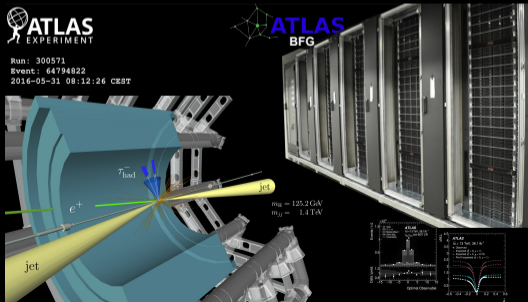


# Annual Meeting of the BMBF-funded Research Compound - “Föderiertes Computing für die ATLAS- und CMS-Experimente am Large Hadron Collider in Run-3”

## Weiterentwicklung und Optimierung des föderierten Computing für das ATLAS-Experiment am LHC

March 26th 2024

Michael Böhler



# Tasks and Manpower

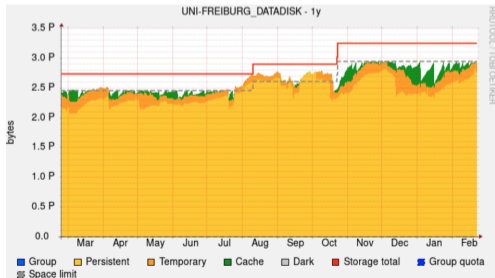
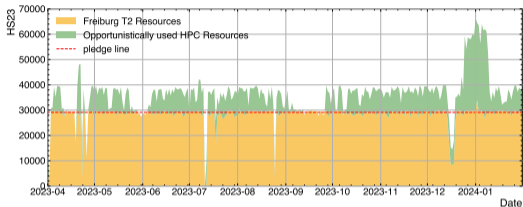
Planned contributions are broken down as follows:

- ▶ **GridBasis:** Expansion and base operations of the ATLAS Tier-2 centre in Freiburg
- ▶ **GridCloud:** ATLAS specific tasks at the local Tier-2 center and in the *GridKa* cloud
- ▶ **HC Devel. :** Further development of the HammerCloud(HC) framework

Arbeitspaket	2021	2022		2023		2024
	2. HJ	1. HJ	2. HJ	1. HJ	2. HJ	1. HJ
GridBasis	0,0 (0,45)	0,0 (0,45)	0,0 (0,45)	0,0 (0,45)	0,0 (0,45)	0,0 (0,45)
GridCloud	0,7 (0,35)	0,7 (0,35)	0,7 (0,35)	0,7 (0,35)	0,7 (0,35)	0,7 (0,35)
HamCloudEnt.	0,3 (0,20)	0,3 (0,20)	0,3 (0,20)	0,3 (0,20)	0,3 (0,20)	0,3 (0,20)
<b>Summe</b>	1,0 (1,00)	1,0 (1,00)	1,0 (1,00)	1,0 (1,00)	1,0 (1,00)	1,0 (1,00)

- ▶ 1 FTE requested, 1 FTE in brackets employees funded by “Landesmittel”

# Operation of ATLAS Tier2 Center at Freiburg



## Compute:

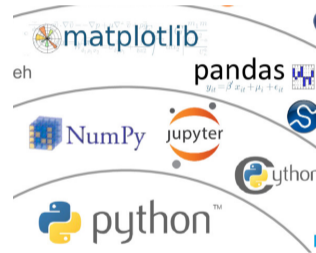
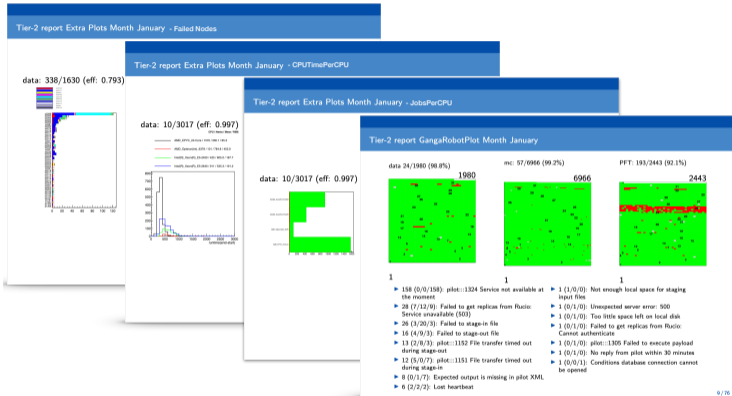
- ▶ Stable Operation of Tier2 in 2023/24 - pledges fulfilled
- ▶ Scheduler upgrade: Slurm 21.08 → 23.02.7
- ▶ New HW ordered (delayed NEMO2)
  - ▶ ~ 50 kHS23 (to be measured)

