



**兰州大学**  
LANZHOU UNIVERSITY

# **Lanzhou University computing cluster status**

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# Outline

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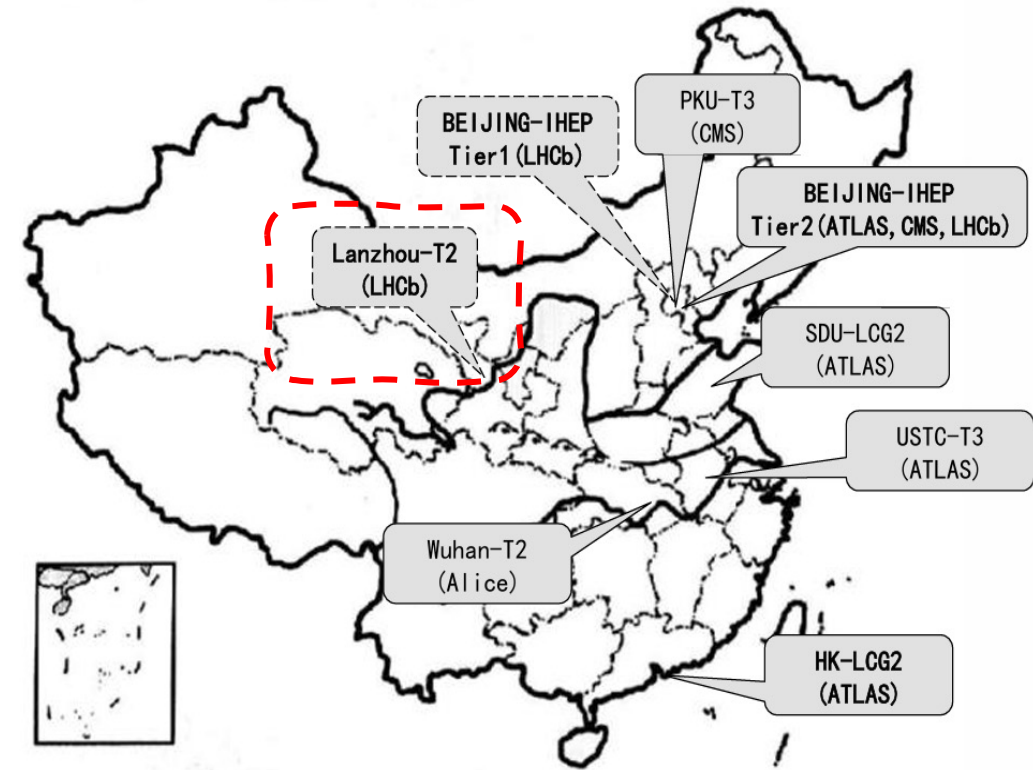
- ✓ Tier-2 Site in Lanzhou University
- ✓ Tier-3 Site in Lanzhou University
- ✓ Current issues
- ✓ Summary

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# Tier-2 Site in Lanzhou University

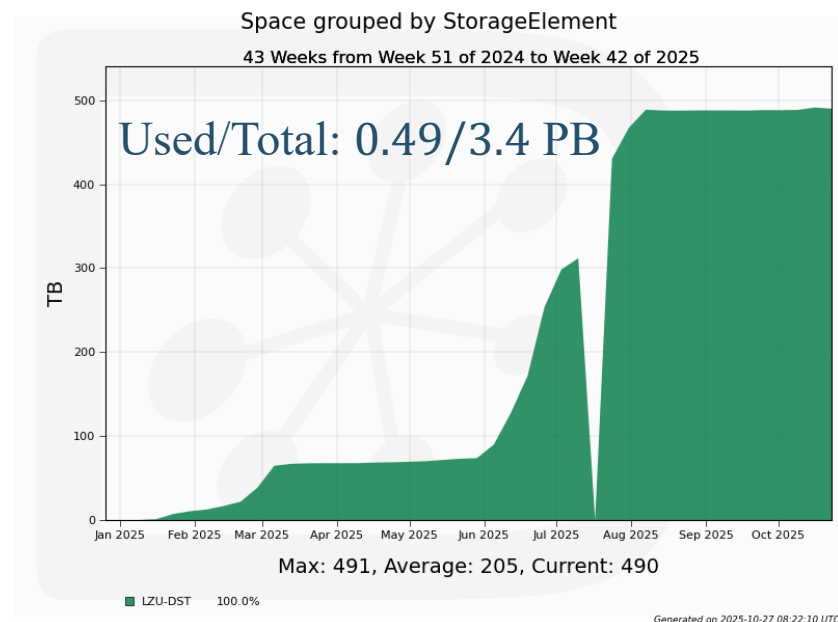
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- Tier-2 site is constructed in Lanzhou University in 2024
  - ~3500 CPU cores
  - ~3.4 PB disk storage
  - 100% contribute to LHCb
- Funds from LZU approved by the end of 2023: ¥ 60M.
- A dedicated 2 Gbps network link between LZU and IHEP.
- CC-IHEP is responsible for software deployment and maintenance.
- The MoU agreement of Tier-2 site is not signed yet but expected to be implemented soon.



