

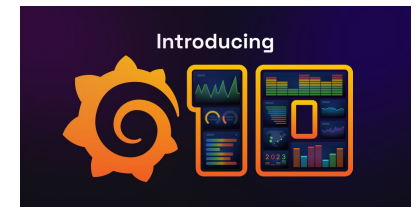
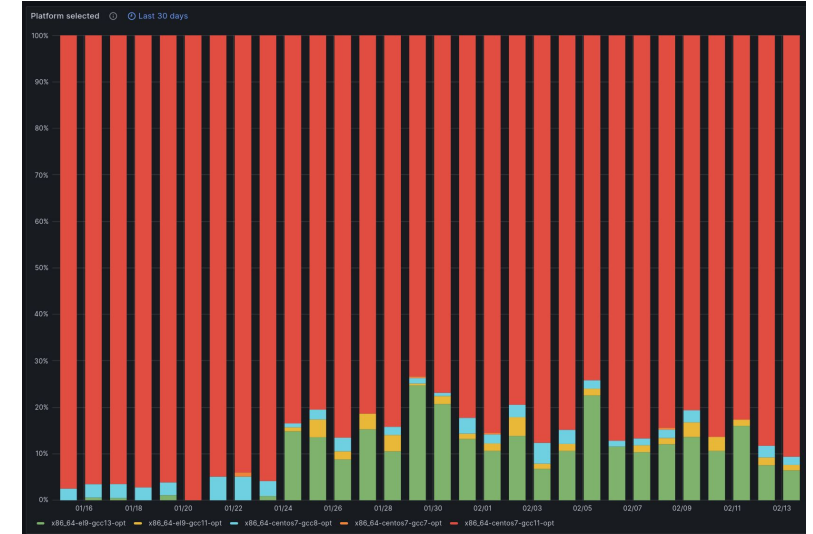
CERN Site Report

HEPiX Spring 2024, Paris

Elvin Sindrilaru
On behalf of CERN IT

Databases & Analytics

- **SWAN**
 - Multi-GPU support attached to Kubernetes VMs
 - Decommissioning of the physical machines
 - Deployed LCG 105 release - first one containing **Alma 9 builds**
 - **ROOT 6.30/04**
- **OpenSearch migration to v2.11 completed**
 - Migrated to the new OpenSearch `index_template` API
 - Introduced new alarming model with alerts set directly on each cluster (email or Service Now ticket)
 - Base alerts on infrastructure problems sent to OpenSearch team
 - User alerts on data problems sent to cluster's admins
- **Grafana migration v10.1.5 done, with unified alerting enabled**
- **DBOD major upgrade campaign completed (MySQL 8)**
 - Issues with NetApp due to pNFS/NFS4 were identified - plan to disable pNFS delegation
 - Minor version upgrade campaign ongoing
 - **MySQL 8.0.28 -> 8.0.35, PostgreSQL 13.9 -> 13.13, 14.6 -> 14.10**
- **Oracle Databases migrated to 19.21**
 - Includes all accelerator and physics databases before start of the Run
 - *Oracle Golden Gate and Oracle Streams* decommissioned after 20 years



Collaborative Applications

- **InvenioRDM and Zenodo**
 - Zenodo migrated to InvenioRDM and backend upgrade to EOS v5
- **Indico v3.3 release in December**
 - Generate PDF documents from registrations, flexible recurrent bookings
 - **“Progressive Web App”** - can be installed by opening the link
- **Microsoft Teams** pilot started in January
- **Exchange 2010 -> 2016 -> 2019**
 - Migration and decommissioning the old infrastructure
 - Forbid **domain spoofing** and **open relaying**
 - Use a **FROM** address in the **@cern.ch domain**
- **CERN Document Server (CDS)**
 - Migration from CentOS7 infrastructure
- **CERN Open Data** new platform - refreshed GUI, use of OpenSearch, better filtering capabilities
- **CERN Library Catalog** plan to integrate with **CERN Maps**

Generate Documents

Generating document for a single registrant

Document Template *
Default Receipt Template

Template Parameters

Address (Organizer)

Venue

Fee category

Invoice number

Add logo?

