Bonn DiFX correlator report August 2011

DiFX Correlator status and operations

In Bonn all VLBI observations are now processed using the **DiFX software correlator**. Two versions of DiFX are installed: 2.01 and 'trunk' which is nearly 2.02. A number of bugs of the 2.0 and 2.01 version has been fixed already in the trunk version.

Quick summary:

- Since December all observations have been correlated with the DiFX version 2.0.
- 14 Mark 5s can be used for playback from disk modules. In addition data can be played back from presently 5 big RAID systems (~100 TB). In theory this setup allows correlation of significantly more than 20 stations in parallel.
- All Mark 5s can playback all flavours of Mark 5 data (A/B/C).
- The Mark 5s have been integrated into the cluster. They can automatically be installed from the cluster install node.
- All Mark 5 systems have been upgraded to SDK 9 and some to SDK 9.1 under kernel 2.6.18. (With newer kernels occasional problems are observed which lead to corrupted data.)
- Big disks (> 1 TB) can be played back.
- Maximum data playback rates of 1.4 Gbps have been reached over 2 x 1 Gb Ethernet using the standard Mark 5A/B RAID cards.
- On all Mark 5s (A/B/C) the data is read using the “native mode” which Walter Brisken has implemented. This makes the Mark 5s part of the correlator cluster; they become “datastream nodes”.
- As a consequence the Mark5A and Domino programs have been replaced by NRAO's mk5daemon. It offers much the same functionality as Haystack's Mark 5 software.
- An Infiniband 20 Gb/s connection between the Mark 5s and the cluster is under test.
- eVLBI data are stored on normal disk RAIDs without the need to copy them to a module.
- Data is archived in raw format, FITS, and MK IV (if desired). FITS (default) or MK IV formatted data is made available to the PIs. (HOPS software for handling MK IV format can now be installed “at home”.)
- The correlation is driven with simple command line calls and/or batch files starting from the observe vex file and an auxiliary input file. In addition directory listings (see above) from the modules or of directories on the RAIDS are used for controlling the correlation.
- Data throughput and CPU usage of Mark 5s is monitored. The cluster usage and status is monitored via a webinterface and NAGIOS.
- Work on a database and an operator GUI are nearing completion. Tests are underway.

Capabilities

The **Bonn DiFX implementation** is significantly more powerful and flexible than the previous MK IV hardware correlator. The capabilities of the DiFX software correlator can be found at **http://www.mpifr-bonn.mpg.de/div/vlbicor/correlator_e.html**

Operations

Correlation is much faster with the DiFX correlator compared to the MK IV. The daytimes are mostly used for development work and tests. Disk turnaround is presently slowed down to a little more than one session. Due to the purchase of new big disks and SATA modules a shortage of disk space has not been caused by this delay.

Astronomical EVN observations waiting for correlation are:

June2011

- EM077F - waiting for feedback from PI
- EY010E - waiting for feedback from PI

- GW022A,B - data copied to RAIDs, waiting for PI
- EY013B - waiting, will be correlated by MPI collaborator

Feb/Mar2011

- EM080B - correlated, waiting for PI feedback

Shipment of disks with less than 4 TB is avoided in favour of the new big disks (whenever possible).