AlmaLinux in the HPC world

HPC Admintech May, 2025

AlmaLinux

src: https://www.eso.org/public/images/archive/top100/

hi, I'm benny

- Many years as a sysadmin
- Many years as a community builder
- Many years around open source
- Many years as a lover of Star Wars
- Many years as a lover of Sci-Fi

social.linux.pizza/@benny
@bennyvasquez
benny@almalinux.org

AlmaLinux

AlmaLinux in the HPC world

HPC Admintech May, 2025

AlmaLinux

src: https://www.eso.org/public/images/archive/top100/

~~AlmaLinux in the HPC world~~ AlmaLinux: building without following

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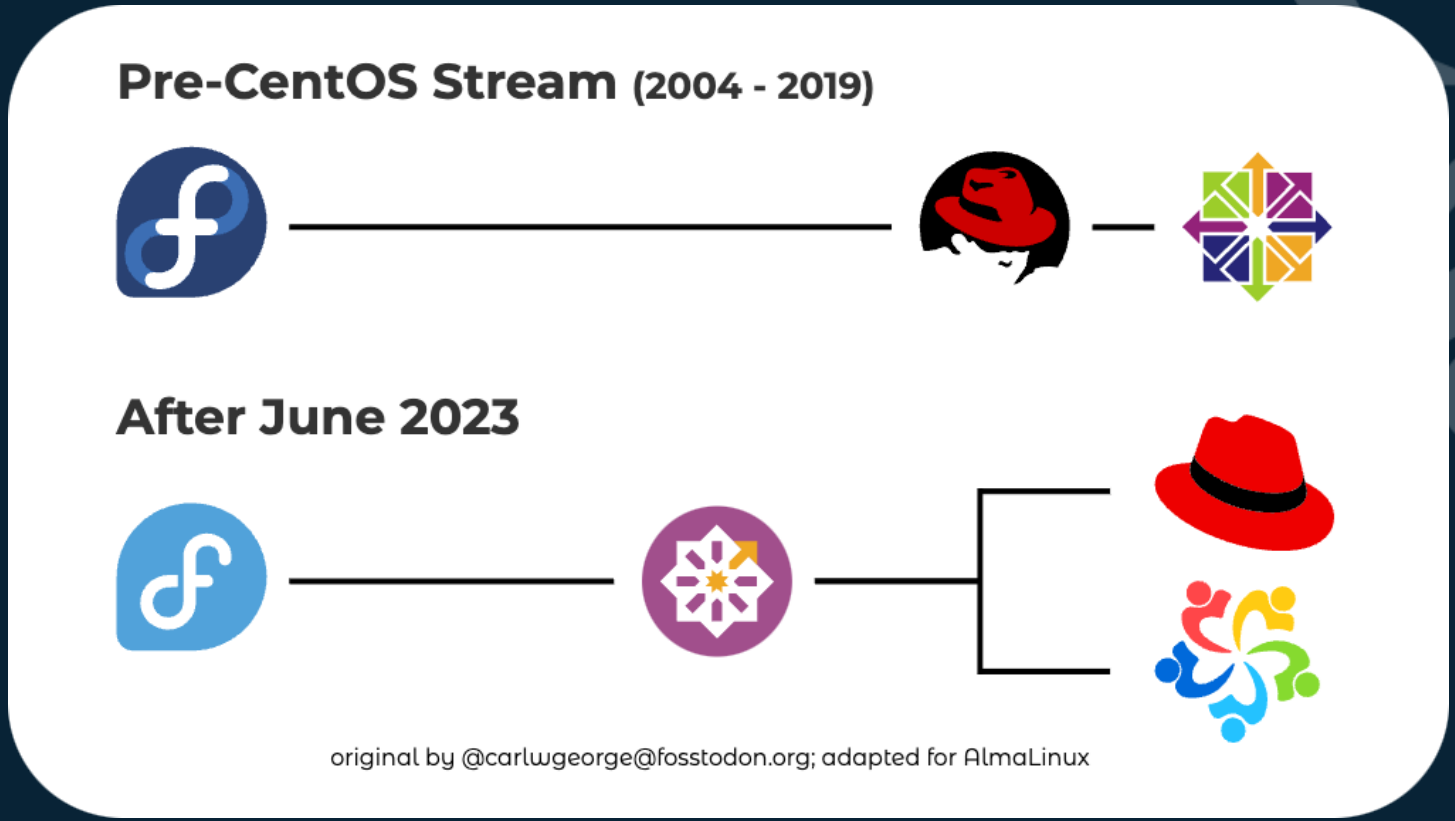
AlmaLinux

src: https://www.eso.org/public/images/archive/top100/

What is AlmaLinux OS?

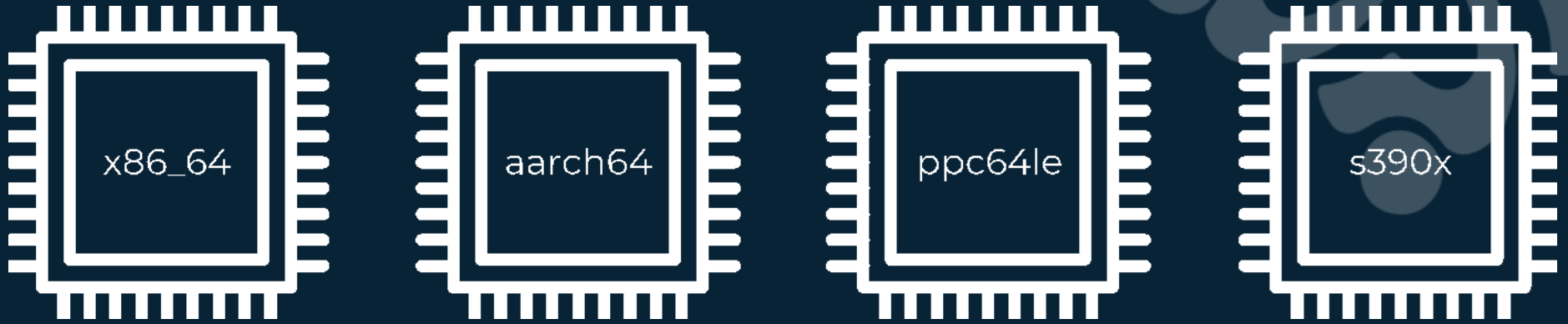
RHEL Compatible, but not a RHEL Copy



AlmaLinux

How we build: https://www.youtube.com/watch?v=qZItk4uBB5Q

Supported Architectures



AlmaLinux

OtisSnerd · 21d ago

I'm running a self-hosted personal website used to host family photos, a couple of which are from the late 1800s. I have over 19k scanned slides and prints, and many documents from my dad's WW2 records, plus stuff from the shipyard that he and I used to work for. I also have my in laws decades of slides, plus family friends of theirs (who belonged to the same church we did) and also more family photos from two cousins. This helps with doing family history in Ancestry.

I started this over 19 years ago, with NT4, Fedora 2?, then CentOS 4, 5, 7. I use jAlbum to build the interface, using Apache for the web server.

I rebuilt the server with all 'new' hardware (Intel version 8xxx family from FleaBay) just last year.

6 Reply Share ···

fransschreuder · 20d ago

I work for a large project at CERN / ATLAS, where we use Alma 9 for everything now. So it is driver and software development, but also production.

9 Reply Share ···

gorestas · 12d ago

micromegas or the pixel sensor?

1 Reply Share ···

fransschreuder · 11d ago

FELIX, the readout system for both of them and basically the whole ATLAS detector

1 Reply Share ···

Adrien Linuxtricks ✔
@_adriend_

Oh @AlmaLinux dans le métro / RER Parisien !

Translate post

> **nimbus** @nimbus444 · 7h
> Une nouvelle signalisation est en cours de mise en place à #Châtelet
> Et ça tourne sous #gnome
> @_adriend_ avec le logo tu arriverais a identifier la distribution ?

abgardn2 · 2mo ago

I'm a researcher (graduate student) in experimental nuclear physics and the collaboration I'm a part of is transitioning to AlmaLinux 9 (from CentOS 7) for our primary research environment. We use it to build and run software for many purposes but mostly statistical data analysis and Monte Carlo simulation related to hadron photoproduction physics at Thomas Jefferson National Accelerator Facility.

3 Reply Award Share ···

abotelho-cbn · 21d ago

Thousands of VMs. A few dozen gateways/routers. Over a hundred hypervisor nodes.

4 Reply Share ···

Dizzybro · 20d ago

Slowly migrating everything from CentOS7 to Alma9.

Once done it will be roughly 200-300 machines

5 Reply Share ···

AlmaLinux

Invayder · 2mo ago

I use it for Emby with a Software RAID 5 configuration.

2 Reply Award Share ···

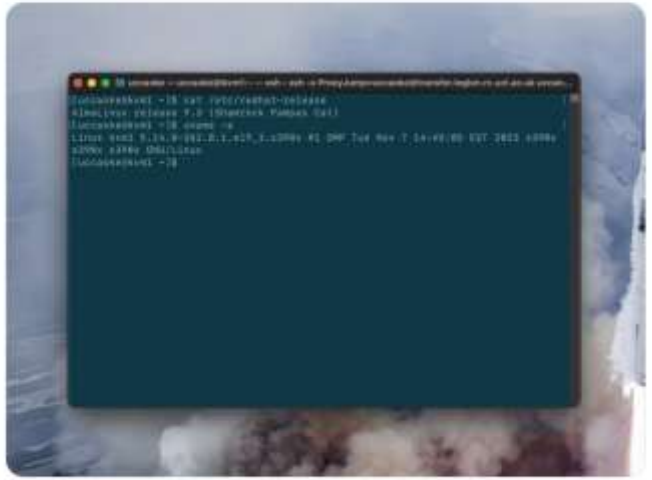
benarent
@benarent

BART runs on AlmaLinux

5:44 PM · Mar 1, 2024 · **1,512** Views

Dr Owain Kenway
@owainkenway

Thanks to my amazing team and help from @IBM, we are now live - yes, we have @AlmaLinux 9.3 for #LinuxOne running on Vindicator:



11:26 AM · Mar 15, 2024 · **721** Views

jsgbrl · 2mo ago

i use it for routing, firewalls, dns servers, openvpn server and clients, podman, virtual machines, nagios, bareos, paperless and nextcloud.

2 Reply Award Share ···

AlmaLinux

Live media, ISOs, container, and cloud images with LXC/LXD and Windows Subsystem for Linux (WSL) support

