RCS-ICT Technical Committee

The RCS-ICT Technical Committee is an inter-departmental and inter-organizational governance body. Establishes and maintains a roadmap of ICT services and projects jointly engaging the communities in the RCS sector.

Notes of the 17th RCS-ICT Technical Committee held on Friday 13th September 2024

Date: 13th September 2024

Main topic(s): Performance impact of RHEL 10 changes, Discussion on IT-Provided Critical Services for RCS: IT Platforms & Workflows group IT-PW, RCS-ICT TC schedule and Survey Review, Action List Status

Agenda (https://indico.cern.ch/event/1454383/)

- Performance impacts of upcoming RHEL 10 changes
- Discussion on Critical Services for RCS: IT Platforms & Workflows Group
- Alma9 Update & Action List Review
- Planning & Survey
- Action List Status

Attendance

Present:

Aleksandra Wardzinska, Alex Iribarren, Alex Kluge*, Alexander Yohei Huss*, Andrea Sciaba*, Andreas Joachim Peters, Armin Nairz, Ben Couturier, Benjamin Bergia, David South*, Dirk Duellman, Domenico Giordano, Enrico Gamberini*, Eric Grancher, Gianluca Cerminara, Ismael Posada Trobo, Jan Van Eldik, Karim Massri*, Latchezar Betev, Liz Sexton-Kennedy*, Lorenzo Moneta, Marc Dobson*, Niko Neufeld*, Phat Srimanobhas, Pere Mato, Ricardo Rocha*, Simone Campana, Shehzaib Aamir*, Stefano Piano*, Wainer Vandelli, Zach Marshall*, Zhechka Toteva. (*) Remote participants

Adoption of Meeting Minutes

Zhechka thanked the contributors to the minutes' review. **Minutes were approved.**

Performance impacts of upcoming RHEL 10 changes (Alex Iribarren)

The migration from CC7 has generally gone smoothly. Alex shared statistics on the number of IP addresses accessing CERN's central Linux software repositories. These numbers include all machines, including those used for software builds (counting GitLab runners as one per runner). RHEL/AlmaLinux 9 has seen much wider adoption compared to RHEL/AlmaLinux 8.

RHEL/AlmaLinux 10 is on the horizon: CentOS Stream 10 is already being built, EPEL 10 repositories are being populated, and Alma 10 preparations are underway. CentOS Stream 10 is expected to be released at the end of 2024, with RHEL/AlmaLinux 10 following in the second quarter of 2025.

Given the timeline for the accelerator, RHEL/AlmaLinux 10 seems to be the most practical option for the next Linux upgrade. It will be available before LS3 and maintenance support will extend to LS4, covering the entire runtime of Run 4. Since RHEL/AlmaLinux 11 is expected to be released during LS3, the schedule for Run 4 would probably be too tight.

Alex highlighted the three key updates in CS/RHEL/AlmaLinux 10:

- Built on Fedora Linux 40, it includes kernel 6.11, glibc v2.39, Python 3.12, OpenSSL 3.2, GCC 14.2, among other components.
- The instruction set architecture (ISA) baseline has been raised to x86_64-v3.
- AlmaLinux 10 is now compiled with frame pointers enabled.

Hardware impact from the ISA baseline changes: RHEL 10 will not be compatible with CPUs older than Intel Haswell (2013) and AMD Excavator (2015). For those systems, Debian could be a suitable alternative, as FECs are already using it.

Advantages of the ISA baseline changes include potential performance improvements through automatic code vectorization. However, thorough benchmarking is essential to assess the impact.

Frame Pointers(FP):
CS/RHEL 10 will still not include frame pointers, while AlmaLinux 10 will retain them, like Fedora 40, but it is planned that CS/RHEL 11 will also include frame pointers. The migration to AlmaLinux 10 can also serve as preparation for RHEL 11.

Performance-related impact from FP: Estimates vary widely and range from 1% to 10%. Given this wide range, HEP SPEC benchmarking is critical. On a positive note, the improved debugging and profiling features are expected to lead to greater performance gains, potentially offsetting the slowdown caused by the inclusion of frame pointers.

Observations rely on containerized applications downloaded from CVMFS. Performance variations may be noticeable depending on where the packages are built and where they are executed.

These changes will impact LHCb's online operations. However, the LHCb community already compiles its software for both ISA V2 and ISA V3, with a preference for running primarily in containers.

Hardware accelerator support runs on bare metal machines.

RHEL 11 will not be available in time to test all CMS online software. RHEL 11 can be considered after the event loading stage. Currently RHEL 9 is used and the release of RHEL 10 is awaited.

The CMS offline community has upgraded the GRID software to ISA v3 and has experienced some performance issues. Liz (CMS Computing) mentioned that while V3 has some performance issues, they are considering moving to V4 in the future as they will have more control on what they run.

ACTION: Track the progress on the HEP SPEC benchmarking on RHEL/AlmaLinux 10.

Discussion on Critical Services for RCS: IT Platforms & Workflows Group (Eric Grancher)

Eric gave an overview of the critical IT-PW services as described by the RCS communities. (IT-PW Critical Services)
According to these communities, the most critical services include identity and access management, developer platforms, web service hosting, reproducible analytics workflow platforms, and authoring tools. Detailed information on these services can be found in the discussion section.