Filename *
receipt - (n).pdf

Remember settings
Puff template parameters (if present) and filename when generating more documents for the same template in this event.

Publish document
Make the resulting document available on the registration page.

Notify registrants via e-mail
Send an e-mail to the registrant with the document attached.

Save to registration

Receipt

Number: 202312041112044
Date: 4 Dec 2023

Joint annual meeting of
Swiss and Austrian Physical
Societies 2017

21 Aug - 25 Aug

John Doe
Etar. des Particules |
Suisse/Allemagne

| DESCRIPTION | PRICE |
|-----------------------|------------------|
| Choice of meal (Fish) | 70.00 CHF |
| Total paid | 70.00 CHF |

Printed by Indico

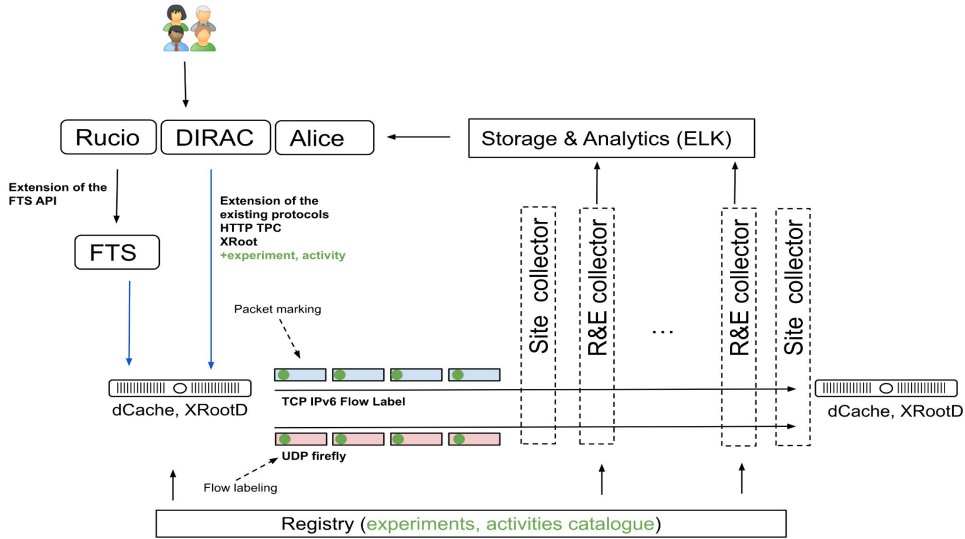


Microsoft Teams

Communication Systems

- **Scientific Network Tags (SciTags)**

- Initiative promoting identification of science domains and their high-level activities at the network level
- SC23 demonstrator, used for volume traffic during Data Challenge 24



- **Juniper routers crashing during ACL updates**

- Reproduced by the vendor and waiting for a fix

- **LoRaWAN network** - accelerator chain fully covered

Fabric - CERN Data Centers

- **Prevessin Data Center**

- Successful “Trial Operation Test” - pod with 572 servers, 450 kW max power load
- Tested various scenarios
 - nominal infrastructure (no degradation)
 - cut one of the two power feeds
 - gradually stopping the room ventilation
 - gradually stopping chilled water generation
- Official inauguration **23rd of February 2024**
- **800 kW** current capacity covering batch and BC/DR

- **Conference Room Support**

- Ongoing renovation across different rooms
- Total of **200 rooms** to be refurbished over a **10 year period**

