



# OPS and Facilities session

*WLCG/HSF Workshop 2024*  
*14.05.2024*

# OPS and Facilities session during WS

- Organized in two slots today and tomorrow, 1.5 hours each
- Topics to be included in the agenda have been discussed with the community (input collected from the LHC VOs, suggestions from the sites, set of proposed topics reviewed at the WLCG OPS coordination meeting)
- We certainly can not cover everything in 3 hours. Concentrate on the topics which in our opinion NOW have impact on the infrastructure evolution and WLCG operations, where currently work is ongoing and progress update is needed
- In preparation for the OPS and Facilities session WLCG OPS launched site questionnaire in order to get site perspective on some points which will be discussed. Many thanks for active participation of the sites. The outcome will be presented during the session
- Today main focus is on the transition to tokens and accounting
- Tomorrow agenda consists of update on the new WLCG helpdesk and a dedicated discussion how LHC VOs handle jobs with specific requirements, pros and cons of different approaches and what WLCG can do in order to manage such jobs more efficiently



# Overview of the ongoing changes and OPS campaigns on the WLCG infrastructure

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# Overview

- WLCG infrastructure is quickly evolving following technology evolution in all areas of LHC computing
- Coordination of this evolution is joined effort of various stakeholders: LHC experiments, sites, WLCG Operations Coordination, EGI and OSG infrastructure providers and middleware projects.
- Current presentation will cover **some** of ongoing changes and/or status of OPS campaigns where we believe update is required while no dedicated talk is foreseen in the agenda

# DPM migration

- EGI support for migration from DPM to dCache ended end of June 2023
- CERN security fixes will no longer be available after June 2024 (CentOS7 EOL). This is a critical point by which all sites which are used by LHC experiments and still run DPM storage **have to** migrate
- Experiments operations play active role in helping sites to migrate
- WLCG have less sites to migrate compared to EGI, but more requirements (enabling SRR)
- Current status (WLCG sites):
  - 34 tickets solved (37 sites)
  - 6 not yet accomplished. Mainly very small sites.

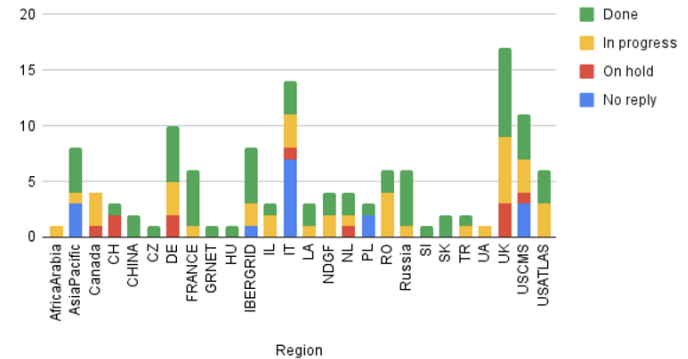
# Drop of FTP protocol in FTS

- Whether GridFTP protocol can be dropped in FTS services?
- There is still some occasional GridFTP usage, often as a backup after something else fails
- Sites are concerned since remaining GridFTP endpoints are running on SL7
- WLCG Ops Coordination pinged VOs using FTS on WLCG infrastructure
- ALICE, ATLAS and CMS do not use it for a while
- LHCb still has GridFTP endpoints as a backup, but agreed that they can be decommissioned.
- DUNE does not use it apart of one single exception FNAL to NERSC (will not be needed soon)
- BELLE II still uses GridFTP endpoints as a fallback solution. Will ensure that they are not needed after June 2024 (SL7 EOF)
- **Can we conclude that sites can stop support of GridFTP endpoints used by FTS considering usage by LHC VOs, DUNE and BELLE II after 30<sup>th</sup> of June 2024?**

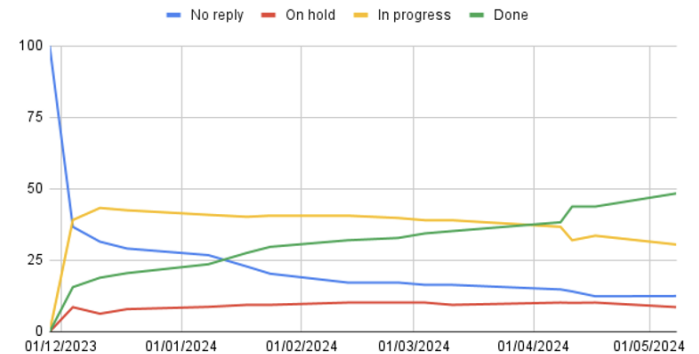
# IPv6 deployment on compute services

- WLCG decided to deploy IPv6 also on compute services by 30 June
  - Deployment on storage completed long ago
- Several reasons for it
  - IPv4 addresses a scarce resource
  - Government mandates
  - Enable packet marking
  - IPv6 fully supported by experiments
  - IPv6-only is the end goal!
- Steady progress, half of the sites have finished
  - Only a few sites say they won't meet the deadline
- Crucial contribution of the HEPiX IPv6 working group

