MASSACHUSETTS INSTITUTE OF TECHNOLOGY

HAYSTACK OBSERVATORY

WESTFORD, MASSACHUSETTS 01886

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

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TO: Distribution
FROM : David Lapsley
SUBJECT: 2 August 2004 e-VLBI telecon summary

Attendees:

Bill Fink, Lee Foster, Pat Gary, Chuck Kodak, Kevin Kranacs, Mary Shugrue – GSFC
Kevin Dudevoir, David Lapsley, Arthur Niell, Jason Soohoo, Alan Whitney – Haystack
Tom Lehman – ISI-E
Charles Yun – Internet2
Russ Roberge – Lincoln Laboratory

This telecon is one of an ongoing series of telecons to prepare for 10 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, DRAGON, MAX and GSFC/HECN.

ACTION ITEMS ARE HIGHLIGHTED IN RED.

Bossnet

David Lapsley reported on the status of the upgrade. Russ installed final Movaz Ray Express at the Millstone RPE building last week. All REs racked and powered up. August 13th will be the day that the REs will be commissioned. The Movaz engineer, Richard Solis will come up on the 12th to configure the REs. They will also use an Optical Spectrum Analyzer to measure the power levels going into Glownet. Conference call on Friday 6th to discuss final details.

Tom Lehman reported that RE at Eckington installed, looking for a way to patch it into ISI-E. If everything goes well on Friday 13th, then we may be able to do end to end OC48 tests then. Goddard connectivity is still an open question. Need to find a way to terminate the OC48. Needs to be discussed further. If there is a spare M20 chassis at Goddard, Tom can loan some of his M20 OC48 blades (they do not work in the M10 chassis). One other option would be to land OC48 on Tom's router and then split it out into 1 GE.

General discussion on architecture and how/where to terminate OC48 from Haystack. Possible to terminate in Eckington? ISI-E? Where would be the best for various scenarios? Need to be able to direct traffic from Haystack to Abilene and also to Goddard. Currently M40 at ISI-E connected to

MAX and to Abilene. Possible to move M40 to Eckington? Need to co-ordinate with Jerry and others for network architecture.

Russ Roberge gave an update on Glownet and LL connectivity to MIT campus. LL Front router that faces internet is also a connection to Internet2. LL connection to campus is via Internet2 connection. This is on the same router that connects LL to regular internet. Connection to Internet2 at 230 Congress St is a gigE. Due to Cisco router limitations, can't achieve line rate. Upgrade of Haystack connection to LL goes through same pipe as Haystack regular internet traffic.

Pat Gary reported that DRAGON Fibergate fiber has been installed and some characterization has been done over the last two weeks. Fibergate fiber has been characterized. A bit more loss than expected may need to resplice. May be useable. Still need to determine what equipment to use to terminate at Goddard to upgrade GGAO connection.

e-VLBI Experiments

David reported on e-VLBI experiments. Continuing with e-VLBI transfers. Latest experiment from Tsukuba. New station. Second experiment. 2.4 TB transfer spanning multiple disc packs. Largest transfer to date. Started to look at "cluster computing" techniques and parallel processing. Kevin, Jason and David have been looking at how to re-architect software we are using for the future. Currently prototyping some ideas to speed-up transfers and file conversions. Mini-cluster at ISI-E being used to test some of these ideas.

Also looking at doing some real-time demonstrations. At the end of the month, Onsala, Westford, GGAO and Kashima. Looking to schedule telescope time for this experiment. Looks like 27th August. Looking at getting dedicated lambda from Onsala. Talking to people from SURFnet and SUnet.

Supercomputing demonstration. Tom and Jerry discussed more at DRAGON meeting last week. Narrowing scope for this. Have a meeting soon to discuss. Tom noted that we are planning to move forward with this demonstration. Look at doing real-time with Onsala, Westford and GGAO. Correlate at Haystack and export display back to showroom floor. Jerry at SC this week, so may be able to get more information on how to tie in Onsala.

Discussion on Supercomputing demonstration. Need to nail down time for demonstration. An EVN experiment spanning the demonstration times, but very likely that we can get one or more windows of two+ hours for demonstration. Demonstrations normally run Monday, Tuesday, Wednesday evening. Can also run canned data from Onsala.

