MASSACHUSETTS INSTITUTE OF TECHNOLOGY

HAYSTACK OBSERVATORY

WESTFORD, MASSACHUSETTS 01886

Telephone: *978-692-4764*
Fax: *781-981-0590*

25 November 2003

TO: Distribution

FROM: David Lapsley

SUBJECT: 17 November 2003 e-VLBI telecon summary

Attendees:
Lee Foster, Kevin Kranacs, Paul Lang, Mary Shugrue, Bill Wiles – GSFC
Terry Gibbons, Rick Larkin, Russ Roberge – MIT Lincoln Lab
Dennis Baron - MIT
Tom Lehman - ISI-E
Kevin Dudevoir, Hans Hinteregger, David Lapsley, Alan Whitney – Haystack Observatory

This telecon is one of an ongoing series of telecons to prepare for gigabit/sec e-VLBI demonstrations between NASA GSFC and MIT Haystack Observatory using a combination of network facilities including all or part of Glownet, Bossnet, ISI-E, SuperNet, Max and GSFC/HECN.

ACTION ITEMS ARE HIGHLIGHTED IN RED.

Glownet/Bossnet

Changes in Status

David Lapsley reported on a few network hiccups. Currently working with Tom and Terry to track down. Isolated a problem with Dell Powerconnect switches which had IGMP enabled by default so that when Multi-cast was enabled at ISI-E Dell switches responded to IGMP queries with a flood of packets. IGMP now turned off on the Dells. Still seeing intermittent loss of gigabit Ethernet between Lincoln Labs and ISI-E.

Tom Lehman reported that it did not seem to be a physical layer problem. The gigE service is up for 6 hours and then down for 3 hours. Cycling. Currently looking at what the issue is, a few clues, but still narrowing down possibilities. Problem seemed to start when Multi-cast turned on at routers, since then, multi-cast has been turned off on the routers and the Dell switches. Need to do further research to work out what the problem is.

Terry Gibbons suggested dropping the M20 at Lincoln Labs out of circuit to see if Haystack can still reach ISI-E/Japan. He thinks it is either an Extreme switch or the M20 that might be causing problems. The M20 is not currently being used to route traffic between Haystack and ISI-E, but there may be some Layer 2 interactions affecting routing.

Tom reported that one problem is that we can't log in to some of the switches to see what their state

is during outages. Makes it difficult to troubleshoot network problems. Doesn't seem to be physical layer. Seems to be interaction between Extreme switches. When gigE goes down link lights are still up, but can't ping between ISI-E and Lincoln Labs. David can reach one of Tom's hosts at Lincoln Labs (Superglide) from Haystack, but can't ping from Superglide to the M20 at ISI-E (.1). Tom can't ping Superglide or the M20 at Lincoln Labs. The M20 can't see superglide.

Kevin Kranacs suggested that the forwarding tables could be messed up. He said that he had seen similar problems in the past with SMC switches. Show fdb/show mac to see if ARP tables are messed up.

Tom said that we can't get fdb information for the Extreme switches because we don't have login accounts on those switches. Need that information in order to troubleshoot during network outages. He also suggested disconnecting the Dell switches from the network to make sure nothing is going wrong with their ARP tables. Terry suggested removing the M20 from network first.

Kevin said that one way would to access this information would be to have a telnet script executed from a user account to retrieve this information. He had seen a similar problem with SMC switches. When an SMC switch was messed up, the switch it was attached to was also confused. The SMC switch was passing back MAC addresses even for the Extreme switch. Link aggregation between SMC and Extreme would work fine for a while, then die. A reboot of the SMC switch or shutting off the link to the SMC switch was required in order to reset the system.

Rick Larkin said that he and Russ Roberge manage the Alpines at Lincoln Labs and Westford and should be able to get access to the Summits at Westford. They can help support coordinated testing. The Alpines are considered production switches (they service a lot of other users). The Summits are dedicated to Haystack and Westford.

Tom suggested having another meeting after the call to discuss coordinated network testing.

Additional Wavelength on BOSSnet

Tom raised the issue of the End-Of-Life Cisco1500 transponders that would allow the addition of an OC48 wavelength between Haystack and ISI-E. He mentioned that he had seen a follow up email from David on this subject.