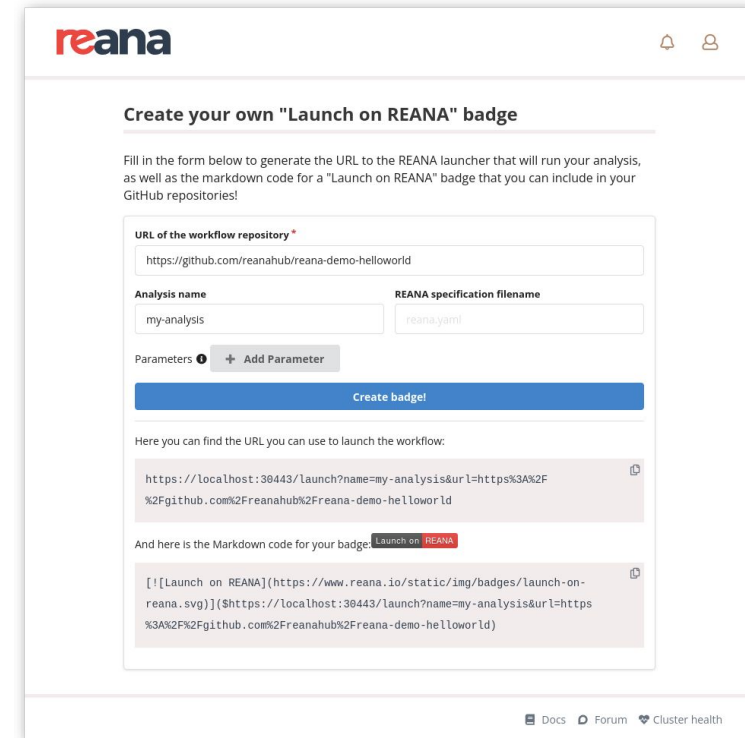
- **Meyrin Data Center**

- Ventilation units renovation led to preliminary **~0.05 PUE improvement**
- Termination of the **Console Operator Service** on 1st of April 2024

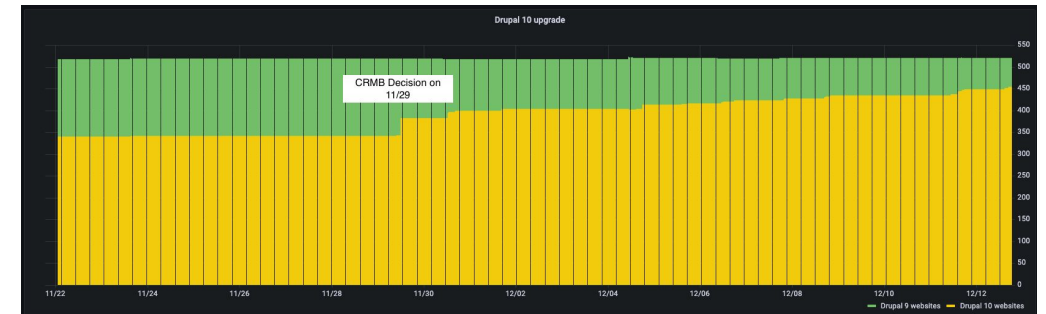


Platforms and Workflows (1)

- **REANA 0.9.2 released in December**
 - Provide support for ARM architectures, “Launch-on-Reana” badge
 - Allow users to automount any CVMFS repository
 - Remove limit on the number of restarts of a workflow
- **Upgrade from Drupal 9 to 10 completed**
- **WordPress chosen as CERN’s future content management system**
- **Authorization Service v3.8.0 released**
 - API endpoint to merge identities - reduce workload for service support
 - Usability improvements and bug fixes
- **New “Group Management System” (GMS) project**
 - Replace existing e-groups **ETA end of 2025**
 - Based on Grappa (Group management API)
 - Add more privacy controls, modern APIs

