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22 May 2003

TO: Distribution
FROM: Alan R. Whitney
SUBJECT: 19 May 2003 e-VLBI telecon summary

Attendees:

Lee Foster, Pat Gary, Kevin Kranacs, Bill Fink, Bill Wildes – GSFC

Alec Aakesson, Tom Lehman – ISI-E

Peter Schulz – MIT Lincoln Lab

Kevin Dudoir, David Lapsley, Arthur Niell, Mike Titus, 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

No changes, but OC-48 still not stable; hope to do further testing and debugging soon.

ISI-E

Workstation ‘kame’ is having some problems with jumbo frames – looking into problem.

NASA/GSFC

Mark 5A system should be shipped back down to GGAO in next week or so.

Bill Fink reported that some Intel PCI-X 10GigE NIC cards are on order; will be used for evaluation.

e-VLBI Workshop

Hans Hinteregger, David Lapsley and Alan Whitney attended the 2nd e-VLBI Workshop in Dwingeloo, The Netherlands. Workshop was quite successful. Europe is quite active; hoping to create a wavelength-based e-VLBI network centered on correlator at JIVE. Japanese have set up 4 Gbps e-VLBI between Usuda (64m antenna) and Tuskuba (32m antenna).

VSI-E

Alan reported on efforts to standardize the format and protocol for e-VLBI. Dubbed ‘VSI-E’ (VLBI Standard Interface – e-VLBI), the target specification is intended to be accepted internationally for e-VLBI transfers; the VSI-E specification would build on the VSI-H (hardware) and VSI-S (software) specifications already approved. David gave a presentation on the virtues of basing VSI-E on RTP at the e-VLBI workshop; a VSI-E meeting was convened to discuss the issue and there seems to be general agreement that RTP is the best approach. David and Alan will prepare a draft to be

distributed for further discussion. David's presentation is available http://web.haystack.edu/e-vlbi/lapsley_dwingeloo_03_files/frame.htm.

Germany Connection

Kevin D. reported on testing to U. of Regensburg in Germany; were able to use Bossnet and Abilene and Surfnet or GEANT; some difficulties establishing paths; maximum data rates ~15 Mbps using Surfnet and ~35 Mbps using GEANT. Tests were at most ~30 minutes. Understanding the details of the network path has been somewhat difficult. **Kevin will attempt to collect enough information to construct a detailed network diagram similar to what was done for the GGAO-to-Haystack link.**

Tom suggested that some UDP testing with iperf might help to better characterize the links.

Japanese Connection

No recent progress, but hope to do more testing this week.

Hawaii Connection

Slow progress, but hope to accelerate in upcoming week.

Performance Monitoring

Pat has distributed references to the scripts developed by Andy Germain of GSFC's ESDIS Network Prototyping Lab to monitor an active distributed archive system with ~200 nodes. The scripts run pair-wise tests for ~30 seconds every hour, including ping, traceroute and iperf characterizations; Andy has also recently added Bill Fink's nuttcp and a few others. The data are collected to a primary machine at GSFC and the results are displayed. Here are the references provided by Pat:

http://corn.eos.nasa.gov/performance/Net_Health/ancillary/Process.gif, which provides an overview of the "regular tests" included in a presently used script; and

http://corn.eos.nasa.gov/performance/Net_Health/files/NCAR.html, which provides an indication of the collected and displayed data from several host pairs where one host in the pair is at NCAR.

http://corn.eos.nasa.gov/performance/Net_Health/files/MIT.html, which provides an indication of the collected and displayed data from several host pairs where one host in the pair is at MIT.

Pat suggests that these tools might form the basis of a monitoring system for our e-VLBI links, or at least portions of them that are available 24x7. **Pat will explore with Andy the possibilities of deploying some or all of this work in the Haystack to GGAO link with possible expansions to some of the international links being constructed for e-VLBI work.**

Looking Down the Road

Pat noted that Bill Fink has put together the first GigE link aggregation at GSFC to achieve a 2 Gbps link. There is increasing capability on backbones to handle up to 10 Gbps and even higher. We should be thinking about how we can bring this sort of capabilities to the edge.

Mark 5A is currently limited to 512Mbps on the network due to motherboard limitations; multiple parallel Mark 5A's can be used to achieve higher aggregate rates. We should begin planning for pushing an e-VLBI demonstration well beyond 1 Gbps. The Mark 4 formatter is limited to 2 Gbps, but parallel systems could send duplicate data for demonstration purposes.

Lee will provide a reference for high-performance Opteron motherboards, which may be suitable to help achieve full 1 Gbps from Mark 5A. PCI-X 266MHz is next step.

In order to get >1Gbps from GSFC Bldg 28 to GGAO, either another fiber will be needed, or multiple

GigE's will have to be multiplexed onto a single fiber. Alan will consult Hans about inexpensive options to achieve this. Pat, Bill and Tom will also pursue possible options.

Pat will expand the present GGAO-to-Haystack diagram to show other components with the goal of constructing a strawman network for more advanced testing.

Next telecon

Next telecon is scheduled for Mon, 16 June 2003 at 2 pm EDT.

xc: 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
Chuck Kodak, GSFC
Kevin Kranacs, GSFC
Paul Lang, GSFC
Aruna Muppalla, GSFC
Bill Wildes, GSFC
Dan Magorian, UMCP
Tom Lehman, ISI-E
Jerry Sobieski, MAX
Richard Crowley, Haystack
Kevin Dudevoir, Haystack
Hans Hinteregger, Haystack
David Lapsley, Haystack
Arthur Niell, Haystack
Joe Salah, Haystack