https://almalinux.org/get-almalinux/

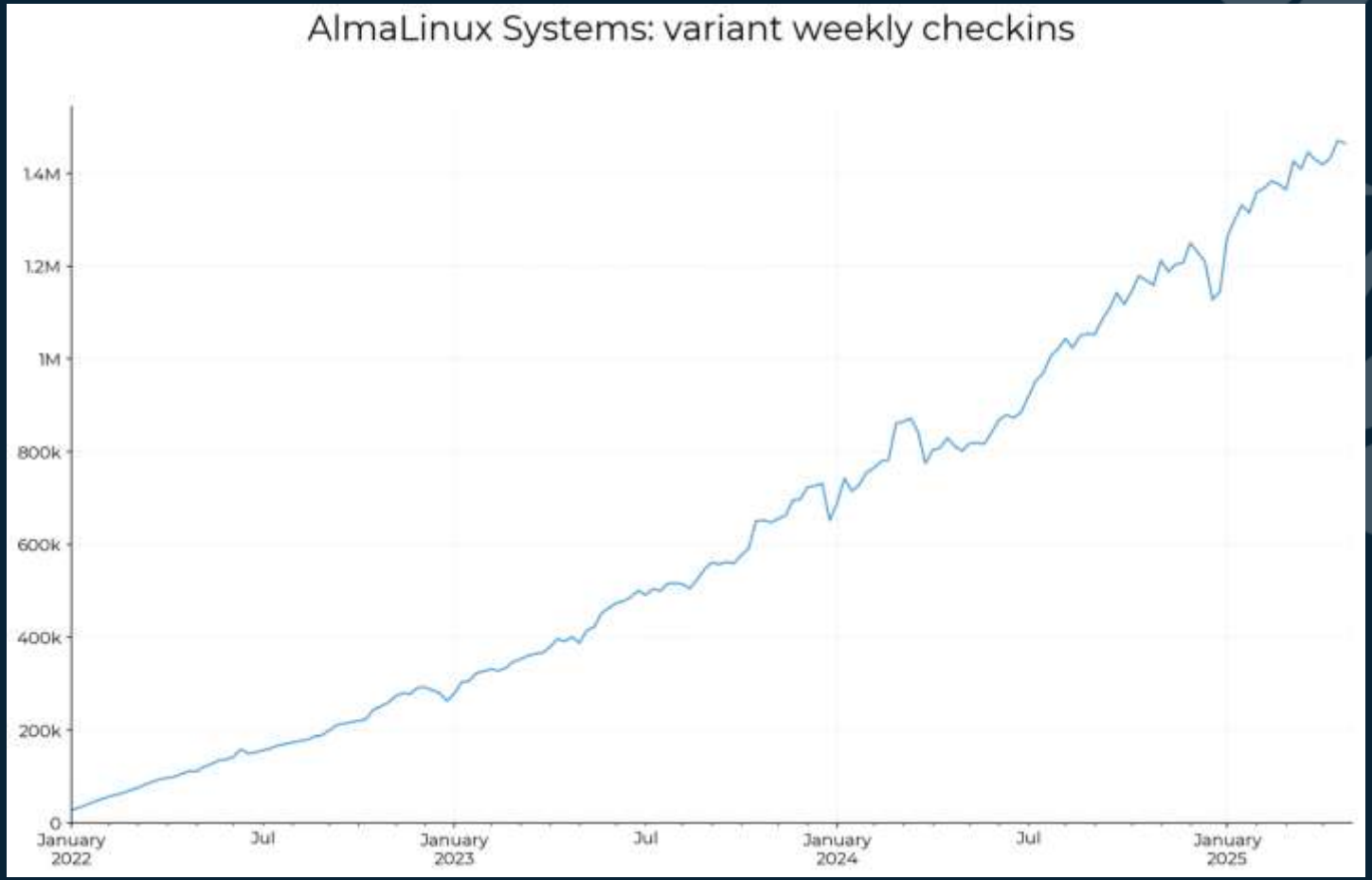
https://almalinux.org/members/

AlmaLinux

Used on 6 of the top 500 HPC clusters

Rank	Name	Computer	Site
51	Capella	Lenovo ThinkSystem SD665-N V3, AMD EPYC 9334 32C 2.7GHz, Nvidia H100 SXM5 94Gb, Infiniband NDR200, AlmaLinux 9.4	TU Dresden, ZIH
79	Helma	Lenovo ThinkSystem SD665-N V3, AMD EPYC 9554 64C 3.1GHz, Nvidia H100 SXM5 94Gb, Infiniband NDR200, AlmaLinux 9.4	Universitaet Erlangen - Regionales Rechenzentrum Erlangen
99	Lem	PowerEdge XE9640, Intel Xeon Platinum 8462Y+ 32C 2.8GHz, Nvidia H100 94Gb SXM5, Infiniband NDR200	Wroclaw Centre for Networking and Supercomputing
250	Alex	MEGWARE NF5488A5, AMD EPYC 7713 64C 2GHz, NVIDIA A100 SXM4 80 GB, Infiniband HDR	Universitaet Erlangen - Regionales Rechenzentrum Erlangen
281	Fritz	Megware D50TNP, Xeon Platinum 8360Y 36C 2.4GHz, InfiniBand HDR100	Universitaet Erlangen - Regionales Rechenzentrum Erlangen
499	VSC-5	MEGWARE SLIDESX, AMD EPYC 7713 64C 2GHz, Infiniband HDR	Vienna Scientific Cluster

https://top500.org/lists/top500/2024/11/



AlmaLinux

https://jonathanspw.com/almalinux-countme/

Who is AlmaLinux?

The AlmaLinux OS Foundation

- Founded in March 2021
- 501(c)(6) Registered US Non-profit Organization
- Opened memberships in Oct 2021
- 400+ members
  - Individual members: Free membership to individuals
  - Sponsor members
    - Tiered Sponsors - tiers based on contribution
    - Mirror Sponsors - free with contributed mirror

https://almalinux.org/members/

The AlmaLinux OS Foundation Board

benny Vasquez
Chair
AlmaLinux OS Foundation

Simon Phipps
open source advocate and
former president of the OSI

Alex Iribarren
Penguin Wrangler
CERN

Jun Yoshida
Corporate Officer
Cybertrust Japan

Jack Aboutboul
Linux Program Manager
Microsoft, Inc

Daniel Pearson
CEO
KnownHost

Moshe Bar
CEO
Codenotary Inc.

Jesse Asklund
Global head of Customer Ex.
WebPros

AlmaLinux

https://almalinux.org/members/

AlmaLinux Engineering Steering Committee

Jonathan Wright
AlmaLinux Evangelist
CloudLinux

Andrew Lukoshko
AlmaLinux Lead Architect
CloudLinux

Elkhan Mammadli
Cloud Engineer
CloudLinux

Cody Robertson
CTO
Hawk Host

Ben Thomas
Principal Research Infra Dev
UCL

Neal Gompa
Principal Consultant
Velocity Limitless

AlmaLinux

https://almalinux.org/alesco/

AlmaLinux Special Interest Groups (SIGs)

AlmaLinux

https://wiki.almalinux.org/sigs/

Why AlmaLinux OS?

AlmaLinux delivers fast updates

Version	RedHat	AlmaLinux	Days Behind RH
8.3	Nov 3, 2020	Mar 20, 2021	137
8.4	May 18, 2021	May 26, 2021	8
8.5	Nov 9, 2021	Nov 12, 2021	3
8.6	May 10, 2022	May 12, 2022	2
9.0	May 17, 2022	May 26, 2022	9
8.7	Nov 9, 2022	Nov 10, 2022	1
9.1	Nov 15, 2022	Nov 16, 2022	1
9.2	May 10, 2023	May 10, 2023	0
8.8	May 16, 2023	May 18, 2023	2
9.3	Nov 7, 2023	Nov 13, 2023	6
8.9	Nov 13, 2023	Nov 21, 2023	8
9.4	May 1, 2024	May 6, 2024	5
8.10	May 22, 2024	May 28, 2024	6
9.5	Nov 13, 2024	Nov 18, 2024	5
10.0 beta	Nov 14, 2024	Dec 10, 2024	26

RHEL compatibility = freedom for AlmaLinux

- Patching security flaws faster than immediate upstream
  - nf_tables
    - https://almalinux.org/blog/2024-04-02-xz-and-cve-2024-1086
  - RegreSSHion
    - https://almalinux.org/blog/2024-07-01-almalinux-9-cve-2024-6387/
- Releasing bug fixes faster than immediate upstream
  - glibc regression causing Houdini to crash
    - https://almalinux.org/blog/2024-07-25-testing-glibc-needed/
- Enabling hardware support removed in RHEL and derivatives
  - https://almalinux.org/blog/2024-04-15-announcing-94-beta/
- Adding additional packages
  - https://almalinux.org/blog/new-repositories-for-almalinux-os-synergy-and-testing/

How we build: https://www.youtube.com/watch?v=qZItk4uBB5Q

RHEL compatibility = freedom for AlmaLinux

Maintain consistency when RHEL releases similar patches

- Glibc, for example:
  - Our patch from Jul 24
    - https://git.almalinux.org/rpms/glibc/commit/2c2f1b6964cbe9cf9b15fdb688ab42549f58f20f
  - Updating our patch to match RHEL after their release on Aug 25
    - https://git.almalinux.org/rpms/glibc/commit/cbae14e61e2cba3c9281f010d092a738d5da697e

Minimal non-Red Hat-duplicate packages:

- Re-branded packages
  - https://wiki.almalinux.org/development/Modified-packages.html

How we build: https://www.youtube.com/watch?v=qZItk4uBB5Q

Incredible Support Partners

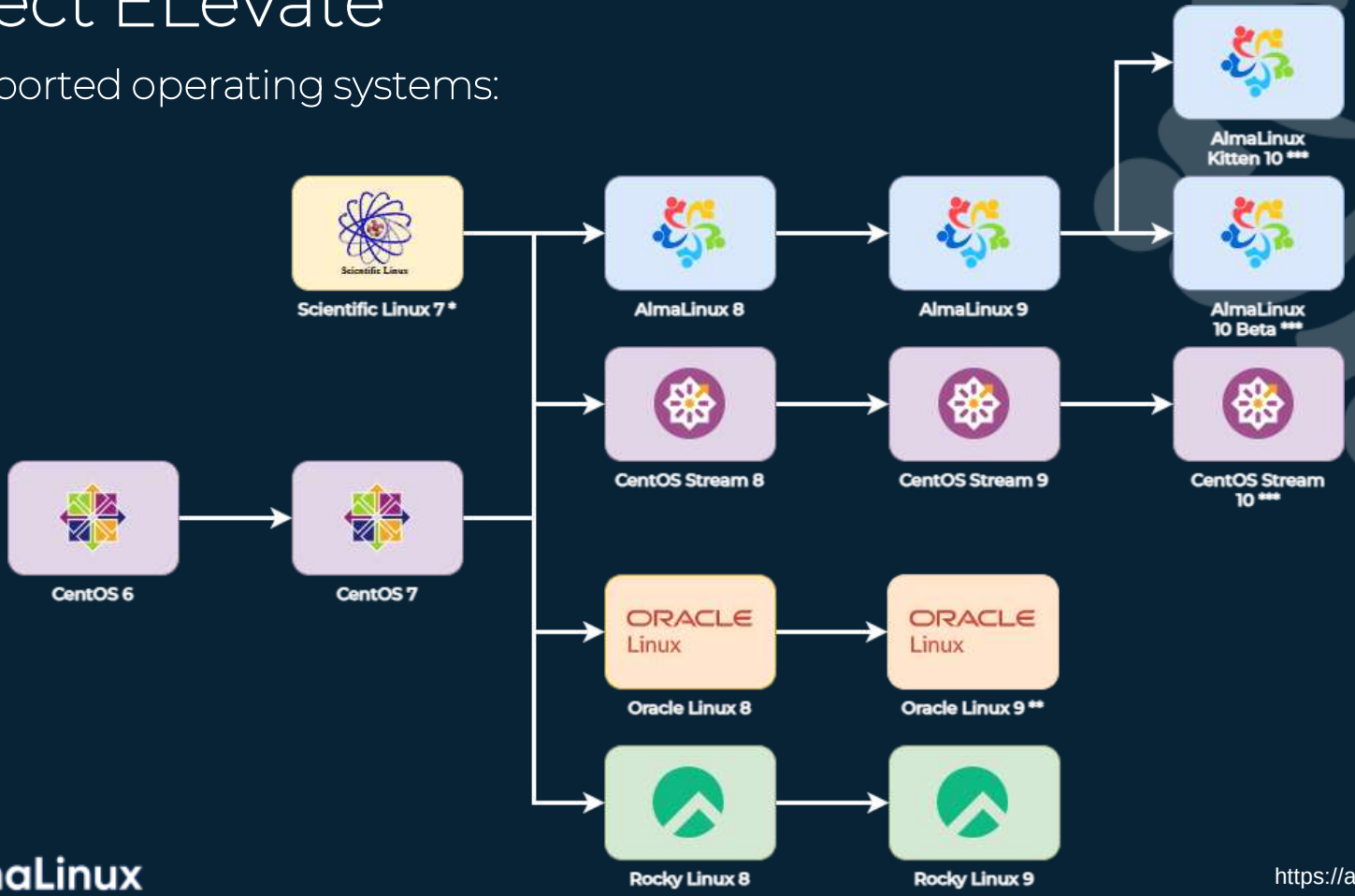
No drama, just Linux.

AlmaLinux

What (else) does AlmaLinux do?

