

## **28 October 2004 HPR TAC Meeting notes**

- 1. Bash the Agenda – no changes**
- 2. Roll Call / Introductions**
- 3. Status Reports / Updates**

### **Chief Executive / Operations Officer (Jim Dolgonas)**

The CENIC Board attended a retreat on October 6-7. As of October 28<sup>th</sup>, the Board retreat minutes had not been published. Representatives from the Advisory Councils attended the retreat.

Michael Van Norman was thanked for his years serving as the Chair of the HPR TAC. Michael Scott of the University of California, currently serving as the HPR TAC Vice Chair, will become the Chair in 2005. Jim asked HPR TAC members for volunteers to serve as the Vice-Chair.

### **DCP Update**

Proposition 98 is now funding DCP. The Imperial County Department of Education (ICDoE) has been contracted to administer those funds. CENIC will continue to manage, operate and drive architecture initiatives on CalREN2 and within CENIC.

DCP will change to a new acronym to better reflect the purpose and capabilities of the statewide DCP network. The new network name is the California High Speed Network (CHSN).

The CHSN has \$21 million of funding this fiscal year. This is an increase of the FY2003-2004 funding from \$14 million. The ICDoE is looking closely at the CHSN. The California State Legislature has asked for a report from the ICDoE by March 1, 2005. The ICDoE will be looking into issues such as "is the CHSN necessary for K-12?" Consultants from the ICDoE will be working with CENIC, performing audit type activities.

CENIC is working on more high profile projects. One of these projects include a fiber circuit between the San Diego Supercomputer Center (SDSC) and the CUDI site in Tijuana, Mexico. This fiber circuit will replace the DS3 currently in place.

The CENIC Board wants to make a change with the Gigabit or Bust (GoB) initiative. The Board thinks the State of California needs to take on the GoB as its initiative and move it forward to stay on the forefront of technology and innovation. The Board would like to have a partnership with the State so the GoB

is a success. CENIC has had positive discussions with representatives from the Governor's office.

Jim Warner (UCSC) asked how the ICDoE activities and funding from Proposition 98 would affect the CalREN Video Services (CVS). Jim Dolgonas said that UC and CSU are operating via H.323. About one-half of the Community Colleges have migrated from H.320 to H.323. K-12 is evaluating whether or not CVS is worth using.

### **Chief Technology Officer (Dave Reese)**

The Coachella Valley project has been funded. A check from the Berger Foundation has been received. The Berger Foundation fully funded the fiber project. CENIC will begin building fiber infrastructure between UC Riverside, Palm Desert, Indio, El Centro and San Diego. Services will be provided by CWDM or CWDM GBICs. CENIC has a requirement to deliver four waves immediately.

CENIC is having discussions with entities in Arizona to build dedicated fiber circuits. Level(3) is not interested in stranding fiber through the desert. CENIC may build fiber between San Diego and Phoenix.

Discussions with Cisco regarding 15808 issues continue. Lots of good work is being made. Cisco and CENIC participate in conference calls each Tuesday and Thursday. Calls cover recent Cisco TAC incidents, 15808 optical and operational issues. The end-of-sales for the 15808 is slated for February, 2005.

CENIC will use 14454 transponder cards to add wave and channels to the backbone once 15808 components are no longer available. Twenty 14454 shelves are on their way to CENIC. CENIC is working toward collapsing the 15530s into 14454 shelves as well.

John Haskins (UCSB) asks about the footprint of the 14454 shelves. Dave responds that CENIC is waiting for permission from Cisco to distribute the presentation provided to him. The Cisco presentation answers these questions.

Replacing all of the 15808 chassis with 14454 shelves is a project that would cost millions of dollars to fund. It's not possible to place a 14454 between a 15808 transponders. A 14454 transponder must terminate on another 14454.

## **Director of Engineering (Brian Court)**

CENIC is evaluating the engineering aspects of implementing the 14454 units. The hope is to reduce the numbers and different types of chassis that CENIC supports.

