Operational Data Transport in the IVS

Part 2

Yoon Kyung Choi & Simone Bernhart (Reichert GmbH/BKG/MPIfR)

Bonn Correlator

Outline

- Prerequisites for e-transfers
- e-transfer protocols & command lines
- Transfer web page
- Module shipment with PACKTRACK

Prerequisites for e-transfers

- Which correlator process the session?

  (Bonn, WACO, Haystack, Wettzell, Vienna, GSI, SHAO etc.)

  Please check masterfile change in short notice!

- Are your IP address(es) and the correlator IPs whitelisted on both side?

  If not, contact correlator.

- Pull the data? Push the data?

  - Correlator allowed to access to the station server?

    Bonn provides its public key to be able to log in without password.

  - Not allowed? Send filelist to correlator for m5copy or data location for etransfer client/demon.

- Data transfer related issues for Bonn,

  please contact **geodesy(at)mpifr-bonn.mpg.de** using **subject [e-transfer]**.

Prerequisites for e-transfers

r11021ys.fl

```
r11021_ys_291-1740
r11021_ys_291-1742b
r11021_ys_291-1746a
r11021_ys_291-1748
r11021_ys_291-1751
r11021_ys_291-1754
r11021_ys_291-1756b
r11021_ys_291-1800
r11021_ys_291-1801
r11021_ys_291-1804b
r11021_ys_291-1806
r11021_ys_291-1810
r11021_ys_291-1813
r11021_ys_291-1816
r11021_ys_291-1818
r11021_ys_291-1820a
r11021_ys_291-1823
r11021_ys_291-1826
r11021_ys_291-1828
r11021_ys_291-1831
r11021_ys_291-1834
r11021_ys_291-1837
r11021_ys_291-1839
r11021_ys_291-1842
```

Message preview

[vlbi] [e-transfer] m25125 ISHIOKA data ready

From 農澤 健太郎 <nozawa-k96xd@mlit.go.jp> Date Fri 03:46

```
Dear colleagues,

Comment:
May 5 is a substitute holiday, we will contact you ahead of time.
We do not observe scans where AZ is in the -5 to 5 degree range.
This is because AZ encoder errors may occur.
Scans that will not be observed are as follows 3scans : 125-0549, 125-0601, 125-0617

The M25125 data will be automatically put at 08:00 UT.
A list of vdif files for m25125_vdif.list is placed in the following directory.

IP 202.223.161.[redacted]
etd -m 3 -f --command tcp://:2641 --data udt://:2643 --udt-mss 9000 /export/vlbi/m25125is/

Band-A H *_0.m5a
CH1    3480.4
CH2    3448.4
CH3    3384.4
CH4    3320.4
CH5    3224.4
CH6    3096.4
CH7    3064.4
CH8    3032.4
Band-A V *_1.m5a
CH1    3480.4
CH2    3448.4
```

e-transfer Protocols

- File Transfer Protocols:

 - FTP/FTPS, HTTP/HTTPS, RCP, SCP

 - Tsunami (UDP based transfers with TCP control)

 - UDP-based Data Transfer Protocol (UDT)

★ jive5ab/m5copy

★ etransfer server/client system

e-transfer protocols and command lines

Jive5ab/m5copy

- https://github.com/jive-vlbi/jive5ab
- The VLBI data recorder software, enabling fast and flexible VLBI data transfers as well as high-speed VLBI data recording.
- Start jive5ab on COMMAND port (default port: 2620) on both sides
- Transfer with m5copy via DATA port
- In Bonn, DATA ports are restricted from 2630 - 2800.
- m5copy does not allow wildcards (*) for remote transfers

  > needs “filelist” from station

e-transfer protocols and command lines

Jive5ab/m5copy

- Copy VLBI data from SRC to DST.
- Usage: /cluster/jive5ab/latest/m5copy [options] SRC DST
- Example:

> m5copy vbs://:2622/r11204_* file://89.1.14.227/data/r11204/on/ -udt -r 1000M -p 2662 -t=120 --resume

- Options:

-udt use UDT as protocol (default: tcp)

-p <port> use this port number for data channel (default: 2630)

-r <rate> limit transmit data rate to <rate> bits per second.