Project ELevate

Supported operating systems:



AlmaLinux

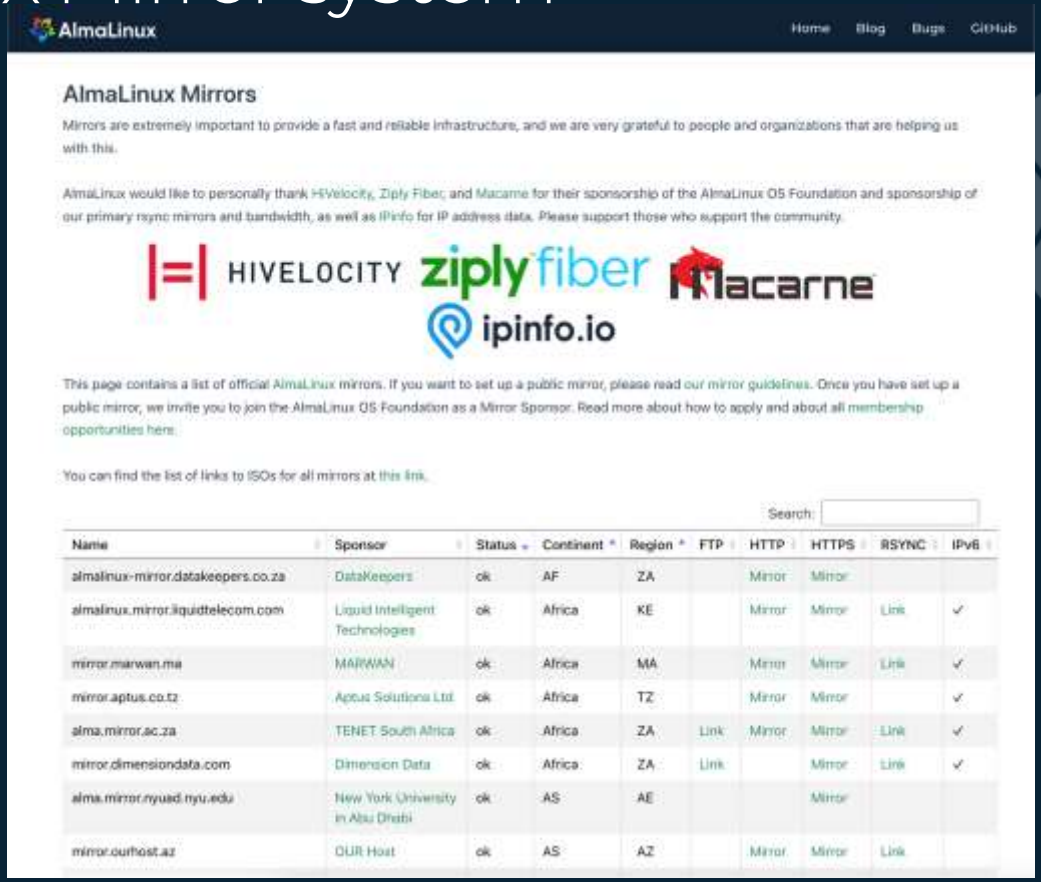
https://almalinux.org/elevate/

AlmaLinux Mirror system

AlmaLinux

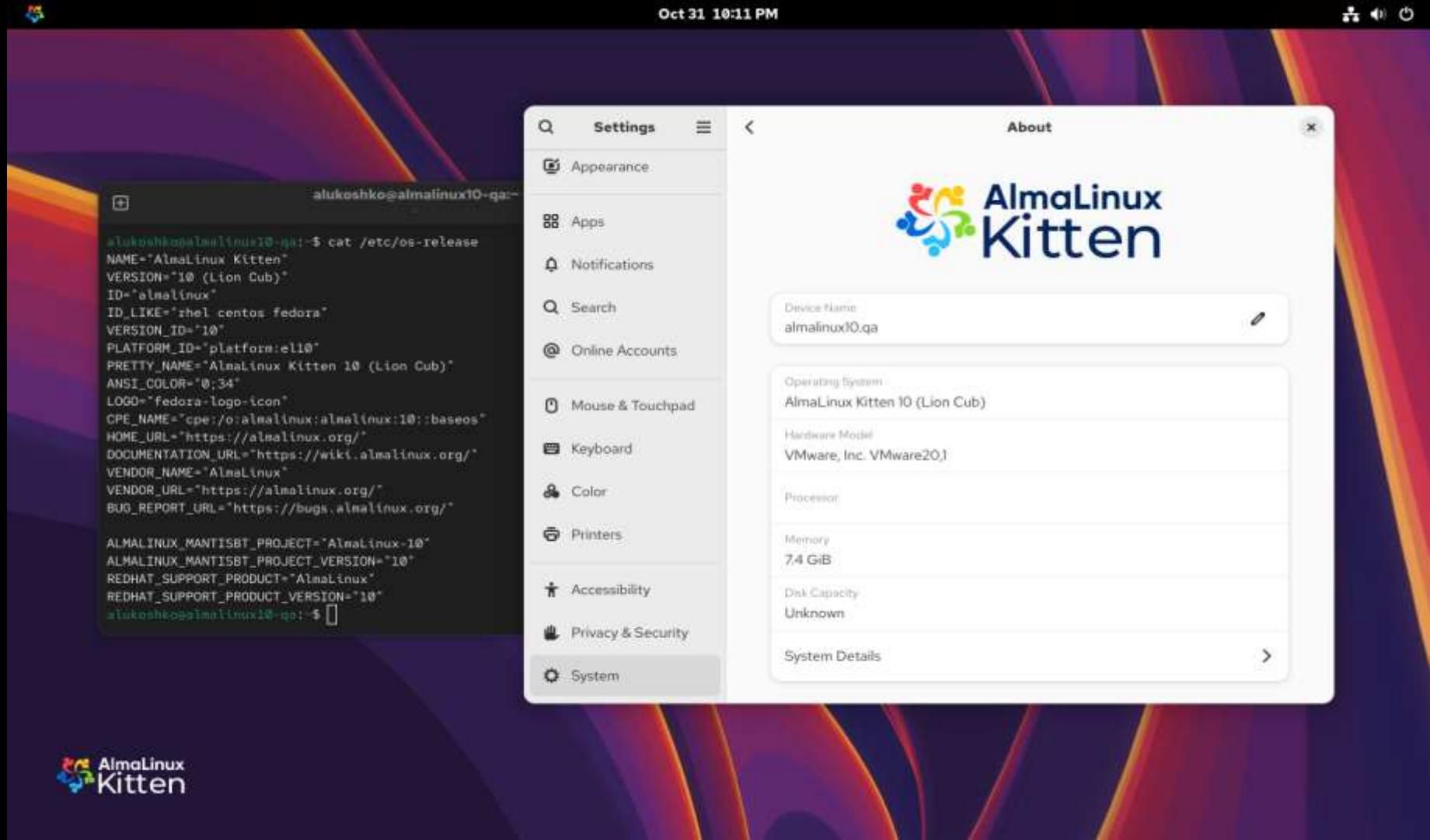
https://mirrors.almalinux.org/

AlmaLinux Mirror system



https://mirrors.almalinux.org/

AlmaLinux


Oct 31 10:11 PM
alukoshko@almalinux10-qa:~
alukoshko@almalinux10-qa:~$ cat /etc/os-release
NAME="AlmaLinux Kitten"
VERSION="10 (Lion Cub)"
ID="almalinux"
ID_LIKE="rhel centos fedora"
VERSION_ID="10"
PLATFORM_ID="platform:el10"
PRETTY_NAME="AlmaLinux Kitten 10 (Lion Cub)"
ANSI_COLOR="0;34"
LOGO="fedora-logo-icon"
CPE_NAME="cpe:/o:almalinux:almalinux:10::baseos"
HOME_URL="https://almalinux.org/"
DOCUMENTATION_URL="https://wiki.almalinux.org/"
VENDOR_NAME="AlmaLinux"
VENDOR_URL="https://almalinux.org/"
BUG_REPORT_URL="https://bugs.almalinux.org/"
ALMALINUX_MANTISBT_PROJECT="AlmaLinux-10"
ALMALINUX_MANTISBT_PROJECT_VERSION="10"
REDHAT_SUPPORT_PRODUCT="AlmaLinux"
REDHAT_SUPPORT_PRODUCT_VERSION="10"
alukoshko@almalinux10-qa:~$
Settings
Appearance
Apps
Notifications
Search
Online Accounts
Mouse & Touchpad
Keyboard
Color
Printers
Accessibility
Privacy & Security
System
About
AlmaLinux Kitten
Device Name
almalinux10.qa
Operating System
AlmaLinux Kitten 10 (Lion Cub)
Hardware Model
VMware, Inc. VMware20,1
Processor
Memory
7.4 GiB
Disk Capacity
Unknown
System Details
AlmaLinux Kitten

AlmaLinux Build System
(ALBS)

AlmaLinux

Why build a build system?

Build System SIG members have 10+ years of experience in developing build system, so we just have own vision how we should do that.

AlmaLinux Build System can:

- Build RPM packages from any git repository or direct src.rpm URL for 7 architectures: x86_64, x86_64_v2, i686, aarch64, ppc64le, s390x, riscv64.
- Build DNF modules (necessary for AlmaLinux 8 and 9)
- Sign bootloader and kernel packages for Secure Boot (Intel and ARM)
- Release RPMs to internal Pulp repos and export them to filesystem
- Collect security advisories from Red Hat's public sources
- Create our own advisories (sometimes we fix CVEs too fast ☺)

🎉 On Feb 01, 2025, we celebrated 4 years since the release of the very first public release of AlmaLinux, **8.3 beta**, codenamed

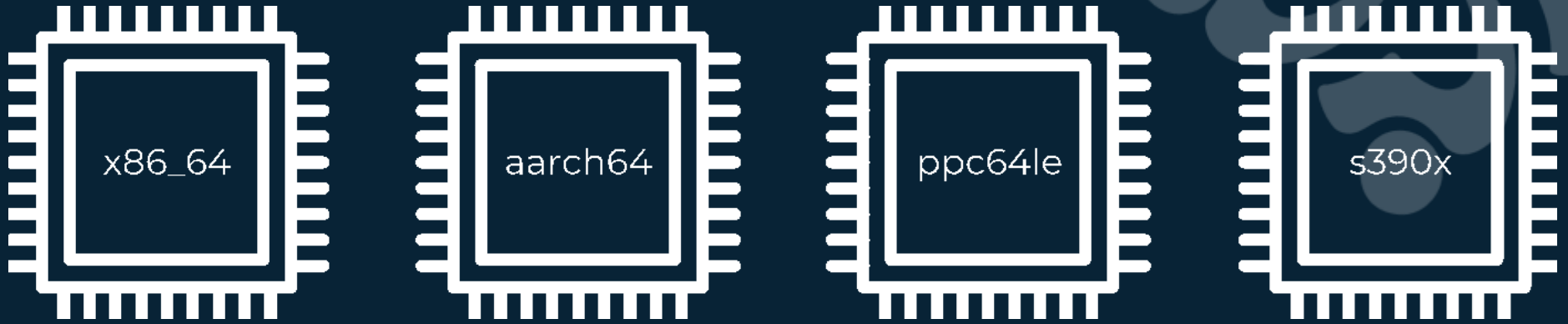
Purple Manul

So this is how we started:

- Release took 55 days since Red Hat announced CentOS Linux 8 EOL
- Only 1 architecture was available - x86_64 (Intel/AMD)
- Exact RHEL clone
- No Secure Boot support
- No mirrors
- No Errata or OpenSCAP support (CentOS Linux never had them either)

AlmaLinux

Supported Architectures



AlmaLinux

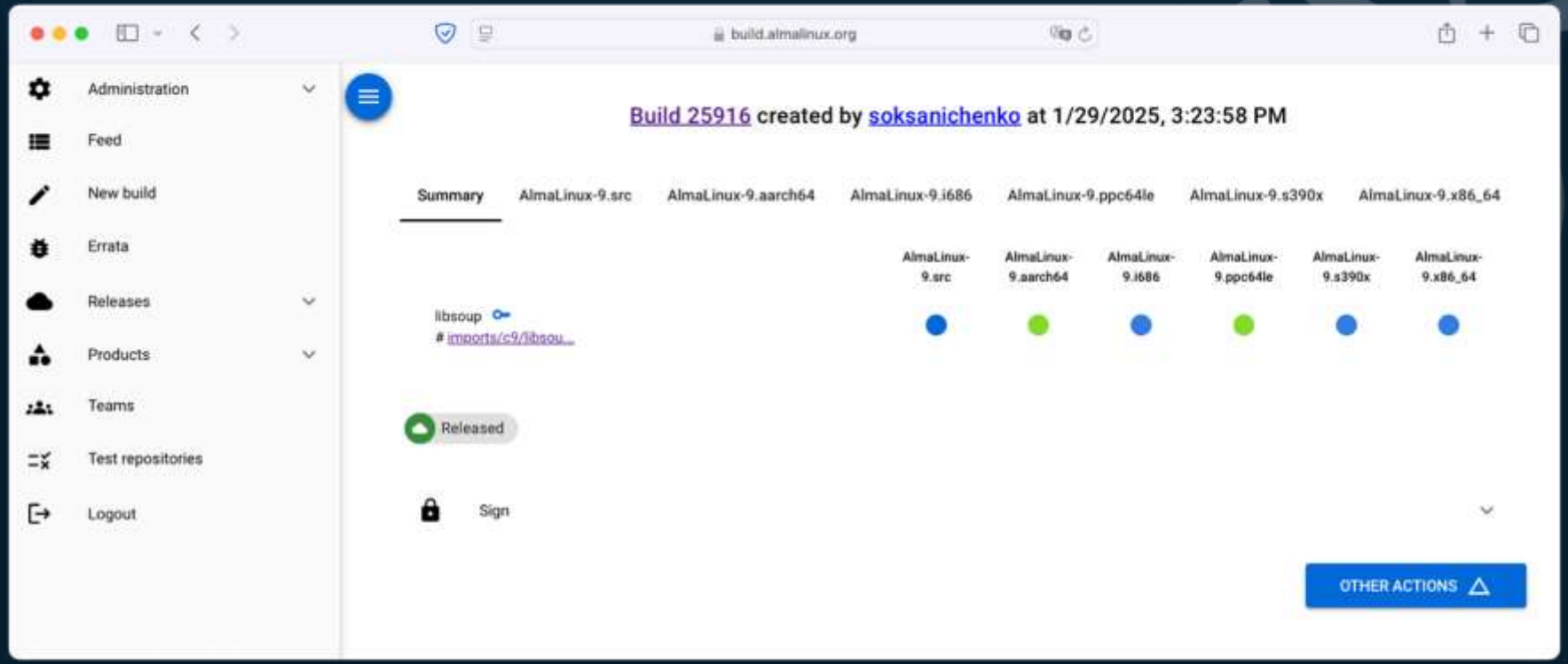
Build system: components

AlmaLinux Build System core components:

