



DAQ status and summer shutdown work plan

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Outline

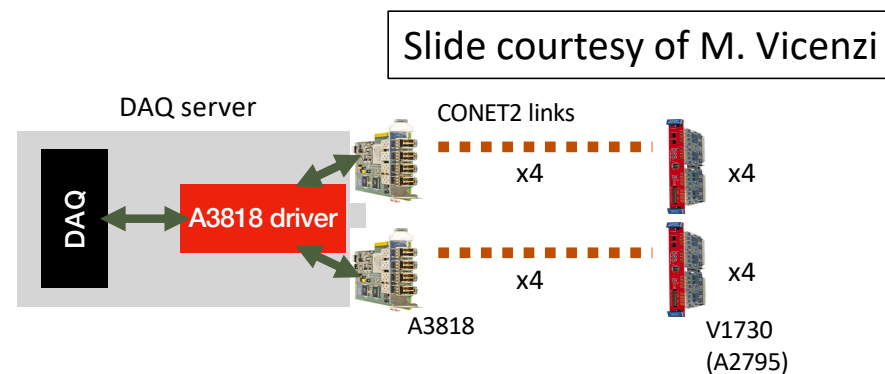
- Current status of daq/software
 - The **DAQ** is performing very well - physics runs **last days**
 - Campaign to address server reboots caused by readout cards in Linux servers
- Status of computers
 - Recovered from failure of main database server in April
 - Installing seven new servers
- Status of move to AL9 [next Linux OS]
 - SLF7 (current Linux version) is end-of-life in June 2024
 - Variance granted to run SLF7 for Icarus during transition to AL9
 - Testing time needed - ~3 weeks (not continuous)
- Other daq efforts

Status of the daq

- The **daq** is overall performing very well
- Running with ***sbndaq* release (v1_10_01)** since **04/16** with no known issues
- Physics runs **last days**
- Occasional runs restarts are due to hardware components (PMT, TPC) issues:
 - usually restarting the run fixes the problem
 - sometimes components power cycle is needed
- During beam downtime, we run special calibration configurations and/or trigger tests

Status of the daq (cont'd)

CAEN A3818 Driver



- Spontaneous **TPC server reboots** triggered by abrupt loss of communication with A2795 boards (root hardware issue unknown)
- CAEN provided a mitigation with **A3818Drv-1.6.5-patched**:
 - New driver installed. Only one reboot reported since ([ECL#212759](#)).
 - CAEN will not include this patch in a release, needs to be managed locally.
- Similar server reboots have been seen for the **PMTs**, so CAEN provided **A3818Drv-1.6.8-patched**:
 - The new driver was installed, but it didn't stop server reboots. Additional "ghost" connection issues appeared after the installation.
 - Driver was reverted to the official 1.6.8 release.
 - We are going to try the TPC patch also for PMTs servers and if needed, open a new ticker with CAEN
 - NOTE: The reduced operating temperature of the boards [obtained with the installation of extra fans in the VME crates] seem to have mitigated the rate of PMT crashes and overall made the system a lot more stable

Status of ICARUS computers

Slide courtesy of G. Savage

- **List of Linux servers at FD used for data taking and auxiliary services**
 - 28 icarus-tpc HPE servers
 - 4 icarus-pmt HPE servers
 - 3 icarus-crttop HPE servers
 - 11 icarus-crt KOI servers
 - 6 Central services – 2 gateways, 2 nfs, 2 database (all KOI)
 - 1 icarus-dcs KOI servers
 - 6 icarus-evb KOI servers
 - 1 icarus-clk04 KOI spare server for white rabbit, installed at MI-12 as hot spare
 - 1 icarus-clk05 KOI spare server for white rabbit, installed in West mezzanine
- **Seven (7) new servers were purchased and are being configured in preparation for AL9 to replace servers getting out-of-warranty**
 - ALL central services, dcs, and clk servers are out of warranty
 - database
 - nfs
 - operations (2) – to run vnc/novnc sessions
 - gateways (2)
 - spares for dcs, clk

VERY IMPORTANT: An OS variance request to keep all DAQ servers at SL7 with access through gateways running AL9 up to the summer 2025, was submitted on 5/24 and approved by the Cyber Security Council . Many thanks to Geoff Savage and Bonnie King (SLAM) for taking care of this.

