Federative CERN CMS TIER2 project in Latvia: infrastructure and technical aspects

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CERN CMS TIER2 project goals

- Cooperation between partners and CERN in high energy physics and HPC

- Project member education about CMS and HPC technologies at CERN

- Involvement of CERN PhD students in TIER2 activities

- Joint participation among partners in EU cross-border HPC projects

- Development of Latvia's HPC infrastructure and its promotion for scientific applications

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Project funding and partners

- Funded by Latvia's government via Ministry of Education and Science

- Led by Riga Technical University

- Academic partners in Latvia

- Private partners in Latvia

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A federated cloud: Pooling high-performance computing resources to create distributed (Federative) CERN CMS TIER2 site

Latvian Academic network
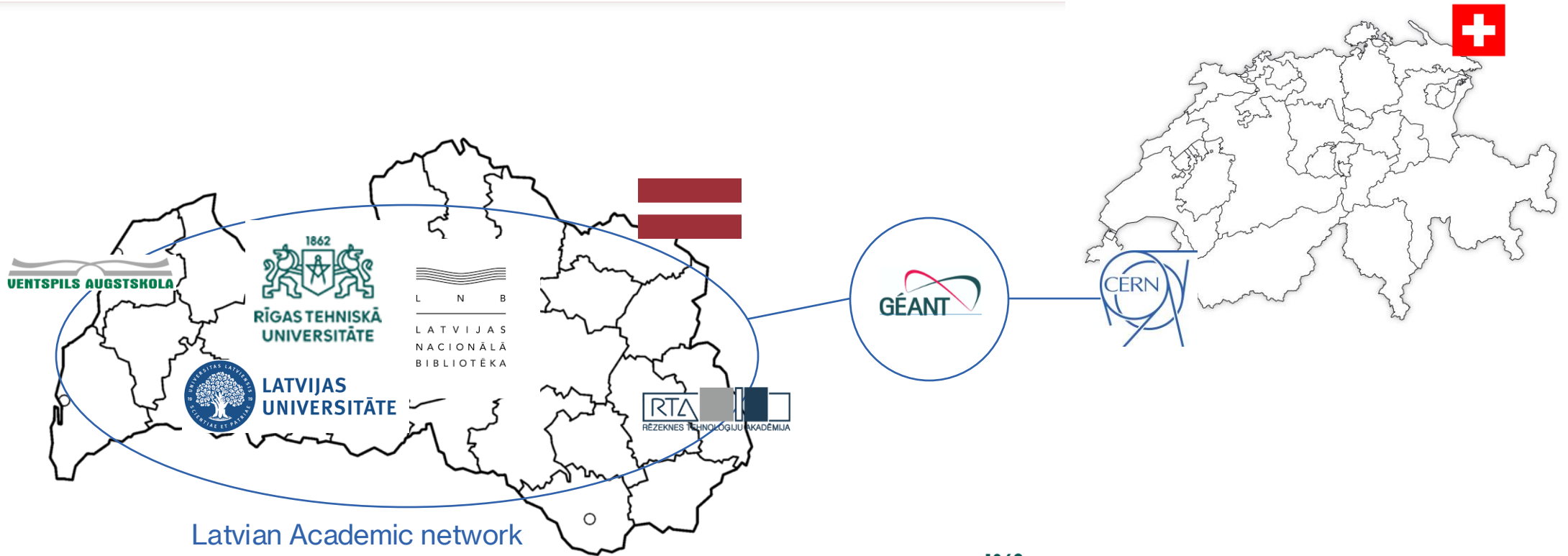
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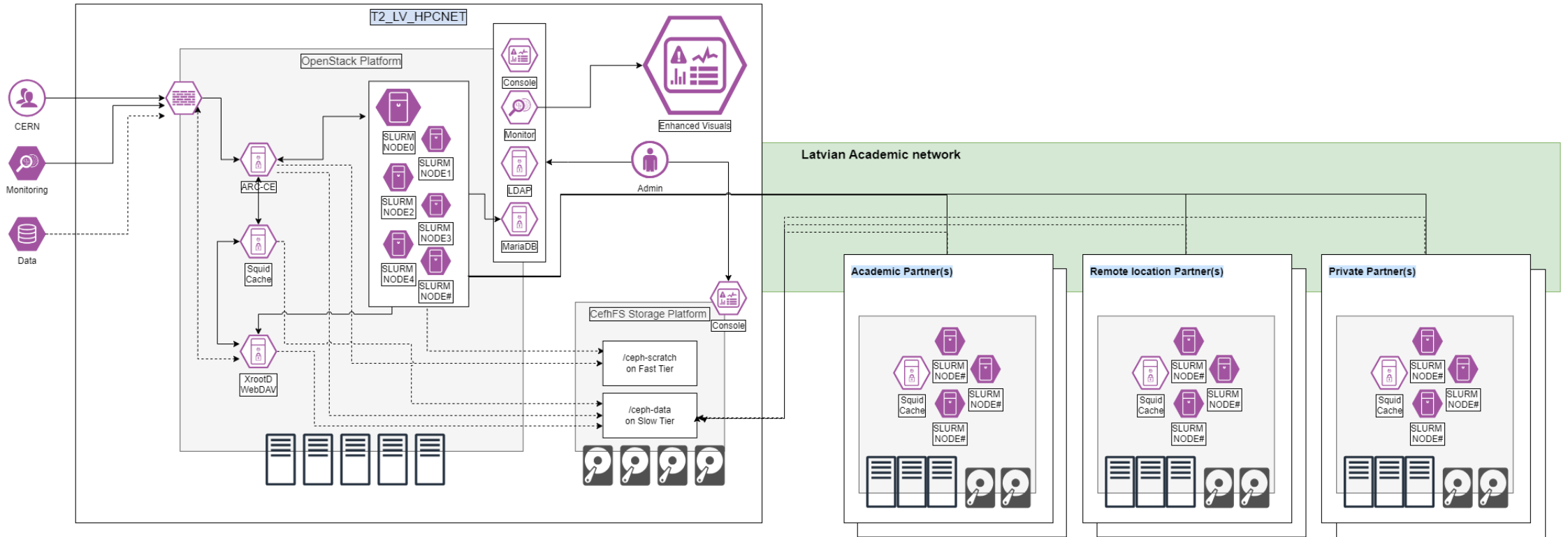
Summary of activities (2022-2024)