1. Web-Server - https://github.com/AlmaLinux/albs-web-server
2. Frontend - https://github.com/AlmaLinux/albs-frontend
3. Build Node - https://github.com/AlmaLinux/albs-node
4. Sign Node - https://github.com/AlmaLinux/albs-sign-node
5. Sign File - https://github.com/AlmaLinux/albs-sign-file

AlmaLinux

AlmaLinux Build System



AlmaLinux

Build system: errata

Red Hat Security Data is publicly available under Creative Commons Attribution 4.0 International License

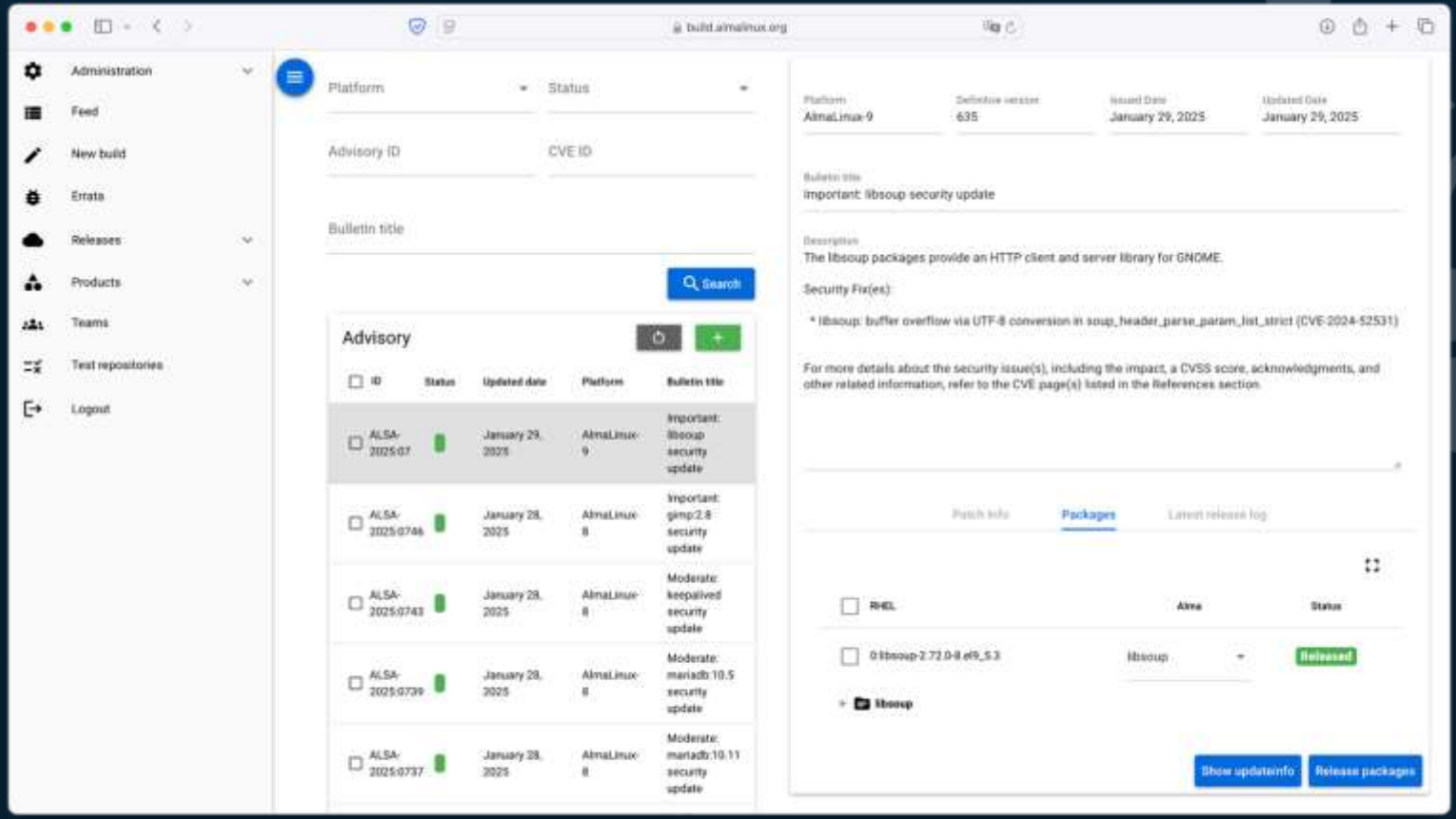
Data is available in several ways:

- Security Data API
- OVAL feed (deprecated)
- CSAF/VEX documents
- RSS feed

Data contains:

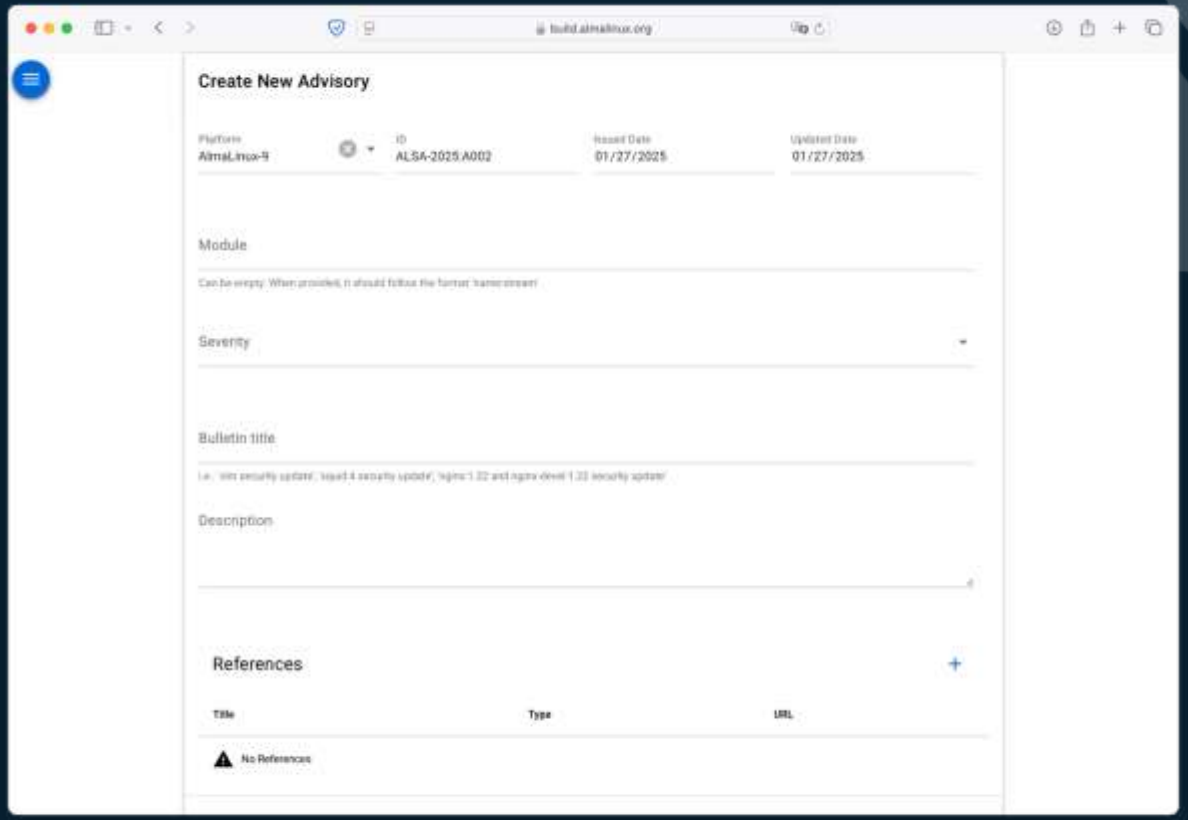
- Advisory id (RHSA-YYYY-NNNN)
- Description
- CVE and Red Hat bugzilla references
- Package names and versions

Build system: errata



AlmaLinux

Build system: errata



AlmaLinux

Build system: errata

Errata website

Mailing list

RSS feed

JSON feed

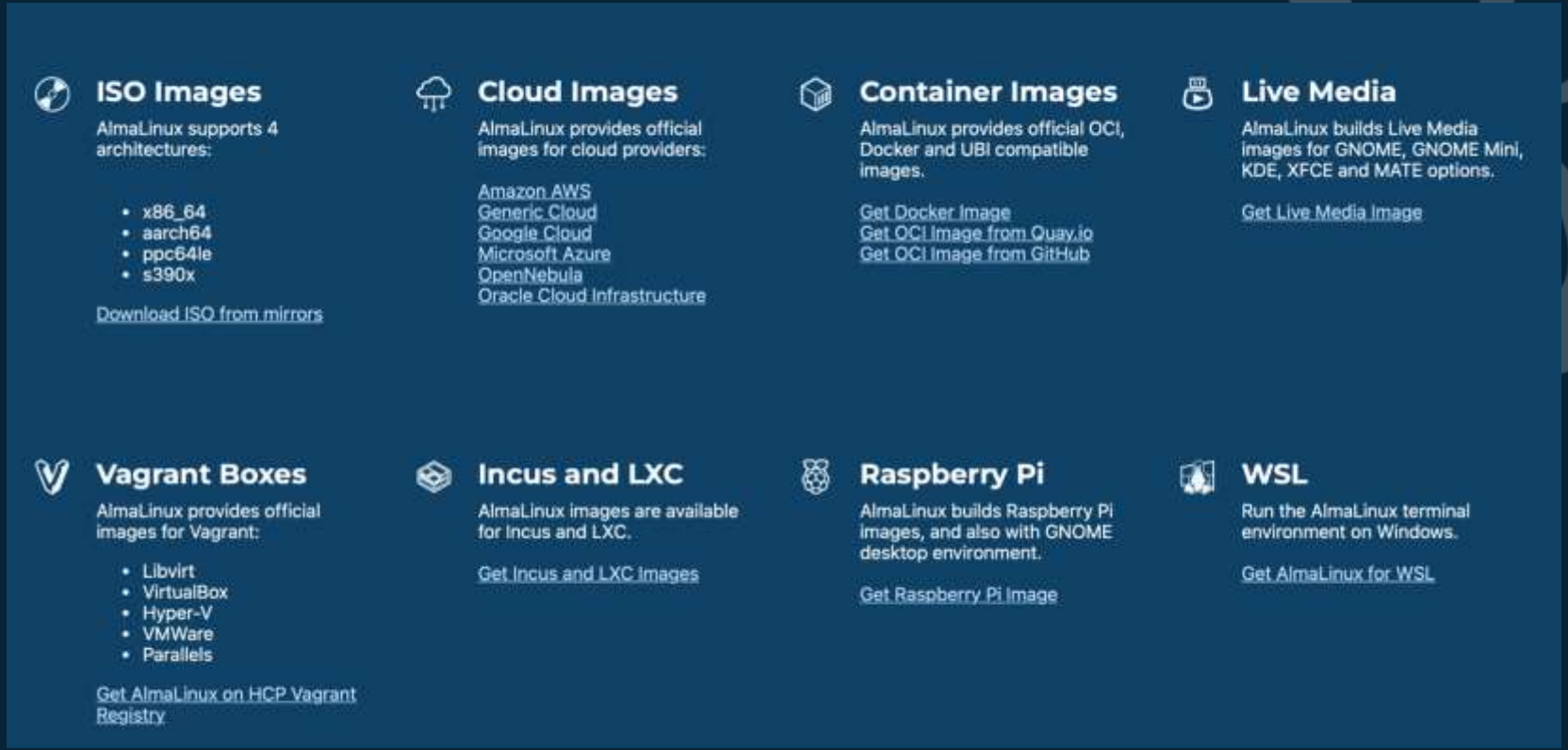
OVAL feed

updateinfo.xml

OSV database

AlmaLinux

Build system: images



AlmaLinux

Build system: images

ISO images:

Pungi tool is patched to build ISO images and repos without koji:
https://git.almalinux.org/almalinux/pungi
(this requires to have a local mirror of AlmaLinux repos we're building from)

Configuration files:
https://git.almalinux.org/almalinux/pungi-almalinux

Guide:
https://wiki.almalinux.org/development/building-almalinux-iso-locally

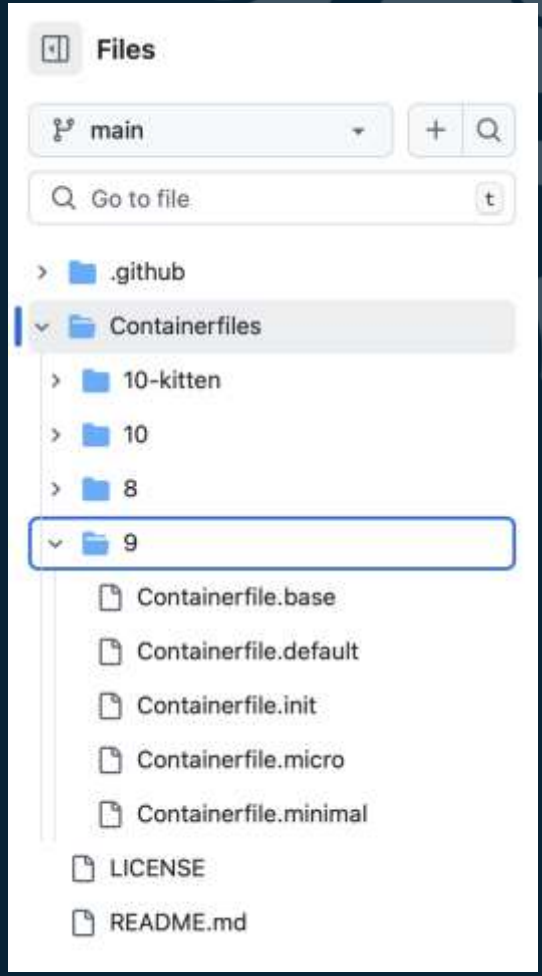
How we build images

Container images:

GitHub repo:
https://github.com/AlmaLinux/container-images

GitHub Actions pipeline is used to:

- Build containers for all supported architectures:
  - x86_64
  - aarch64
  - ppc64le
  - s390x
- Push to Docker Hub, Quay.io, GitHub Packages
- Create PR to Docker Hub Official Library



AlmaLinux

How we build images

Live Media images:

GitHub repo:
https://github.com/AlmaLinux/sig-livemedia

GitHub Actions pipeline is used to:

- Run AlmaLinux vagrant box
- Build for x86_64 and aarch64 with livemedia-creator
- Upload ISOs and logs to Amazon S3 bucket
- Notify in SIG/LiveMedia chat channel

AlmaLinux

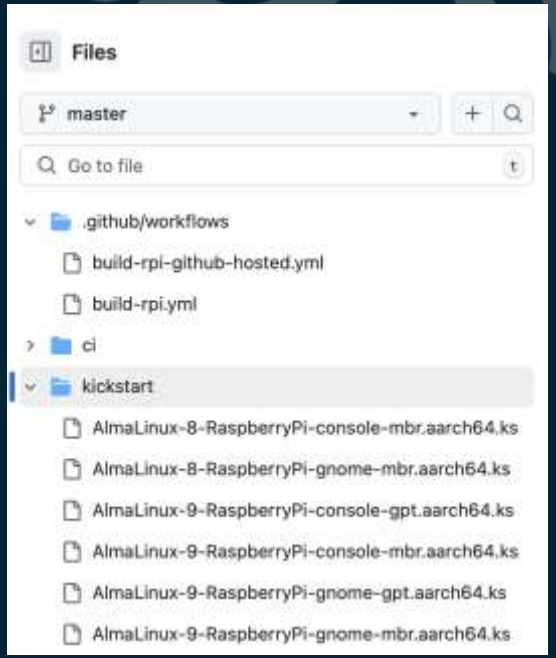
How we build images

Raspberry Pi images:

GitHub repo:
https://github.com/AlmaLinux/raspberry-pi

GitHub Actions pipeline is used to:

- Run AlmaLinux aarch64 container
- Build images with appliance-creator
- Upload images and logs to Amazon S3 bucket
- Notify in SIG/AltArch chat channel



AlmaLinux

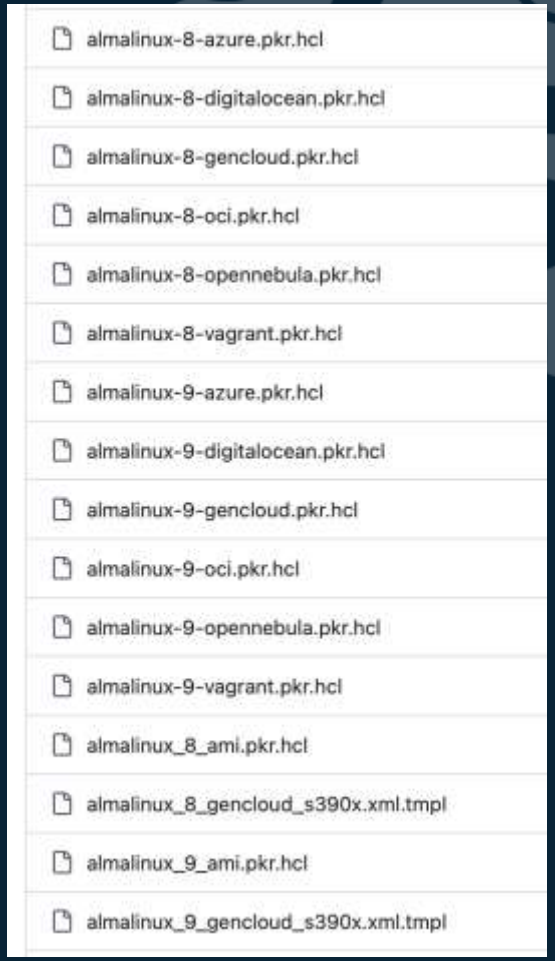
How we build images

Cloud and Vagrant images:

GitHub repo:
https://github.com/AlmaLinux/cloud-images

We use Packer + Ansible to produce images for:

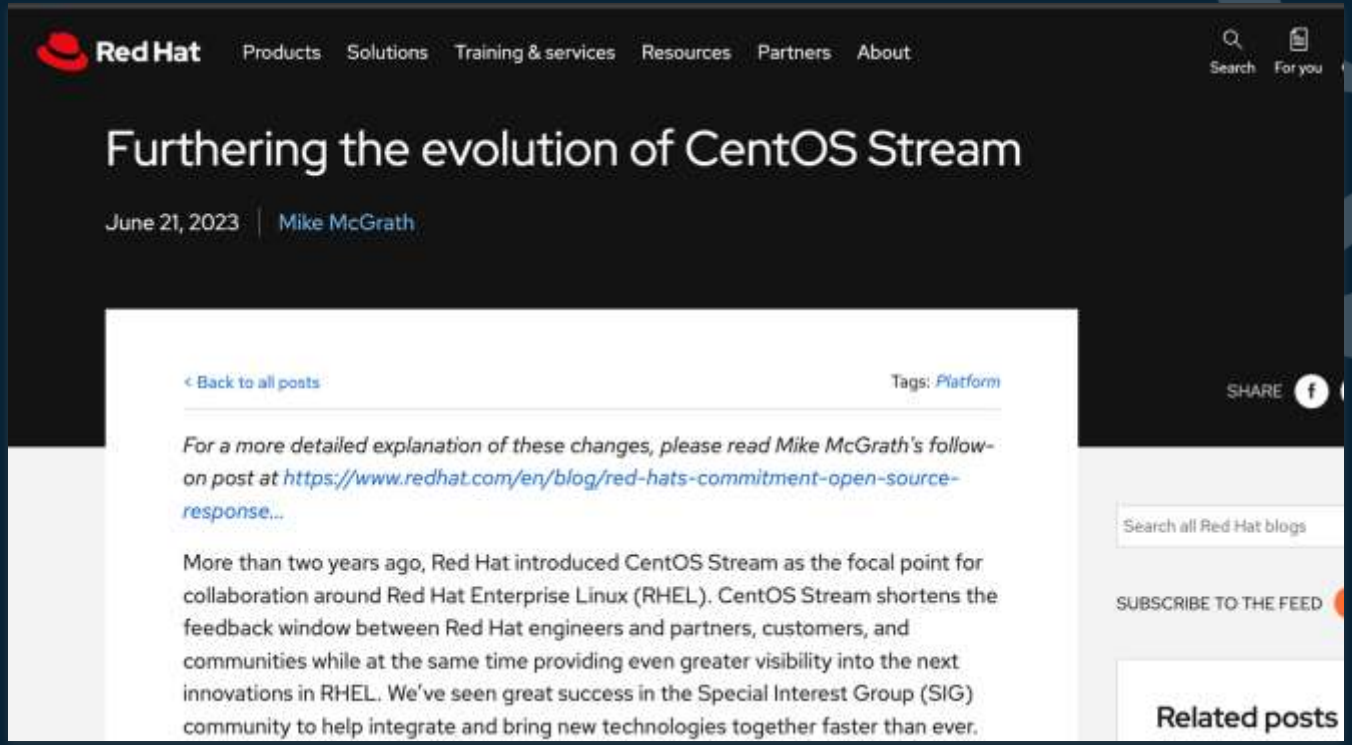
- OpenStack
- OpenNebula
- Azure
- AWS
- Oracle OCI
- Vagrant



AlmaLinux

AlmaLinux: the Sources

AlmaLinux: the Sources



Red Hat stopped uploading sources to git.centos.org on June 21, 2023

AlmaLinux

AlmaLinux: the Sources

AlmaLinux: the Sources

Red Hat Universal Base Image (UBI)

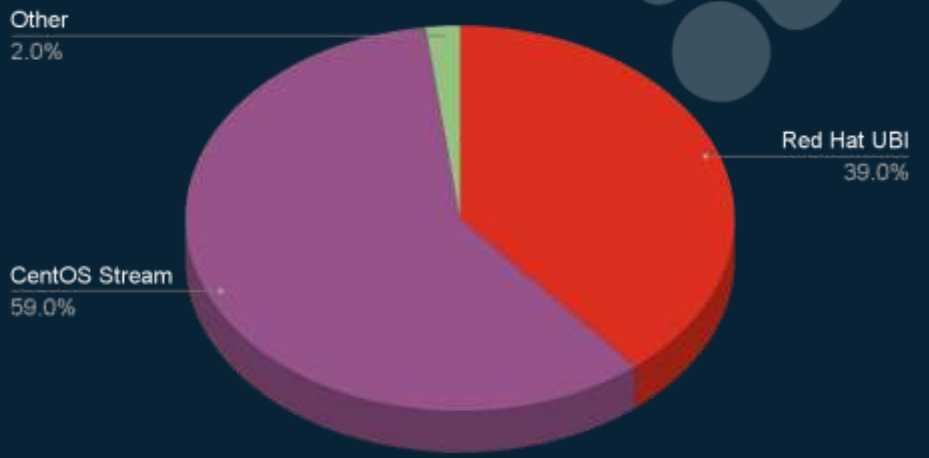
https://cdn-ubi.redhat.com/content/public/ubi/dist/

- RHEL sources in public, updated daily
- Limited set of packages

CentOS Stream

https://gitlab.com/redhat/centos-stream/rpms/

- Future RHEL packages
- We pick only specific package versions
- Not all packages are the same as RHEL



AlmaLinux

AlmaLinux: the Sources being RHEL-equivalent

- We can release bugfixes requested by our community
  - ...without waiting for RHEL updates.
  - And send fixes to CentOS Stream ourselves!
- We can fix vulnerabilities earlier
  - ...without waiting for RHEL updates.
  - As a distribution vendor we get **distros@vs.openwall.org** notices
- AlmaLinux derivatives can request changes specific to them to avoid maintaining the package fork
  - (only if such changes don't affect AlmaLinux users)
- AlmaLinux can include device drivers that were removed from RHEL

AlmaLinux: the Sources - more hardware!

