

The logo for HEPiX, featuring the letters 'HEPiX' in white. The 'H' and 'E' are on a dark blue square, the 'P' is on an orange square, and the 'iX' are on a lighter blue square. The background of the entire slide is a night-time aerial view of Paris, France, with the Eiffel Tower prominently lit and visible in the center-left.

HEPiX

HEPiX Spring 2024 Workshop Wrap-Up

Helge Meinhard / CERN
HEPiX Paris (France)
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Contributions by

Dino Conciatore, Max Fischer, Sebastien Gadrat, Pete Gronbech, Michel Jouvin, David Kelsey, Shawn McKee, Michele Michelotto, Tomoaki Nakamura, Andrew Pickford, Ofer Rind, Matthias Schnepf, Andrea Sciaba, Jingyan Shi, Elvin Sindrilaru, Peter van der Reest, Dennis van Dok, Mattias Wadenstein

Attendees (1)

- 107 registered participants
 - Healthy mixture of experienced and first-time attendees
 - Academia: 90 from Europe (including 14 from CEA IRFU), 7 from North America, 6 from Asia; companies: 4
 - 34 France, 16 Germany, 14 Switzerland, 9 United Kingdom, 6 The Netherlands, 3 Italy, 2 Czechia, 2 Sweden, 2 Spain, 1 Russia, 1 Israel; 7 USA; 3 PR China, 2 Japan, 1 Taiwan
- 38 different academic affiliations
 - 29 from Europe, 4 from North America, 3 from Asia, 2 companies
 - Significant participation from non-HEP institutes: ALBA synchrotron, ESS, KM3NeT, ...

Attendees (2)



Attendees (3)



Programme (1)

- 54 contributions in the standard tracks (free abstract submissions)
 - Scheduled total duration (incl. Q&A): 20 hours 40 minutes
 - Rich, very interesting programme
- Very high quality, interest and relevance of presentations
- Thanks to all speakers for their contributions and to all chair persons for having solicited contributions
- Thanks to all speakers and chair persons for good time-keeping

Programme (2)

- Topical session: Linux future
 - Presentations by Alma Linux and Debian (thanks!)
 - Debian experience at a HEP lab
 - Plans of CERN, FNAL, DESY
 - Round of sites: Plans to handle CentOS 7 EOL
- (See report by Peter van der Reest and Tomoaki Nakamura attached)

Programme (3)

- Topical session: Deploying dual-stack connectivity to site computing services
 - WLCG ticket campaign
 - Dual-stack configuration via Puppet
 - IPv6 deployment on worker nodes; removing IPv4

Programme (4)

- “Show us your toolbox”
 - About five very interesting live demos
- Welcome, logistics, wrap-up

Streaming

- We announced in good time that the workshop is in-person
 - Real participation on-line not possible
- Streamed the sessions anyway via Zoom
 - Between 10 and 40 people connected (maximum during Linux Future session)

Tracks and Trends (1)

- Basic and end-user IT services: 11 contributions, 4h35'
 - AI technology to detect misbehaving jobs in worker nodes and storage systems before they cause too much disruption
 - ‘Shift left’ testing in the CI/CD pipelines to integrates security in the DevOps process
 - Data Analysis Facilities: Blueprint for bootstrapping smaller collaborations onto today's HTC ecosystem; CERN's use of its systems at scale
 - Storing sensitive data in a vault, integrating with configuration management
 - Coming end of VOMS and transition to INDIGO-IAM may not be smooth, help needed
 - A different approach to packaging with Nix, touted to be a better Docker image builder than Docker's own
 - Micro-services for ATLAS muon alignment monitoring need consistent configuration management
 - Scaling up streaming and remote desktop services

Tracks and Trends (2)