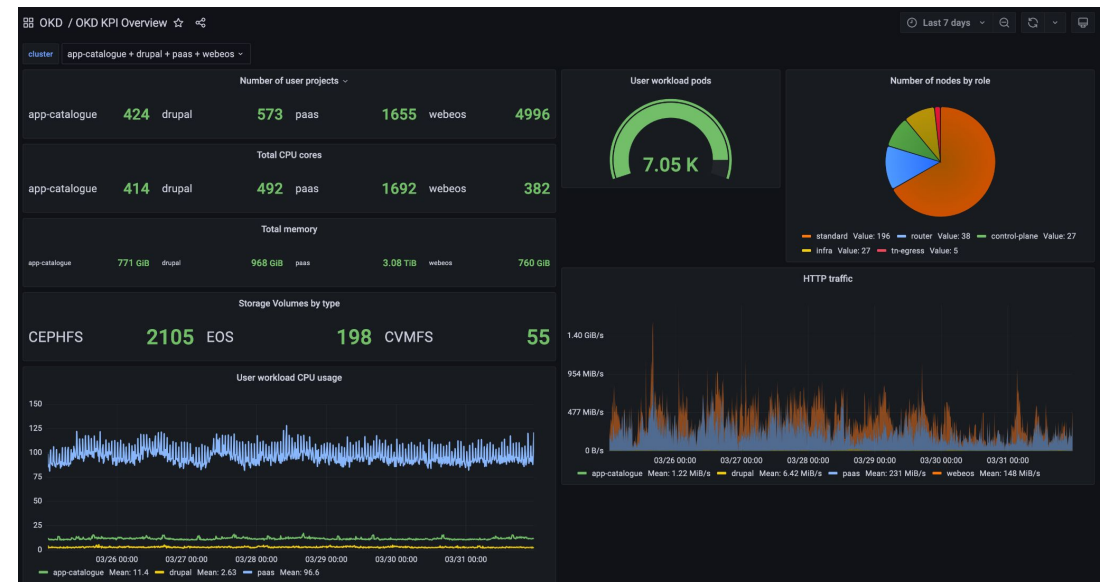


The screenshot shows the REANA web interface for creating a 'Launch on REANA' badge. The form includes a 'URL of the workflow repository' field with the value 'https://github.com/reanahub/reana-demo-helloworld'. Below this are fields for 'Analysis name' (my-analysis) and 'REANA specification filename' (reana.yaml). A 'Parameters' section has an 'Add Parameter' button. A blue 'Create badge!' button is prominent. Below the button, the generated launch URL is shown: 'https://localhost:30443/launch?name=my-analysis&url=https%3A%2F%2Fgithub.com%2Freanahub%2Freana-demo-helloworld'. The Markdown code for the badge is also displayed, featuring a 'Launch on REANA' badge image.



Platforms and Workflows (2)

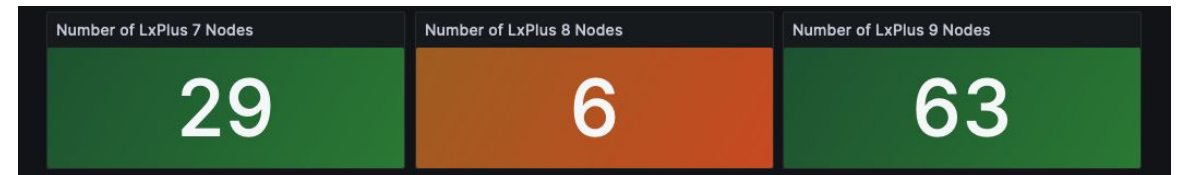
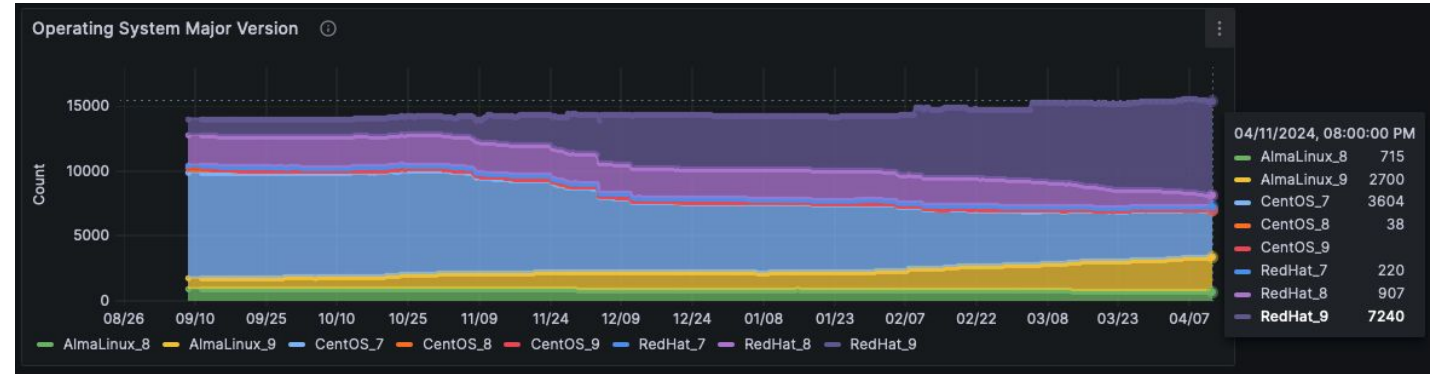
- **Migration of web sites out of CC7 (CentOS7 CERN)**
 - **Total: 6168, AFS (CC7): 2014, EOS (CC7): 2890, Migrated: 1112, Deleted: 152**
- **WLCG IAM** - upgraded to v1.8.4
 - New kubernetes deployment and plans for high-availability
 - VOMS-Admin to be decommissioned by June 2024
 - IAM VOMS-AA being deployed to provide VOMS
- **OpenShift service KPIs**
- **SharePoint 2013**
 - To be decommissioned by **end of June 2024**
 - More than 200 sites migrated to **SharePoint Online**
- **Google Workspace @ CERN** - available to users since February 2024