# Tier-2 Site in Lanzhou University

- Defined as T2D site:
  - Not only for simulation task.
  - Start to process experimental data.
- Biggest Tier-2 site in LHCb
  - Always busy:  $> 80\%$  average resource usage.
  - Substantial computing contribution.
    - $\sim 18.37\text{M}$  CPU hours. (since Jan. 2025)
    - 2.91 PB data transferred.



Volume of data written

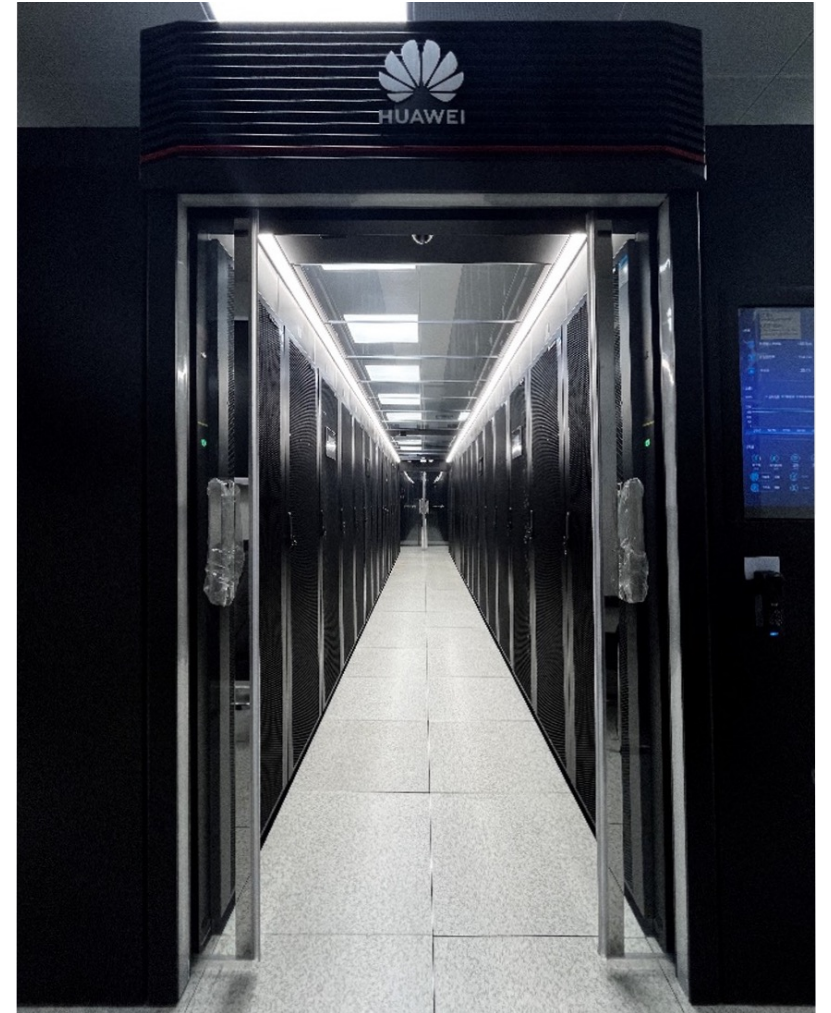
Running jobs at T2



# Tier-3 Site in Lanzhou University

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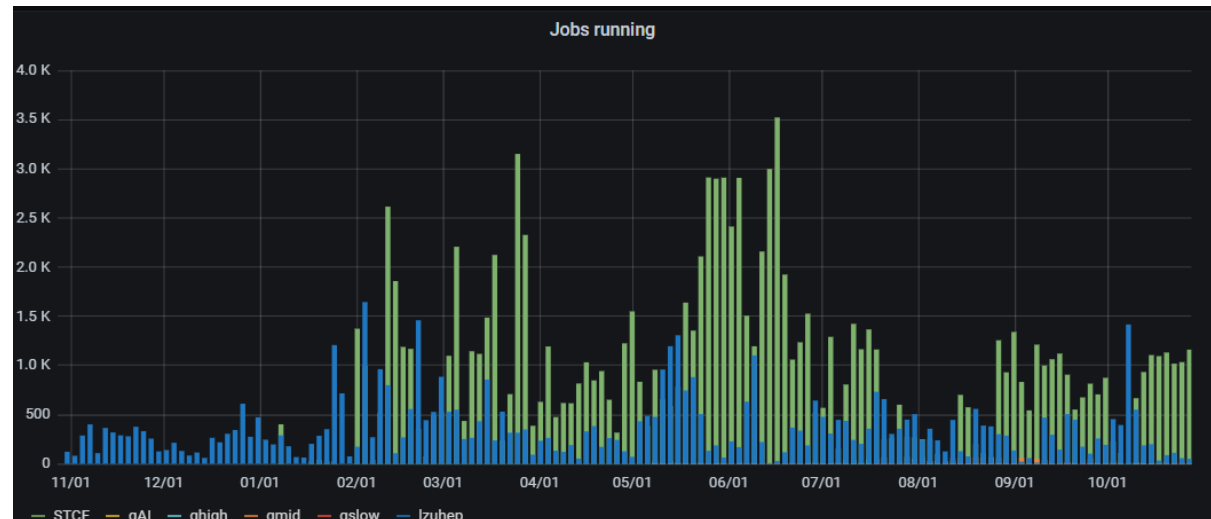
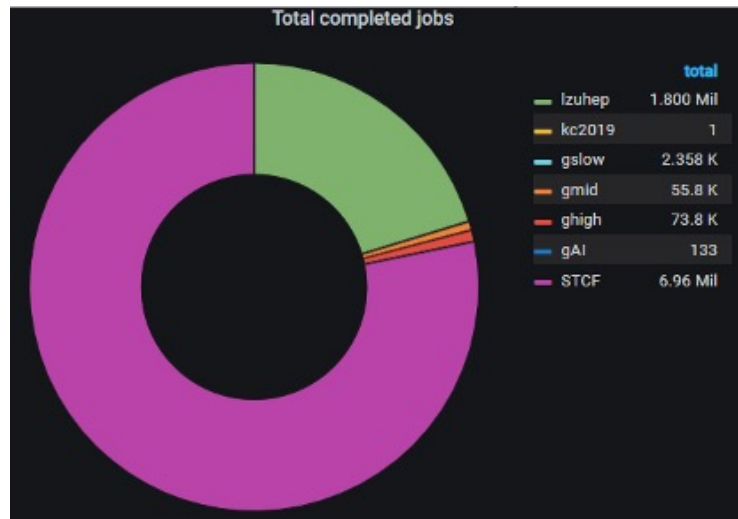
- Local cluster for user jobs with experiments including BESIII, LHCb and STCF etc.
  - ~4000 CPU cores
  - ~4 PB disk storage
  - ~90 NVIDIA GPUs (RTX2080Ti, RTX3080, and L20)
- Satisfy various computing environment of several experimental groups.
- Computing resources are managed by HTCondor.
- Around 300 regular users are working properly.
- Cluster maintenance:
  - Hardware: LZU local group
  - Software environment: IHEP computing group



Machine room

# Tier-3 Site in Lanzhou University

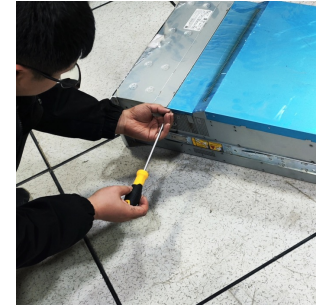
- The local cluster is dedicated to supporting the research activities of HEP group.
  - CPU jobs (2024.10 - Now)
    - 1.8 M jobs with 8 M CPU hours
  - GPU jobs (2024.10 - Now)
    - 170 k jobs with 220 k GPU hours
- Recently, it is actively used by STCF colleagues.



# Current issues

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- Hardware requires regular replacement to maintain high performance.  
Support from school funding is only one-time, the follow-up maintenance still requires a lot of investment:
  - CPU, GPU and disk: ¥ ~5.25 M / 6 years,
  - Network device: ¥ ~1.8 M / 10 years.



regular maintenance

- Cost of other projects for the operation of the equipment is also a large expense,  
*e. g.*
  - Electricity power: ¥ ~0.66 M / year,
  - Network connection: ¥ ~0.4 M / year.



# Summary

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- The Tier-2 site is defined as T2D site and in stable operation.
- The local computing cluster continues to operate reliably over the past years, offering dedicated computational support to the local HEP group.
- Cluster maintenance entails substantial and recurring costs.

*Thanks*