--resume appends missing bytes in case of interruption (--ignore_existing/--allow_overwrite)

- SRC format: mk5, mk6, vbs, file

e-transfer protocols and command lines

Jive5ab/m5copy

- m5copy does not allow wildcards (*) for remote transfers

  > needs “filelist” from station

```
#!/cluster/jive5ab/latest/m5copy vbs://193.146.252.24/{0} file://89.1.14.227/data/t2167/ys/ -udt -r 900M -p 2647 --resume
t2167_ys_107-1730b
t2167_ys_107-1733
t2167_ys_107-1737
t2167_ys_107-1746
t2167_ys_107-1750
t2167_ys_107-1756
t2167_ys_107-1800
t2167_ys_107-1811a
t2167_ys_107-1823b
t2167_ys_107-1826
t2167_ys_107-1831a
t2167_ys_107-1834
```

e-transfers protocols and command lines

etransfer server/client system

- https://github.com/jive-vlbi/etransfer
- The etransfer server/client system allows the client program to initiate server to server transfers, just by specifying two remote locations.
- Remote side needs to start daemon
- must have at least one command and one data channel specified
- client is used to perform the actual transfer
- allows the client program to initiate server to server transfers without login to remote server
- natively supports remote wildcards

e-transfers protocols and command lines

etransfer server/client system

- Usage: etc [--buffer <unsigned long>...] [--display-format <display_format>] [-h] [--help] [--list <URL>] [-m <int>] [--max-conn-retry <unsigned int>] [--max-retry <unsigned int>] [--mode <file copy mode>] [--overwrite] [--resume] [--retry-conn-delay <duration (s)>] [--retry-delay <duration (s)>] [-s --silent] [--skipexisting] [--udt-bw <int (bytes per second)>] [--udt-mss <int (bytes)>] [--version] <URL>...
- Options:

-m: Message level

--udt-bw: Set UDT maximum bandwidth.

--udt-mss: Set UDT maximum segment size in bytes.

--resume: Existing target file(s) will be appended to, if the source file is larger

e-transfers protocols and command lines

etransfer server/client system

- Example:

- etd running in Ishioka

> **etd -m 3 -f --command tcp://:2641 --data udt://:2643 --udt-mss 9000**

- pulling the data from Bonn using etc

> **etc -m 5 --udt-bw 1000Mbps --udt-mss 1500 'tcp://202.223.161.20#2641:/export/vlbi/r11205is/*' /data/r11205/is/ —resume**

- checking file list remotely

> **etc --list 141.74.6.203#2623:/exchange/wds300b/m25125ws/**

Transfer Web page

http://www3.mpifr-bonn.mpg.de/cgi-bin/showtransfers.cgi

Transfer Web Page for VLBI Stations and Correlators

Transfer Priority		
Correlator	**Experiment(+Station)**	**Bandwidth (when indicated)**
BONN	r11205	-
BONN	vo5120	-

Available transfer rates for BONN		Available transfer rates for RZ-BONN		Available transfer rates for WACO		Available transfer rates for VIEN	
TO Bonn:	-1700m	TO RZ-Bonn:	950m	TO WACO:	7800m	TO VIEN:	10000m
FROM Bonn:	10000m	FROM RZ-Bonn:	0m	FROM WACO:	2000m	FROM VIEN:	2000m

List of Active Data Transfers

Started at	Sent from	Sent to	Raid	Experiment Name	Preset Transfer Rate	Port	Serial Number
2025-05-02 08:24:09	gs	Bonn	data	vo5120	1200m	2676	20250502082409
2025-05-02 00:00:00	kv	bonn	data	r11205	700m	default	20250502000000
2025-05-01 02:38:47	hb	bonn	data	r11205	1000m	2654	20250501023847
2025-04-30 23:59:59	nn	bonn	data	vo5120	1500M	2697	20250430235959
2025-04-30 14:10:04	nn	waco	data	r41204	1200M	46243	20250430141004
2025-04-30 12:52:23	Kc	Bonn	data	c251a	1000M	2635	20250430125223
2025-04-30 12:41:15	Kt	Bonn	data	c251a	1000M	2634	20250430124115
2025-04-30 12:37:56	Ku	Bonn	data	c251a	1000M	2633	20250430123756
2025-04-30 12:33:48	Ky	Bonn	data	c251a	1000M	2632	20250430123348

Default tsunami port 46224
Default m5copy port 2630

Bonn Storage Information				
Raid	**Via Server**	**Size**	**Free**	**Note**
/data	bonn/rzbonn	2.8 PB	209.1 TB	

Haystack Storage Information				
Raid	**Via Server**	**Size**	**Free**	**Note**
/data-st10	evlbi1	36.2 TB	2.2 TB	
/data-st11	evlbi1	54.4 TB	3.1 TB	
/data-st13	evlbi1	54.4 TB	3.9 TB	
/data-st12	evlbi1	54.4 TB	15.3 TB	

WACO Storage Information				
Raid	**Via Server**	**Size**	**Free**	**Note**
/data0	data0	1.9 PB	796.3 TB	

Hosted by the Geodesy VLBI Group of the Bonn VLBI correlator centre.
Written by Frederic Jaron.
Maintained by Simone Bernhart.