Compute and Devices

- Roll out of EL9 (Alma 9/ RHEL 9) OS
 - Interactive (Ixplus) ~ 65% done
 - Batch (Ixbatch) ~ 90% done
- Cloud
 - Hypervisors upgrade to EL9 (~95% done)
 - **Kernel bug in RHEL8** render virtual machines unresponsive
 - Monitoring probe **eBPF** to spot candidates to hit this issues
 - VMs pro-actively migrated to mitigate issue whenever possible ([more details](#))
 - Fixed kernel release available and deployed in production
- **Windows 10 to Windows 11 migration campaign**
 - More details in a [dedicated talk](#)
- **Compute in Preveessin Data Center**
 - ~1000 machines, each 128 cores → ~140k cores as HTCondor workers

PuppetDB view



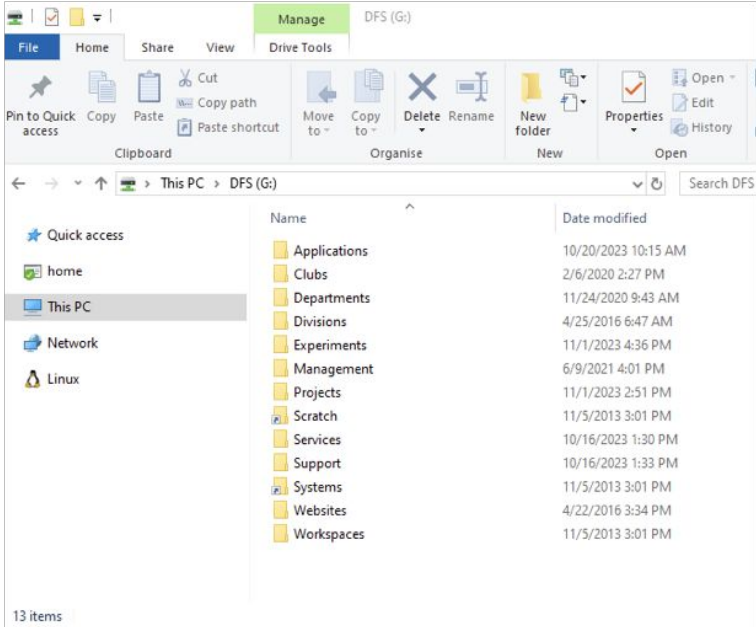
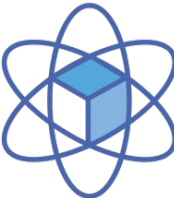
Storage and Data Management

- **DFS ongoing decommissioning**

- Completion expected by the end of 2025
- **CERNBox** service replaces DFS delivering higher capacity, sync and share capabilities, modern web interface with applications

- **CERNBox** - new clients and web improvements

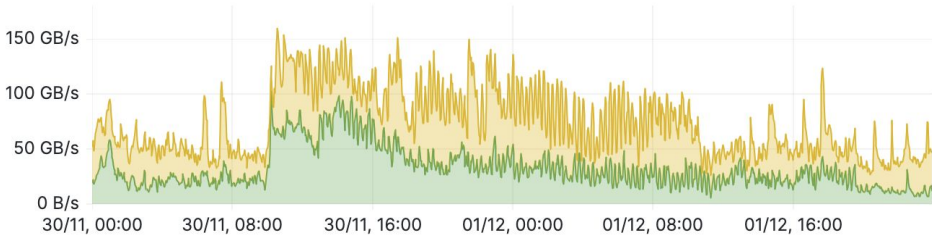
- Sync client v5.2.0 (all OSES) and Android v4.1.1
- Improved trash-bin functionality and filtering