Eric reminded that all PW services are provided on a best-effort basis.

In his presentation, he highlighted services that are not listed in the matrix of critical IT services by the RCS communities but are considered critical by the IT-PW group.

The IT-PW group has several questions for the RCS communities to better understand the specific needs and usage of these services.

Discussion

Identity and access management

E-groups

"e-Groups, currently provided by FAP-BC, will be replaced by a new Group Management System (GMS), formerly known as Grappa, through a joint project with FAP-BC."

- E-groups are extensively used at CERN for authorization, but typically, users obtain e-groups information directly from Active Directory.
- ATLAS online groups are planning to discontinue the local management of accounts and transition to Active Directory.

SSO (based of Keycloak)

""Legacy" SSO will be cut from Internet access on October 2nd 2024 (OTG0152114), then retired (date to be decided)"

Key points noted:

- Single Sign-On (SSO) is essential for most CERN applications, with the IT department focussing on Business Continuity and Disaster Recovery (BCDR).
  - SSO cold recovery exercises have been largely successful.
- SSO is not critical for data taking.
- All critical access is originating from CERN accounts.

General comments

- The versioning of identity and access management systems is essential to enable a rollback to the last stable version if required.
- `https://accounts.cern.ch` is not accessible from outside of CERN
  - On the day of the migration to the new SSO, implementing a redirect could be beneficial.

Platforms for developers

- ATLAS relies heavily on JIRA workflows, especially for trigger calibration.
- ATLAS listed Openshift under agile services. However, it is not highly critical for them.
- While GitLab and GitLab/CI are not crucial for LHCb datataking, they are critical for daily work.
- CMS already uses GitLab to automatically push fixes in the online systems.
- JIRA is mainly used by CMS to track issues, but if it is unavailable, communicating production issues will be challenging.
- Sentry should be added to the list.

Web services hosting

- ATLAS online are moving their web hosting to **`docs.cern.ch`**.

General comments

- The IT critical services table and presentation slides reflect the current state of service usage and the needs of the RCS communities, but they do not account for future developments. As discussions about Run4 are already underway, it is essential to regularly review and update the IT critical services table and its criticality ratings.
    - The table should be treated as a live document, with potential adjustments including splitting or merging entries as necessary.
- It is important to document all aspects of services and usage that are not well-understood. All services are run on best efforts still this is quite a wide-spectrum definition.
- Ideally, the services with high criticality should serve a common purpose for all communities. Providing exceptional support for a specific use of a service by a single community is quite expensive and must be well justified.
- Services may be categorised into external-only client projects, those providing both internal IT and client services, and those supporting only internal IT services.
    - The IT critical services table should focus solely on client facing services
    - The IT department will address dependencies related to internal IT services.
- **BC/DR**
    - Tim is collecting service dependencies.
    - Business Continuity (BC) is crucial, but it needs to be tested. The LS3 period will be a favourable time to begin phasing out services.
        - Tim is preparing the test, but the IT department must ensure that both the services and their managers are ready for the planned service shutdowns
        - Such an exercise will be of great benefit to the experiments as it provides valuable insights into the dependencies of services.

ACTIONS:

1. IT-PW group to prepare the list of questions (in a table) that need to be addressed by the RCS communities about the usage of some IT-PW services.
2. RCS communities to provide the input in the table from Action 1.

RCS ICT Schedule, Feedback Survey Result and Action List review (Andreas Joachim Peters)

Andreas presented the tentative RCS-ICT Technical Committees schedule and how it maps to the CHEP2024 in Krakow and to the IT department PoW meetings. The proposed agenda:

1. 18th RCS-ICT Technical Committee - Critical Services DA & VA Group
2. 19th RCS-ICT Technical Committee - Data Management PSO report and RNTUPLES PSO report.

Andreas also presented the result of the Feedback Survey.

General feedback: with full consensus, the voting communities find :

- the RCS-ICT engagement initiative useful and can see a positive impact,
- the topics discussed mostly relevant for their community,
- the frequency of the meetings is good as is,
- the technical meetings leave enough time for discussions.

Topics feedback:
Among the proposed topics the majority of votes (6) was given to:

- **“Machine Learning Infrastructure/LLM platforms in IT”.**

Only one vote less (5) got each of the following topics:

- Evolution of Data Handling
- CPU, TPU, NPU Computing
- Interactive Computing - LXPLUS Future

A number of other topics were also of high interest.

Alma9 update (Zhechka Toteva)

Zhechka presented the list of the remaining CC7 puppet hosts. Individual feedback has been collected about the remaining machines, and the OTG0150918 Termination of outer perimeter firewall openings for CentOS7 servers was carried over smoothly. Successfully closing the topic. The next one will be about the Windows 11 upgrade.

AOB

Nothing to add.

Action List

- **2024-17-A1 - Action on RCS communities: Track the progress on the HEP SPEC benchmarking on RHEL/AlmaLinux 10.**
- **2024-17-A2 - Action on IT/PW: Prepare the list of questions (in a table) that need to be addressed by the RCS communities about the usage of some IT-PW services.**
- **2024-17-A3 - Action on RCS communities: provide the input in the table from 2024-17-A2**

Comments/Amendments

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