

**MASSACHUSETTS INSTITUTE OF TECHNOLOGY**  
**HAYSTACK OBSERVATORY**  
*WESTFORD, MASSACHUSETTS 01886*

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

September 13, 2004

TO: Distribution  
FROM : David Lapsley  
SUBJECT: 24 August 2004 e-VLBI telecon summary

Attendees:

Lee Foster, Pat Gary, Chuck Kodak, Kevin Kranacs, Paul Lang, Mary Shugrue, George Uhl – GSFC  
Kevin Dudevoir, David Lapsley, Arthur Niell, Jason Soohoo, Alan Whitney – Haystack  
Tom Lehman – ISI-E  
Charles Yun – Internet2  
Terry Gibbons – 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 upgrade of Haystack's network link. Ray Expresses all powered up and configured by Russ Roberge and Richard Solis (Movaz). Connectivity now between Haystack and Lincoln Lab. Power issues on leg from Lincoln Lab to Washington, D. C. Needs to be investigated further. In the process of testing from Lincoln Lab to Eckington to see if this leg can be brought up. Optical signal coming in to Eckington a bit weak and a bit off center. Seems to be a minor problem.

Tom Lehman also reported on the upgrade. Some testing being down to test Washington, D. C. local loop between Eckington and ISI-E. Might try tomorrow/Thursday to do some end to end testing across Bossnet/Glownet.

General discussion on test scenarios.

Some discussion on management interface between Haystack and Lincoln Lab. Need to get management connectivity between Ray Express's at Lincoln Lab and Haystack to allow remote configuration.

General discussion of network architecture. Currently, looking at terminating OC48 flow from Haystack at M20 router at ISI-E. Then pass 2 x 1 GE flows on to GGAO.

---

Bill Fink reported on performance of GGAO to MAX link. Recent testing showed TCP performance 700-800 Mbps (instead of line rate). Also seeing re-transmissions.

Pat Gary discussed the possibility of using 10G wavelengths to transport Nx1 GE e-VLBI sources across DRAGON to GGAO. Possible to connect Force10 at GGAO to Nortel switch at ISI-E.

General discussion about 10G infra-structure and interoperability. Cheap Chelsio 10 GE NICs (\$2700 for short reach, \$3500 for long reach). Extreme networks Summit 48 switch (2 x 10 GE uplink). DRAGON will have some 10G transponders coming in as part of year 2 build-out.

### e-VLBI Experiments

Kevin Dudevoir reported on Germany-Hawaii experiments. Network bandwidth has been at 28 Mbps from Kokee and almost 34 Mbps from Wetzell for the past couple of weeks. Last night throughput from Kokee has dropped to 10 Mbps. Routing from Kokee has changed. Path now symmetrical through DREN.

### Supercomputing Demo

David reported that Kevin had been doing some testing of the application to see if it could do real-time at the required rate.

Kevin reported that he had done some testing and that 512 Mbps seemed to be achievable quite comfortably. The test was done between Westford antenna and Haystack correlator. End to end test from acquisition to output of correlator.

David reported that he had been working with Tom, Jerry and some of the international networking people to get a picture of element by element composition of network path from Onsala. A few conference calls with people from NORDUnet, SUNet, SURFnet and people from Japan. Layer 3 topology is now looking clear, now working on physical layer topology to see what capabilities are.

Tom reported that it should be fairly easy to get a dedicated path from Stockholm to either Chicago or New York. Need to do some advanced testing across these paths. Also need to discuss what will be displayed on the showroom floor.

### Performance Monitoring

David reported that Jason has been rolling out NSDB software to some of our test hosts. Japan, Onsala, Haystack and to Australia have had the software installed.

Pat reported on the Internet2 article that discussed the work done by David and Tom in collaboration with the Internet2 people.

Next telecon is scheduled for Monday, 13th September 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