David reported that it doesn't seem like anyone can get hold of the OC48 Wave Channel Module that would allow us to add the OC48 wavelength onto BOSSnet using the existing Cisco 1500 equipment. He had spoken with two second hand equipment vendors and they could not get their hands on it. He had also called Cisco and escalated it and spoken with salesman who said that he might be able to get the part but had not heard back from him since then (a couple of days ago).

Tom said that he didn't have any luck either to getting hold of this part.

Alan mentioned that we still have the JDS Uniphase option, which would look at using optical components to map the additional wavelength to a suitable wavelength for transport across BOSSnet.

David reported on the Caltech M10 loan. He said they were very positive when we first discussed, and sounded like they were ready to ship it, but he had not heard back from them yet. He will get back to them and report.

ACTION ITEM: Tom, Terry, Rick, Russ and David to continue network testing/troubleshooting.

ACTION ITEM: David to check on availability of Juniper M10 router.

e-VLBI Testing/Experiments

Kevin Dudevoir gave an update on the German and Hawaii connections. He said that Wetzell has fiber installed and up to the University of Regansberg (34 Mbps). They are currently testing this link and should have a test server up and running later this week. They are currently testing and want us to hold off testing until they have completed their testing. Hopefully it will be possible to start testing sometime later this week.

In Hawaii, there has been another personnel change. Previously, Kevin had been dealing with Chris Blackstadt. Subsequently, he was supposed to deal with Patrick Alvarez. He is now working with Evelyn Tran. They are currently installing a new OC-3 radio link. The project has been completed and they are currently testing so that they can do a formal turnover to the maintenance contractor. There is no rigorous timetable for this turnover (1-2 weeks). Hopefully it will be possible to start testing within a week or so.

David gave an update on an e-VLBI experiment he is currently doing to Japan. He has been running an experiment between Kashima and Haystack since 31st October. Data from two VLI sessions has been recorded using the Japanese K5 system. The Japanese have converted the data to Mark5 format. David has been transferring this data for the last couple of weeks. There is 440GB of data, 220GB for each session. David has just finished the first transfer. Currently, the data is being transferred via the Japanese corporate link as their high speed link has gone away (they are looking at getting this back at the end of the year). Current corporate link is limited to 100 Mbps. David is trying to be gentle with this link so that the transfers don't bring down corporate email/web surfing etc. and so is limiting the transfers to ~ 20-30 Mbps.

Alan Whitney mentioned that David had emailed the Internet2 demonstration write-up earlier today. If you did not get a copy of this report, let Alan or David know and we can forward it to you. We will also put it up on the e-VLBI page.

ACTION ITEM: Kevin to follow up on testing to Wetzell and Hawaii.

ACTION ITEM: David to continue e-VLBI experiments with Japan.

Performance Testing

David reported on a few developments in the performance monitoring area. Andy Germaine has been kind enough to put us on his performance monitoring test site. Currently have tests between GGAO, and one other site to Haystack. Tests periodically measure throughput, round trip time, loss, routing hops etc. To view the results of these tests, go to:

http://ensight.eos.nasa.gov/Organizations/esto_ct/Haystack.shtml

Locally, we have installed performance monitoring software at Haystack. Currently looking at two of our Dell switches and keeping track of all of the interfaces and traffic coming in and out. If anybody is interested in looking at this, then send David the IP address of the workstation you will be viewing the results from and he can give you access to this site. We have also downloaded the Dell MIBs, and will be installing those soon. Our MRTG server is behind our firewall, so send David your workstation IP address and he can add you to the access list.

Currently, we are working with Internet2 to deploy a prototype of what will be their End-to-end performance initiative framework for doing performance monitoring. We have deployed that software locally and looking at deploying it on other VLBI test servers. If you are interested in this software, let David know and he can forward this software to you.

Kevin Kranacs reported that Bill has just updated his nuttcp to have a third party functionality where you can initiate a test between A and B from C and have result sent back to C. Useful feature to have.

