# e-transfer at the Bonn correlator

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Guten Morgen, Chef!

- DiFX Correlator
  - 60 nodes with 8 compute cores each (480 cores in total)
  - 14 Mark 5 units are connected to the software correlator. VLBI data can be played into the cluster from the Mark 5 recorders via 1 Gb Ethernet connection.
  - All Mark 5s can play back all kinds of Mark 5 data (A/B/C).

- 1 Gbps connection to MPIfR via DFN (German Research Network) and GÉANT (pan-European data network dedicated to the research and education community)
- 10 Gbps dedicated fibre connection for Effelsberg / LOFAR station
- firewall computer for e-transfer servers since late 2011

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- Tsunami - based on UDP (User Datagram Protocol)
- Version 1.1 cvsbuild42 (http://tsunami-udp.sourceforge.net/)
- Alternatives: UDT, VDIF-SUDP etc.
- Capacities:
  - 3 machines with shared 1 Gbps connectivity
  - io03 and io10: connection to DiFX correlator via InfiniBand
- data storage capacity ~70 TB
  - sneezy2: 7.6 TB
  - io03: 20 TB (data3)
  - io10: 37 TB (data10) + 8.2 TB (data10b)
- structure of data storage path:
  /parent_folder/experiment/station_name/exp_name/
  e.g. /data10/ohig/fortaleza/ohig76

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- regular e-transfers to / from Bonn:

| Station | Datarate [Mb/s] | Experiments |
|---|---|---|
| Onsala | 500 | GEO (R1, EURO, T2, dBBC test data) |
| Metsähovi | 800 | GEO (EURO, T2) |
| Medicina | ? | GEO (EURO, T2, R1) |
| Ny-Ålesund* | 100 | GEO (INT3, R1, EURO, T2) |
| Wettzell | 250 | GEO (INT3, dBBC test data) |
| Yebes(*) | 800 | GEO (R1, EURO, T2) |
| JIVE | 400 | ASTRO |
| Hartebesthoek* | 400 | GEO (R1, T2, OHIG) |
| Tsukuba (Aira, Chichijima, VERA-Ishigakijima) | 600 | GEO (INT3, R1, T2) |
| Kashima (K1, Kb, Syowa) | 600 | GEO (R1, T2, OHIG) |
| Mitaka (VERA-Mizusawa) | 400 | GEO (T2) |
| Seshan* | 250 | GEO (INT3) |
| Hobart12, Hobart26* | 300 | GEO (R1) |
| Warkworth* | 250? | GEO (R1, T2, OHIG) |
| CSIRO, Sydney (ATCA, Ceduna, Mopra, Parkes) | 500 | Astrometry (GEO planned) |
| Fortaleza* | 400 | GEO (R1, T2, OHIG) |
| WACO | 250 | GEO (R1 Hb) |

*via FuseMk5A

- on average ≥ 50 % of the stations do e-transfer

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----------------------------------------------------------------------------
|IVS-CRDS57|CRDS57|FEB01| 32|18:00|24|HbHhWw                                 |
|IVS-R4518 |R4518 |FEB02| 33|18:30|24|BdFtKeKkMcNySvTcWzYg                   |
|IVS-R1519 |R1519 |FEB06| 37|17:00|24|FtKeKkNyTcTsWfWz -Yg                   |
|VLBA91    |RDV91 |FEB08| 39|18:00|24|FtMcNyTsVaWz -Wf                       |
|IVS-R4519 |R4519 |FEB09| 40|18:30|24|FtHbKkMaNyTcWwWzYg -Zc                 |
|IVS-R1520 |R1520 |FEB13| 44|17:00|24|FtHhMaNyOnTcTsWz -Wf                   |
|IVS-T2081 |T2081 |FEB14| 45|17:30|24|13AiBdCcFtHhK1KgKkKmMcNyOhOnTcTsUcUrVmVsWz|
|IVS-OHIG76|OHIG76|FEB15| 46|18:00|24|FtHhKkOhSyTc                           |
|IVS-R4520 |R4520 |FEB16| 47|18:30|24|BdFtKkNySvTcWzYsZc                     |
|IVS-R1521 |R1521 |FEB21| 52|17:00|24|HbHoKeKkNyTcWwWz -TsWf                 |
|IVS-R4521 |R4521 |FEB23| 54|18:30|24|FtKeKkMaNyTcWzYg -Ts                   |
|IVS-R1522 |R1522 |FEB27| 58|17:00|24|FtHbKkMaNyTcWzYg -Wf                   |
|IVS-OHIG77|OHIG77|FEB28| 59|17:30|24|FtKkOhSyTc                             |
|IVS-OHIG78|OHIG78|FEB29| 60|18:00|24|FtHhKkOhSyTc                           |
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- average amount of e-transfer data per week ~4 - 6 TB

- transfer errors (data loss) from  Hobart and Ny-Ålesund - likely due to fuseMk5A - further testing

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- http://www.mpifr-bonn.mpg.de/cgi-bin/showtransfers.cgi

### List of Active Data Transfers

| Started at | Sent from | Korrelator | Experiment Name | Preset Transfer Rate | Port | Serial Number |
|---|---|---|---|---|---|---|
| 2012-02-28 13:49:53 | cc | Bonn | t2081 | 250m | default | 20120228134953 |
| 2012-02-28 07:58:23 | ny | Bonn | r1522 | 100m | default | 20120228075823 |

- Notification at start and stop of a transfer to
  ftp://ftp.mpifr-bonn.mpg.de/incoming/evlbi/transfers
  via anonymous FTP
- Cronjob regularly calls a script that generates an html page from these files
- Only active transfers are shown
- First come, first served

- Start file name as follows:

  [sn]_[exp name]_[sent from]_[correlator]_[preset transfer rate]_[tsunami port]_start

  where
  - sn = serial number - time stamp, format: YYYYMMDDhhmmss
  - experiment name = r1520
  - sent from = two-letter station code
  - correlator = Bonn
  - transfer rate = 100m
  - tsunami port = default


- Stop file name:

  [serial number]_[sent from]_stop

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- FuseMk5 test with test data from Hobart to Bonn

- Further (test) transfers with additional stations

- At the moment 1 Gbps network connection is sufficient for the current observing mode of 256 Mbits and the number of e-transfer stations per experiment

- As soon as the observing mode is upgraded to 512 Mbits and more stations do e-transfer, it cannot be guaranteed to meet the 15-days turn-around time for the R1 experiments

- Plans to upgrade the network connection to 2 Gbps (preferably 10 Gbps) in view of VLBI2010

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