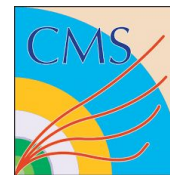


# CMS Needs and future views on HPC

Daniele Spiga (INFN)  
On behalf of CMS

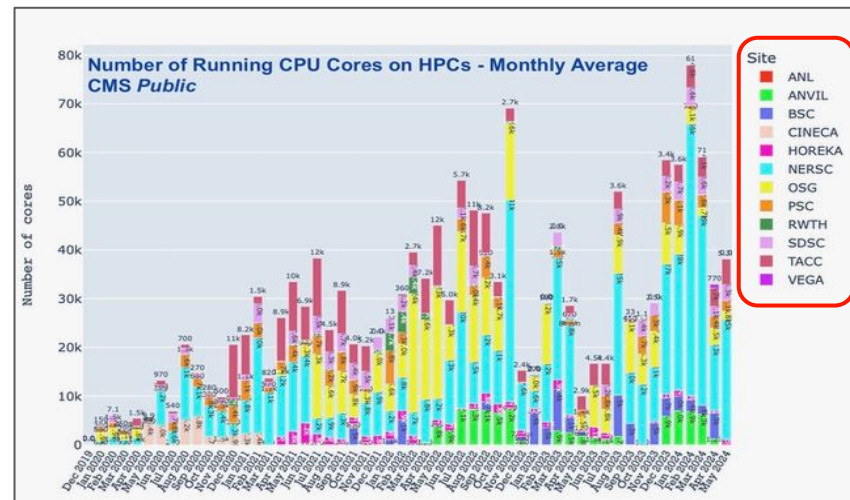


# HPC @ CMS

After several investments by CMS a number of HPC machines has been integrated since the year 2020.

## Commissioning and supporting HPC costs

- CMS has to provide interface between experiment and HPC.
- Ad hoc solutions needed in order to bypass some HPC design features not matching CMS computing mode.
- Each HPC is different and need individual solutions.

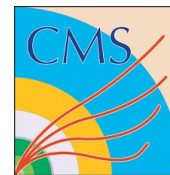


## Software perspectives: CMS very active and quite advanced

- Investing on GPU support, porting to new architectures (POWER, ARM, Risc-V) or accelerators

Continuous effort is spent to integrate HPC resources to increase HPC contributions

- **CMS wants to further increase the HPC exploitation particularly in the EU Zone,** where CMS uses less resources compared to the US



# (Some of the) open points

for later discussions

**Integration with CMS computing infrastructure** do not represent a real problem so far, **if we can rely on enough network** (and storage)

- Is this still true when we scale up HPC use?

**Workflow types:** CMS tries to run almost all production workflows at HPC, but often we cherry-pick the "easiest" (least demanding in terms of I/O) types

- If we manage to increase HPC usage, is this (still) sustainable?
- However it can become problematic in case HPC resources become part of official WLCG pledging

**Allocation process** and CMS (LHC experiments) planning horizon/process mismatch

- Based on the current allocation process it would need order 1+ years to include HPC resources into CMS planning
- Current HPC use is beyond pledge and thus not an issue. It can be problematic if use increases a lot

**Platforms for edge services** (cloud/K8s based) at HPC

- It seems to be more popular now. These are instrumental and ease the integration with CMS infrastructure

**Actively manage storage at HPC**

- Streaming is "simple" although add stress on networks and remote CMS site. Larger storage allocation should be explored to enable a full integration with CMS Data Management
  - Converging on a small set of approaches would help to maintain HPC integrations

**Access policy** (Identity Federation)

- Current approach is "service account based". A federated model (based on "trust") can be needed to further integrate HPC