

# 2x2 Slow Controls Update

Renzo Vizarreta | University of Rochester

DAQ/Computing Meeting

*Thursday 08, August 2024*

# Logistics

- Mondays (biweekly) at 2PM CT.
  - ▶ Biweekly meetings. Online only. Next meeting 08/12
  - ▶ Email will be sent few days before meeting day.
- Subscribe\* to the mailing list: ***DUNE-2X2-SLOW-CONTROLS***
- System is currently down due to power outage underground. Expect it to come back between tomorrow and Monday.

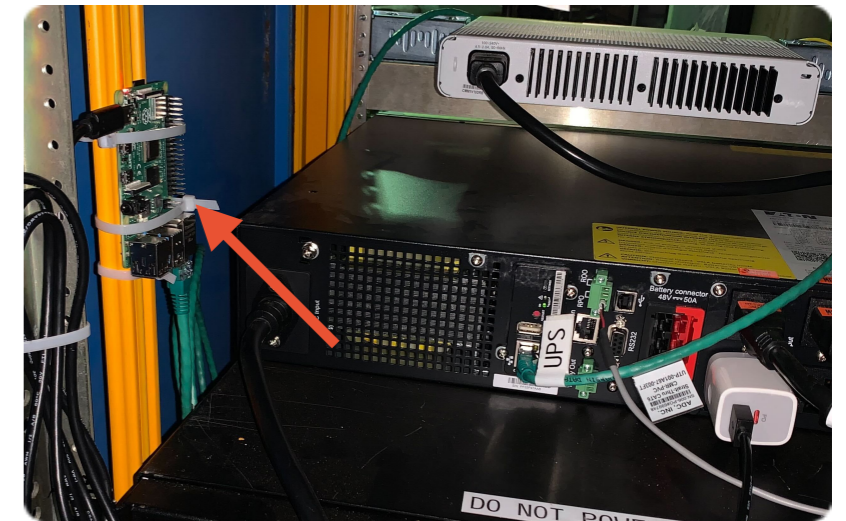
# Slow Controls Activity List

- **Slow Controls pending tasks from last run:**

- ▶ Push UPS  , MPOD PM, and TTIs monitoring to influxDB and Grafana.
  - ▶ Thanks to Luis Mora and Brandon for helping setting this UPS.
  - ▶ UPS data is permanently displayed on IGNITION under the *Detector* tab.
  - ▶ Information recorded on the *ups\_mpod1* Postgres table on the prd DB.
  - ▶ Grafana monitoring coming (very) soon as well.
  - ▶ **First test of Grafana + Postgres stack!**

- **(Ongoing) Goals for next beam run:**

- ▶ Replace current GUI with EPICS for remote controls and configuration (more on next slides).  
**Tests with devices are needed, need to coordinate with RC and subsystem experts.**
- ▶ Re-target slow controls data to be saved on PostgreSQL DB supported by Central Web Services at Fermilab rather than InfluxDB.
- ▶ Allow Grafana login through SSO.
  - ▶ **Need to meet with Kevin Retzke. Start by getting a grafana instance and see what's reachable.**
- ▶ ~~Setup IGNITION for testing on 2025.~~



UPS Data From: 2024-08-06-10-13-37

MPOD-1 UPS powering Module 2 and 3	
Battery Charge:	99 percent
Battery Voltage:	52 Volts DC
Battery Time:	33.6 minutes
Output Current:	3 RMS Amps
Output Voltage:	121 RMS Volts
Output Power:	391 Watts
Input Current:	3 RMS Amps
Input Voltage:	121 RMS Volts

# EPICS Progress (Thanks Sungbin!)

## SpellmanHV - Monitoring Page

Status				Settings			
<b>HV On/Off</b>	<b>Current Mode</b>	<b>Voltage Mode</b>	<b>Remote Mode</b>	<b>Set</b>	<b>Set Read back</b>	<b>Monitored</b>	
Off	Off	Off	Remote		27.08 kV	0.00 kV	
<b>Interlock</b>	<b>HV Inhibit</b>					0.00 mA	
Open	Inhibited				3.25 mA		
<b>Over V Fault</b>	<b>Over Curr.</b>	<b>Over Power</b>	<b>Over Temp.</b>				
OK	OK	OK	OK				
<b>Regulator Err.</b>	<b>Arc Fault</b>	<b>Adj. Ovid Fault</b>	<b>System Fault</b>				
OK	OK	OK	OK				

