22 November 2002

TO: Distribution
FROM: Alan R. Whitney
SUBJECT: 20 November 2002 e-VLBI telecon summary

Attendees:
Lee Foster, Kevin Kranacs, Bill Wildes – GSFC
Tom Lehman - ISI
Lorraine Prior – MIT Lincoln Labs
Kevin Dudevoir, Hans Hinteregger, Joe Salah, 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.

Status Reports

The attached figures of the e-VLBI path have been updated to reflect current status and are pretty much self-explanatory. The following status updates were reported:

- New fiber is in place and operating between ISI-E and Eckington, as Tom reported to everyone by e-mail.
- Lorraine and Tom reported that there are still problems trying to bring Bossnet back up to OC-48. Tom suggested that some loopback testing with Sonet gear is being planned to isolate the problem.
- Tom reported that Abilene connection at ISI-E should be in place in a couple of weeks. Connection will be into ISI-E Juniper M40 (G10 on diagram). Kevin will send Haystack, Hawaii and Germany IP information to Tom in support of the Abilene connection at ISI-E.
- Alan reported that agreement has been made with MAX to connect USNO to MAX via George Washington University and that project is moving ahead. Agreement with NASA to support e-VLBI as a sponsored project needs to be reached.
- Alan and Hans reported that the efforts to connect Kokee Park, Kauai, Hawaii and Wettzell, Germany to Haystack are continuing, hopefully beginning to bear fruit within the next month or so.
- Tom reported ISI is submitting proposal to NASA CAN for further development of high-data-rate real-time data over shared network in collaboration with Haystack Observatory and...
NASA. e-VLBI is a major application that would benefit from this work. The proposal is due 26 Nov 02 with decisions to be announced late Feb 03.

Direct-transfer e-VLBI experiment

Alan reported that a successful direct-transfer e-VLBI experiment was conducted on 24 Oct, just two hours before Verizon pulled the plug on the ISI-E to Eckington connection! Due to operational constraints at Westford, which was involved in scheduled observations at the time, GGAO had to piggyback onto the Westford operating at the same 256 Mbps mode. A direct real-time transfer of data was made from GGAO to Haystack at 256 Mbps (actually, 288 Mbps with parity overhead) where it was recorded on disk. Correlation with the Westford data produced normal fringes.

There was a lot of scrambling done on a very short fuse to make this experiment happen and much thanks is due to everyone involved.

Report Outline

The goal for the first draft of the final report has been moved to Monday, 9 Dec 2002. Please send your contributions to Alan, who will act as editor and prodder.

Executive Summary - Alan
Introduction - Alan
What is VLBI? - Alan
Why e-VLBI? - Alan
Goals of the 1-Gbps e-VLBI Demonstration - Alan
Elements of the 1-Gbps Demonstration
  Mark 5 VLBI Data System – Alan
  Westford connection - Alan
  Glownet/Bossnet – Steve/Lorraine/Peter
  ISI-E/Max – Tom/Jerry
  GSFC Networks – Pat/Bill F./Paul/Kevin K./Dan
  Haystack/GGAO – Kevin D./Alan/Bill W.
Testing and Performance – Tom/Bill F./Kevin K./Kevin D.
Results of e-VLBI Demonstration – Alan
Recommendations for further work/Future Directions in e-VLBI - All
Summary - Alan

Next telecon

Next telecon is scheduled for Wed, 18 December 2002 at 2 pm EDT.

xc: Steve Bernstein, LL
    Jim Calvin, LL
    Lorraine Prior, 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
    Jerry Sobieski, Max
    Richard Crowley, Haystack
    Kevin Dudevoir, Haystack
    Hans Hinteregger, Haystack
    Arthur Niell, Haystack
    Joe Salah, Haystack
Figure 1: e-VLBI Path - Haystack to ISI-E
Figure 2: e-VLBI Path - ISI-E to GSFC/GGAO

- **ISI-E (Tom)**
  - Tuner
  - Transponder
  - Test WS (G7)
  - Summit 5i (G5)
  - Test WS (G7B)
  - Summit 5i (G4)
  - Juniper M40 (G8)
  - GigE

- **MAX @ ISI-E (Jerry)**
  - Switch
  - H1
  - Test WS
  - H2
  - GigE

- **MAX/UMCP (Jerry/Dan)**
  - Juniper M160
  - GigE
  - J1
  - Test WS
  - J2
  - GigE
  - J3
  - GigE
  - J4
  - Switch
  - J5
  - GigE
  - J6
  - GigE
  - J7
  - GigE
  - J8
  - GigE
  - J9
  - GigE
  - J10
  - GigE

- **GSFC/Bldg 28 (Pat/Paul/Kevin/Bill F.)**
  - WDM
  - K1
  - GigE
  - K2
  - Summit 5i (K3)
  - Test WS (K4)
  - Test WS (K5A)
  - Cisco 12016 (K5B)
  - Windows PC
  - ('xly')
  - G4 Mac with Yellowdog/Linux
  - ('clifford')

- **GGAO/Bldg 201 (Pat/Chuck)**
  - GigE
  - L1
  - Summit 5i
  - G8
  - GigE
  - L2
  - GigE
  - L3
  - RJ-45
  - L4
  - GigE
  - L5
  - RJ-45
  - L6
  - GigE
  - L7
  - RJ-45
  - L8
  - GigE
  - L9

- **GGAO Antenna Trailer (Bill W./Chuck)**
  - GigE
  - L10
  - Summit 5i
  - Mark 5
  - L11
  - GigE
  - L12
  - RJ-45
  - L13
  - GigE

- **Internet**
  - NASA LAN
  - Mark 5
  - Cmpl

- **Scheduling on Bossnet calendar**
- **Backup plan**
- **No jumbo frames**
- **Need details**
- **Need configuration**
- **Borrowed OC-48 interface - may not be able to keep**
- **Abilene**
- **OC-48**
- **Dedicated - no scheduling necessary**
- **Mark 5**
- **Mark 5**
- **Mark 5 Cmpl Cmplt**
- **OS-48**
- **Jumbo frames required during data acq**
- **GigE**
- **GigE**
- **GigE**

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*Figure 2: e-VLBI Path - ISI-E to GSFC/GGAO*