- CERN Baltic Group meetings held in Latvia, Lithuania and Estonia

- CERN PhD student assigned to the TIER2 project

- 9 TIER2 HPC computing nodes procured and deployed for TIER2 site in RTU managed datacenter and OpenStack cloud infrastructure with CephFS storage subsystem

- Configuration of ArcCE, SLURM workload management VMs and TIER2 supporting services

- Authentication services (certificated and tokens) configured

- OSG and WLCG registrations and configurations completed

- Agreement with private partner signed for additional compute resources

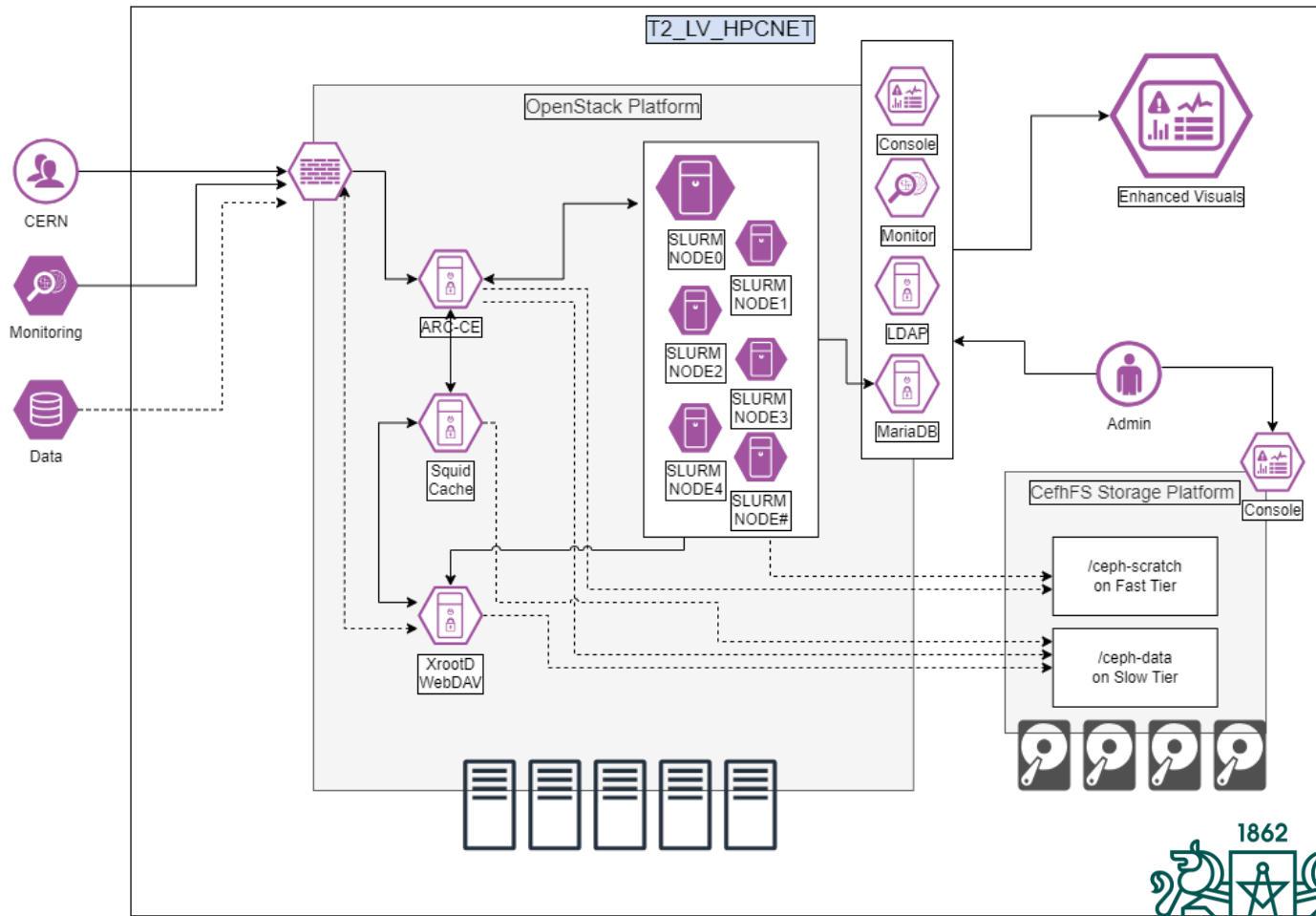# WLCG Agreement Signing, June 5th 2024

Deployed TIER2 resources in the Main site @RTU

- 9 worker nodes with:
  - Total of 550+ CPU cores, 4+TB total RAM
  - nVME pool + HDDs pool on CEPH Software Defined Storage platform
  - 4x25Gb/s LAN connections
  - 100Gb/s gateway to GEANT network
  - One node has NVidia Ampere A40 high-performance GPU for hybrid CPU/GPU processing

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Deployed TIER2 resources in the Main site @RTU

Planned activities for 2024/2025

- Improvement of monitoring and technical support processes

- Automated deployment of opportunistic compute resources on federated cloud member locations

- Representation of compute activities with Enhanced Visuals

- Storage pool expansion with fast nVME drives.

- Refresh the technology stack with future-proof OS and program versions

- Participation in GPU workload-processing tests

- Creation of Solution Architecture Design documentation for stabilized platform

- Join the EGI Federation through the EGI affiliation program (under discussion)

- We thank the Estonian Tier-2 team for the assistance in the initial stages of the project!

- We hope we can expand this Federative Tier-2 site to partners in the Baltics in the future – watch this space !

Thank you!

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