



HEPIX Spring 2023 Workshop Summary

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HEPIX co-Chair

Venue/Participants



- Academia Sinica, Taipei
 - Bldg. Research Center for Environmental Changes
 - Mar. 27 - 30, 2023
 - co-lo. ISGC 2023 (Mar. 19 - 24)



- The second hybrid meeting following the Umea workshop in Autumn 2022.
- We had 80 participants registered including the workshop period.
 - In person: 38
 - Online: 42 (+18 during the workshop)
- We could see roughly 20 actual participants were joined via zoom for the afternoon session.
 - We know the morning sessions were difficult to join due to the time difference.



Group Photo



Site Reports

- 9 talks
 - from ASGC, CERN, PIC, KEK, IHEP, DESY, FZU, AGLT2, and BNL.
- Expanding field covered by individual sites
 - Growing capability not only for high-energy physics experiments but also for many other fields as nationwide computing centers.
 - Covering multidisciplinary science, WLCG, astroparticle physics, photon science, biology, etc.
 - New collaboration with HPC, Quantum computing.
- Data volume has still evolved
 - Many new services and network technology are introduced to extend the current system functionality.

Site Reports (some topics)



- ASGC: Supporting Big data analysis and AI for multi-disciplinary eScience.
- CERN: Construction of new Prévessin Data Centre. Deployment of IAM.
- PIC: Utilizing Barcelona Supercomputer Center. New AI group. InCAEM, QC.
- KEK: Balancing WebDAV data transfer. Moving to token environment.
- IHEP: Going to LHCb Tier-1. R&D for QC and AI platform.
- DESY: Sustainability projects, recycling heat, energy saving (front-runner?).
- FZU: Focusing on energy efficiency by resource monitoring.
- AGLT2: Enabling Precision Time Protocol by dual GPS clock ($< 1 \mu\text{sec}$).
- BNL: Core Facility Revitalization, Building new data center in 2023Q1.

Basic IT Services & End User Services



- 6 talks
- Four presentations were focused on "authentication and authorization infrastructure" and "Identity federation" using tokens.
 - IHEP, CERN, BNL teams are constructing and developing token-based AAI. + SSO, 2FA, Keycloak.
 - Already became one of the hot topics.
- The other two presentations are related to controlling and managing infrastructure and computing resources.
 - Monitoring Windows server infrastructure at CERN.
 - Elastic Cloud on Kubernetes at CSCC.

Grid, Cloud & Virtualisation and Operating Systems



- 7 talks
- Private cloud
 - Many development and deployment with respect to openstack components.
 - VM, Container, Ironi (bare metal), SDN, Ceph etc.
 - Flexible use of compute node with GPU and ARM.
- Distributed Computing
 - Update of SLATE project: service delivery via container orchestration in edge networks in US.
- Operating system
 - Linux strategy after the CentOS7.
 - RHEL 8/9 family and migration path.
 - Detailed comparison on advantage of Alma and Rocky.
 - Automation of Linux build for supporting distributions at CERN.

Networking & Security

- 6 talks
- Networking
 - Evolution link between CERN main DC and the other CERN site.
 - CERN new DC setup and plan.
 - IPv4/IPv6 dual stack storage. IPv6-only WLCG. Report HEPiX IPv6 WG.
 - Research Networking Technical WG: Status and Plan for HEP.
 - PerfSONAR towards 100G.
- Security
 - Ransomware trends, Cloud security, Credential leaks.
- While these presentations represent a smaller set of contributions to HEPiX in this area compared to “normal”, there was still a good, diverse set of topics and technical details provided.

Storage and Filesystems

- 5 talks
- Migrating DPM to the federated NDGF-T1 dCache at the UNIBE-LHEP ATLAS Tier-2
 - Univ of Bern has transitioned from a local DPM-based Tier2 into the federated NDGF dCache. Detailed planning and good communication with NDGF resulted in a successful migration.
 - Some aspects of changes in the accounting of storage contributions were also discussed.
- Operating a federated dCache system
 - NDGF is operating a federated dCache. Many operational considerations and procedures were discussed to showcase how a geographically distributed service can be provided efficiently.
- Status of CERN Tape Archive operations during Run3
 - A detailed description of the tape storage system at CERN and the infrastructure needed to provide this storage service for the LHC experiments.
- CERN Storage Services Status and Outlook for 2023
 - A comprehensive overview of storage services at CERN with a focus on the developments in the coming year.
- Archive Storage for Project sPhenix at BNL
 - A deep dive into the mass storage infrastructure at BNL and focusing on optimizing the access speed to hot data.

Computing and Batch Services



- 5 talks
- HEPscore: A successor of HEPSepc06
 - Report from HEPiX Benchmarking WG and WLCG HEPscore Deployment TF. A successor of HEPSepc06.
 - Sites are expected to run HEPscore23 on newly procured hardware.
 - Existing hardware need not be re-benchmarked
 - ARM and GPU support is in preparation.
- HTCondor
 - Job Accounting in Heterogeneous system
 - Cloud Scheduler
- Energy Efficient Compute Clusters at DESY
 - Reducing the number of WN is efficient to reduce the power consumption during the holiday period, but it does not work for Grid since the usage always reached 100%.
 - CPU throttling? Expand optimistic resource?
- Expanding local clusters to remote site
 - Big difference of computing requirement from LHAASO and available resource.
 - Enable to utilize multiple resources spared several sites by the HTCondor.

Show Us Your Toolbox

- 4 demonstrations
 - Session was born at the last HEPiX (Umea).
 - Demonstrating IT tools used in day-to-day activities to share the experience.
- Marcus Hardt
 - Token based solution, using SSH with federated Identity.
- Riccardo Di Maria
 - Kubernetes cluster management.
- Tim Wetzel
 - OIDC token agent, case e.g. WLCG token generation.
- Julien Leduc
 - SystemTap for monitoring and tracing Linux kernel.

Board meeting



- Style of future workshops
 - Going to the normal (in-person) workshop as much as possible.
- Topics
 - AAI, IAM has been recognized as one of the hot topics for both development and deployment.
 - An informal discussion group (not an official WG) will be formulated.
 - Green IT, energy saving will be added explicitly to “IT Facilities & Business Continuity” track.
 - Any suggestions and comments are welcome: hepixonboard@hepixon.org
- Call for nomination of the third co-chair (non-European, non-Asian)
 - Search committee will be established toward election.
 - EU: Peter van der Reest (appointed in Spring 2020)
 - AP: Tomoaki Nakamura (appointed in Fall 2022)
 - NA: to be filled
 - To be announced: hepixonusers@hepixon.org
 - Current co-chairs are not included in the committee.

Acknowledgments



- We would like to express our great gratitude to Eric and their colleagues for their kindness and hospitality, and their hard work preparing the 2nd hybrid workshop.
 - Good environment of the conference room, audio, and Zoom.
 - Bus transportation was very smooth.
 - Coffee break and Lunch, dinner for reception, and banquet brought us fruitful time for discussion.
- Member of the Local organizers;
 - Eric, Stella, Vicky, Jade, Nereid, Chien, Laspha, Tomo, and Kian

See you at the next HEPiX WS



- **October 16th - 20th, 2023**
- **Victoria, Vancouver Island, Canada**
- **Local organizer: Randall Sobie (University of Victoria)**
- **co-loc. LHCOPN/ONE meeting**
- **Registration will open at least before the summer break**

