U.S. CMS Operations Program

CMS HEPCloud Usage

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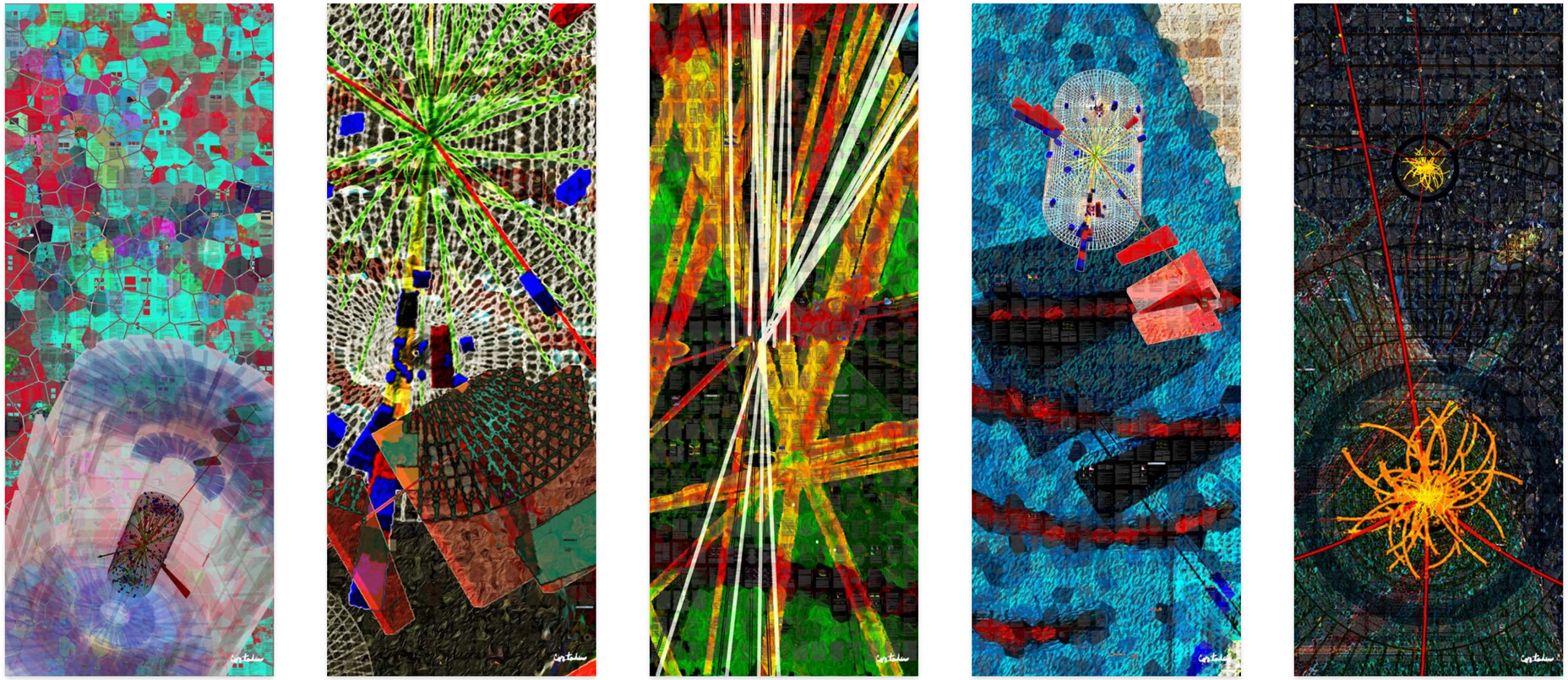
HEPCloud Stakeholder Meeting, September 25, 2024



