
Field System Topics

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FS Linux Distribution

- ◆ FSL9
 - ⊕ Current Standard
 - ⊕ Based on Debian “wheezy”
 - ⊕ Older systems should be upgraded or be replaced
 - ⊕ Has some minor serial issues, but so far we have solutions
- ◆ FSL10
 - ⊕ Next standard
 - ⊕ Will be based on Debian “Jessie” which was just released
 - ⊕ Availability TBD
- ◆ 64 vs 32 bit
 - ⊕ This is a looming issue
 - ⊕ Soluble but will take some effort

Current FS Release (FS 9.11.8)

- ◆ FiLa10G Support for DDC
 - ⊕ It is necessary to run FMSET 's' each time DBBC and/or FiLa10G is (re)-started
- ◆ Mark 5C/6/Flexbuff support with jive5ab
- ◆ VLBC and CDAS racks
 - ⊕ Requires local VSI4 command
- ◆ VDIF fanout_def track lay-outs in DRUDG
- ◆ Version logging for:
 - ⊕ DBBC, FiLA10G, and jive5ab
- ◆ Log output of arbitrary linux command
 - ⊕ `sy=popen 'linux command' &`
 - ⊕ No clean-up or time-out provided (yet)

Next release (9.11.9)

- ◆ For Session 2
- ◆ DBBC/PFB recording support
 - ⊕ vsi1=.. and vsi2=... commands to select channels
 - ⊕ form=flex
 - ⊕ 64 bit masks for fila10g_mode and mk5c_mode
- ◆ CHEKR checking of DBBC version/personality
- ◆ (to be completed) Radiometry for DBBC/PFB
 - ⊕ Tsys
 - ⊕ ONOFF and FIVPT
 - ⊕ gnplt support for longer device names
- ◆ Testing still needed:
 - ⊕ Verify flow of original DDC support
 - ⊕ Test of 32 channel support
- ◆ The possibility of continuous cal support depends on DBBC configuration

Future Release

- ◆ FS 9.12.x
- ◆ Currently in use for VGOS testing
- ◆ Preliminary Support for
 - ⊕ Up to four RDBE-G racks (in parallel)
 - ⊕ Up to two Mark 6 recorders with cplane (in parallel)
 - ⊕ UDCs (Up/Down Converters)
 - ⊕ RFD (RF Distributor)
 - ⊕ VGOS Observing
- ◆ Input case sensitive
- ◆ Exactly two polarizations per LO or more?
 - ⊕ L/R, H/V, X/Y

VEX2

- ◆ Second draft design was released
 - ⊕ February 13, 2015
 - ⊕ Version 1.9996
 - ⊕ Minor updates only
- ◆ Walter Brisken proposes to replace all non-star source information with SPICE toolkit .bsp files.
 - ⊕ Response to community calls for non-star pointing information in VEX file.
- ◆ Implementation schedule
 - ⊕ Parser update about half finished
 - Available second quarter 2016
 - ⊕ VEX2 writing schedule TBD

Hot and Cold loads

- ◆ Can be supported now for fixed temperature hot and cold loads
- ◆ Put temperature difference of *hot – cold* in .rxg file as cal temperature (CALTEMP)
- ◆ Sample hot load with TPICAL (TPIHOT)
- ◆ Sample cold load with TPI (TPICOLD)
- ◆ Use TPDIFF as usual to get TPIHOT-TPICOLD
- ◆ Sample sky with TPI
- ◆ Then TSYS calculates
 - ⊕ $T_{sys} = (TPI) * CALTEMP / (TPIHOT - TPICOLD)$
- ◆ FS could provide TPIHOT and TPICOLD as aliases for TPICAL and TPI to provide more clarity
- ◆ Incremental modifications could support use of realtime load temperatures

Possible FLAGR changes

- ◆ Assumption in FLAGR (and FS) is that the ANTCN processing is prompt, but apparently in some cases it is not
- ◆ FLAGR can measure the time needed to process the request
- ◆ Add field to response indicating delay in processing
 - ⊕ `flagr/antenna, off-source, time`
- ◆ Add “error” record to report antcn errors:
 - ◆ `flagr/antenna, error, time`
 - ◆ Only useful if ANTCN reliably returns errors
 - ◆ Could be suppressed with environment variable `FS_FLAGR_SUPPRESS_ANTCN_ERRORS`

eVLBI with FiLa10G

- ◆ Select rack type in **DRUDG** type that does not include FiLa10G to suppress `fila10c_mode=...`
 - ⊕ 9.11.8
 - use `dbbc` instead of `dbbc/fila10g`
 - ⊕ 9.11.9
 - use `dbb_ddc` instead of `dbbc_ddc/fila10g`
 - use `dbb_pfb` instead of `dbbc_pfb/fila10g`
- ◆ Must use rack type with Fila10G in **FS** (`equip.ctl`) to allow time setting/set-up:
 - ⊕ 9.11.8
 - use `dbbc/fila10g`
 - ⊕ 9.11.9
 - use `dbbc_ddc/fila10` or `dbbc_pfb/fila10g`

