

Migrating from CentOS 7 & Mythbusting Linux on Microsoft Azure



benny Vasquez
Chair, AlmaLinux OS Foundation



Claus Wieser
Azure Linux team



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](https://twitter.com/bennyvasquez)

 benny@almalinux.org



hi, I'm Claus

- I'm a dinosaur, 30+ years in IT, 29 years at Microsoft
- Involved in Open Source for the last decade
- CrossFitter / coach ... did you know CF is Open Source?
- Recovering Fallout addict
- South Park fan!

 [linkedin.com/in/claus-wieser/](https://www.linkedin.com/in/claus-wieser/)

 clausw@microsoft.com

In the beginning, there was dog...



Linux is the #1 operating system in Azure today

Linux-based images comprise



of Azure Marketplace offerings



of VM cores in Azure run Linux

Microsoft works closely with all major distro vendors & communities



CANONICAL



Open source is an
integral part of
Microsoft & Azure

60K+

Unique open-source components

30K+

Microsoft employees have GitHub accounts
associated with Microsoft identity

7.6K

Github repositories across Microsoft and
Azure orgs

Microsoft is active in a broad range of open source projects and communities



Linux

- Linux Kernel
- Linux Integration Services
- IPE
- LISA testing framework
- Azure Linux
- SONiC
- SMB3/CIFS & NFS
- Systemd
- Rysnc
- Garnet
- Confidential Containers



Cloud Native

- Moby & Kubernetes
- Dapr & OAM
- Akri
- Helm & CNAB
- Cilium
- Istio
- KEDA
- Flatcar
- Inspektor Gadget
- Headlamp



Data + AI

- Spark & YARN
- PostgreSQL
- Pandas
- TensorFlow
- ONNX



Languages & Dev tools

- VS Code
- Terminal
- Git/Github
- Node.js
- Python
- Rust
- Go
- PHP
- Java (OpenJDK)



Web

- TypeScript
- Webpack
- Babel
- Vue.js
- Bootstrap
- Svelte

CentOS end-of-life (EOL) Overview



What is CentOS?

[CentOS](#) (Community Enterprise Operating System) is a free and open-source community supported operating system based on Red Hat Enterprise Linux (RHEL). CentOS is one of the most widely used Linux distributions.



What is the CentOS end-of-life (EOL)?

In September 2019 Red Hat [announced](#) its intent to sunset CentOS and replace it with CentOS Stream, a new, upstream platform for the CentOS community. CentOS 7 and 8 are the final releases of CentOS Linux. The end-of-life dates for CentOS 7 and 8 are:

- [CentOS 8 – December 31st, 2021](#)
- [CentOS 7 – June 30th, 2024](#)



What does this mean for customers running CentOS?

Customers running CentOS will have to migrate to a new operating system to continue receiving security updates, patches, and new features. After the EOL date, CentOS will no longer receive security updates, bug fixes, or other updates, which means that any vulnerabilities or issues that are discovered will not be patched. This can leave workloads open to security threats and other problems.

Migration considerations



Retaining compatibility with CentOS

Do you want to continue using a Linux distribution that is compatible with CentOS?



Community vs commercial distribution

Do you want to continue using a community supported (unpaid) distribution or move to a commercial (paid) distribution?



Migration path

Do you want to convert in place, redeploy to new VMs, or modernize with PaaS?

Migration options for CentOS customers



On-Premises

Convert to new Linux distro and stay on-premises

Leverage Azure Arc to manage workloads on-premises

Convert to new Linux distro before deploying workload to Azure



Move to Azure

Lift and shift workload to VM in Azure and then convert to new Linux distro

Redeploy workload on new VMs in Azure with new Linux distro

Modernize on Azure with PaaS solutions



In Azure

Convert in place to new Linux distro

Recommended by Microsoft

Redeploy workload to new VMs with new Linux distro

Modernize in Azure with PaaS solutions

Browse apps

Get Started

AI + Machine Learning

Analytics

Blockchain

Compute

Containers

Databases

Developer Tools

DevOps

Identity

Integration

Internet of Things

IT & Management Tools

Media

Trials

All

Operating System

All

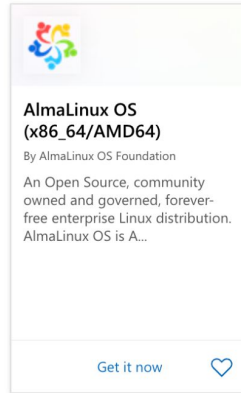
Publisher

All

Pricing Model

All

All results



AlmaLinux OS (x86_64/AMD64)
By AlmaLinux OS Foundation
An Open Source, community owned and governed, forever-free enterprise Linux distribution. AlmaLinux OS is A...

Get it now



AlmaLinux HPC
By AlmaLinux OS Foundation
The official AlmaLinux OS Image for High Performance Computing on Azure

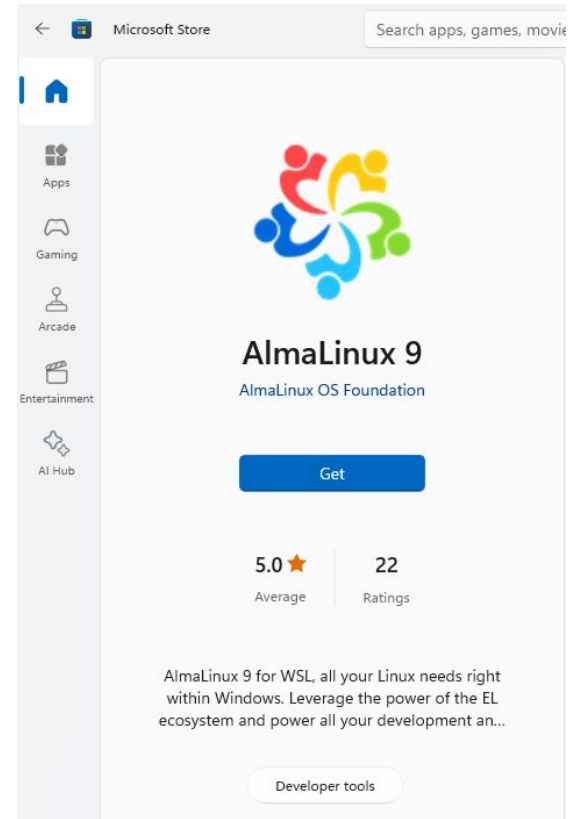
Bring your own license

Get it now



AlmaLinux OS (AArch64/ARM64)
By AlmaLinux OS Foundation
The Community Owned and Governed Enterprise Grade Linux OS. 1:1 RHEL and CentOS compatible.