## Storage:

- ▶ New Hardware deployed
- ▶ Smooth operation
- ▶ dCache upgrade: 6.2.47 → 8.2.25

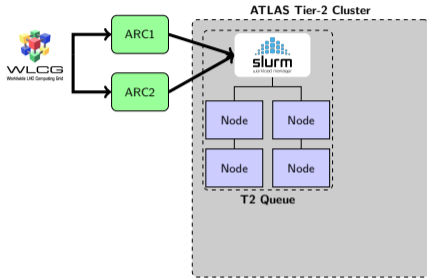
Space Token	Disk [TB]
UNI-FREIBURG_SCRATCHDISK	60
UNI-FREIBURG_DATADISK	3250
UNI-FREIBURG_LOCALGROUPDISK	650
<b>Total</b>	<b>3960</b>

# ATLAS tasks around the Tier1 centre GridKa



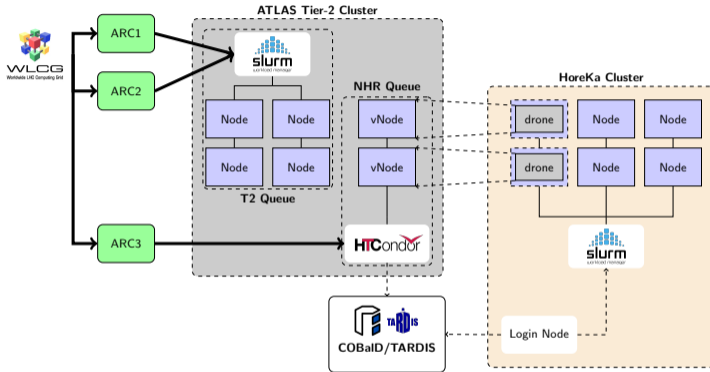
- ▶ Member of GridKa Squad (weekly/monthly meeting - presenting Tier-2 Report)
- ▶ T2 Report will get a face lift → moving plotting to scientific python tool stack
- ▶ Member of GridKa Technical Advisory Board - ATLAS Collaboration (2022-06 - today)

# NHR integration - Status



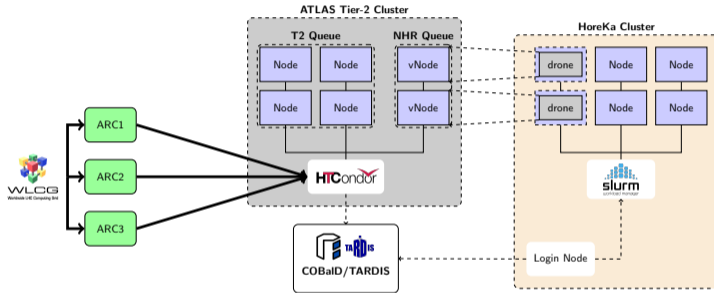
- ▶ Status before adding NHR queue

# NHR integration - Status



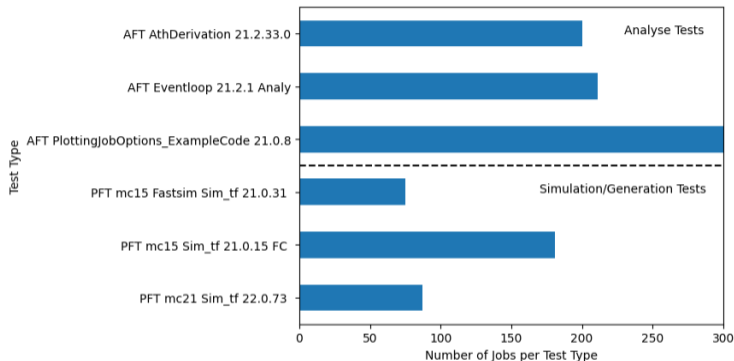
- ▶ Status before adding NHR queue
- ▶ HTCondor required to integrate containers as resources