Moving to AL9 – List of software/processes to be tested

- ICARUS DAQ (SBNDAQ)
 - **Preparing to run a mixed SLF7/AL9 daq**
 - daqinterface
 - boardreaders
 - event builders
 - run control
 - CAEN software – drivers, tools – verified on AL9 by CAEN
 - White rabbit – stay at SLF7 with variance
- **Online monitoring (DQM)**
- **Databases**
 - Redis – online monitoring
 - MongoDB – daq configurations – transition to v6 on AL9
 - Postgres – slow controls, trigger, ??? – works on AL9
- **Grafana**
 - Grafana is currently running in a Singularity container, and we need to develop a new Singularity build script, build the container, and run tests on Alma9. A more conventional approach would be using Docker, Podman, or Kubernetes. Therefore, we need to decide which route to take.
- **Network file system (nfs)**
- **File transfer service (fts) – does it work on AL9?**
- **Virtual network computing (VNC/noVNC)**
 - AL9 – noVNC part of websockify
 - move to icarus-ops01 and icarus-ops02 – does run control and daqinterface need to be on the same server

Slide courtesy of G. Savage

Moving to AL9 – Tentative testing plan

Slide courtesy of G. Savage

- **ICARUS DAQ testing**
 - **Test run control, daqinterface, dispatcher, and OM**
 - Do these processes need to be on the same server? - no
 - They all run on icarus-evb01 now
 - dispatcher and OM need to be on the same server
 - run control and daqinterface can be on different servers, this is the usual configuration
 - **Servers already at AL9 to test board readers**
 - icarus-tpc25 – tpc
 - icarus-crt10 – crt
 - icarus-pmt04 – pmt, crttop (a3818 cards installed???)
 - **Servers still at SLF7**
 - event builders – daqinterface, event builders, dispatcher, run controls, white rabbit servers
- **Transition other functions to AL9**
 - **Gateways** – replace out-of-warranty computers gateway01 and gateway02
 - Use icarus-gateway03 and icarus-gateway04
 - **Central services**
 - icarus-nfs03 (AL9 now) – setting up as backup nfs server
 - icarus-nfs02 will become available
 - icarus-db03 (SLF7 now) – setting up as backup db server
 - **VNC** - Move vnc sessions to operations servers from event builders servers
 - icarus-ops01 and icarus-ops02
 - Can now run multiple vncs on the same server
 - Still only one vnc per user account at a time

Other Daq efforts completed or in progress

- **Create a Wiki to keep track of Certificates' expiration dates and owners [in progress]**
 - The sudden expiration of Certificates can halt the daq operations for days
 - Example: On Dec 31st, the Per certificate to access *icarus_con_prod* db expired and this halted the FTS file transfer for 2 days until the certificate was renewed
- **Implement cron job to periodically clean Bottom CRTs intermediate binary files from disks [DONE]**
 - They fill the disk and create issues in running Bottom CRTs and the daq
- **Implement a disk % occupancy alarm to alert if occupancy is above a set threshold [DONE]**
 - Usually this happens when the FTS (File Transfer Service) dies and the data is not transferred out of the offline storage hence filling up disks.
 - Cleaning the disk may require stopping data taking (to avoid writing new files and allow to drain the existing ones) and we can't afford this while beam is on. We must catch this issue as soon as possible
- **Upgrade FTS for Overlays Analysis [DONE]**
 - Update the FileTransferService (FTS) to transfer *offbeamMINBIAS* files from calibration/physics into their own file family (i.e. same set of tapes at FCC)
- **Event-by-event trigger database [In progress ; will be implemented over the summer]**
 - Requested by the offline for correct POT evaluation

Computers' ongoing tasks

Slide courtesy of G. Savage

- **Two main tasks**
 - **Setup icarus-nfs03 as backup for icarus-nfs01**
 - Reused network hookups from icarus-db01 (kaput)
 - Enable backups with veeam, the Fermi backup service
 - Begin rsync from nfs01 to nfs03
 - **Setup icarus-db03 as backup for icarus-db02**
 - Needs network hookups for ipmi and daq
 - Tickets open with database groups to setup postgres and mongodb
- **Setup Linux servers for AL9**
 - **gateway01, gateway02 ready**
 - **ops01, ops02** – network and vnc as AL9 nodes
 - **gateway03, gateway04** – network access
 - **pmt05**
 - network
 - also need A3818 cards
 - **servers [tbd] for mongodb v6**