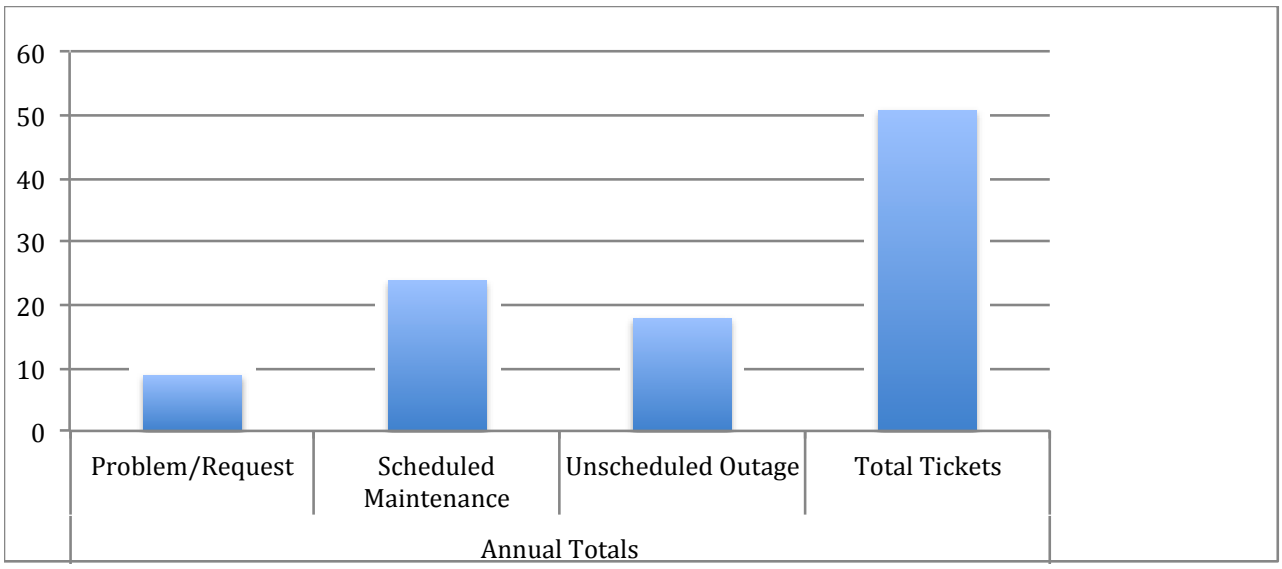
US (Pearson) developed a draft information sharing agreement and shared with APAN (Kitamura) and DANTE (Routly). APAN and DANTE will vet the draft within their communities

ACE, 2011-2012, Tickets Types by Quarter



*Note: During Q1 and Q2 the ACE circuit was pre production. Ticket in Q2 was for administrative tracking.

ACE, 2011-2012, Annual Tickets by Type



Plans for 1-March-2011 thru 29-February-2012 Annotated

1. Finalize RFP process, select vendor and implement circuits. <Done>
2. Attend and participate in DICE activities. <Limited DICE activities>
3. Set up general advisory structure for ACE, when circuits are in place. <In process>
4. Work with Internet2, Stanford and involved international participants to implement OpenFlow across the ACE infrastructure. <In process>
5. Work with Internet2 and GRNOC engineers to implement measurement resources for the new circuits <In process>
6. Establish a three continent dynamic layer 2 connection, with monitoring, for large data flows. <Done for SC2011>
7. Develop specific science support cases for ACE <LHCONE participation>
8. In cooperation with our partners, implement a new circuit between London and NYC to directly carry Africa (and UK) traffic to the US <Done>
9. Working with IRNC:SP projects to deploy, where deemed appropriate, new measurement and advanced service technologies developed in SP projects <In process>
10. Investigate capabilities to understand traffic characteristics mapped to NSF supported science applications, potentially including flow level mapping, measurement, and reporting <In process>
11. Work with NSF to provide greater insight into NSF-supported science projects and applications, which are directly supported and enabled by ACE connections and services. <In process>

Plans for 1-March-2012 thru 28-February-2013

1. Implement flow specific measurement technology for ACE (Sflow and Inmon).

2. Hold vendor meeting to review Year 2 of ACE and plan for Year 3.

3. Complete peering and publicize Africa connection.

4. Begin discussions with DANTE/GEANT about transatlantic bandwidth expansion (addition of a sixth 10G between the US and the EU) and 100G connectivity.