Tier-1/2 IPv6 CE/WN deployment status [08-05-2024]



Tier-1/2 CE/WN IPv6 deployment status vs. time



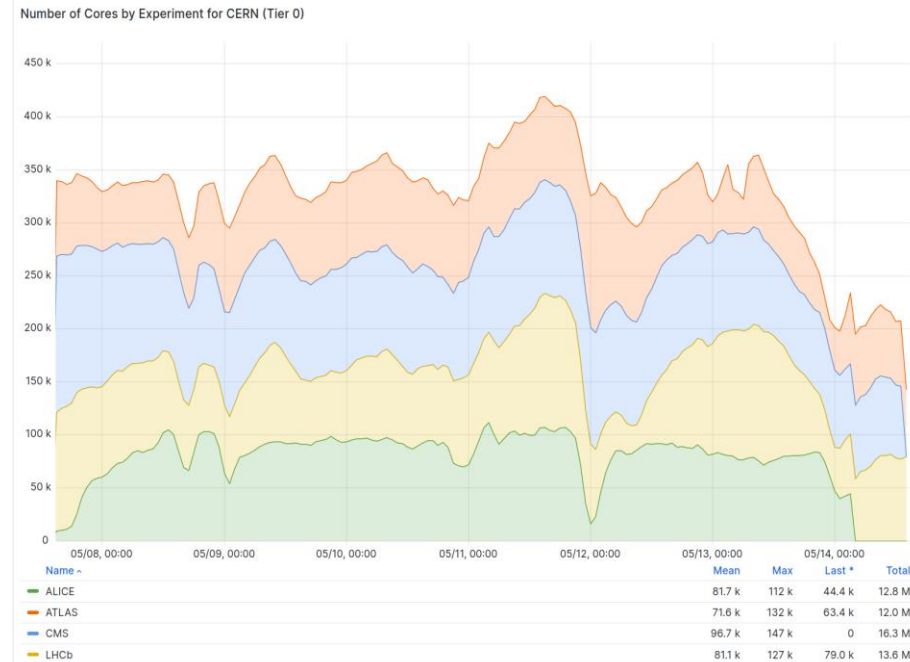
# Benchmarking

- After 1 year of increasing adoption, HEPsScore23 has been executed on
  - ~110 distinct configurations (CPU models, SMT conf., ...) including ~10 ARM-based servers
    - Neoverse-N1 (Altra, Altra Max), Neoverse-V2 (Grace)
  - Enabled power consumption vs performance studies
  - Expect to see more HS23 data in the central benchmark DB
    - Public data at [https://w3.hepix.org/benchmarking/scores\\_HS23.html](https://w3.hepix.org/benchmarking/scores_HS23.html)
- Plans:
  - CPU: Improvements and new features will be released before summer in HEPsScore v2.0
  - GPU workloads exist, but we are still far from having an HEPsScore for CPU+GPU
- The working group is lacking in contributors in the development and operation areas
  - Opportunity for new participants
  - Further info at <https://indico.cern.ch/event/1377701/contributions/5863768/>



# Monitoring. Job processing

- **Unified Experiment Monitoring is a WLCG project with the objective to harmonize the WLCG job accounting reports across the LHC experiments in order to provide aggregated reports of the compute capacity**
- **Started in October 2022**
- **Gained access to necessary/required data sources from all LHC experiments**
- **Agreed on a common set of metrics**
- **Alignment of experiment definitions still in progress**
- **Preliminary dashboard can be found in WLCG grafana organisation (numbers not yet fully validated)**



# Monitoring. Data transfer

- A lot of work on enhancement of monitoring of data transfer and remote data access in preparation for DC24
- WLCG site network monitoring has been enabled allowing sites to report incoming and outgoing network traffic. Deployment campaign has been run for big sites. About 50 sites have enabled this new functionality. Data is available in [dashboard](#)
- New workflow for monitoring of the remote data access via xrootd protocol has been put in place shortly before DC24. Two use cases :
  - Reporting monitoring flow from xrootd server (re-implementation)
  - Using dCache billing information for dCache+xrootd door (completely new implementation)
  - Though deployed, not really validated during DC24. Validation of this new monitoring workflow and massive deployment on the infrastructure is the main goal for the coming months

# MW readiness for EL9

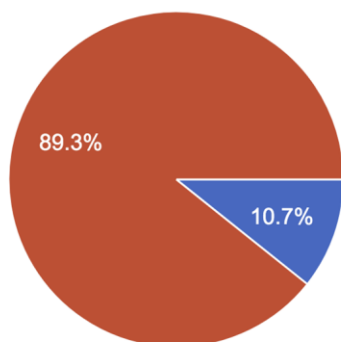
- Newly available for EL9:
  - LCMAPS
    - Available in EPEL as of March 20
- Not yet available for EL9:
  - APEL client & parsers
    - May-June
  - FTS server
    - May-June
  - StoRM
    - May-June
  - UI, WN
    - UMD-5 meta packages
- EGI UMD-5 will bring support for EL9
  - Expected to become [available](#) this month
  - The [WLCG repository](#) can also be used to some extent

# Adoption of ARM resources (1)

Site input via questionnaire. 55 sites responded among them T0 and 9 T1s

Does your site already host ARM resources?

