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TO: Distribution
FROM :   David Lapsley
SUBJECT: 22 November 2004 e-VLBI telecon summary

Attendees:

Bill Fink, Lee Foster, Pat Gary, Paul Lang, Bill Wildes – NASA GSFC
Chris Tracy – MAX/DRAGON
Kevin Dudevoir, Hans Hinteregger, David Lapsley, Arthur Niell, Jason Soohoo, Mike Titus,
Alan Whitney – Haystack
Tom Lehman – ISI-E
Charles Yun – Internet2

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.

Super Computing 2004 Review

Tom Lehman reported that it was overall a very positive experience. Real-time e-VLBI demo done at 512 Mbps. Visual display on showroom floor worked out very well. Several people at NSF including Kevin Thompson indicated that they were pleased to see the integration of e-VLBI with the network capability. Kevin Thompson would really like to see us pushing the envelope and adding more and more capability to e-VLBI. He would like to see it more automated, particularly with network provisioning. Definitely worth the effort. Effort greatly appreciated. Would be good to keep pushing on towards 1024 Mbps.

Alan Whitney agreed that the demonstration was very successful. A lot of behind-the-scenes work and preparation. Demonstration went well and impressed a lot of people.

Tom reported that Kevin Thompson came by on Thursday and viewed the canned data e-VLBI experiment.

Alan reported that a note had been sent out and a website with information about the demonstration and a few photos.

General discussion on SuperComputing conference and importance of lambda networking. Next year conference is in Seattle. Plans for a bigger and better demonstration in 2005.

1024 Mbps

Kevin reported that he is preparing to do 1024 Mbps testing with Westford and GGAO sites. He is just about to start back to back testing of a new Mark5 platform with more capable computers than current Mark5 platforms. 1024 Mbps has been done between a single Mark5 and a data source/sink on the network. Planning to send a new platform down to GGAO and do a 1024 Mbps test. Code used to do initial 1024 Mbps test being integrated with Mark5A software. Hopefully test 1024 Mbps between two Mark5's late this week or early next week. Channel bonding of 2 x 1 Gbps Ethernet interfaces used to get throughput beyond 1024 Mbps. A single new Mark5 with more capable motherboard and 2 x 1 Gbps Ethernet interfaces will be sent to GGAO.

General discussion on network infrastructure required to support 2 x 1 Gbps Ethernet connections from GGAO to Haystack. Generally agreed to use current model using CCC into MPLS LSPs.

Kevin reported that he is also looking at using Raptor dual port Gbps Ethernet cards to see if 1024 Mbps throughput is possible from existing platforms. Kevin doesn't think it is very likely that this will work on existing Mark5 Pentium III platforms as there are issues with the shared PCI bus.

Pat Gary mentioned that his group had loaned an Extreme Networks Summit 400 10 Gbps capable switch to GGAO for the SC demonstration. However, he would not be able to keep the loaner switch at GGAO. The cost to purchase one of these units is 17 K with 2 x 10 Gbps connections.

Network Changes

David reported that there had been no changes in the network at Haystack.

Tom reported on the changes to the network for the Supercomputing demonstration. Supercomputing configuration involved some loaner equipment from Juniper, which has since been returned. GGAO to Westford connectivity still in place, but not using exactly the same configuration as for the Supercomputing demonstration. Tom also reported that DRAGON would be getting some new equipment. In addition to new transponders, two new switching elements would be added.

Pat reported that they were planning to do 10 Gbps across the DRAGON network. Currently can do 10 Gbps from GGAO to building 28. Would like to do 10 Gbps across DRAGON. DRAGON planning to order 10 Gbps transponders.

General discussion on evolving architecture of DRAGON network and new equipment to be ordered.

VSI-E and EGAE

David reported that he is finishing off the latest release of the Experiment-Guided Adaptive Endpoint

software. Part of this functionality was used for automating some of the SuperComputing demonstration. This is a control plane for the Mark5 system that allows the integration of multiple Mark5 systems and controls the transfer of data between them. Also integrates with VSI-E software for transporting data in standard format (especially between Mark5 and non-Mark5 systems).

e-VLBI

Jason has been working on automating e-VLBI transfers and making them more robust and efficient. He has been making good progress. There was a backlog of e-VLBI experiments due to the SuperComputing demonstrations (3 e-VLBI experiments backed up). Jason has taken over the running of regular e-VLBI experiments. Two 1 TB 800 Mbps Firewire discs purchased to allow storage of data from multiple experiments in format that is easy to manipulate/convert. All 3 experiments were downloaded onto these discs in one weekend. Data rates were quite reasonable given that they are being downloaded from NFS mounted volumes in Japan. Average transfer rate was 100 Mbps, which is the best so far. Expecting this to increase significantly in the next few experiments as Japan has added a new server (Quad Xeon 3.4 Ghz with Serial ATA RAID). Data will be transferred directly from this server's hard drive.

Jason has also been working on putting together a production grade facility for doing e-VLBI transfers. This facility consists of a few high speed servers, a Mark5 unit and network switches that will be dedicated to the transfer of e-VLBI data. Volume of e-VLBI experiments increasing, with 2-3 per month and an additional weekly intensive from Japan. There will also be the intensive experiments that Kevin is working on. Should see a large increase in the utilization of our network link.

Currently looking at setting up another series of e-VLBI experiments and demonstrations with the Joint Institute for VLBI in Europe (JIVE) based in Dwingleoo. They have excellent connectivity from JIVE into SURFnet with 7 x 1 Gbps wavelengths to their correlator. Array of antennas at Westerbork which we may be able to access. Two or three telescopes in Europe that we can connect into at high speeds.

Kevin reported on Hawaii-Wetzell intensives. Currently running at 30 Mbps (out of 34 Mbps) to Wetzell. Kokee was running at 90 Mbps UDP and 28 Mbps TCP. Throughput dropped significantly, Kokee still working on this.

Bill Wildes will be a Kauai there December 6th - 10th and will discuss with people there.

Next telecon is scheduled for Monday, 13th December 2004 at 3 pm EST.

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
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Tom Lehman, ISI-E
Jerry Sobieski, MAX
Dennis Baron,
Guy Almes, Internet2
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