
CERN

HEPiX Autumn 2022 – Linux BoF

CERN Linux Updates and Outlook

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On behalf of CERN IT

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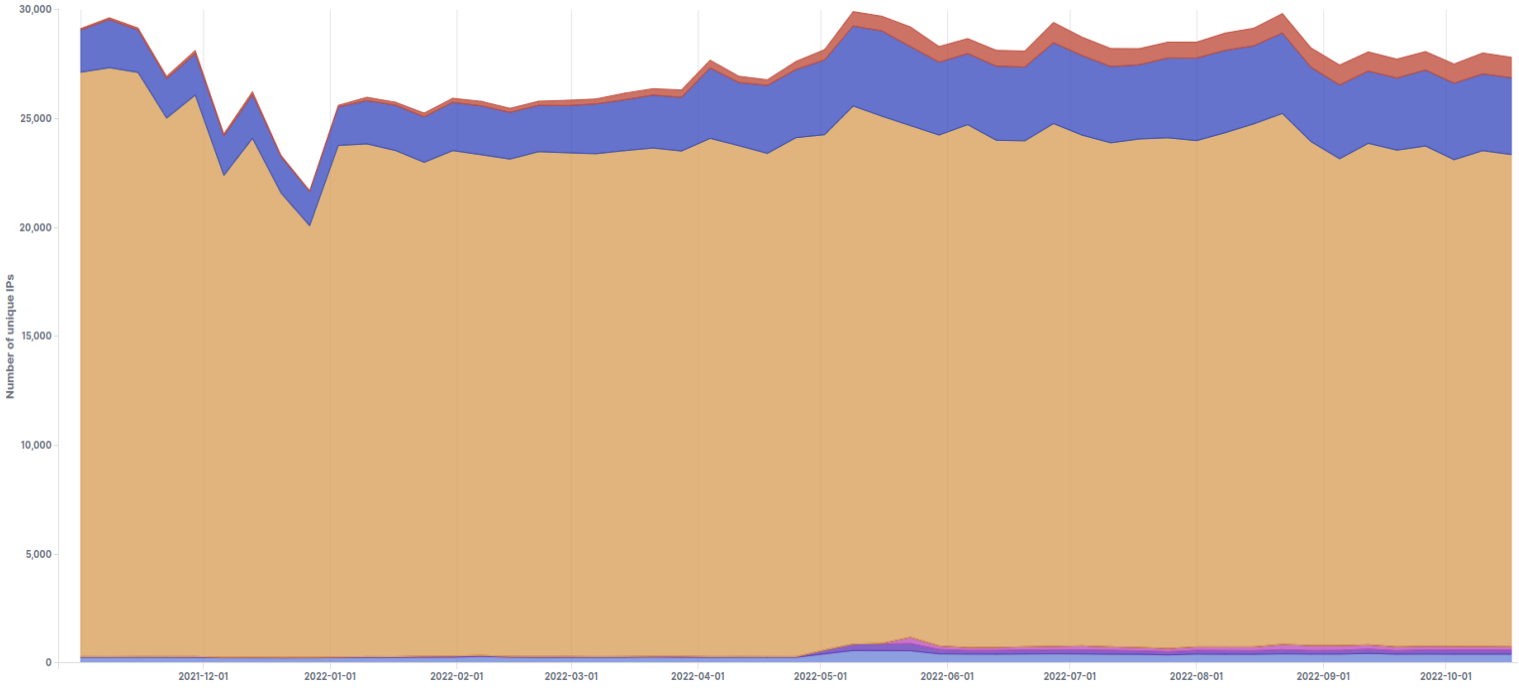
Agenda

- Recap
- Situation today
- Why CentOS Stream 8?
- Experiences with Stream
- Future Plans
  - Options
  - Timelines
- Questions

Previously, on The CentOS Saga...