5. Re-architect the AMS-CHI ACE link to create a US-EU OpenFlow capable testbed and connect this testbed to the Internet2 iNDDI infrastructure.

6. Continue LHCONE activities and close cooperation with ESnet.

7. Export sFlow data from MANLAN and Washington exchange points for collection and analysis. (See #1 above).

8. Prepare for the transition of the NYC - London and NYC - Paris circuits due to GEANT removal of their SDH equipment in those cities as a part of the DANTE network wide equipment upgrade.

9. Coordinate perfSONAR infrastructure between ACE, Internet2, and DANTE' across transatlantic connections.

10. Prepare for the implementation of the DANTE Open Exchange in London. This will be a fairly simple but important step for DANTE (implementing an open exchange).

11. Participate in TNC2012 and SC2012, where DANTE will share booth space in the IU booth with ACE.

ACE Financial Details **3/1/2011 thru 2/29/2012**

ACE NSF, OCI-0962973					
Compensation	**1st Quarter total(s)**	**2nd Quarter total(s)**	**3rd Quarter total(s)**	**4th Quarter total(s)**	**Annual total(s)**
Williams, James	3,077.91	3,190.31	3,248.23	3,249.09	12,765.54
Graham, John	16,209.21	16,796.45	17,090.07	17,090.07	67,185.80
Wittke, Eric	1,232.25	1,175.38	0.00	0.00	2,407.63
Wagner, Kimberly	375.48	0.00	0.00	0.00	375.48
Meylor, John	0.00	2,958.82	29.01	0.00	2,987.83
Pearson, Douglas	0.00	0.00	1,478.71	887.22	2,365.93
Wiersema, Alisa	0.00	0.00	116.25	415.00	531.25
IC on Compensation	6,686.35	7,718.71	6,990.73	6,925.24	28,321.03
Total Qtr Compensation	**27,581.20**	**31,839.67**	**28,953.00**	**28,566.62**	**116,940.49**
Other Expense					
Metropolitan Printing Expense	0.00	0.00	0.00	0.00	0.00
Jacqueline Brown/Consultant	5,282.22	841.93	5,353.94	2,424.51	13,902.60
Travel-Williams/NSF Mtg, Washington DC	0.00	1,130.34	0.00	0.00	1,130.34
Travel-Williams/Science in Africa Meeting/Boulder Co.	0.00	621.16	0.00	0.00	621.16
Travel-Williams/ICEC/Brussels	0.00	1,572.43	1,554.90	0.00	3,127.33
Travel - Credit fr TERENA Registration	0.00	-742.41	0.00	0.00	-742.41
GLIF Funding paid to Terena	0.00	0.00	0	0.00	0.00
Wire Transfer Fee	0.00	0.00	60.00	40.00	100.00
Brocade Purchase - Maintenance	5,478.95	0.00	0.00	0.00	5,478.95
GoDADDY.COM	76.30	0.00	0.00	0.00	76.30
Travel-C. Small/APAN Travel Expense	0.00	0.00	0.00	0.00	0.00
Travel-Williams/London, UK & N. Ireland	4,535.00	0.00	0.00	0.00	4,535.00
Travel-Hicks/London, UK & N. Ireland	2,779.54	0.00	0.00	0.00	2,779.54
Equipment - Brocade Purchase	47,373.41	0.00	0.00	0.00	47,373.41
IC on Other Expense 32%	5,623.54	631.13	2,738.06	788.64	9,781.37
Total Qtr Other Expense	**72,070.01**	**4,054.58**	**11,294.50**	**3,253.15**	**90,672.24**
Circuit Expense					
Surfnet	0.00	116,716.00	75,920.00	104,595.60	297,231.60
George McLaughlin/Consultant Services	16,320.00	16,320.00	12,240.00	12,240.00	57,120.00
NLR	0.00	0.00	0.00	0.00	0.00
Hibernia Atlantic(OC-192 Connections)	0.00	0.00	113,551.65	85,119.53	198,671.18
Wire Transfer fee	60.00	100.00	80.00	140.00	380.00
Total Qtr Circuit Expense	**16,380.00**	**133,136.00**	**201,791.65**	**202,095.13**	**553,402.78**
Grand Total ACE Annual	**116,031.21**	**169,030.24**	**242,039.15**	**233,914.90**	**761,015.50**

IN@IU Internship Review
Eric Wittke

The International Networking Publicity Internship has been one of the most rewarding experiences of my college career. With the flexibility and trust embodied in the position, I have had the opportunity to translate my personal hobbies and interests into real world applications. More importantly, however, I believe that I have been able to enact an enduring influence upon the future success of Indiana University's International Networking initiative.