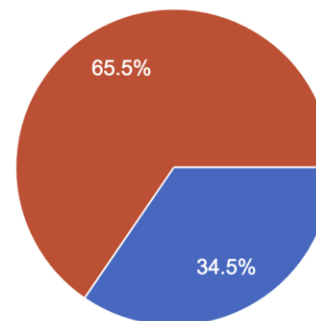
56 responses



● YES  
● NO

Does your site intend to purchase ARM resources in the near future?

55 responses

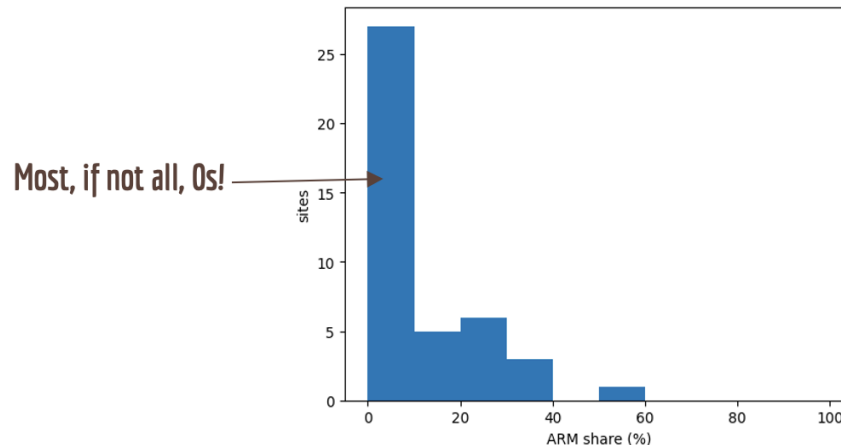


● YES  
● NO

# Adoption of ARM resources (2)

- 1. Current Adoption Levels:** The majority of sites currently have zero or very low (less than 1%) ARM resources. Some have around 10% ARM resources, with expectations for growth over time
- 2. Future Plans:** some express openness to the idea of purchasing ARM resources in the future, contingent on various factors such as experiment adoption, cost-effectiveness, and energy efficiency. Others mention a cautious approach, waiting for experimental software validation or clear use cases before committing to ARM adoption, but open to experiment with ARM at some point

What is your estimation regarding fraction of ARM resources vs overall computing resources on your site in the time frame of 2-3 coming years?



In general, no current plans or funding for ARM resources

Some (small) interest in testing and potential adoption

# Adoption of ARM resources (3)

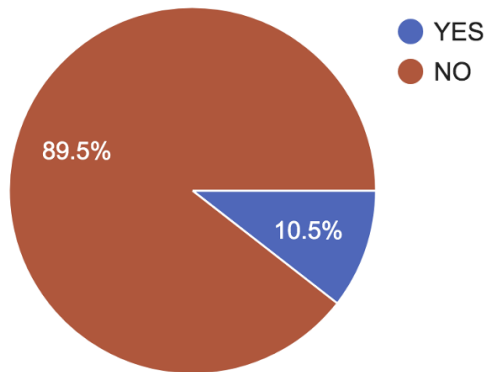
## 3. Factors Influencing Adoption:

- Readiness of experiments to utilize ARM resources
- Comprehensive comparisons with AMD processors are necessary to fully evaluate their efficiency and effectiveness
- Compatibility with existing cooling infrastructure (such as liquid cooling systems)
- Limited funding and space constraints are mentioned as challenges in expanding ARM adoption

## 4. Other comments:

- Limited benefits of ARM resources for specific workloads, especially in physics, when compared to modern x86 CPUs with large vector extensions?
- Compatibility issues, administrative hurdles, complexity in resource management, immaturity of datacenter-grade ARM servers, and/or limited vendor support
- Mix of interest, skepticism, and practical considerations regarding the adoption of ARM resources, with some seeing potential benefits in terms of power efficiency and cost savings

# Running x86\_64-v1 or even older?



**1. Amount? What is the plan for retirement?** Minimal remaining resources. Many sites have plans to retire x86\_64-v1 and (even) older resources, at most by end of 2024 (partial retirement or gradual replacement processes). Older resources to be replaced with newer ones that support x86\_64-v3 or higher