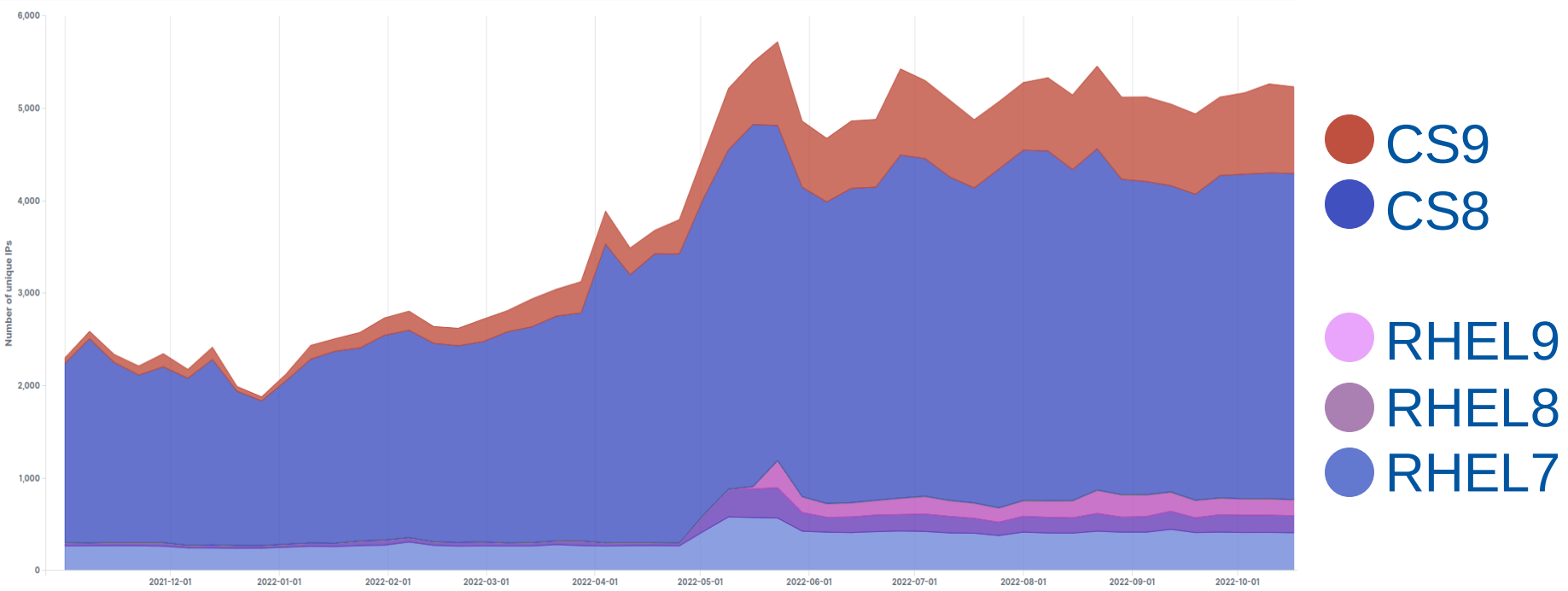
- Dec. 2020: CentOS Project deprecates CentOS Linux to focus on Stream
- Jan. 2021: CentOS Stream 8 available for testing at CERN
- Feb. 2021: 1st Linux Future Committee meeting to discuss options
- Oct. 2021: Joint FNAL-CERN statement on supporting CentOS Stream 8
- Dec. 2021: WLCG Management Board approves GDB's recommendation:
  - Red Hat Enterprise Linux, CentOS Stream and RHEL rebuilds **should be treated equally**
- Feb. 2022: CentOS Stream 9 available at CERN
- Mar. 2022: Red Hat Academic Site License available at CERN

Evolution of distribution usage



CS9
CS8
CC7
RHEL9
RHEL8
RHEL7

Evolution of distribution usage (excluding CC7)



Why CentOS Stream 8?