Get it now



Microsoft Store Search apps, games, movies

AlmaLinux 9
AlmaLinux OS Foundation

Get

5.0 Average Rating 22 Ratings

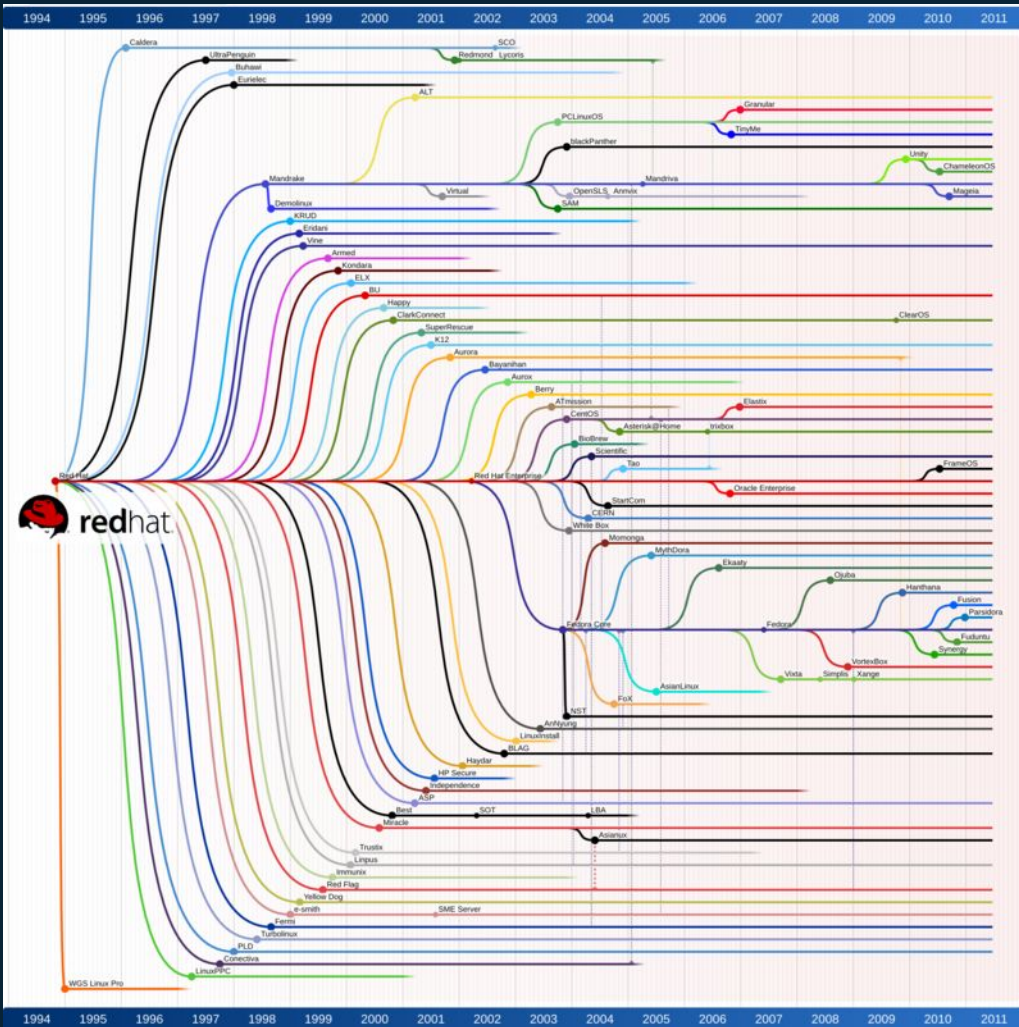
AlmaLinux 9 for WSL, all your Linux needs right within Windows. Leverage the power of the EL ecosystem and power all your development an...

Developer tools

Get started on Azure:
<https://aka.ms/almalinux>

CentOS EOL guidance:
<https://aka.ms/centoseol>

AlmaLinux's history



Red Hat Family Tree

based on GLDT version 11.6

A. Lundqvist, D. Rodic - futurist.se/gldt
 Published under the GNU Free Documentation License

- Influence, developer switching
- Rebasing, substantial code flow, project overtaking
- - - - - Developer & code sharing, project merging



By Andreas Lundqvist, Donjan Rodic - <http://futurist.se/gldt/>, GFDL,
<https://commons.wikimedia.org/w/index.php?curid=18201795>

https://en.wikipedia.org/wiki/Red_Hat_Enterprise_Linux_derivatives

2004 - 2019



[CentOS-announce] Release for CentOS Linux 8 and CentOS Streams

Karanbir Singh

[kbsingh at centos.org](mailto:kbsingh@centos.org)

Tue Sep 24 16:38:36 UTC 2019

- Previous message: [\[CentOS-announce\] CESA-2019:2729 Critical CentOS 7 firefox Security Update](#)
- Next message: [\[CentOS-announce\] CEBA-2019:2871 CentOS 7 tzdata BugFix Update](#)
- **Messages sorted by:** [\[date \]](#) [\[thread \]](#) [\[subject \]](#) [\[author \]](#)

We would like to announce the general availability of CentOS Linux 8 and the new CentOS Stream, on all architectures.

CentOS Linux 8

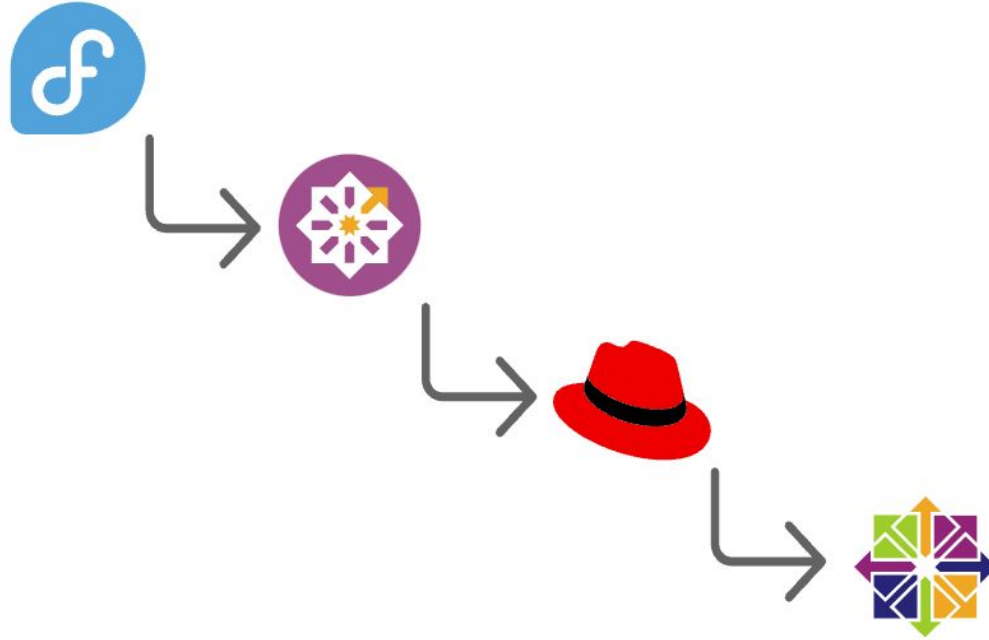
This is the first release for CentOS Linux 8 and its version marked as 8.0-1905, derived from sources published by Red Hat, delivered via git.centos.org

