CERN Linux Landscape Update

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Agenda

- Current situation

- Recent Enterprise Linux drama

- Impact for CERN

- Recommendation

- Outlook

- Current ARM Status

Current Situation

- Deprecation of CentOS Stream at CERN:
    - CentOS Stream 9 EoL on June 30th 2023 (OTG0077723)
    - CentOS Stream 8 EoL on September 30th 2023 (OTG0079474)
    - Migration to AlmaLinux or RHEL required: https://linux.cern.ch/migration

- **CentOS 7 EoL** coming soon: **June 30th 2024**
    - Extended Lifecycle Support for special cases until June 30th 2026
    - Migration to AlmaLinux/RHEL 9 strongly encouraged

- AlmaLinux/RHEL 8 EoL on May 31st 2029

- AlmaLinux/RHEL 9 EoL on May 31st 2032

- End of Red Hat Site License on May 31st 2029

Recent Announcements

- June 21 2023: Red Hat no longer publishing source RPMs in the open
  - "Furthering the evolution of CentOS Stream"
  - Debranded sources used to be published to git.centos.org
  - No longer makes sense for RHEL 8 and 9, the source is CentOS Stream
  - No change for RHEL 7 sources, no impact on CC7

- Only source for all* RHEL 8 and 9 SRPMs is now the Customer Portal
  - Access to the Customer Portal is covered by a EULA that forbids redistribution of packages
  - Rebuilders no longer have legal access to Red Hat SRPMs

  * Some sources still available through UBI repositories

Rebuilders' Reactions

- Oracle: provocative.
  - "Keep Linux Open and Free—We Can't Afford Not To"
  - Oracle as a Champion of Open Source
  - "RH, can't afford to pay developers? Pull from us."

- SUSE: unclear.
  - "SUSE Preserves Choice in Enterprise Linux by Forking RHEL with a $10+ Million Investment"
  - How would this affect their current distribution?
  - Later announced OpenELA "trade association" to "distribute RHEL source code"
    - Oracle, SUSE and CIQ (and Rocky Linux, sort of)

- Rocky Linux: confrontational.
  - "Keeping Open Source Open"
  - Ignoring the changes, using public cloud instances running RHEL

- AlmaLinux: conciliatory.
  - "The Future of AlmaLinux is Bright"
  - Dropping aim of 1:1 in favor of ABI compatibility

ABI Compatibility

- "1:1 bug compatible"
  - Red Hat source RPMs are rebuilt as is
    - Same versions of everything, no deviations
  - Applications built on RHEL work because they're the same

- "ABI compatible"
  - Red Hat packages are "recreated" from "legal" sources
    - Versions *may* differ, deviations are allowed but minimized
  - Applications built on RHEL *should* work without any issues
    - If they don't, it's a bug which will be fixed

Current status for AlmaLinux

- Multiple sources of packages/patches
  - UBI, CentOS Stream, Oracle Linux, upstream projects

- ~99% of packages are 1:1 rebuilds
  - ~75% straight from UBI or CentOS Stream
  - ~24% require some manual patching
    - Sourcing patches from Stream's git or upstream projects

- <1% differ from RHEL
  - Kernels only include security patches
  - Updated microcode for recent CPU vulnerabilities

- Watching closely the evolution with the next point release

Impact on security updates in AlmaLinux

- CVE-2023-32233: use-after-free in nf_tables [Important]
    - RHEL 9 update published on 21st of June, just as access to sources was cut off
    - AlmaLinux had a patch ready, but wasn't sure if they could legally release it
    - AlmaLinux 9 patch released 3 weeks later

- CVE-2022-40982 and CVE-2023-20569: Downfall and Inception [Moderate]
    - CVE announced 8th of August
    - AlmaLinux 8/9 patches released 1 week later
    - Red Hat 8/9 patches for Downfall released 4 weeks later
    - No Red Hat patches available yet for Inception

Recommendation

- Continue relying on **RHEL and AlmaLinux**

- We will continue to monitor the situation and adapt as necessary

- Maintain frequent contact with our upstream providers and partners

AlmaLinux

Red Hat
Enterprise Linux

2023

2024

Limited Debian Support (for ATS FECs)

- Front-end computers: embedded machines currently using CC7
  - ~65% won't be able to run RHEL 10, can't be replaced

- Limited scope, well defined use-case
  - Pending final approval

debian

AlmaLinux

???