Discussion on cluster computing. At the moment we have two general purpose computers and a Mark5. This is enough to show speed-up. Ideally would like to expand to 4 and then hopefully more. Still proto-typing software. Trying to offload processing off Mark5 onto general purpose computers (e.g. conversion of file formats). Currently using LAM/MPI as general cluster environment to allow us to spawn processes across computers in cluster. Then have pipeline with various tasks (e.g. getting data from remote location is one task, then spawn another task to convert data, then spawn task to transfer

data to Mark5). Ideally, want to do this is a stream of data in real-time. Currently working pretty well, able to make practical use of this. Think that this is a good direction to go in.

Pat indicated that this would be of interest to people with clusters and that some of these techniques may be able to be re-used for other applications.

For Tsukuba transfer bottleneck is conversion process, about 40 Mbps on a single processor. Throughput is 50-60 Mbps. This transfer not too smooth due to issues with server availability at remote side as well as server crashed due to high CPU load. Still a few teething problems. The intent of VSI-E is to have the source doing conversion to standard format. Hopefully this will make things smoother.

Kevin Dudevoir reported on Wetzell and Kokee intensive experiments. Regularly transferring data from intensives. Five times per week transfer of hour long intensives. Sessions record at 128 Mbps for about 30 minutes. Able to transfer data from Wetzell at 30 Mbps to Haystack (34 Mbps channel). To ISI-E average 28 Mbps. Kokee averaging about the same (28 Mbps). Transfers are pretty much autoamted. Data repository at each site. Data transferred from Mark5 discpack to System disc. Then transferred to ISI-E or Haystack. Data can be carried to USNO from ISI-E or correlated here at Haystack. Occasionally problems connecting to Kokee. Path is assymetrical. East-bound goes through Abilene. West-bound go through DREN. If channel idle for a long time, then need to run a traceroute to Kokee from ISI-E to start traffic flowing.

Discussion on connectivity to Kokee. Traceroute needed to “wakeup” connection after long idle time. Possible that it is tickling a firewall somewhere. Can’t ping destination until after traceroute has been run. First traceroute from ISI-E to Kokee works. Traceroute from Kokee to ISI-E doesn’t work.

Kevin reported that we have added a second Mark5 at ISI-E temporarily. Tom has installed that for us. Using that for intensive transfers.

Performance Monitoring

David reported that Jason is currently bundling the NSDB software. RRDTool has been added as the back end. Much more scalable backend. A lot nicer to use than initial text based platform. Now consolidating pieces of software, bwctl, RRDTool, the software Jason has written NSDB and a few other bits and pieces required into a single package so that it is easy for us to distribute to remote computers and also for anyone else interested.

David reported that there was a conference call with Andrea, Aruna, George and other people in Pat’s group to discuss testing. Currently writing scripts for testing. Servers setup now and ready for testing.

Discussion of transformations at GSFC. Pat mentioned that interest in connecting to National Lambda Rail and work with DRAGON is continuing to increase.

Next telecon is scheduled for Tuesday, 24th August 2004 at 2 pm EDT.

cc: Steve Bernstein, LL
Jim Calvin, LL
Rick Larkin, LL
Peter Schulz, LL
Terry Gibbons, LL
Russ Roberge, LL
Bill Fink, GSFC
Lee Foster, GSFC
Pat Gary, GSFC
Andy Germain, GSFC
George Uhl, GSFC
Kerry Kingham, USNO
Chuck Kodak, GSFC
Kevin Kranacs, GSFC
Paul Lang, GSFC
Aruna Muppalla, GSFC
Mary Shugrue, GSFC/ADNET
George Uhl, GSFC/ADNET
Bill Wildes, GSFC
Dan Magorian, UMCP
Tom Lehman, ISI-E
Jerry Sobieski, MAX
Dennis Baron,
Guy Almes, Internet2
Charles Yun, Internet2
Richard Crowley, Haystack
Kevin Dudevoir, Haystack
Hans Hinteregger, Haystack
David Lapsley, Haystack
Jason Soohoo, Haystack
Arthur Niell, Haystack
Mike Titus, Haystack
Joe Salah, Haystack