



LWA Technical Status

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LWA Users Meeting

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Current Status – LWA1

- DP used for the backend
- Three data products:
 - TBW – 12-bit digitizer samples for up to 61 ms from all dipoles
 - TBN – 8+8-bit I/Q data from all dipoles, 100 kHz bandwidth, 100% duty cycle
 - DRX – 4+4-bit I/Q data from a beam, two tunings, dual polarization



Current Status – LWA1

- Up to 19.6 MHz bandwidth per DRX tuning
- Lost beam #1, strictly limited now to only three beams
 - Not clear what happened
 - Unlikely to get back to four beams in the near term
- LASI all-sky imager running when beams are not



Current Status – LWA-SV

- ADP used for the backend – hybrid FPGA/GPU architecture
- Four data products:
 - TBF – 4+4-bit complex spectra, two tunings, up to a few seconds
 - TBN – same as LWA1
 - DRX – same as LWA1
 - COR – correlator visibility output with full polarization, one tuning



Current Status – LWA-SV

- Up to 19.6 MHz per tuning*
 - TBF and wide band correlator running at 19.8 MHz
- Three beams*
 - Not fully independent; tunings are tied together
- LASI-SV running even when beams are running
- Orville Wideband Imager



Current Status – LWA-SV

- Up to 19.6 MHz per tuning*
 - TBF and wide band



- Orville Wideband Imager



Recent Changes at the Stations

- At LWA1
 - Upgraded the monitor and control machines to new 1U servers
 - Added a 40G link from the LWA UCF to the VLA CBE to speed up data transfers for eLWA
 - Installed DLITE
 - Using four of the outriggers installed as part of the LEDA project
- Most of the recent work as been at Sevilleta
 - New 1G link to the outside world
 - Improved networking inside the LWA-SV shelter



Recent Changes at the Stations

- Most of the recent work has been at Sevilleta (cont'd)
 - Installed a weather station
 - Switched over to UDP multicast for ADP
 - F engine data and output TBN/beam data
 - Moved LASI-SV and the Orville Wideband imager to the SERF building
 - Install a commensal E-Parallel Imaging Correlator (EPIC) machine
 - Both enable by new 10G and 40G optical links from the LWA-SV shelter to the SERF building



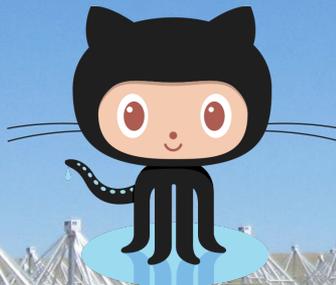
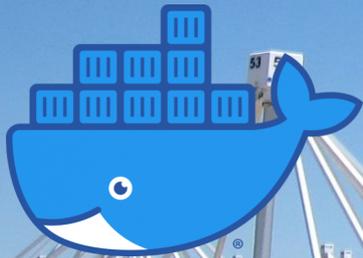
Computing – Status and Changes

- LWA Users Computing Facility
 - Six nodes with hexacore processors and Ubuntu 18.04
 - 32 to 64 GB of memory
 - 4 to 6 TB of scratch storage
 - Recently upgraded to have at least one Nvidia GTX 980 GPU per node
 - Pooled storage of 138 TB for raw data
 - Also serves as a software correlator for eLWA



Software – Status and Changes

- Major update to LSL and the station operating software
 - Support for Python3 and a new API
 - Removed the ATLAS library as a dependency for LSL
 - (Almost) all code is on GitHub now:
 - <https://github.com/lwa-project/>
- The new LSL has led to an easier way to run the tutorials
 - Docker containers provide all the necessary software
 - Xpra for an easier way to display graphical interfaces



Software – Status and Changes

- Working on integrating VLITE-Fast data processing into the eLWA correlator
 - Builds on work with eLWA imaging Crab giant pulses
 - Imaging of dedispersed fast transients detected at 350
- Realtime detection of single dispersed pulses in beam data
 - Commensal system using the multicast beams at Sevilleta
 - Currently using FDMT for searching, considering switching over to coherent dedispersion for targeted searches
- Integration of OVRO-LWA into the LWA Swarm



The Future

- Get Sevilleta back up to speed
- Grow the software needed to support the LWA Swarm
- Expand transient capabilities
 - Both hosted systems through collaborations with other projects/frequencies