- Fermilab and CERN agreed it was the best option at the time
  - Most obvious migration path from CentOS Linux 8
  - Good to stay connected to the wider CentOS community
- Immaturity of Enterprise Linux rebuilds
  - Projects just ramping up
  - Build systems still being set up and in heavy flux
  - Uncertain community commitments
- Some reluctance due to upstream nature of Stream, but no experience to back it up

Experiences so far with Stream

- Both CentOS Stream 8/9 are feature complete in the CERN environment
- General uptake (replacing CC7) has been slow, though steady
- CVE handling with Stream has been complicated
  - Hard to map RH Advisories to Stream packages
- Several bugs have been encountered in Stream, which were not present in RHEL
  - The CS8 release process is… not great.
  - CS9 *should* be better, but Red Hat still hasn't put in place full public integration testing

Examples of Issues in Stream

- NetworkManager not renewing DHCPv6 lease on CS8 [0]
- New mdadm can't assemble md devices created with previous mdadm [1]
- podman-catatonit upgrade conflict with catatonit [2]
- gflags/glog packages built in wrong order [3]
- Unpriviledged users can't use ping in CS8 [4]
- Ceph kernel client issues: [5], [6] (affected RHEL too)
- glibc crashes during updates [7] (RHEL also affected, but less common)
- Rsync client broken [8]
- CS9 kernels signed with test Secure Boot key [9]

QA has been great, but...

- The CERN IT gated release process caught most of these issues
  - see "Navigating the Stream: automating CentOS releases at CERN", HEPiX Autumn 2021
  - These issues still generated work for us *and* our users
- Some user communities had previously expressed concerns on the feasibility of using Stream in a production setting
  - This feeling has also recently been expressed internally by some IT groups

Future Plans

- CERN is reevaluating our original recommendation of CentOS Stream as the default Linux Operating System
- Discussions are currently taking place internally within CERN IT
- We are continuing to work with the WLCG community
  - Linux BoF session coming up next, please share your experiences!

Potential Options

- Recommend **RHEL**
  - CERN has a site license
  - Not all HEP sites are this lucky, though some may profit from the ERN(*)
- Recommend a **RHEL rebuild** (AlmaLinux / Rocky Linux)
  - CERN site license would not be taken advantage of
  - All HEP sites could profit (if they choose the same rebuild)
- Recommend **both RHEL and a RHEL rebuild**
  - CERN site license could be taken advantage of for hosts at CERN
  - Some services could use a RHEL rebuild
    - Such as those that have interactions with other HEP sites/users
  - More distributions would need to be supported by the Linux team
- A timeline to decommission CentOS Stream would also need to be planned
- Continuing to use CentOS Stream could still be an option 🙃

Timelines

- We would like to converge on a decision as soon as possible
  - Internal analysis is ongoing
  - Feedback from HEPiX and the wider CERN community will greatly assist
- Information on any changes to the recommendation will be announced through a Linux Future Committee meeting
- For **NEW** deployments at CERN:
  - We currently recommend to pause the deployment of CentOS Stream

Questions?

www.cern.ch

Issues on Stream references

[0] https://github.com/systemd/systemd/pull/21558
[1] https://bugzilla.redhat.com/show_bug.cgi?id=1966712
[2] https://bugzilla.redhat.com/show_bug.cgi?id=2123319
[3] https://bugzilla.redhat.com/show_bug.cgi?id=2055222
[4] https://bugzilla.redhat.com/show_bug.cgi?id=2037807
[5] https://bugzilla.redhat.com/show_bug.cgi?id=2046021
[6] https://cern.service-now.com/service-portal?id=outage&n=OTG0064504
[7] https://bugzilla.redhat.com/show_bug.cgi?id=2119304
[8] https://bugzilla.redhat.com/show_bug.cgi?id=2043753
[9] https://bugzilla.redhat.com/show_bug.cgi?id=2138019

RHEL Academic Site License ERN

- As part of CERN's Academic Site License negotiations, we negotiated special conditions for HEP sites as part of our Extended Research Network
  - Sites can obtain 1000 free RHEL licenses **for the purposes of research in partnership with CERN**
  - Interested sites need a commercial agreement with Red Hat and an "introduction" through CERN
- Larger HEP sites can also apply directly to Red Hat for a Site License agreement like CERN's

Research: servers exclusively doing computations, analysing and storing research data. HPC, Big data

Non-research: computing capacity required to run organisation's backend systems such as email servers, file servers storing various documents, HR, ERP, backup servers etc.