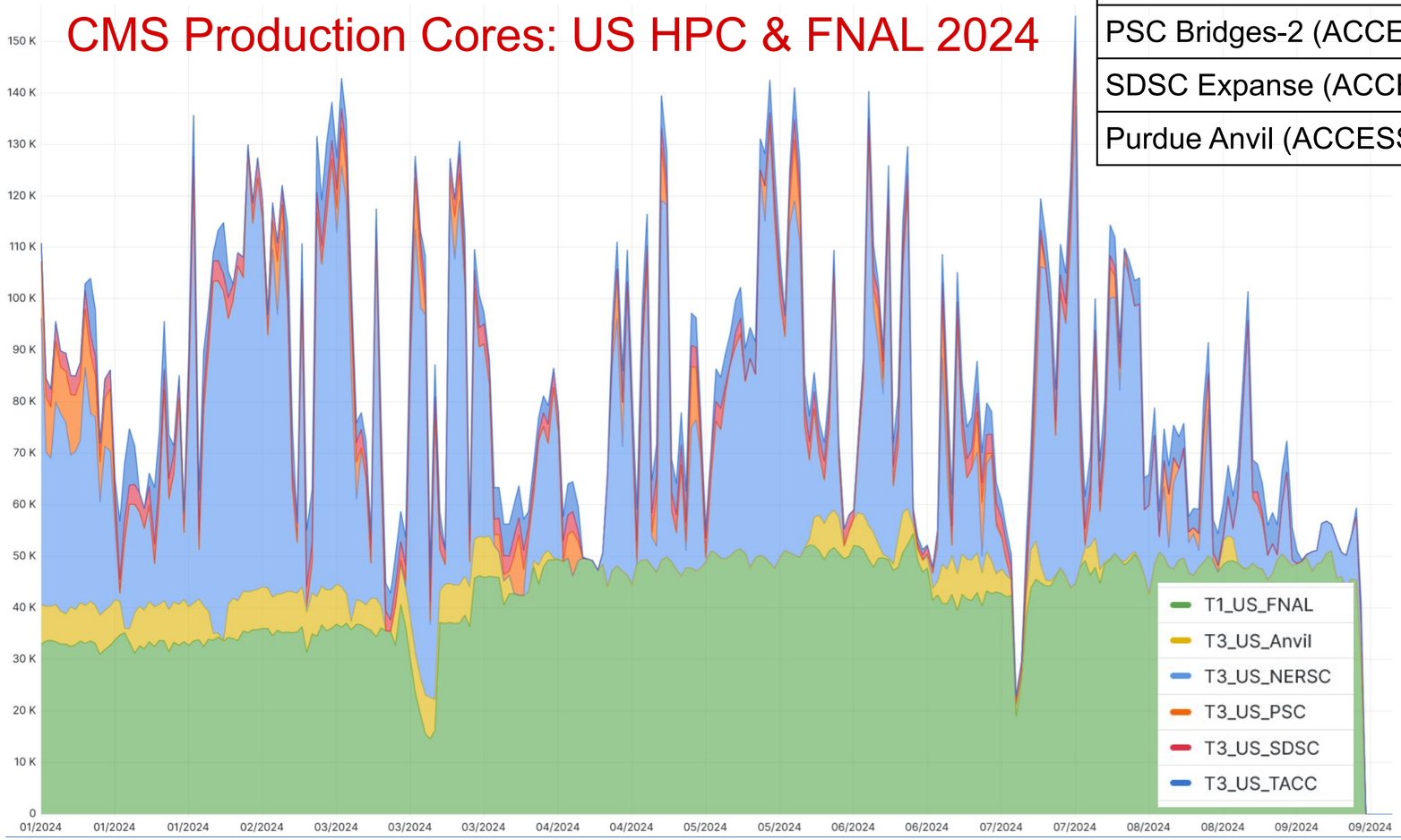
Overview

- Providing HPC resources to CMS via HEPCloud well-established for many years now
- 2024 was an unusually stable operations year, no HPC retirements, no new HPC additions (bit unusual, but even HPC seem to stay around longer these days)
- OTOH, SL7 retirement also affected HEPCloud Operations
  - Plus the related Submission Infrastructure on the CMS side
  - Plus the CMS WMAgents at FNAL
- Problem cases are the same as always
  - Lack of job pressure from CMS => can't fix on our end, but can poke CMS
  - HPC busy => first order can only wait, second order can shape glideins somewhat (#nodes)
    - Did it for NERSC recently, too early to fully tell, but first indications look ok
  - Technical issues (HEPCloud Factory, Hosted-CE,etc) => not often, usually quickly addressed
- Seem to be on the path to formalizing support somewhat
  - Tickets submitted to ServiceNow
  - Initially a bit of a delay compared to old-style slack chat way of working
    - Most/All of the debugging still happening in slack for now
  - In the long run a plus since there are records and a history of what was done

Current HPC Usage

- Comparable to FNAL T1 in scale (but not continuously available/used, utilization fluctuates)
- Providing most of the opportunistic CMS resources (which CMS is relying on for MC production)

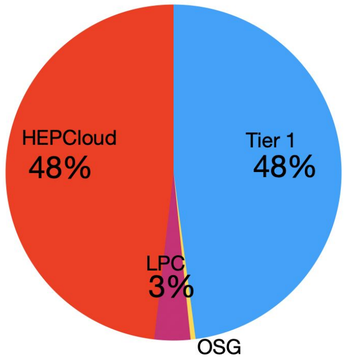
CMS Production Cores: US HPC & FNAL 2024



Currently Active Allocations

HPC Resource	Allocation (node hours)	Allocation Period	%Used*
NERSC Perlmutter (DOE)	1318k CPU	Jan 2024 - Jan 2025	71%
TACC Frontera (NSF)	640k	Jun 2024 - May 2025	36%
PSC Bridges-2 (ACCESS)	229k	Jul 2023 - Sep 2024	100%
SDSC Expanse (ACCESS)	236k	Jul 2023 - Sep 2024	100%
Purdue Anvil (ACCESS)	260k	Jul 2023 - Sep 2024	100%

- First year number of CoreHr the same between T1 and HEPCloud (as of a few weeks ago), HPC CPU usually faster than T1 CPU



Outlook

- We are happy to be part of the HEPCloud team, things work well
- Record usage this year (mostly because of the huge NERSC allocation)
- New ACCESS allocation approved, will include hours at Stampede3

- LCF still very much an R&D Project
  - Integration method used at other HPC doesn't work (no internet on batch nodes)
  - Recent ALCC award on ALCF Polaris ended with some technical successes, but not a production-ready result
    - Will continue R&D with DD (directors discretionary) allocations
  - Very interested in anything new coming out of the IRI initiative
    - Trying to get CMS/LHC in as a IRI Pathfinder project (for longterm campaign)