Cable wrap implementation

- ◆ More than you ever wanted to know about cable wrap:
 - ⊕ <ftp://ivscg.gsfc.nasa.gov/pub/TOW/tow2013/notebook/Himwich.Sem2.pdf>
- ◆ Definitions are a little non-intuitive
 - ⊕ Neutral is the non-overlapped region, not central point
 - ⊕ Counter-clockwise and Clockwise are overlapped
- ◆ Scheduling is most of the work
 - ⊕ Algorithm must predict antenna motion
 - ⊕ For the first scan “pick” a wrap if not neutral
 - ⊕ Exclusion zones are needed to avoid ambiguities
- ◆ At the stations
 - ⊕ Implement “source” command cable wrap parameter to select correct wrap
 - ⊕ Handle edge cases for more robustness

Whither FS Time?

- ◆ From a bygone era when NTP and GPS were not readily available
- ◆ Significant conceptual complication for operators
- ◆ NTP is obviously a possible mechanism for time distribution
 - ⊕ Pros:
 - Generally available
 - Reasonably reliable
 - ⊕ Cons
 - Very complicated “black box”
 - Will require additional monitoring
 - Leap second behavior is bad
 - Useless if NTP servers are not available

NTP Proposal (second cut)

- ◆ Two local stratum 2 server(s) for site
 - ⊕ Use mix of local and remote stratum 1 servers
 - ⊕ Is two not enough or too many?
 - ⊕ How many local stratum 1 servers?
- ◆ All other devices use the local stratum 2 servers
- ◆ Monitoring daemon to check for large offsets among all servers and/or no sync by stratum 2 servers
- ◆ If we rely on NTP, should setting formatter time be automated (automatable)?
- ◆ Monitor formatter for offset from NTP
 - ⊕ Formatter continues to be an independent clock?
- ◆ Preserve “FS Time” as separate check of time and use in case NTP is unavailable

caltsys & LO command

- ◆ caltsys procedure options:
 - ⊕ 1. DRUDG generates caltsys procedure
 - ⊕ 2. Band (or receiver) procedures that set
 - Use “save_file” command to store/read commands
 - caltsys procedure contents
 - cont_cal=... command
 - ...?
 - ⊕ 3. Table in the FS for procedures to use
 - caltsys procedure
 - cont_cal=... command
 - ...?
 - put in RXG file as comment or data?
- ◆ Tcal – remove station specific caltemp commands
 - ⊕ Standardize use of hot and cold loads
- ◆ Remove station specific LO commands
 - ⊕ All station specific code in LO_CONFIG command, options
 - Executes new mode in ANTCN
 - Station specific code

Additional Items

- ◆ eRemoteControl
- ◆ RXG file related:
 - ⊕ New rxgfile SNAP command to allow RXG file updates without restart
 - ⊕ Logging of RXG file identification information for better accountability
- ◆ RDBE DDC Support
- ◆ Improved rack=none set-up comments
- ◆ Source scanning on the fly
 - ⊕ Improvement on FIVPT for antennas that can scan in rate

Additional Items II

- ◆ TLE Satellite pointing
 - ⊕ Currently
 - Generates ephemeris that can be sent to antenna
 - Fixed RA/Dc and Az/EI pointing
 - ⊕ Future
 - Periodic Satellite Commands in RA/Dc and Az/EI
 - Satellite visibility output
 - Expand to other non-sidereal sources
 - Using Spice toolkit .bsp files
- ◆ Band switching
- ◆ ANTCN termination mode
- ◆ 30 minute periodic “BEOB” procedure in place of “MIDTP” for periodic monitoring functions

Conclusion

- ◆ It would be very helpful to have:
 - ⊕ Feedback on new `gnplt`
 - ⊕ Feedback on bugs that are occurring in the field
 - ⊕ Input on what features are still needed or need to be changed in DBBC support
 - ⊕ Any other requests