Comcast and Time Warner peering agreements have been made, Comcast at LA and San Francisco. The pipes to the peering points are not constrained, but there are concerns about the peering routers themselves.

It's time to look at engineering changes in the HPR network. A straw man proposal is being made to the CENIC Board. Brian has asked the HPR routing committee to make recommendations for the HPR Next Generation requirements. HPR TAC members are asked to send suggestions to Brian ([bac@cenic.org](mailto:bac@cenic.org)).

Brian presented a request from the California Department of Emergency Services to use HPR in conjunction with the OASIS Satellite Network to provide video conference services between emergency workers in the field and experts at Universities.

The Bay Area Metro retrofit project has been completed. The metro backbone using the 15540s from Oakland through San Francisco and PAIX to Sunnyvale now fully 10gbps capable. Kudos go out to Chris Costa (CENIC) for managing the project and to ken lindahl and Michael Sinatra (UC Berkeley) for their expertise and dedication to a successful completion. .

**NOC** – unrepresented – nothing new to report.

## **DC-TAC**

The next DC-TAC meeting is Wednesday, 12 January 2005 at WestED. CSU Chancellor's Office is hosting the meeting.

## **Backbone Redesign/Coachella Valley Project (Dave Reese)**

This was covered in the **CTO** report.

## **MPLS and RSVP Forwarding - update and progress (Tom Hutton SDSC)**

Tom Hutton did not attend the meeting. no update available.

## **HPR-TAC representative to BAC (Jerry Keith – UC Riverside)**

Jerry asks for a TAC member to join the BAC session to help guide technical discussions. The effectiveness of a TAC member is greatly diminished when they leave the TAC meetings. Jerry will look at holding the BAC meetings on separate days. That way, perhaps a TAC member would be willing to participate in the BAC meetings.

## **CENIC 2005 (Jerry Keith)**

The 2005 CENIC conference will be held at the same Los Angeles hotel that the 2004 conference was held. CENIC was very happy with the facility and service. There will be more space for vendors. The hotel has been willing to do whatever CENIC needs for networking. They are willing to allow a line-of-site optical connection to ISI. A test will be performed in November. If you are interested in participating in the testing activity, contact [jerry.keith@ucr.edu](mailto:jerry.keith@ucr.edu).

Jerry is asking for help early and will target your e-mail address to promote the CENIC 2005 conference. The electronic sign-up site is supposed to be up in November. The site recommends signing up early – it's less expensive for attendees.

Jerry is now looking for more technical papers for presentations. Do you know someone on your campus that can contribute presentations?

## **HPR-TAC vice-chair (mike scott – UC Irvine)**

Please contact Jim Dolgonas ([jdolgonas@cenic.org](mailto:jdolgonas@cenic.org)) if you would like to be the Vice-Chair for calendar year 2005, or to nominate someone for this position.

## **Backbone MTU (Chris Costa)**

This was a long discussion topic. Chris Costa provided a presentation in Power Point. A PDF of that presentation is available by aiming your browser at:

<http://www.cenic.net/tac/hpr-mtu-discussion-28oct04.pdf>

some points made during the discussion:

1. 9000 vs. 9180 octet length frames is truly trivial. The I2 community is leaning toward frame sizes of 9000 octets in length.
2. MTU discovery will be configured on CENIC gear.
3. MTU discovery seems to be broken at many sites on the commodity internet (Warner).

4. RFC 1918 address space answers incorrectly as well (Van Norman).
5. Though we are discussing HPR, some sites in HPR use RFC 1918 address space. So, MTU discovery will break.

### **Black Hole Route Injection and Peering Options (Nitesh Bondale - UCLA)**

UCLA, UCSB and CENIC are participating in trying out the BHRI project. Brian raised an issue distributed earlier via e-mail. CENIC sets BGP multi-hop to campuses. Campuses set multi-hop to CENIC. It works, but seems a bit strange. A discussion about the inter-workings of BGP ensued. It was decided that the issue Brian presented was actually correct, though confusing – was working properly.