- Computing and batch services: 7 contributions, 2h55'
 - X86-64 dominates but new compute architectures emerge
 - ARM gaining popularity for sites, also due to performance/watt
 - Growing GPU capacities that should be used, also via HPC
 - How to balance the CPU and GPU usage and supply?
 - Increased impact and use of performance metrics
 - HEPscore23 benchmark also used to spot misconfigurations
 - Attention to power efficiency and carbon footprint
 - New experiments beyond traditional HEP interested in existing and future compute infrastructure

Tracks and Trends (3)

- IT facilities, business continuity and Green IT: 6 contributions, 2h30'
 - Mainly concentrating on Carbon reduction and measurement
 - Comparison of storage technologies including Carbon footprint
 - Don't shred hard drives, manufacturers take them back
 - Carbon life cycle modelling of scientific computing: predict energy and carbon usage, comparing different architectures. Significant Carbon cost embedded in manufacturing of the hardware. Addressing the question of how to run kit. Answer depends on many factors. Rather complete models developed
 - Power and Performance Impact of Inlet temperature difference
 - HEPiX Technology Watch Working Group Report: First report by restarted group – consider contributing

Tracks and Trends (4)

- Network and security: 6 contributions, 2h30'
 - Grand Unified Token (GUT) profile working group: Merge three existing security token profile efforts into a single one for the community. Many challenges, additional effort needed.
 - Collaborative operational security and Security Operations Centre deployment models: Security threat to R&E remains persistent. Security Operations Centres (SOCs) at STFC, CERN, IHEP established
 - Computer security update: Supply chain problems, Phishing to 2FA, email security & R&E Community security
 - HEPiX 2004 (!) recommended multi-factor authentication. PLEASE - deploy MFA! (Concern from the audience that every 12 hours for MFA is a disincentive for adoption)
 - Update on WLCG Network Monitoring and Analytics Updates: perfSONAR data pipeline is evolving and sites need to upgrade not only software but also possibly hardware to match their current storage. DC24 was successful and the global networks were not a bottleneck. Extensive efforts underway to use AI/ML to proactively identify problems and estimate their locations
 - Research Networking Technical Working Group Status and Plans: Focus on network traffic visibility via flow labelling via “fireflies”. SciTags initiative hosts work to mark network transfers etc. For WLCG, Rucio and FTS already enabled to pass information on the experiment and activity for data transfers. Xrootd and EOS are also able to send fireflies and dCache and STORM are in the process of enabling this.
 - Update from the HEPiX IPv6 Working Group: Significant progress in enabling IPv6 with about 97% of our WLCG sites having IPv6. Work on trying to identify why IPv4 is still present between already dual-stacked sites. Reminder that the end goal is getting back to single network stack (IPv6 only)

Tracks and Trends (5)

- Operating systems, clouds, virtualisation, grids: 5 contributions, 2h05'
 - Most talks related to Kubernetes-based cloud usage, with an emphasis on DevOps and Infrastructure as Code (IaC) approaches, where tests run before deployment increase the service availability
 - Hyperconverged cloud infrastructure at CSCS: Based on Rancher, Harvester and ArgoCD
 - Cloud Resilience by taking advantage of second datacentre: No transparent failover, but rapid restart
 - Infrastructure as Code and DevOps approach for the SVOM mission: CICD-based deployment of microservices relying on Gitlab
 - Virtual networks and beyond in a private cloud: OVN chosen
 - Migration to Windows 11 in your endpoint device park?
 - At CERN, 10k Windows machines with Windows 10 that is EOL at the end of 2024; W11 compatibility issues with almost half of the machines. Privacy issues with Copilot in W11

Tracks and Trends (6)

- Site reports: 11 contributions, 2h45'
 - Computing: New accelerators, ARM testing increasing
 - WLCG DC24: High throughput achieved with peaks saturated the available bandwidth (especially for multi-VOs sites) , but went well for most sites (no bottleneck)
 - Operating Systems
 - RHEL is becoming the main OS at more sites (probably more licence site around compared to a couple years ago)
 - AlmaLinux is the main RH clone around
 - Rocky however still around (but quite fewer than in Victoria)
 - Some Ubuntu/Debian (especially for specific use-cases requiring that OS); interest in establishing Debian as an alternative to RH (clones)
 - AuthN/Z: Upgrade to tokens / retirement of certificates
 - Security MFA being enforced at several sites, reducing phishing
 - Discussion on which combination of MFA would be more secure and more comfortable for users