My personal career passion lies in public relations, publicity, and branding. I have also been heavily involved in web development and web design as a personal interest/hobby. This internship has allowed me to pursue both of these passions equally, providing a fantastic opportunity to build up my experience, portfolio, and to learn more about the scientific community. Throughout this internship, I've had the opportunity to maintain and improve the websites, construct a brand identity for IN@IU, become a part of the IN@IU team through correspondence with outside persons, and create print materials.

It is increasingly the case that any public service must have a robust online presence and a consistent brand image in order to maintain their credibility and social capital. When Jim spoke to me during my interview, he provided me the goals of nurturing IN@IU's success by forming a stronger identity and finding new ways to seek out clients and partners. Upon hearing this, I immediately set to work applying my skills in branding and social media networking.

I first set out to focus on the audience that I wanted to help IN@IU appeal to. Based on the NSF's 2006 survey research of the demographics of science, engineering, and health (SEH) doctorate recipients[1], I concluded the following about the target audience:

- ✓ Predominantly male - 5 : 2 ratio
- ✓ White and Asian dominated - 5.5 (White) : 1 (Asian) : 0.5(Remainder)
- ✓ Mainly between 35 and 59 years old

This demographic tends to have a very structured, mathematical way of thinking. They value succinct, concise information presented in an easily-presentable manner. Furthermore, they are educated thinkers, who need compelling, logical reasons for why to choose one service over another. With an awareness of these demographic qualities in mind, I set out to designing composing a concise visual brand image through print design, website design consolidation, editing and cleaning up online content, and designing a case study template to publicize and promote the services of IN@IU.

To further deploy this new brand image and to promote IN@IU's services to prospective SEH researchers, I set out to develop a social media presence. These services would promote the services by (1) providing updates on IN@IU activities, and (2) disseminating presentations, publications, media coverage, and other informative materials. By creating an the necessary presences on Facebook,

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[1] http://www.nsf.gov/statistics/showpub.cfm?SubID=6&TopID=14

Twitter, Scribd, and SlideShare, IN@IU is now firmly established in the channels necessary for it to cater its services in the most efficient manner.

For this demographic, it is important that the social media updates be linked to tangible events and incentives. For instance, rather than connecting with followers by social media conversations, the connection should be made by providing the incentive of learning about developments and activities at IN@IU, and providing them with informational materials.

With demographic ages ranging from 35 to 59, attention needed to be given to their general unfamiliarity with social media. Thus, conscious efforts were given to make sure that all of the information was very clearly labeled, in the most succinct and effective way possible. The different social media channels were created with their distinctive purposes in mind, and that fact was communicated through their every aspect. For instance, the IN@IU Facebook Fan Page was created as a linking hub for everything associated with IN@IU, and acts as a binding knot of rapport between IN@IU and any individual who follow it. The IN@IU Twitter feed serves the simpler purpose of providing easy, live, and even more concise list of updates and recent activities. Finally, the IN@IU website serves as the fuller source of more in-depth and complete information, while also providing links to the Facebook and Twitter pages for individuals and organizations to connect with it and "take a little piece of it home with them."

Initially, IN@IU's visual identity - both in print and new media – was very heterogeneous. To forge a more robust brand image, I normalized as many IN@IU products as I could into the same consistent visual identity. This included web sites, PowerPoint presentations, social media accounts, informational handouts, and case study templates. Furthermore, I brought as many materials as possible towards the brand guidelines of Indiana University while maintaining a distinct aura around IN@IU materials.

Finally, it must be emphasized the knowledge I have gained of the scientific community, international networks infrastructures, and the National Science Foundation. In sorting through the various projects, acronyms, technology names, and organizations, I formed a good knowledge of the way that the international scientific community is structured and how projects are born and carried out. Much to my delight, I learned of the great efficacy with which the National Science Foundation uses the nation's tax dollars.

To conclude, it is my hope that the work I have done for IN@IU will persist onward as it achieves a greater influence on the international and scientific communities. While striving towards my goals during the internship, I have learned much about my desired future in public relations as well as a knowledge of the workings of the scientific community and the efforts that support it.