CentOS 7 EOL happened June 30, 2024 and since 2023 many users started upgrading to AlmaLinux 8 and have found that many of their storage and network devices are not supported anymore and basically don't work because upstream decided to drop support to hardware they considering outdated.

We decided to bring this removed devices support back to kernel, it's more than 140 devices covered by the following drivers:

- aacraid - Dell PERC2, 2/Si, 3/Si, 3/Di, Adaptec Advanced Raid Products, HP NetRAID-4M, IBM ServeRAID & ICP SCSI
- be2iscsi - Emulex OneConnectOpen-iSCSI for BladeEngine 2 and 3 adapters
- be2net - Emulex BladeEngine 2 and 3 adapters
- hpsa - HP Smart Array Controller
- lpfc - Emulex LightPulse Fibre Channel SCSI
- megaraid_sas - Broadcom MegaRAID SAS
- mlx4_core - Mellanox Gen2 and ConnectX-2 adapters
- mpt3sas - LSI MPT Fusion SAS 3.0
- mptsas - Fusion MPT SAS Host
- qla2xxx - QLogic Fibre Channel HBA
- qla4xxx - QLogic iSCSI HBA

The ELRepo Project

AlmaLinux

AlmaLinux: the Sources - more hardware!

Global patch to move all “disabled” pci ids to “unmaintained” list:
0001-Enable-all-disabled-pci-devices-by-moving-to-unmaint.patch

Per-driver patches:
0002-Bring-back-deprecated-pci-ids-to-mptsas-mptspi-drive.patch
0003-Bring-back-deprecated-pci-ids-to-hpsa-driver.patch
0004-Bring-back-deprecated-pci-ids-to-qla2xxx-driver.patch
0005-Bring-back-deprecated-pci-ids-to-lpfc-driver.patch
0006-Bring-back-deprecated-pci-ids-to-qla4xxx-driver.patch
0007-Bring-back-deprecated-pci-ids-to-be2iscsi-driver.patch

https://git.almalinux.org/rpms/kernel

The ELRepo Project

AlmaLinux

AlmaLinux: the Sources - more hardware!

Complete list of enabled hardware is available in Release notes for every release

Extended hardware support

The following devices support is added in AlmaLinux OS 9 release compared with the RHEL:

Device PCI ID	Device name	Driver name
0x0E11::: *:01:04	Compaq	hpsa
0x1000:0x0050	LSI SAS1064	mptsas
0x1000:0x0054	LSI SAS1068	mptsas
0x1000:0x0056	LSI SAS1064E	mptsas
0x1000:0x0058	LSI SAS1068E	mptsas
0x1000:0x0059	LSI SAS1068_820XELP	mptsas
0x1000:0x0060	LSI MegaRAID SAS1078R	megaraid_sas
0x1000:0x0062	LSI SAS1078	mptsas
0x1000:0x0064	LSI SAS2116_1	mpt3sas
0x1000:0x0065	LSI SAS2116_2	mpt3sas
0x1000:0x0070	LSI SAS2004	mpt3sas

AlmaLinux

What's coming next?

What's coming next?

- No minor versions
- Based on CentOS Stream 10 sources
- Supported for at least 5 years
- Foundation for AlmaLinux 10 Beta
- Will allow to get AlmaLinux 10 updates earlier

Since Day 1 has the following changes compared CentOS Stream:

- Compiled with **Frame Pointers enabled** to improve profiling and debugging
- **Secure Boot** is supported for both Intel and ARM
- **SPICE** protocol support for virtualization environments (dropped since RHEL9)
- **KVM** virtualization support on **IBM Power** platform (dropped since RHEL9)
- Even more devices supported that were dropped from RHEL
- Has additional **x86_64_v2** architecture option to support older Intel/AMD CPUs (since 2008)
- ~~Firefox and Thunderbird are included~~

Keeping x86_64_v2 (_v3,_v4) architecture in EL

Architecture levels define instructions that CPU should support

x86_64_v1:	any 64 bit Intel/AMD CPU
x86_64_v2:	Nehalem (2008) ->
x86_64_v3:	Haswell (2013) ->
x86_64_v4:	Skylake-X (2017) ->

https://en.wikipedia.org/wiki/X86-64

Keeping x86_64_v2 (_v3,_v4) architecture in EL

RPM supports x86_64 levels as architectures since 4.19.0

But it's still necessary to patch:

- dnf
- libdnf
- efi-rpm-macros
- libsolv
- lorax
- pesign
- python-productmd
- ...

For full packages list with v2 patches applied go to:
https://wiki.almalinux.org/development/Modified-packages.html

How to add x86_64_v2 (_v3,_v4) architecture to EL?

RPM supports x86_64 levels as architectures since 4.19.0

Surprisingly, we still need to patch RPM as well because of this:

```
%ifarch x86_64
# some genius code
%endif
```

```
%ifarch %{x86_64}
# some genius code
%endif
```

AlmaLinux

So we treat x86_64_v2 as x86_64 in architecture checks now

How to add x86_64_v2 (_v3,_v4) architecture to EL?

AlmaLinux OS is cool, but everyone still wants EPEL.
https://github.com/AlmaLinux/ALESCo/blob/master/rfcs/0001-build-fedora-epel-for-almalinux-and-almalinux-kitten-x86_64_v2.md

- First RFC that ALESCo received
- About 4400 packages
- We are building packages directly from EPEL sources, no forks
- If build fails on x86_64_v2 then we contribute fix to EPEL source repos
- Install by traditional way with dnf install epel-release
- Packages have .alma_altarch suffix to distinguish them from original EPEL
- We'll maintain 2 branches:
  - epel10 for AlmaLinux Kitten 10
  - epel10.x for current minor version of AlmaLinux 10. After new minor release corresponding EPEL branch will be moved to vault but still kept available

What's next?

Plans for 2025:

- AlmaLinux 10 stable release in May
- AlmaLinux 9.6 stable release in May
- AlmaLinux 10 for RISC-V
- EPEL 10 for x86_64_v2 public release
- Automation, automation, automation
- Improve contributor experience

How can you help?!

How to help!

Anyone

- Join the Foundation!
  - almalinux.org/members
- Engineering or admins
  - Join a SIG!
  - Answer questions in chat or forums
    - lnx.rocks/forumhelp
  - Write guest posts about something cool you've done!
    - Contributing to Translations
    - Using AlmaLinux at UCSB
- Help with testing!
  - Running enterprise linux?
- Marketing
  - Website updates and content writing
  - Graphic design help!
- Translations
  - Weblate makes it easy
  - More than 80% done in 9 languages!

Companies

- Talk about the open source you rely on, publicly and often
- Provide time to employees for volunteering in open source
- Join as a member (send money!)

AlmaLinux

Questions?

https://mailchi.mp/admin-magazine.com/focusguide-almalinux

hi, I'm benny

social.linux.pizza/@benny
@bennyvasquez
benny@almalinux.org

Places to find us:

- chat.almalinux.org
- x.com/almalinux
- reddit.com/r/almalinux
- lists.almalinux.org
- almalinux.discourse.group
- github.com/AlmaLinux
- hub.docker.com/_/almalinux
- almalinux.org

AlmaLinux

Open Source is not a spectator sport

- Joe Brockmeier, at OLF, Sept '23

https://www.youtube.com/live/D2QaUrt2DDo?feature=shared&t=29369

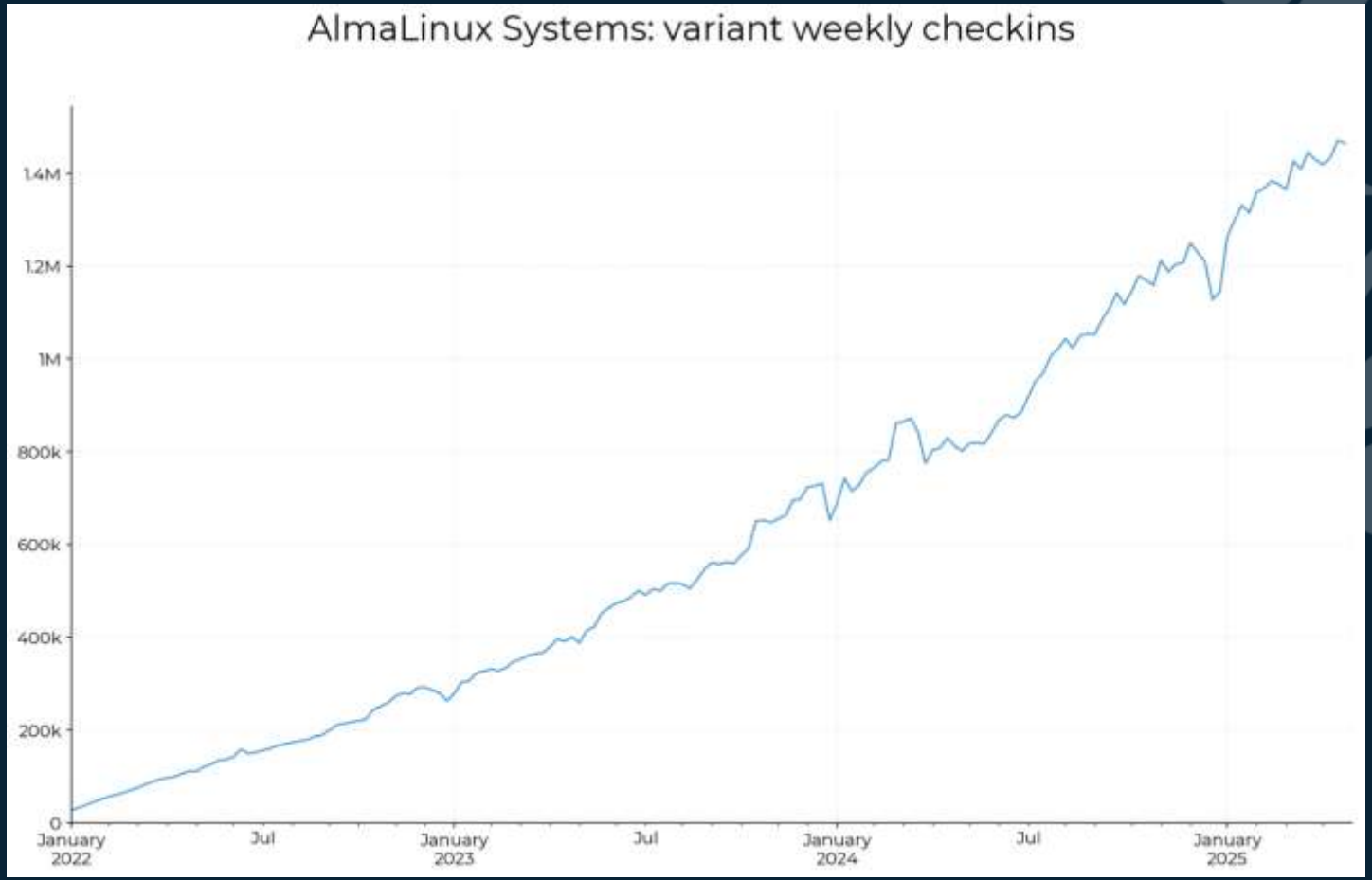
AlmaLinux mirror system

How it Started...

- Not a mirror system at all
- Single server serving all traffic
- No fallback
- A few thousand hits per hour

How it's going...