First, please read through the release notes at : <http://wiki.centos.org/Manuals/ReleaseNotes/CentOSLinux8> - these notes contain important information about the release and details about some of the content inside the release from the CentOS QA team. These notes are updated constantly to include issues and incorporate feedback from the users and should be the first port of call for anyone looking to use CentOS Linux 8.

CentOS Stream

When the CentOS Project announced it was joining forces with Red Hat in January 2014, we put an emphasis on how the new relationship would “(drive) forward development and adoption of next-generation open source

2019 - 2020



CentOS Project shifts focus to CentOS Stream

📅 Tuesday, 8, December 2020 ✍️ Rich Bowen 📁 Uncategorized 💬 717 Comments

The future of the CentOS Project is CentOS Stream, and over the next year we'll be shifting focus from CentOS Linux, the rebuild of Red Hat Enterprise Linux (RHEL), to CentOS Stream, which tracks just *ahead* of a current RHEL release. CentOS Linux 8, as a rebuild of RHEL 8, will end at the end of 2021. CentOS Stream continues after that date, serving as the upstream (development) branch of Red Hat Enterprise Linux.

Meanwhile, we understand many of you are deeply invested in CentOS Linux 7, and we'll continue to produce that version through the remainder of the [RHEL 7 life cycle](#).

CentOS Stream will also be the centerpiece of a major shift in collaboration among the CentOS Special Interest Groups (SIGs). This ensures SIGs are developing and testing against what becomes the next version of RHEL. This also

[Home](#) / [Blog](#)

/ [CentOS Project shifts focus to CentOS Stream](#)

Recent Posts

- [CentOS Hyperscale SIG Quarterly Report for 2023Q2](#)
- [CentOS ISA SIG Performance Investigation](#)
- [CentOS Board Meeting Recap, August 2023](#)
- [CPE Quarterly Update Q2 2023](#)
- [Open To All](#)

[Archives](#)



Jan 14, 2021 5:09:43 AM

AlmaLinux is born!!



Igor Seletskiy

Igor Seletskiy is a renowned expert in the web hosting and cybersecurity industry, with over two decades of experience. As the CEO and founder of CloudLinux, he has been instrumental in developing cutting-edge security solutions for shared hosting providers. Igor is also the driving force behind Imunify360, a comprehensive, automated security suite designed to protect Linux web servers. His expertise and innovative approach make him a trusted voice in the field, offering valuable insights on the critical role of web hosts in ensuring WordPress website security.

[Open-source](#)

AlmaLinux Is Born!

Powerful And Free CentOS Alternative

Alma means "soul" in many Latin languages, including Spanish and Italian. The word comes from the Latin word *almus*, which means "nourishing, kind".

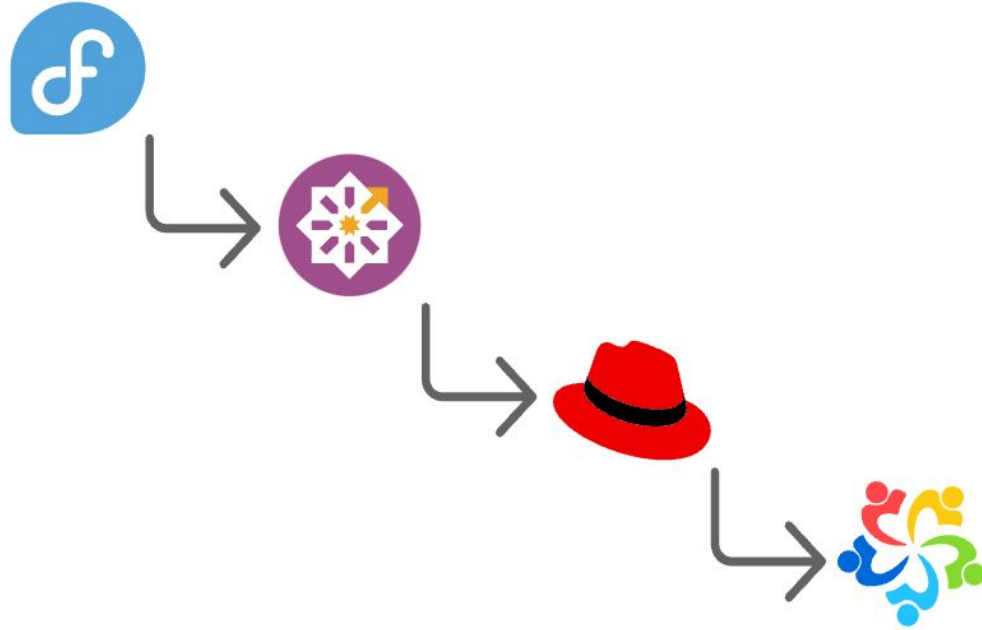
A soulful community

No tech community is as soulful and as passionate as the Linux community. It is a caring, collaborative, nourishing community that turned the efforts of an individual into software that powers the world.