Once testing is complete, CENIC will distribute information to the HPR TAC about injecting BHR.

A long discussion about Black Holing and Policies ensued. CENIC does not want to be an arbiter deciding what service ports and IP addresses are blocked. That should be a campus decision.

During the discussion, Brian reminded the TAC that the Cisco 4003 switches connected to the EGM circuits do not support jumbo frames. This is a limitation of:

1. The supervisor 1 installed in the switch.
2. The more sophisticated supervisors cannot be installed in the 4003 switches.

This lead the discussion to the last item on the agenda:

### **EGM / Optical splitters (Brian Court)**

UC Santa Cruz performed tests using various optical splitters.

1. Use of high quality optical splitters is a must.
2. One cannot cascade many optical splitters.
3. Splices on campus fiber seem to be insignificant as far signal quality goes.

The EGM equipment is not frame or octet oriented, it understands encoding. EGM doesn't care about frame of any size. The optical splitters are installed in such a way that a wave is separated, bypassing the 4003 switch and fed to a different interface on the campus router. This presents an operational/network management issue for CENIC. CENIC needs/desires an active, CENIC

manageable termination point on the end of the wave to help resolve problems reported to the NOC. Passive optical devices provide no control point.

ken lindahl asked to for a cost to upgrade the 4003 switches to a platform which would:

1. provide jumbo frame support.
2. provide a way for the NOC to monitor service.

Brian Court will provide a cost to the TAC for supporting jumbo frames at UC sites.

### **Classful routes for DC, HPR, ISP (Nitesh Bondale)**

If there was a discussion about this, the note taker failed to record it.

### **Performance Measurement and Goals (Russ Hobby - Internet2)**

Russ asked for commitments from campuses to get P&M tools operational. The equipment required to participate at the campus is a decent PC box, with a good Ethernet NIC. The PC needs to have the BWCTL tools loaded.

The testing bandwidth limits for 1gbps pipes currently feeding HPR sites need to be determined. It seemed that a 500Mbps stream for a period of 30 seconds would be acceptable. Other questions that arose:

1. Where should the scheduler reside?
2. Where should the database with results reside?

Iperf can use UDP or TCP, but the control setup is TCP. UCLA uses ACLs on their router to block Iperf connectivity over DC and the commodity internet. It is undesirable to flood the two 1Gbps interconnects to DC (or CHSN).

Mark Boolootian and Michael Van Norman are willing to lead the effort promoting this project. Mark or Michael will make a mail listserv for performance testing and get people on it to exchange ideas and coordinate work.

Jim Warner adds that Cisco has a toolbox built into IOS that measures one-way jitter, latency, etc. the toolbox has had various names such as RTT. The current acronym is SAA (Service Assurance Agent). Jim asked if anyone has tried it and is it of any use?

Russ said a cookbook may be available for performance measuring at the next TAC meeting. There may even be some statistics available.

## **DDoS blackholing (Mark Boolootian – UCSC)**

Mark has been very active in the anti-BotNet vulnerabilities community. Discovering and fixing machines is inefficient. Discovering the command and control systems of BotNets are being performed. Disabling access to the internet for these machines is a lot more effective than finding compromised client machines. Mark advocated CENIC perform the discovery and blocking of hosts connected to CalREN2.

Brian Court stated that the HPR-TAC historically has not wanted the NOC to apply ACLs on the backbone without the request coming from a campus. The DC Policy is that the NOC will not apply ACLs affecting connectivity to the network without campus permission.

Brian pointed out that the RANCID back ups reveal the ACLs. It was suggested that the /32 route could be configured a router that is not backed up by RANCID.

Some campuses would prefer to blackhole the route at the campus. Having an outside entity perform that function may lead to confusion when campus personnel troubleshoot problems.

Brian asked: if we can't do this on DC because of the DC Policy, what good does it do to perform it on HPR? A long discussion about how to implement, what the implications of and what is or is not acceptable ensued.