- Network of over 400 mirrors worldwide
- Over 1.4 million installs using public mirrors
  - Many more using private mirrors
- >1,000,000 requests per hour (~280 req/s)
- Automatic horizontal scaling
- Custom mirrorlist software behind it



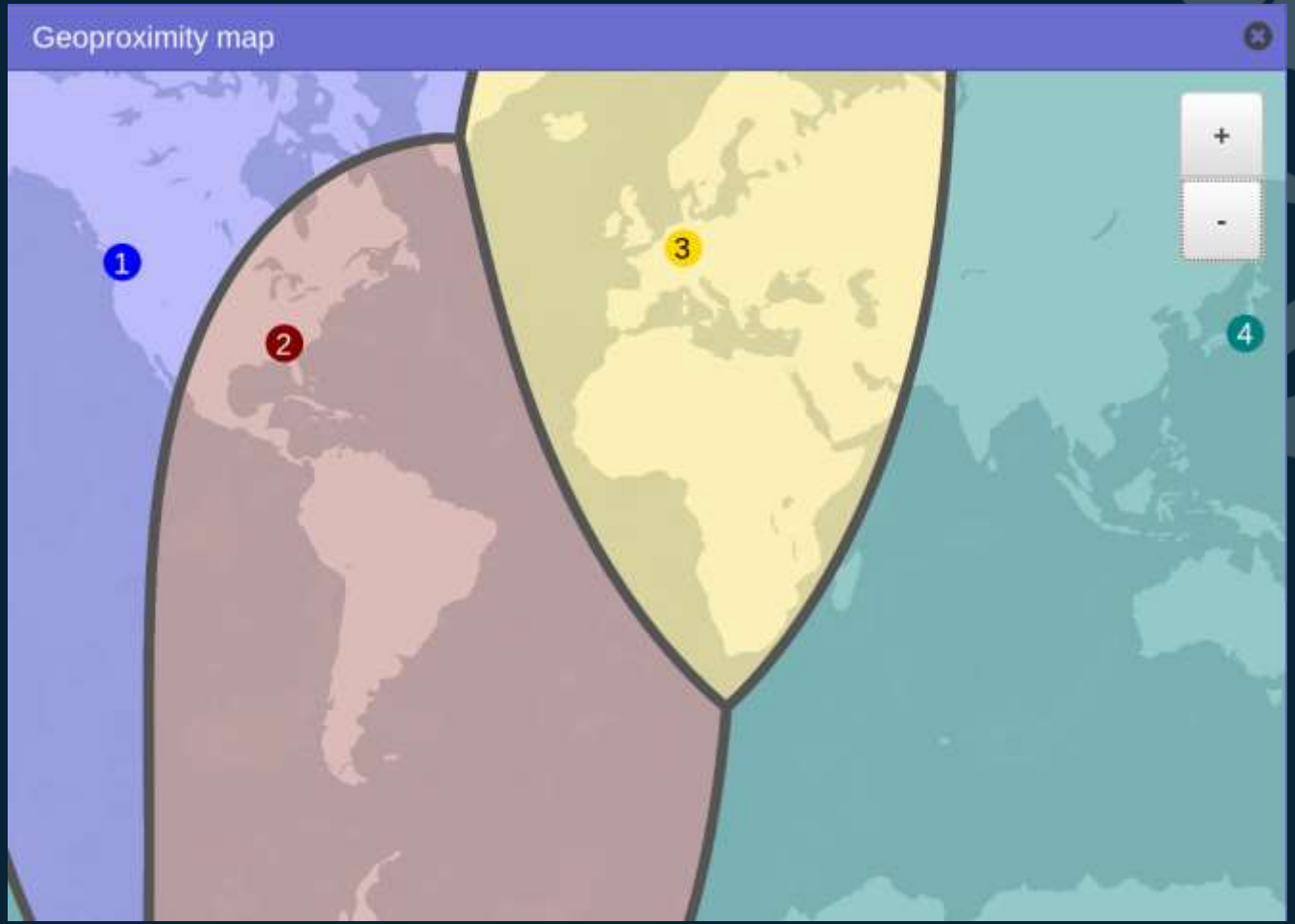
AlmaLinux

https://jonathanspw.com/almalinux-countme/

How did we get here?

Tier 0

- Receives pushes from master repo at repo.almalinux.org
- K.I.S.S - simple rsync, local filesystems on flash, high RAM, big network connections
- DNS geo-steering


Geoproximity map
+
-
1
2
3
4

“Alma had the highest performance tier0 of literally any project mirrored by FCIX, then they went and upgraded it”

- Kenneth Finnegan, Micro Mirror Project

February 2021

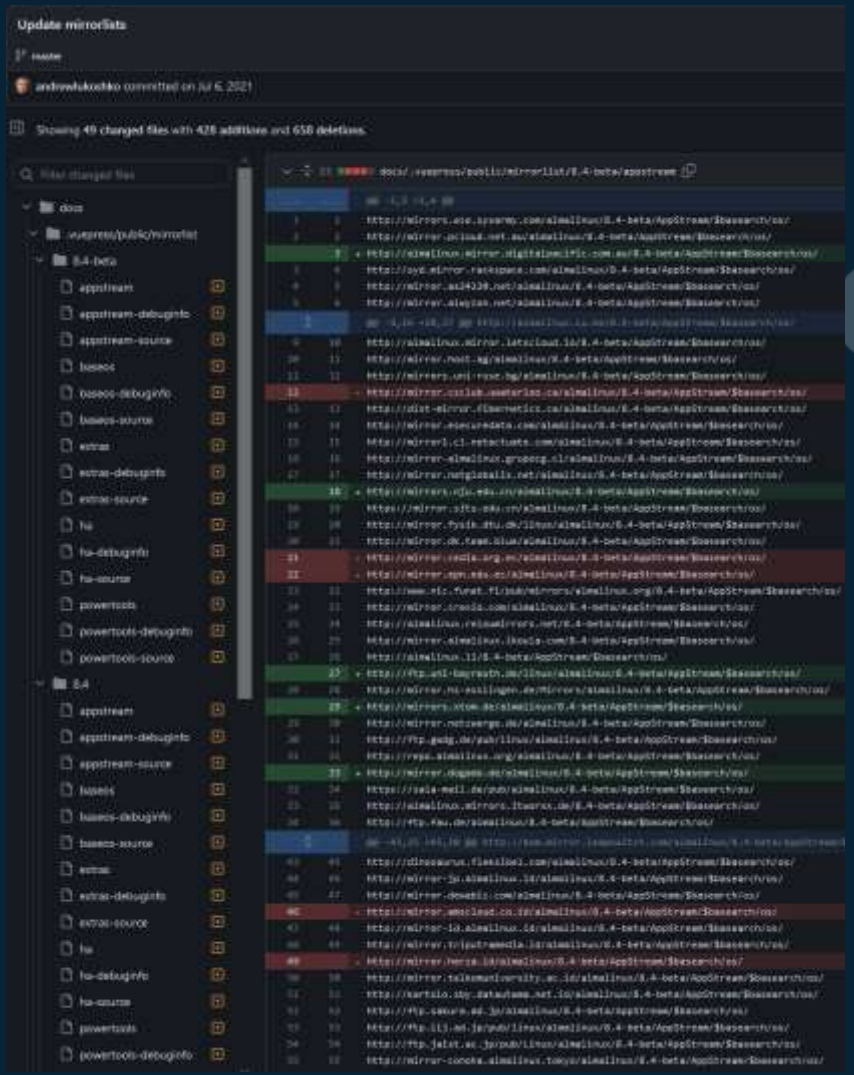
- Initial mirror system
- Very little logic
- Served a list of public mirrors
- 2 total mirrors as of February 8
- 32 total mirrors as of February 28
- No AlmaLinux stable release yet

March 2021

- 54 total mirrors as of March 31
- Healthy # for user base at the time
- System was “dumb”
- AlmaLinux 8.3 stable released March 30

April - June 2021

- AlmaLinux continues to grow
- AlmaLinux 8.4 stable released May 26
- Andrew is a git machine managing the mirrorlist by hand
- 128 mirrors by July 6



AlmaLinux

#FlockToFedora

July 2021

- Geolocation-aware mirrorlist
  - MaxMind geolocation data
- Basic mirror status checks
- Mirrorlist automatically generated from git, Andrew can take a break

August - October 2021

- ASN/Subnet pinning
- Cloud Providers (AWS/Azure) pinning
- Python asyncio for status check speed
- Mirror-defined geolocation fields
- Mirrors in some locations get hammered
  - random() to the rescue!

November 2021

- AlmaLinux 8.5 released Nov 12
- More asyncio optimizations
- Redis caching
- Mirror flap detection
- Better geolocation based on coordinates

2022

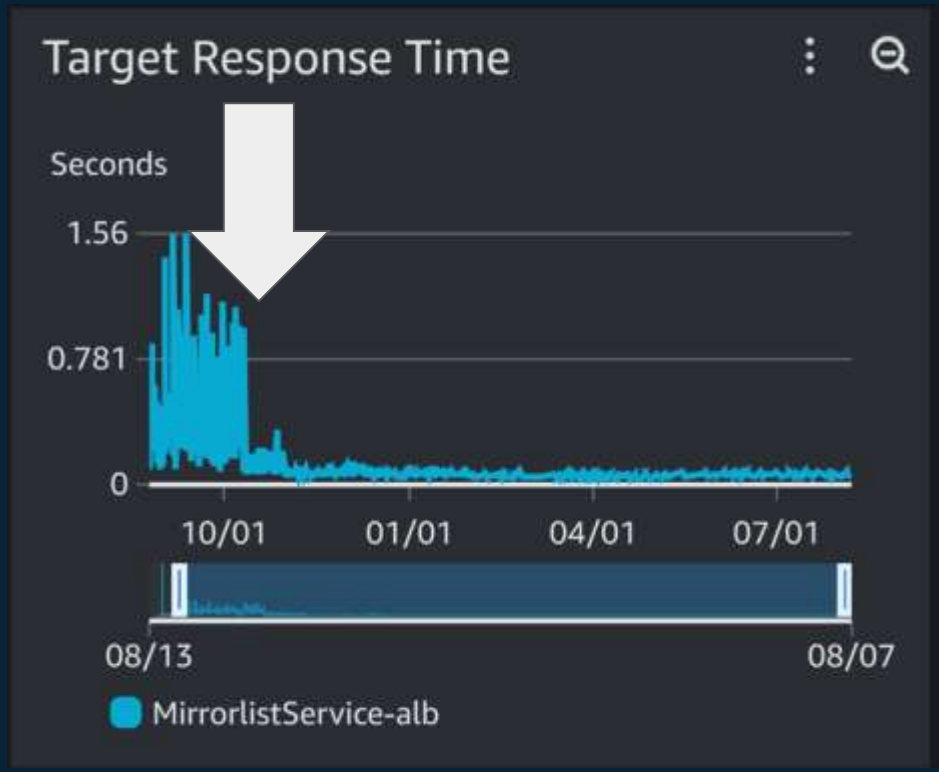
- 4 AlmaLinux releases (8.6, 8.7, 9.0, 9.1)
- Minor tweaks and patches
- Overall things are running smoothly

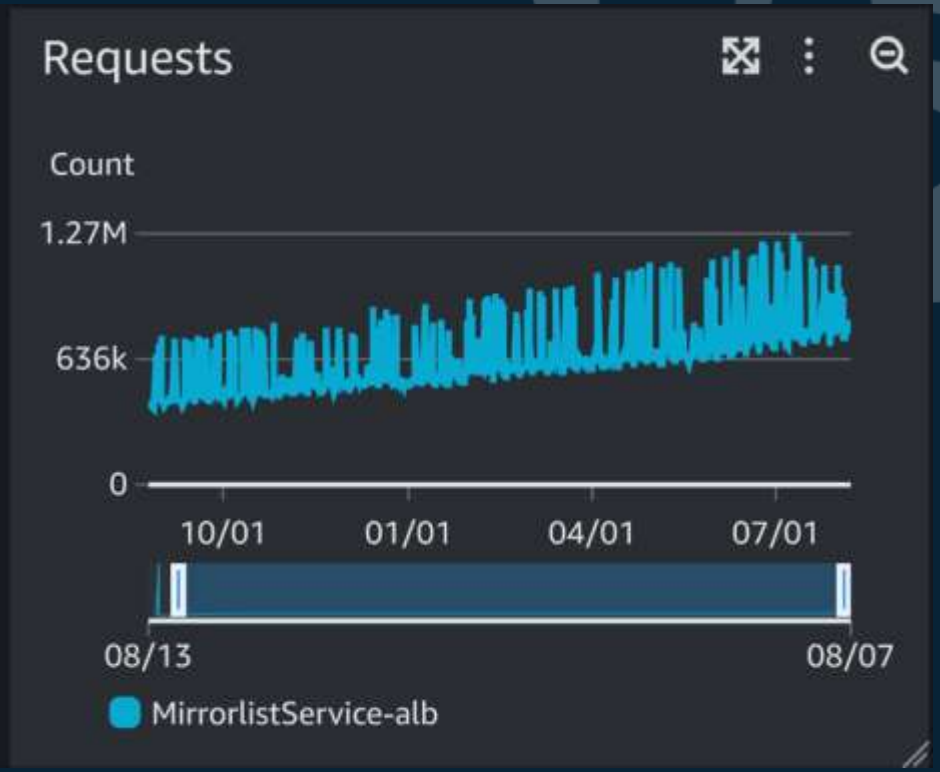
2023

- 4 AlmaLinux releases (8.8, 8.9, 9.2, 9.3)
- Increase VM size to improve cache hits
- Mirrorlist could differ between VMs
  - This was due to independent caches
- Independent caches meant low hit rates
  - Being per IP/repo didn't help either