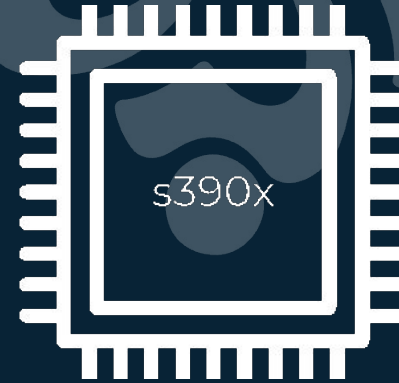
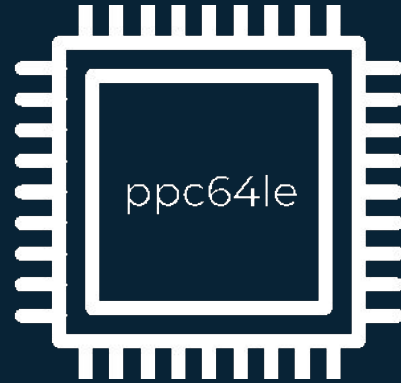
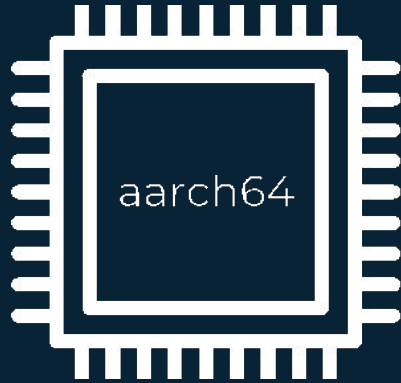
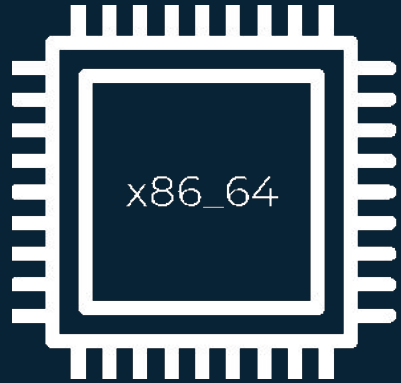
The story of Linux starts with the personal story of Linus Torvalds who, in 1991, announced that he was developing a free UNIX-like kernel for x86 machines – a kernel he called Linux. A kernel for the community.

Developers quickly saw the potential of a free, open-source UNIX kernel. Step by step, members of an incredibly passionate developer community grew Linux into a powerful, flexible kernel that underpins countless popular operating systems – from

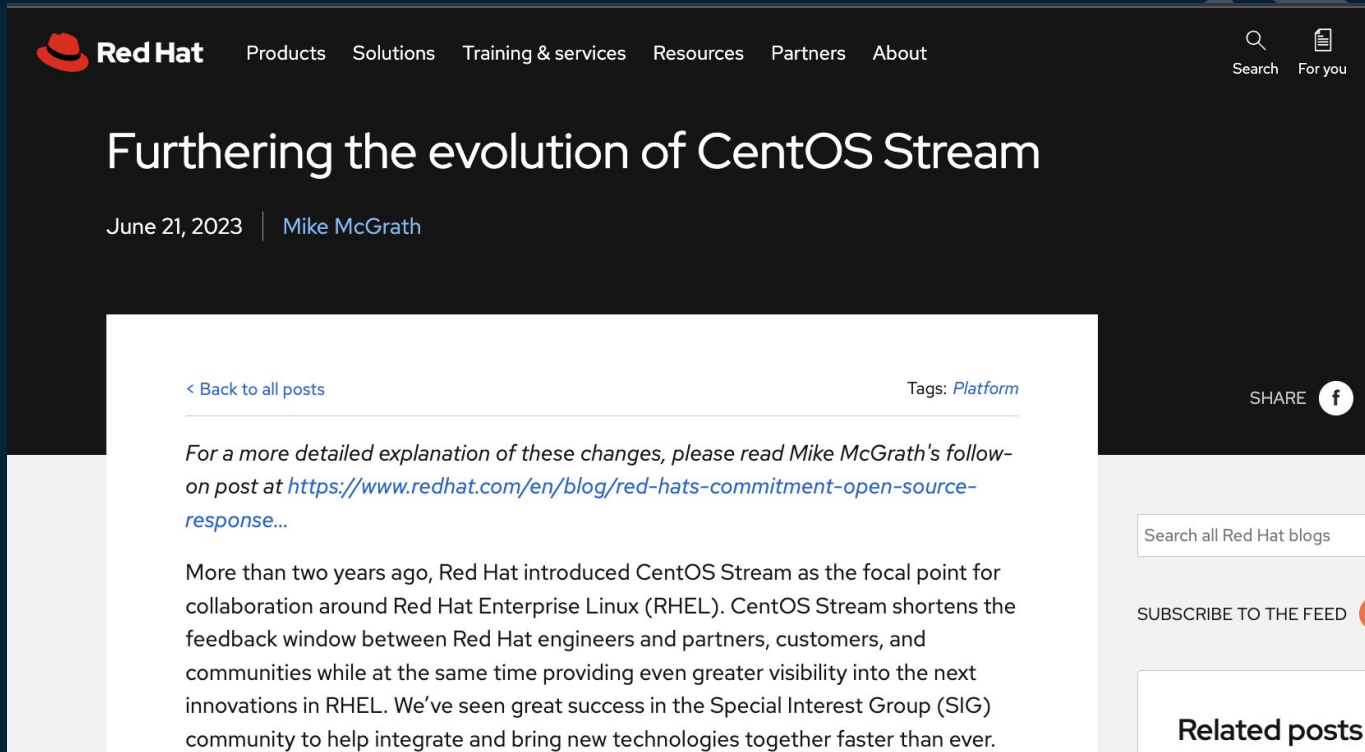
Mar 2021 - Jun 2023




Supported Architectures



June '23: no more 'sources



The screenshot shows a Red Hat blog post. The header includes the Red Hat logo and navigation links: Products, Solutions, Training & services, Resources, Partners, and About. There are also search and 'For you' icons. The main heading is 'Furthering the evolution of CentOS Stream', dated June 21, 2023, by Mike McGrath. The post content includes a link back to all posts, a tag for 'Platform', and a paragraph of text. On the right side, there are social sharing options and a search bar for Red Hat blogs.

 [Products](#) [Solutions](#) [Training & services](#) [Resources](#) [Partners](#) [About](#) Search For you


Furthering the evolution of CentOS Stream

June 21, 2023 | [Mike McGrath](#)


[< Back to all posts](#) Tags: [Platform](#)

For a more detailed explanation of these changes, please read Mike McGrath's follow-on post at <https://www.redhat.com/en/blog/red-hats-commitment-open-source-response...>

More than two years ago, Red Hat introduced CentOS Stream as the focal point for collaboration around Red Hat Enterprise Linux (RHEL). CentOS Stream shortens the feedback window between Red Hat engineers and partners, customers, and communities while at the same time providing even greater visibility into the next innovations in RHEL. We've seen great success in the Special Interest Group (SIG) community to help integrate and bring new technologies together faster than ever.