David reported that he spoke to Internet2 people about nuttcp and also spoke to Bill Fink about this. He mentioned that he had been using it for some of his e-VLBI performance tests Internet2 folks are currently looking at integrating it into their prototype performance software. David had spoken with them about some of the nice features that nuttcp has. Bill forwarded him the latest version so he has forwarded that to Internet2.

Kevin also reported that Goddard is supposed to be getting their Force10 switch in the week of thanksgiving. They will start testing it at this point.

Funding Opportunities

Alan reported that the UltraLight project is being resubmitted again. This proposal was to the NSF Physics division. The Program is called Physics at the Information Frontier. Harvey Newman is leading the proposal for High Energy Physics. Haystack is seeking funding from the Astronomy division and not from the Physics division. We should know the result in a few months. Work for the new proposal is aimed at helping to build the Astronomy infrastructure. Some testing work, but not too much:

David reported that the proposal would look at how to integrate e-VLBI applications, for example, the Experiment Guided Adaptive Endpoint, into the infrastructure that the physicists use. They have a few tools that they use for resource management, provisioning bandwidth and controlling job distribution across their networks: MonaLisa and GEMS. Haystack will also be doing a study of connectivity across US telescopes and how this can be improved. Haystack will also be involved in running proof-of-concept tests to prove how we can connect up to those telescopes at high bandwidth. Servers will be distributed to some of these well connected telescopes. To not-so-well connected telescopes, servers we will be distributed to the POPs that are closest to them.

Tom reported that DRAGON will have a kickoff meeting sometime in December. Need to look at how we can better integrate NASA resources, connect USNO in, increase the amount of bandwidth we can get up to Haystack. There are significant architecture issues to discuss. Want to tie USNO and GGAO in a bit more robustly than currently. He asked Alan if he had a plan for connecting USNO in to the network.

Alan said that we have had a solid plan for more than a year to connect USNO to the high speed network but USNO has not responded with the modest funds required to make it happen. We are trying to keep this active, but can't say when that will happen.

Tom also said that the DRAGON program will have new optical gear using GMPLS to control optical resources. Looking at putting some optical gear over at Goddard. Talked to Pat Gary about this. Need to work out optical engineering and implementation to locate optical gear at College Park, Goddard and ISI. This equipment is from Movaz Networks. Need to have discussions with Pat and

other people at Goddard to figure out how this will fall in to place.

Alan said that we are a still expecting the loan of an M10 router from Caltech that will allow us to connect to ISI-E. Hoping to connect to ISI-E at CO48.

Miscellaneous

Denis Baron, asked whether the Haystack to NOX connection still has a 10 Mbps limit.

Alan said that this hasn't changed. Haystack is still interested in pursuing possibilities with NOX. Right now, with BOSSnet we can do quite a bit of work with this link at relatively low cost. Has anything changed at NOX?

Dennis, NOX still has an OC48 connection to Abilene. Still has 2 Gbps of unused bandwidth on it. Also working with NICERnet(?) in New York and some other people in New England about getting dark fiber into Boston. NLR is still trying to get more participants (with $5 million over 5 year commitment rate). MIT still has not figured out how this would work. Getting dark fiber to New York would help to get us access.

Next telecon

Next telecon is scheduled for Monday, 8 December 2003 at 2 pm EST.

cc: Steve Bernstein, LL
Jim Calvin, LL
Rick Larkin, LL
Lorraine Prior, LL
Peter Schulz, LL
Leslie Weiner, LL
Herbert Durbeck, GSFC
Bill Fink, GSFC
Lee Foster, GSFC
Pat Gary, GSFC
Andy Germain, GSFC
Chuck Kodak, GSFC
Kevin Kranacs, GSFC
Paul Lang, GSFC
Aruna Muppalla, GSFC
Mary Shugrue, GSFC/ADNET
Bill Wildes, GSFC
Dan Magorian, UMCP
Tom Lehman, ISI-E
Jerry Sobieski, MAX
Guy Almes, Internet2
Charles Yun, Internet2
Richard Crowley, Haystack
Kevin Dudevoir, Haystack
Hans Hinteregger, Haystack
David Lapsley, Haystack
Arthur Niell, Haystack
Joe Salah, Haystack