- **EOS/FTS/CTA**

- Pre-Data Challenge and Data Challenge '24 successful with no impact on production traffic
- During Heavy-Ion run (1st - 30th of October) **~63 PB** got written for **14 million files**
- All physics EOS instances migrated to **Alma 9.3**
- More details in a dedicated [storage talk](#)

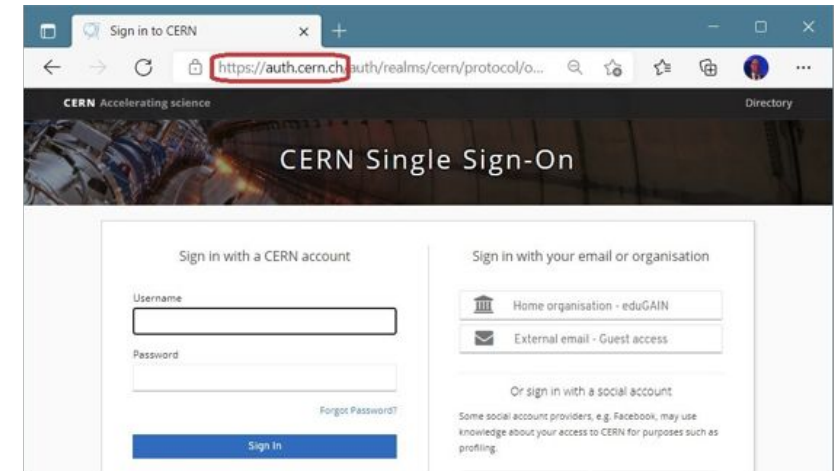
Cluster Network Rates (out)



| Name | Max | Mean | Last * |
|----------|----------|---------|---------|
| eosatlas | 102 GB/s | 32 GB/s | 11 GB/s |
| eoscms | 116 GB/s | 41 GB/s | 36 GB/s |

Security: Two factor authentication (2FA)

- **2FA offers enhanced protection against:**
 - password theft, **Ransomware** attacks
- Enforced via CERN's web-based **Single Sign-On (SSO)**
 - But also via **SSH access** for experts accessing critical infrastructure (AIADM/AITNADM/ROG SSH gateways)
- 2FA tokens are available via: **Smartphone** app (free: "ente", "Aegis") or **Yubikeys** (~50 CHF each)
- **2FA asked about twice a day** as the login is persistent for 12 hours (in the same device)
- **2FA deployed so far to 2100+ MPAs & MPEs**, incl. the CERN Pension Fund
- **Deployment schedule**
 - **February 27th: USER >55% at CERN** (~1500 people)
 - **March 26th: Secondary Accounts** (Service Accounts are **NOT** affected)
 - **May 28th: EXTN-DIST** and similar (~1500) & **USER 20-55% at CERN** (~4700)
 - **Later (if at all): PART** (~6800) & all other **USER** (~5400)



List of talks from CERN IT

- [Streaming Science Globally: CERN's Live Streaming Service](#) - Rene Fernandez Sanchez
- [CERNBox: Community Distribution for Analysis Facilities](#) - Giuseppe Lo Presti
- [Computer security update](#) - Roman Sumailov
- [Cloud Resilience Unleashed: A Dual-Site Approach for HL-LHC era](#) - Daniel Failing
- [Wiring the Future: Open Virtual Networking and Beyond](#) - Daniel Failing
- [Ready for Windows 11 in your endpoint device park?](#) - Sebastien Dellabella
- [Prototyping an Analysis Facility at CERN](#) - Andrea Sciabà
- [Re-designing the Remote Desktop Service: A solution for remote desktop access management at CERN](#) - Petar Stojkovic
- [From Entanglement to Duality: Preparing a multi-ecosystem Linux strategy at CERN](#) - Arne Wiebalck
- [Enabling LHC Run 3 data storage workflows at CERN](#) - Elvin Sindrilaru



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