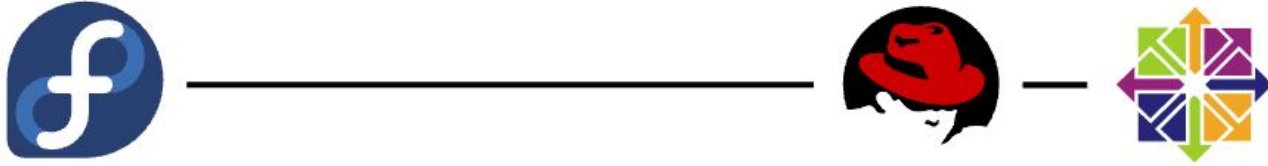
SHARE 

Search all Red Hat blogs

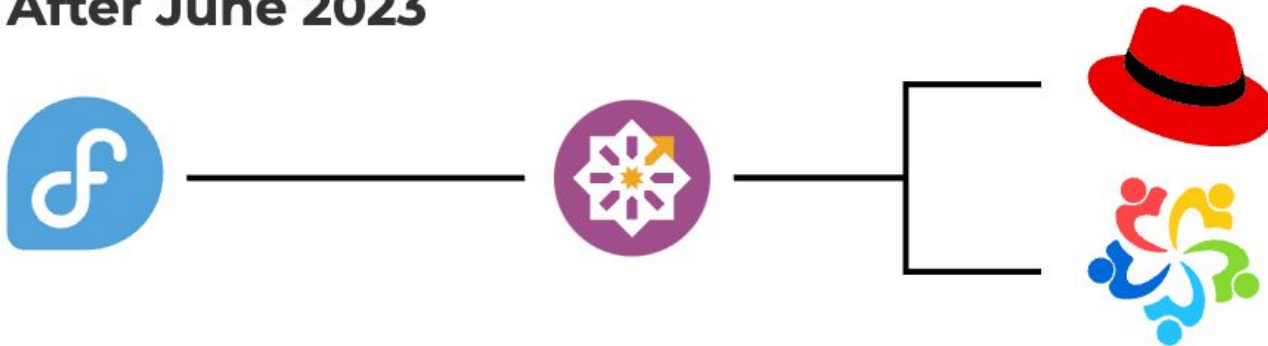
SUBSCRIBE TO THE FEED 

Related posts

Pre-CentOS Stream (2004 - 2019)

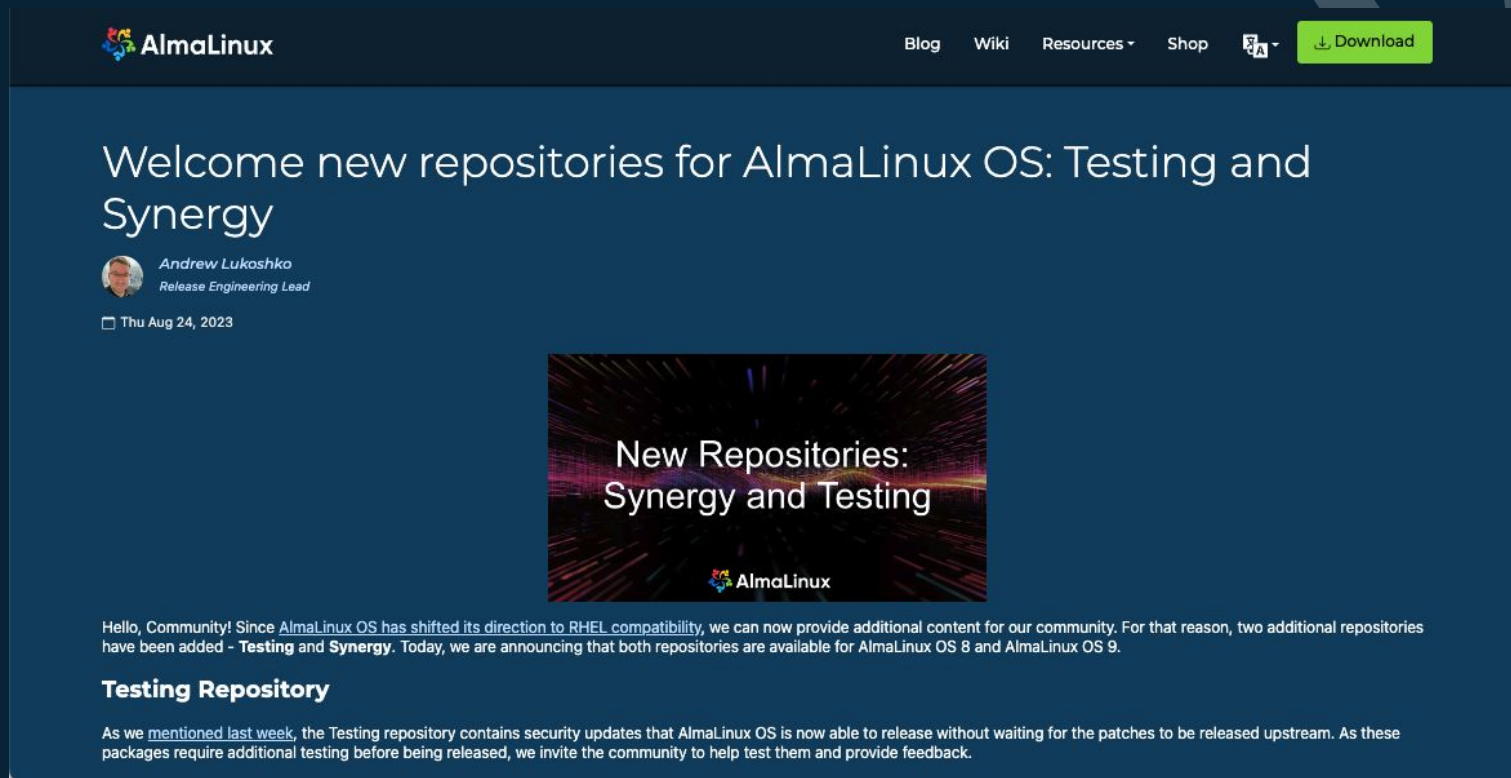


After June 2023




original by @carlwgeorge@fosstodon.org; adapted for AlmaLinux

RHEL compatibility = freedom for AlmaLinux




The screenshot shows the AlmaLinux website header with the logo on the left and navigation links for 'Blog', 'Wiki', 'Resources', 'Shop', and a 'Download' button on the right. The main content area features a dark blue background with the title 'Welcome new repositories for AlmaLinux OS: Testing and Synergy' in white. Below the title is a profile picture of Andrew Lukoshko, identified as 'Release Engineering Lead', and a date stamp 'Thu Aug 24, 2023'. A central image shows a dark space with light trails and the text 'New Repositories: Synergy and Testing' above the AlmaLinux logo. The text below the image explains that since AlmaLinux OS has shifted to RHEL compatibility, two new repositories, 'Testing' and 'Synergy', have been added for AlmaLinux OS 8 and 9. The 'Testing Repository' section notes that it contains security updates that can be released without waiting for upstream patches, and invites the community to test and provide feedback.