# EPICS Progress (Thanks Sungbin!)

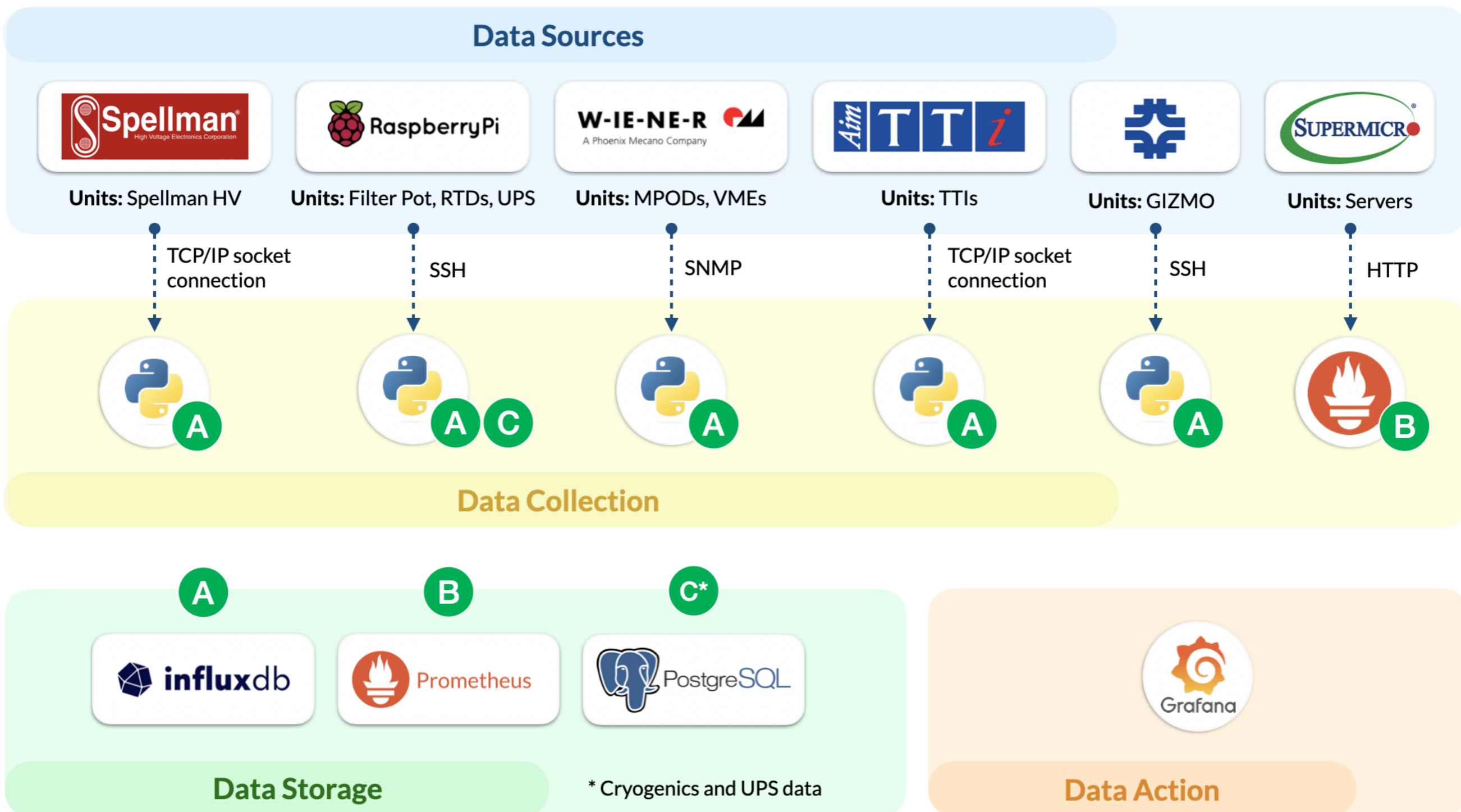
The screenshot shows the CS-Studio interface for MPOD1 / Slot0 : VGA for Module 0 and 1. The interface is divided into several sections:

- Module 0:** A table with 11 columns: Channel, Device, Status, Switch, Set Volt, Current Limit, Sense Volt, Terminal Volt, Current, Trip Delay, and Trip Behavior (0x1040). Each row represents a channel (0-3) with a device name (e.g., Mod0-VGA\_Card\_1) and a status of 0. The 'Switch' column contains green circles, which are highlighted with red boxes.
- Module 1:** A similar table with 11 columns, representing channels 0-3 for Module 1. The 'Switch' column also contains green circles, highlighted with red boxes.
- MPOD1 Summary:** A panel showing Main Power (green circle), Power Status (<mpod1/sysStat>), and Serial Number (<mpod1/psSerial>).
- MPOD1 / Slot0 Summary:** A panel showing Max Sense Volt (<mpod1\_slot>), Max Terminal Volts (<mpod1\_slot>), Max Current (<mpod1\_slot>), and Ramp Rate (1000.000 V/sec).

# Backup

# The Big Picture

UPS not included yet.  
PM MPOD not included yet.  
TTIs need more tests.



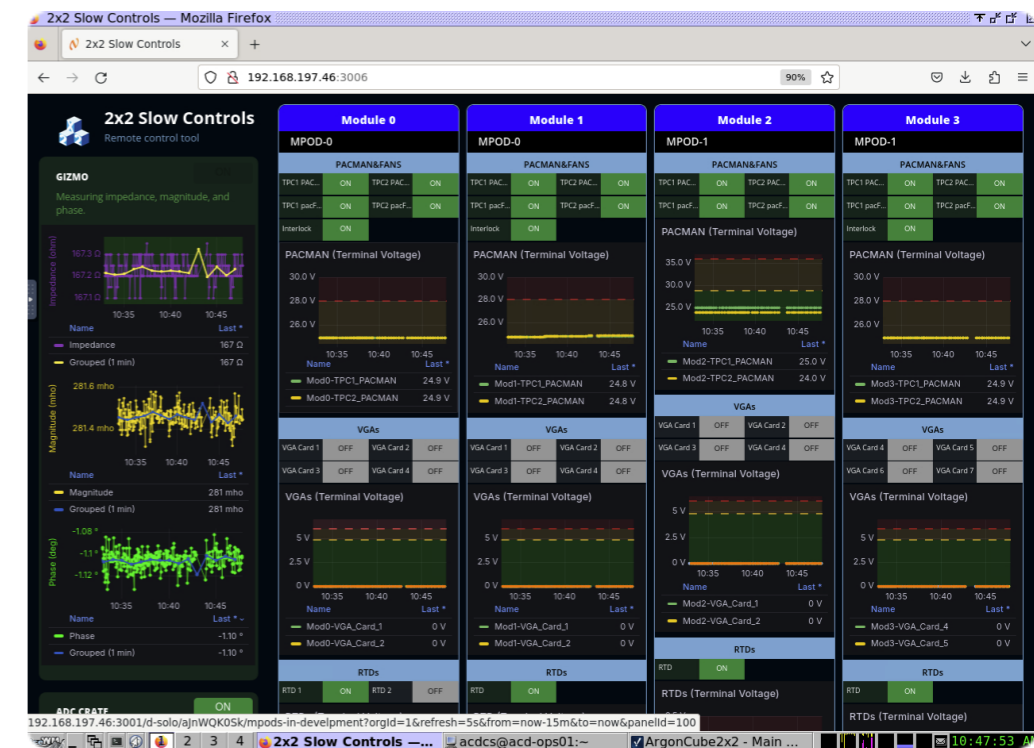
# Current Monitoring Setup

- Configuration is set by power cycling a channel on the GUI.
  - ▶ All configuration exists on a set of JSON files located at: */home/acd/acdcs/2x2/SlowControls2x2/GUI/Classes/Backend/CONFIG*.
  - ▶ Can also be accessed through [GitHub](#).
- How to (currently) change one of these pre-defined values?
  - ▶ On the adcs area, create a new branch with any name of your preference.
  - ▶ Make the desired configuration changes on the JSON files.
  - ▶ Push your changes to git.
  - ▶ On GitHub, make a pull request to the main branch.
  - ▶ After merging with main, go back to the acdcs area and checkout to main again.
  - ▶ Pull changes to main.
  - ▶ Re-run the container by going to */home/acd/acdcs/2x2/SlowControls2x2/GUI/*
- This software hasn't been developed to make changes on the pre-defined configuration, that's why we don't have a 'user friendly' way to do it. We will have an expert tool in the future for this using EPICS or IGNITION.