Transfer Web page

- Start message form: 20250430095300_r11205_is_bonn_1000m_2641_data_start

  serial number [yyyymmddhhmmss in UT]_session code_data origin_destination_transfer rate_port__raid_start

- Stop message form: 20250430095300_is_stop

  serial number [yyyymmddhhmmss in UT]_sent from_stop

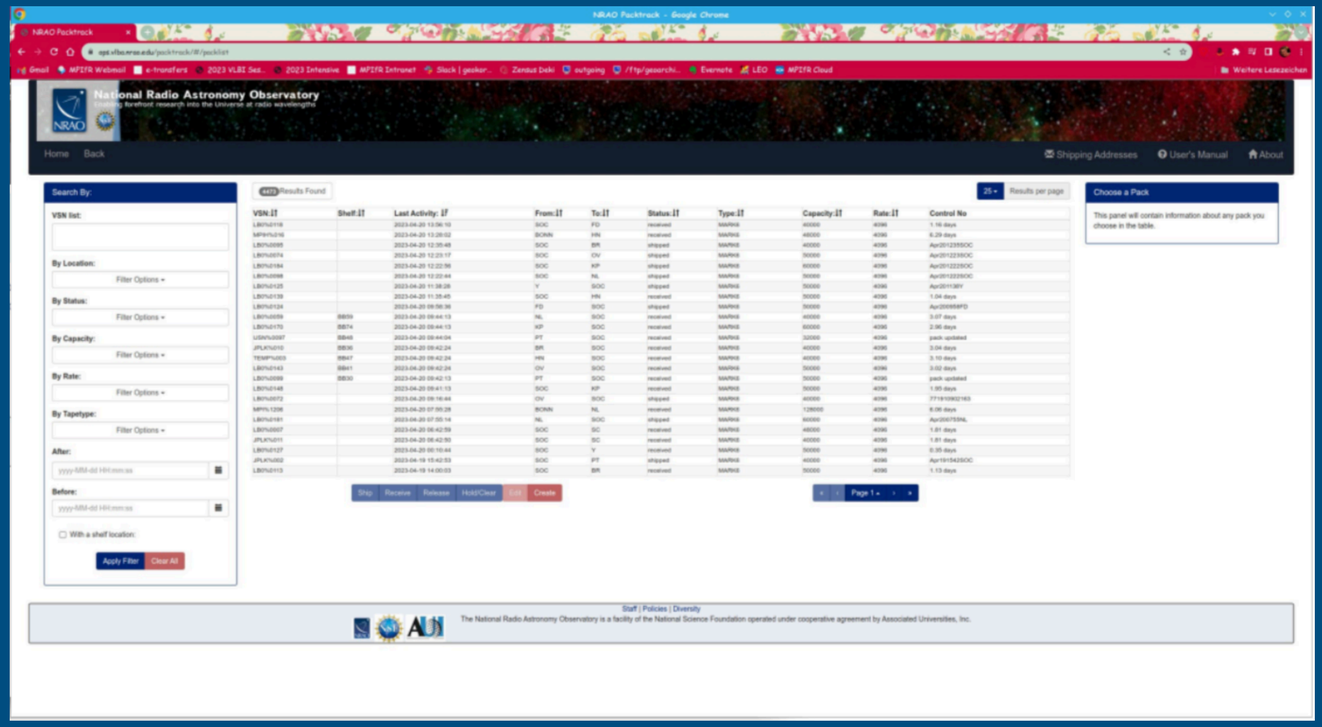
- Transfer Start/Stop messages(empty files) to the Bonn correlator server (89.1.14.226) under /data/transfers

Summary for e-transfers to Bonn

http://www3.mpifr-bonn.mpg.de/div/vlbi/geodesy/Docs/etransfer_how-to.txt

Shipment with PACKTRACK

- https://ops.vlba.nrao.edu/packtrack/#/
- To get an account, contact Cynthia Thomas: cynthia.c.thomas(at)nasa.gov
- Receiving AND shipping modules via input of VSN/MSN and location (station/correlator)
- specify VSN/MSN in IVS ops message (stop)



Questions? Comments?

Let’s start “Real Transfers!”