AlmaLinux

Blog Wiki Resources Shop  [Download](#)

Welcome new repositories for AlmaLinux OS: Testing and Synergy

 *Andrew Lukoshko*
Release Engineering Lead

☐ Thu Aug 24, 2023



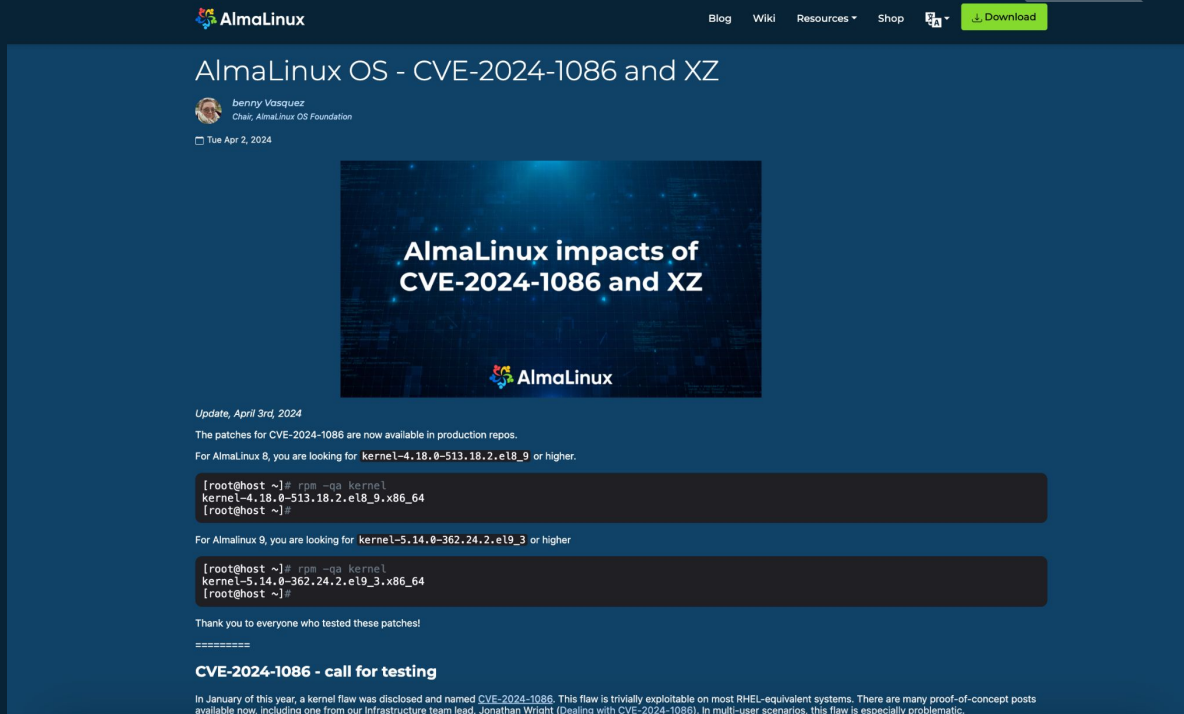
Hello, Community! Since AlmaLinux OS has shifted its direction to RHEL compatibility, we can now provide additional content for our community. For that reason, two additional repositories have been added - **Testing** and **Synergy**. Today, we are announcing that both repositories are available for AlmaLinux OS 8 and AlmaLinux OS 9.

Testing Repository

As we [mentioned last week](#), the Testing repository contains security updates that AlmaLinux OS is now able to release without waiting for the patches to be released upstream. As these packages require additional testing before being released, we invite the community to help test them and provide feedback.


RHEL compatibility = freedom for AlmaLinux

Patching critical flaws outside of upstream




The screenshot shows the AlmaLinux website header with navigation links for Blog, Wiki, Resources, Shop, and a Download button. The main content area features a dark blue background with a central image that reads 'AlmaLinux impacts of CVE-2024-1086 and XZ'. Below the image, the author is identified as Benny Vasquez, Chair of the AlmaLinux OS Foundation, with a date of Tue Apr 2, 2024. The post includes an update from April 3rd, 2024, stating that patches for CVE-2024-1086 are available in production repositories. It provides specific kernel version requirements for AlmaLinux 8 and AlmaLinux 9, along with terminal snippets showing the command to check installed kernel versions using 'rpm -qa kernel'. The post concludes with a 'call for testing' for CVE-2024-1086 and a note that the flaw is trivially exploitable on most RHEL-equivalent systems.


AlmaLinux

Blog Wiki Resources Shop  [Download](#)


AlmaLinux OS - CVE-2024-1086 and XZ

 **benny Vasquez**
Chair, AlmaLinux OS Foundation

Tue Apr 2, 2024



**AlmaLinux impacts of
CVE-2024-1086 and XZ**

 AlmaLinux

Update, April 3rd, 2024

The patches for CVE-2024-1086 are now available in production repos.

For AlmaLinux 8, you are looking for `kernel-4.18.0-513.18.2.el8_9` or higher.

```
[root@host ~]# rpm -qa kernel
kernel-4.18.0-513.18.2.el8_9.x86_64
[root@host ~]#
```

For AlmaLinux 9, you are looking for `kernel-5.14.0-362.24.2.el9_3` or higher

```
[root@host ~]# rpm -qa kernel
kernel-5.14.0-362.24.2.el9_3.x86_64
[root@host ~]#
```

Thank you to everyone who tested these patches!

=====

CVE-2024-1086 - call for testing

In January of this year, a kernel flaw was disclosed and named [CVE-2024-1086](#). This flaw is trivially exploitable on most RHEL-equivalent systems. There are many proof-of-concept posts available now, including one from our infrastructure team lead, Jonathan Wright ([Dealing with CVE-2024-1086](#)). In multi-user scenarios, this flaw is especially problematic.

RHEL compatibility = freedom for AlmaLinux

Renewing support for upstream deprecated hardware

- **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
- **hpsa** - HP Smart Array Controller
- **lpfc** - Emulex LightPulse Fibre Channel SCSI
- **megaraid_sas** - Broadcom MegaRAID SAS
- **mpt3sas** - LSI MPT Fusion SAS 3.0
- **mptsas** - Fusion MPT SAS Host
- **qla2xxx** - QLogic Fibre Channel HBA
- **qla4xxx** - QLogic iSCSI HBA

Provide feedback on this list:

<https://almalinux.discourse.group/t/re-adding-support-for-older-hardware/3851/2>

The Community

The first mirrors

interServer.net

Cloud
Propeller

Infrastructure You Can Rely On!