# NHR integration - Status

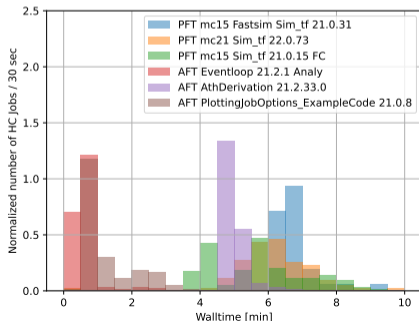


- ▶ Status before adding NHR queue
- ▶ HTCondor required to integrate containers as resources
- ▶ Migration plan: install new nodes (ordered for 2024 pledges) into HTCondor batch system

# HammerCloud Jobs - on UNI-FREIBURG\_NHR Queue



- ▶ successful HammerCloud test jobs first days of UNI-FREIBURG\_NHR queue
- ▶ only short running HC tests can be completed in 4h wall time of development queue

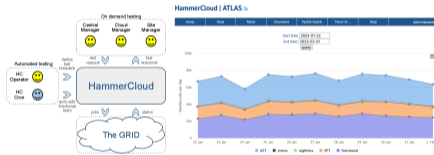




# HammerCloud Infrastructure Migration and Containerization

## HammerCloud(HC) in a Nutshell

- ▶ HC is testing and benchmarking framework used in ATLAS & CMS
- ▶ central service: submits thousands of test jobs per day to all WLCG grid sites

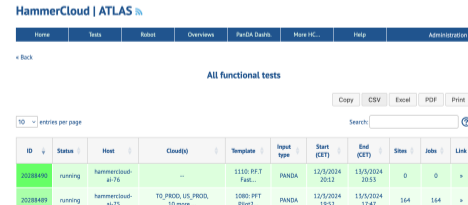
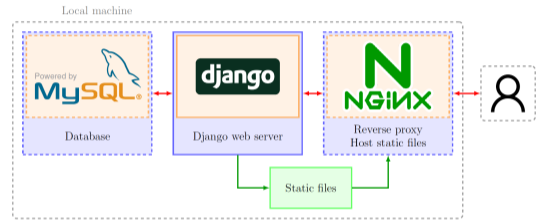


## Ongoing task

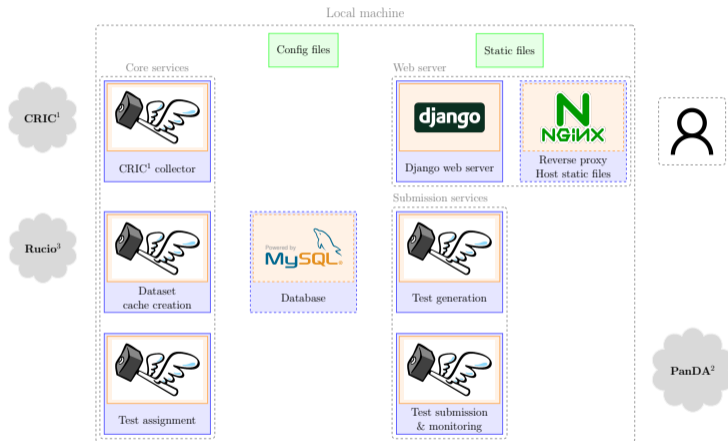
- ▶ Migration Python2 → Python 3
- ▶ Containerization of entire framework

## Containerization of HC infrastructure

- ▶ web server migrated



# Containerization - all services



- ▶ Several tasks are transformed into dedicated containers

- ▶ Efficient and successful operation of ATLAS Tier2 centre in Freiburg
- ▶ Important contribution to ATLAS GridKa Cloud Operations
- ▶ NHR Test Phase successful  
→ continue with Pilot Phase  
(5% of pledged resources of the Uni-T2 over 1 year maintained from Freiburg)
- ▶ Innovative developments to the HammerCloud Framework

# Back-up