Red Hat
Enterprise Linux

2023   2024   2025   10

Potential Future Scenario: Dual Ecosystem Strategy

- Ramp up Debian support to match Red Hat / AlmaLinux
  - Credible exit strategy for multiple risk scenarios

- Long-term project, major effort from multiple parties
  - Requires management approval and commitment

debian

AlmaLinux

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Red Hat
Enterprise Linux

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LS3

2023

2026
RHEL contract renegotiation

2029
End of current RHEL contract
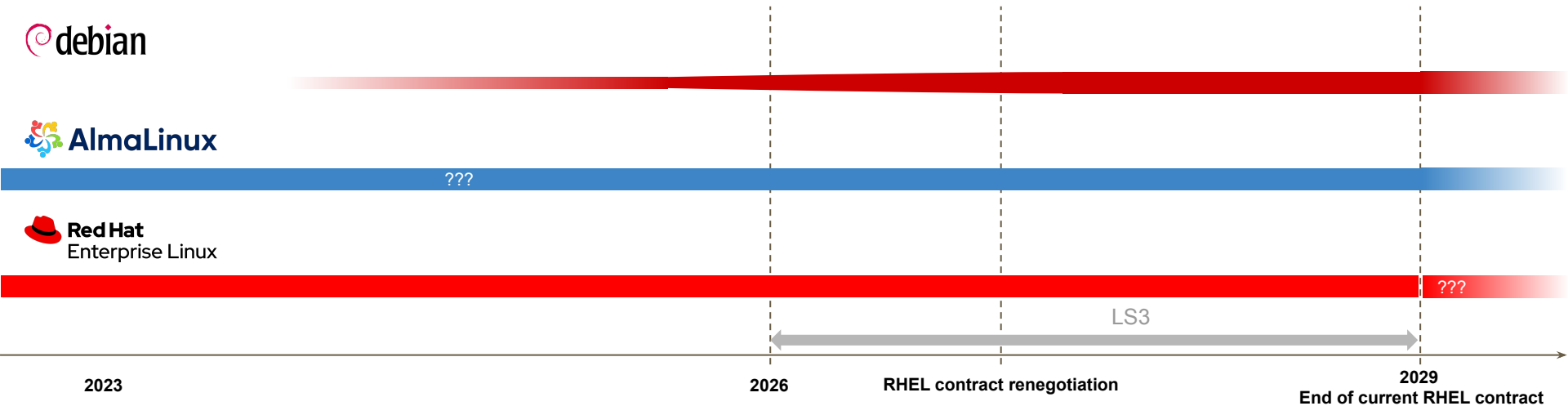
Current ARM Status

- 5 ARM servers in the CERN Cloud
  - Ampere Altra Neoverse-N1 (Armv8.2-A) 3GHz 80 cores, 256GB RAM, 1TB NVME disk
  - Already fully committed

- OTG0144823: Gitlab CI ARM runners in production
  - Limited capacity
  - Use tag **k8s-arm** or **docker-aarch64**

- Awaiting delivery of ~40 new servers
  - Expected in production early next year
  - Contact the Cloud Team for access

Questions & Discussion

Can Red Hat do this despite the GPL?

- The GPL requires that sources are available to whomever you distribute binaries to
  - Red Hat customers have access to sources through the Customer Portal
  - No obligation to non-customers, as they didn't receive the binaries

- The GPL forbids any further restrictions on the recipients' rights
  - RH's EULA does not apply to the software, but to the commercial relationship

- The GPL doesn't give you any rights to future versions of the software

- In short: you *can* distribute the sources, but only once.
  - Red Hat can then terminate your contract and cut you off from future updates

Further discussion in the Software Freedom Conservancy's post: "A Comprehensive Analysis of the GPL Issues With the Red Hat Enterprise Linux (RHEL) Business Model"

Announcements

- June 21: **Red Hat** announces changes to RHEL 8/9 source availability
    - https://www.redhat.com/en/blog/furthering-evolution-centos-stream
- June 22: **AlmaLinux** studying impact
    - https://almalinux.org/blog/impact-of-rhel-changes/
- June 22: **Rocky Linux** "mitigation" in place
    - https://rockylinux.org/news/2023-06-22-press-release/
- June 24: **Rocky Linux** updates are up-to-date
    - https://rockylinux.org/news/brave-new-world-path-forward/
- June 26: **Red Hat** responds to criticism
    - https://www.redhat.com/en/blog/red-hats-commitment-open-source-response-gitcentosorg-changes
- June 29: **Rocky Linux** pushes back on Red Hat
    - https://rockylinux.org/news/keeping-open-source-open/
- June 30: **AlmaLinux** highlights their contributions
    - https://almalinux.org/blog/our-value-is-our-values/
- July 10: **Oracle** criticises Red Hat
    - https://www.oracle.com/jo/news/announcement/blog/keep-linux-open-and-free-2023-07-10/
- July 11: **SUSE** forks RHEL
    - https://www.suse.com/news/SUSE-Preserves-Choice-in-Enterprise-Linux/
- July 13: **AlmaLinux** drops 1:1 in favor of ABI compatibility
    - https://almalinux.org/blog/future-of-almalinux/
- August 10: **SUSE, Oracle and CIQ** announce OpenELA "trade association"
    - https://www.suse.com/news/OpenELA-for-a-Collaborative-and-Open-Future/
- August 31: **Rocky Linux** supports OpenELA, but not their primary source of packages
    - https://rockylinux.org/news/statement-openela-2023-08-31/