LITE
SERVER

CloudFly

iNET

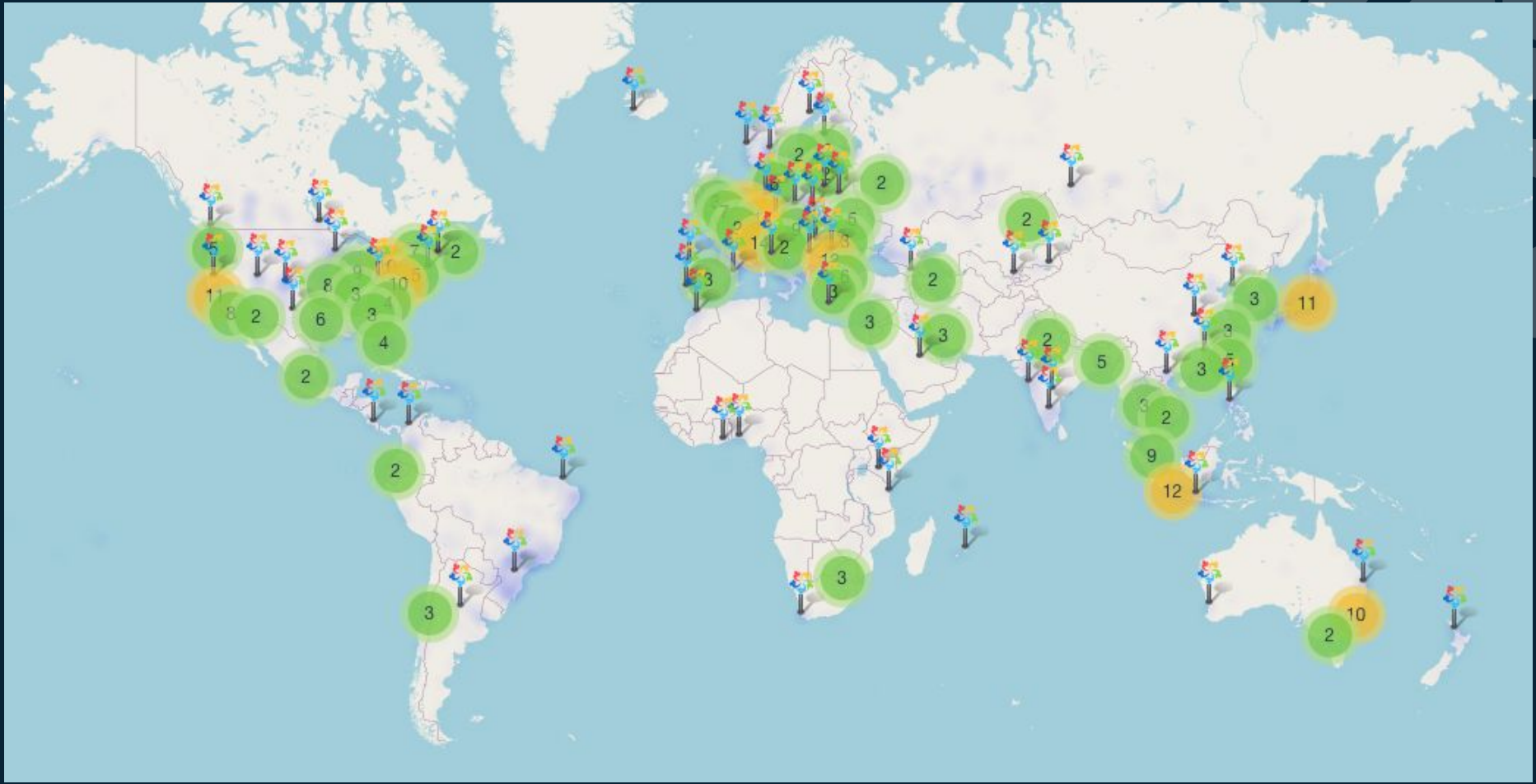
UK SERVERS

team.blue

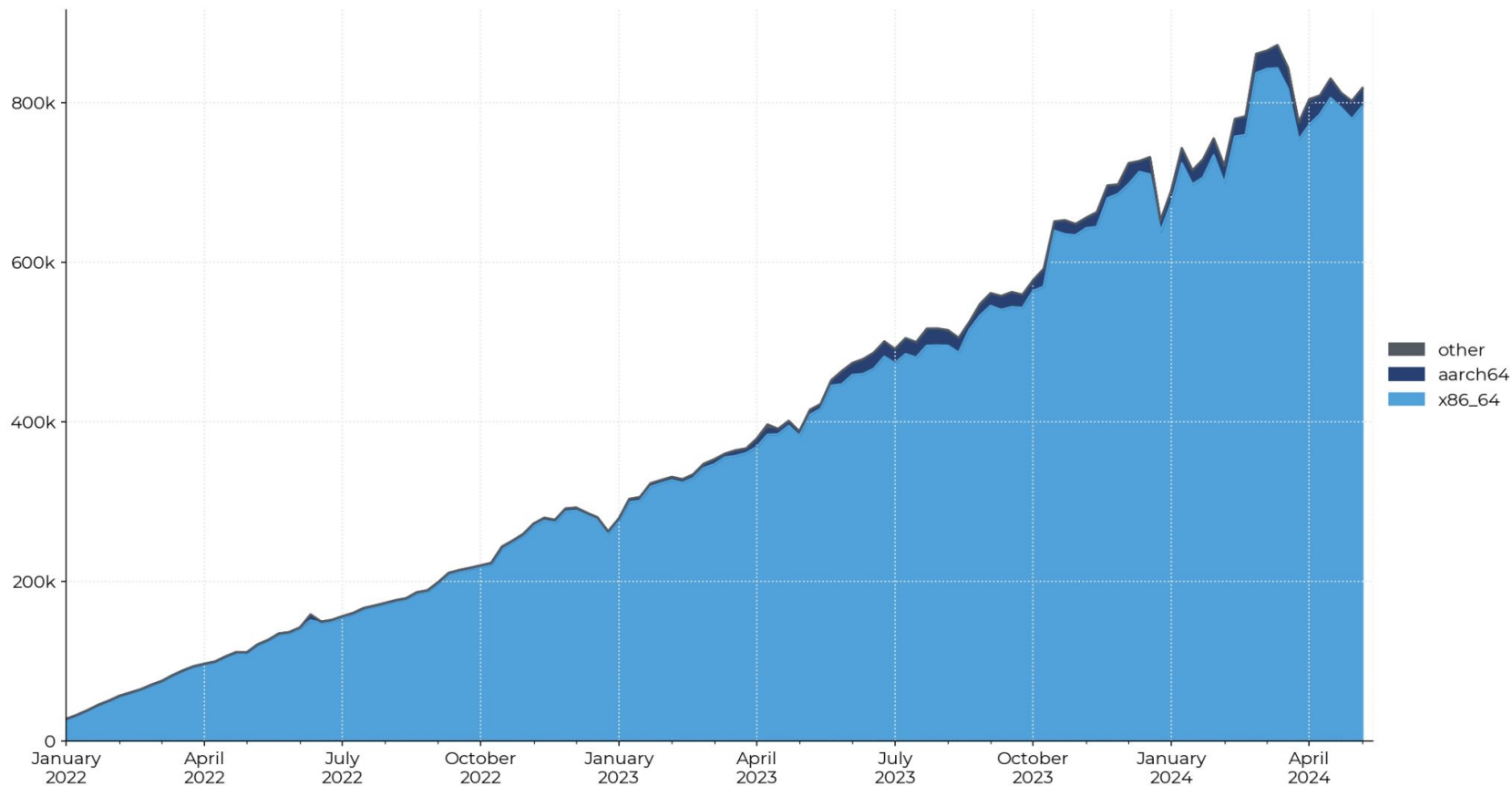
hybula

datakeepers

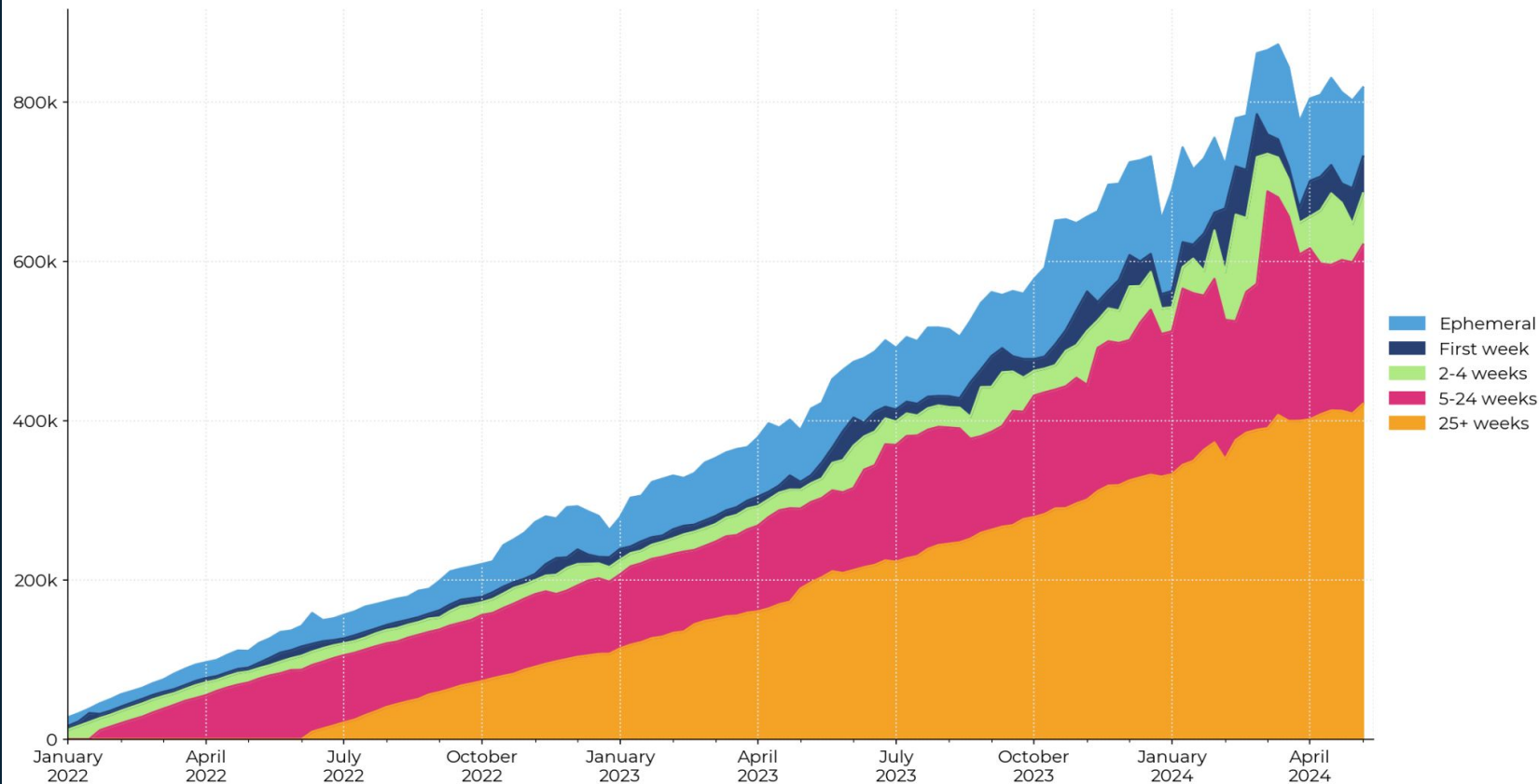
AltusHost




AlmaLinux Systems: CPU architecture weekly checkins








AlmaLinux Systems: age category weekly checkins