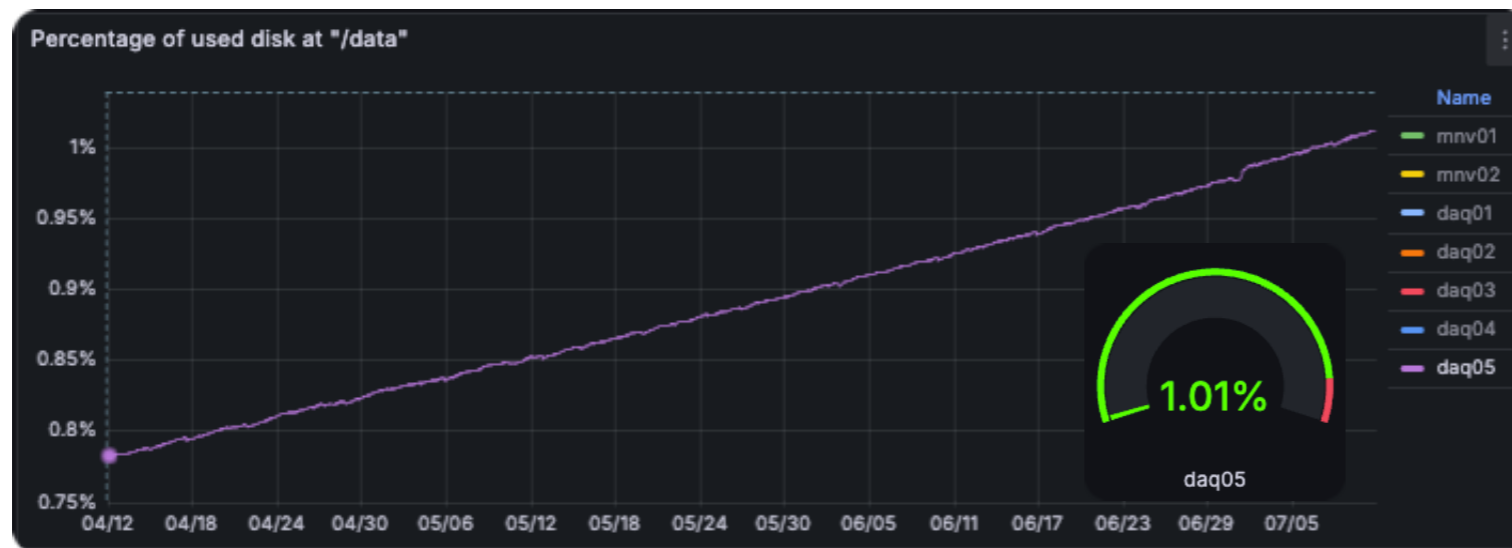
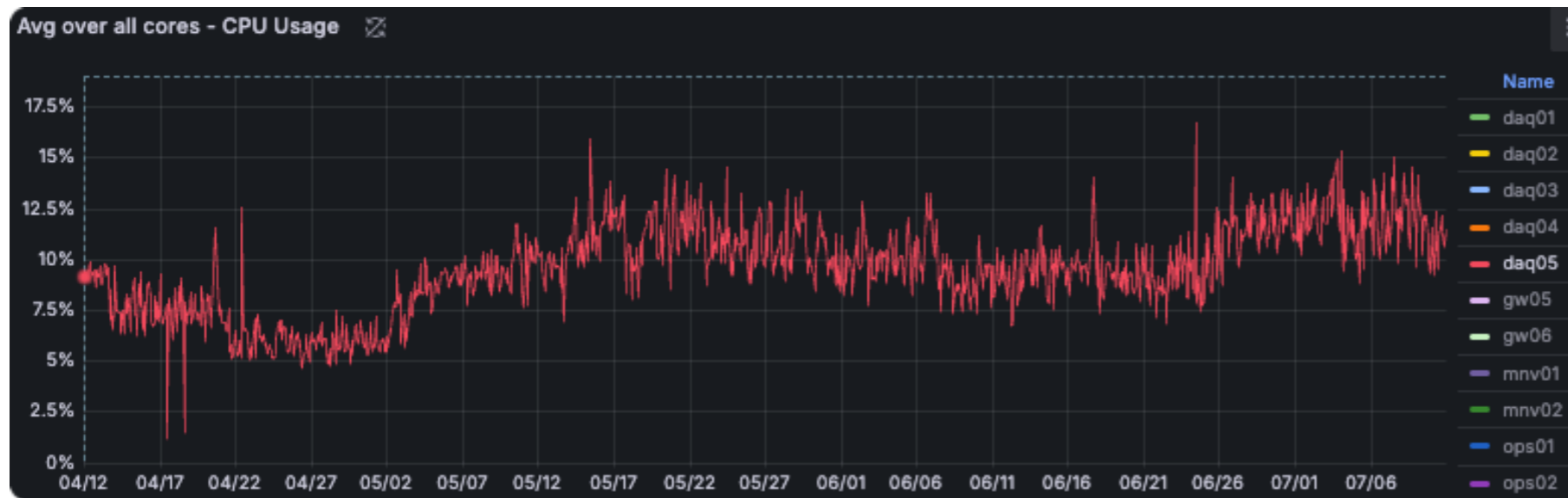
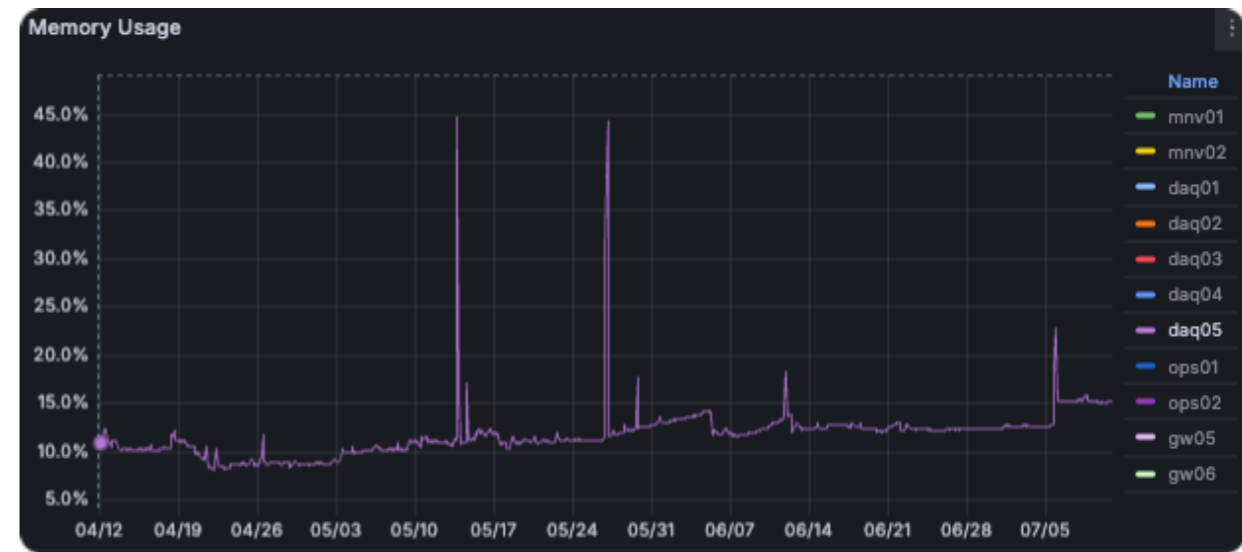
# The Big Picture

- System has proved itself to be stable and consistent.
  - ▶ Pros: It works.
  - ▶ Cons: Remote controls/config not optimal (HV).
  - ▶ Cons: Not scalable for DUNE ND slow controls



# acd-daq05

- Resources consumption.
  - 1.1% of /data used.
  - This is 104GB out of 10T available.



No resource limitations to start implementing new technologies such as EPICS or Prometheus.

Filesystem /data is backed on acd-daq05.fnal.gov. [RITM2030156](https://doi.org/10.21203/rs.3.rs-3811111/v1)

Containers storage will be moved to the new /containers partition after July 12.