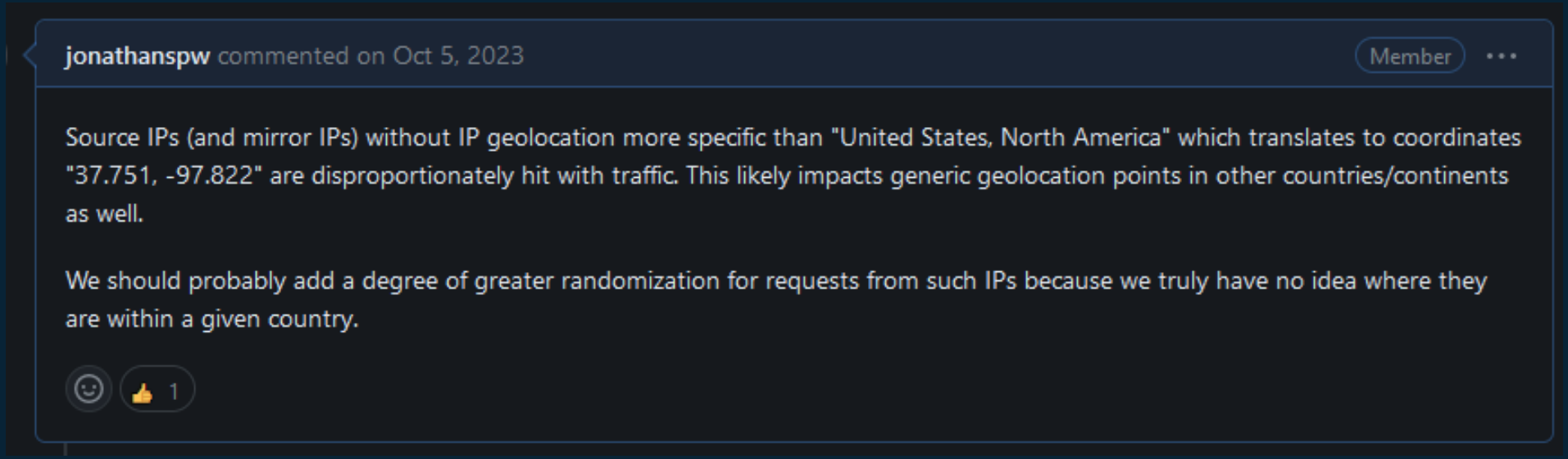
2023 (continued)

- Mirror status checker moved to machine
  - Singular cache/DB for all workers
- AWS ElastiCache to increase cache hit rates
- Dedicated AWS mirroring via CloudFront
- Single cached mirrorlist per IP - ignoring version/repo
  - Drastically increased hit rates. 75% fewer workers required


Target Response Time
Seconds
1.56
0.781
0
10/01
01/01
04/01
07/01
08/13
08/07
MirrorlistService-alb


Requests
Count
1.27M
636k
0
10/01
01/01
04/01
07/01
08/13
08/07
MirrorlistService-alb

MaxMind GeoIP

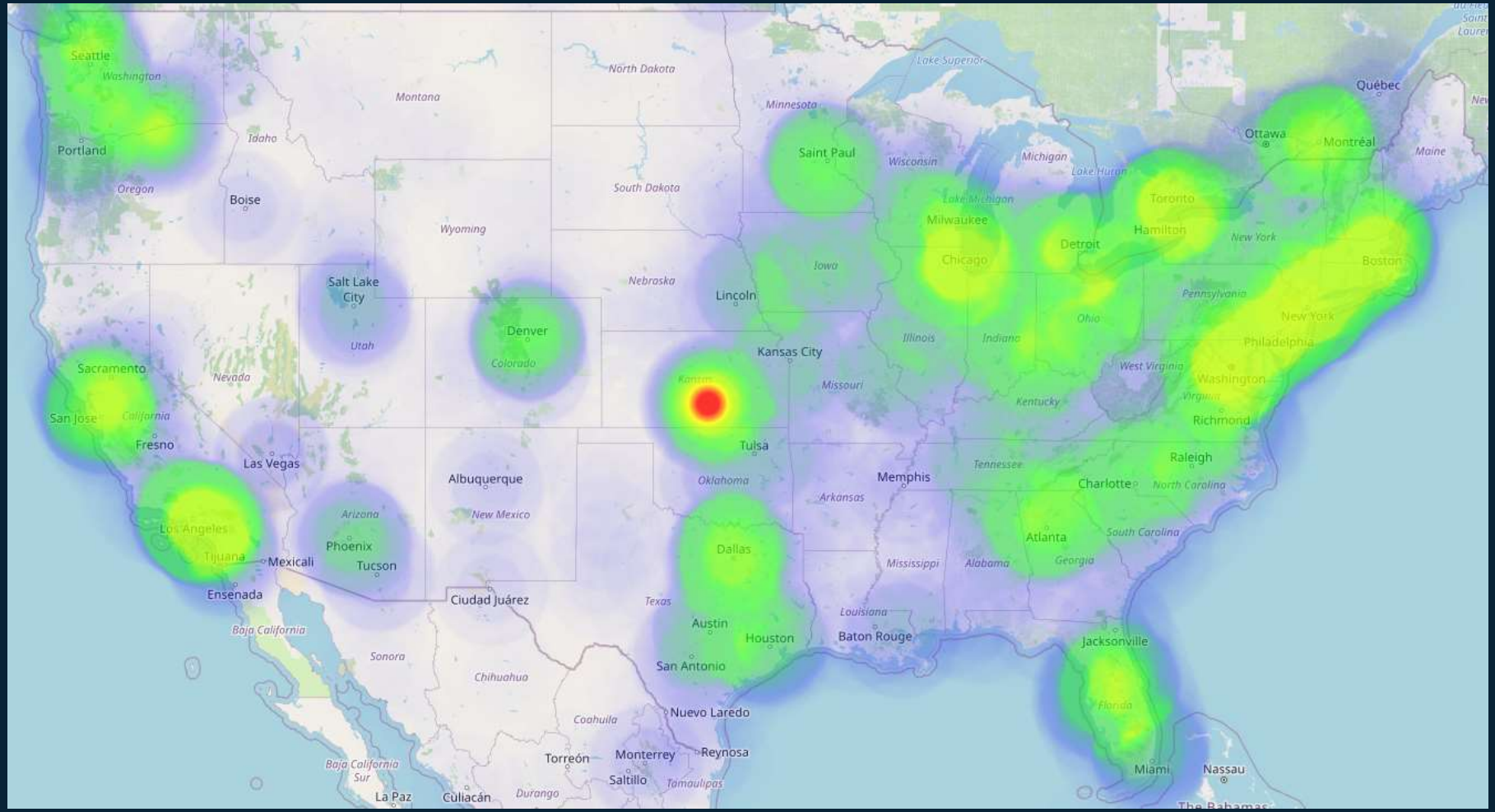


jonathanspw commented on Oct 5, 2023 — Member

Source IPs (and mirror IPs) without IP geolocation more specific than "United States, North America" which translates to coordinates "37.751, -97.822" are disproportionately hit with traffic. This likely impacts generic geolocation points in other countries/continents as well.

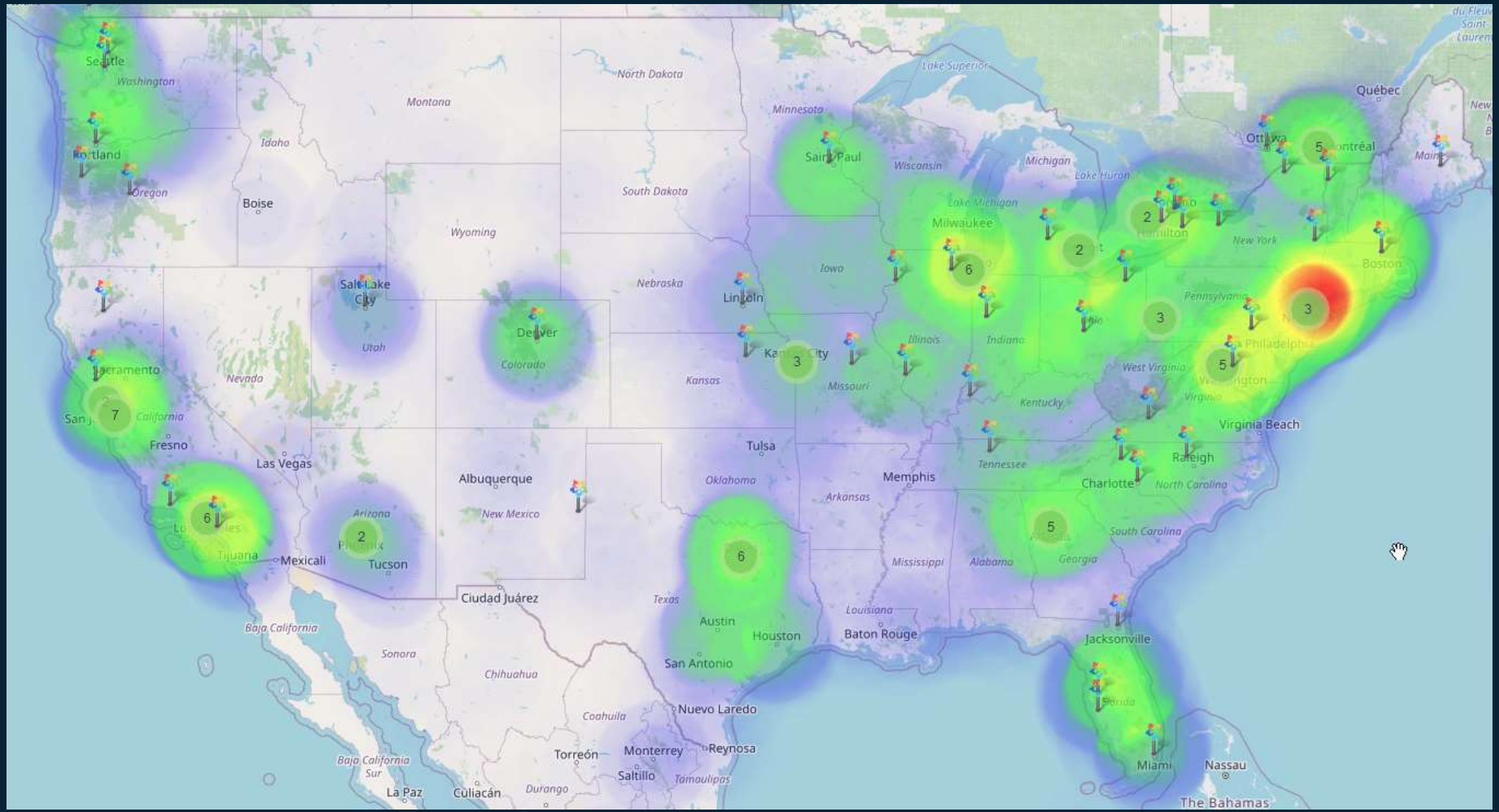
We should probably add a degree of greater randomization for requests from such IPs because we truly have no idea where they are within a given country.

1



#FlockToFedora

IPInfo.io to the rescue!



#FlockToFedora

Takeaways

- "Traditional" mirror is amazing for FOSS distribution
- Delivering releases and updates without public mirrors would be impossible ($$$)
- Mirroring is best kept simple - no CDNs, shared filesystems, etc.
- Accurate geolocation data improves UX a LOT!

What's next?

1) statistics

What's next?

1) statistics

2) better development env.

What's next?

1) statistics
2) better development env.

3) protocol filtering

What's next?

1) statistics
2) better development env.
3) protocol filtering

4) partial mirroring

What's next?

1) statistics
2) better development env.
3) protocol filtering
4) partial mirroring

5) better mirror validation

Get Involved

- https://mirrors.almalinux.org
- https://github.com/AlmaLinux/mirrors