Tracks and Trends (7)

- Storage: 8 presentations, 3h20'
 - A nice variation in topics over the two sessions
 - Seagate gave a view on what is expected with disc hardware and what's newly out now (HAMR)
 - Covered storage services and software distribution landscape targeting analysis facilities. Interesting to see how this evolves in the future
 - Looked at performance both in pushing the CVMFS performance and in measuring disc performance
 - Presentations about often overlooked backup and archiving of data. Some potential here for larger discussions on what solutions are available for such activities

Breaks

- Coffee breaks
- Lunches
- Dinner, evening discussions
 - Welcome reception
 - Social event: Boat on the Seine river
- Countless hours of valuable discussion

Board Meeting (1)

- Current and next workshops
 - Board very satisfied with current workshop; thanks to local organisers
 - Positive view on topical sessions on Linux future and deploying dual-stack services
 - Follow-up agreed on NVIDIA support for Alma and on recommendation for Debian alternative
 - Confirmed next workshops:
 - 04 – 08 November 2024: University of Oklahoma, United States
 - 31 March – 04 April 2025: CSCS Lugano, Switzerland
 - Quite firm ideas about autumn 2025 and spring 2026
 - Some expressions of interest even beyond that
 - Expressions of interest and proposals still very welcome
 - ... including for hosting the HTCondor workshop in Europe

Board Meeting (2)

- European co-chair election
 - Peter van der Reest's mandate ends now
 - Pepe Flix (CIEMAT/PIC) elected co-chair for 2024 – 2028
 - Warm thanks to Peter – now honorary member of the board
- Working groups
 - All three active working groups reported during the week
- Cross-representation of HEPiX and WLCG
 - HEPiX representative at WLCG Management Board: HM
 - WLCG representative at HEPiX board: to be nominated after the WLCG workshop in May



Board Meeting (3)

- Board operations
 - Board and track conveners to play a more active role in between workshops
 - Discover trends, suggest topical sessions, wrap up after workshops
 - Your input will be highly welcome – contact co-spokespersons (or your board representative if you have one)
 - More regular board meetings not only focused on workshop preparation

Take-aways

(Other than covered by tracks and trends)

- CSBS is OUR journal. Let's use it and publish our work! Many interesting things this week – consider writing an article!
 - <https://www.springer.com/journal/41781>
- Board strongly encourages YOU to propose presentations – HEPiX is all about sharing experience and ideas, even bad ones. Exchanges happen during the breaks, even days after a presentation – attend the full week!
- Abstracts are accepted continuously, usually just days after submission. Accepted abstracts visible under 'Contribution list', even if timetable may be established later
- We want your feedback – will reach out with a (very short) survey

Very Personal Remarks

- Thanks to all for having accepted my role as workshop chair despite me not having any official function any more
- If there were questions why we hold HEPiX workshops (and why we hold them in person), this workshop was a very strong positive response

Thanks

- ... to all participants
- ... to all speakers
 - ... for their contribution and for having accepted constraints and short-term changes
- ... to all conveners and session chairs
 - ... for having solicited contributions
 - ... for having kept sessions well within schedule
 - ... for having provided their track's highlights
 - ... for having agreed to follow up between workshops

Special Thanks

... to the sponsor



for its financial support and for
insightful presentations

Special Thanks (cont'd): Local Organisers

LOC CEA-IRFU:

- Pierre-François Honoré
- Imed Magroune
- Joël Surget

APC:

- Sarodia Vydelingum
- Suyan Dong
- Philippe Malbranque

Final Words

Have a safe trip back ...

... and ...

See you at the University of Oklahoma!



04 – 08 November
2024