 **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 ...


 **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 ...

 **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

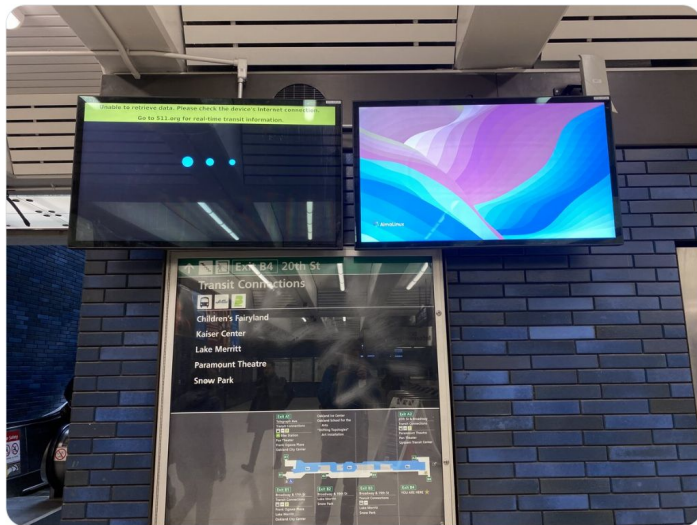
 5   Reply  Share ...



benarent

@benarent

BART runs on AlmaLinux



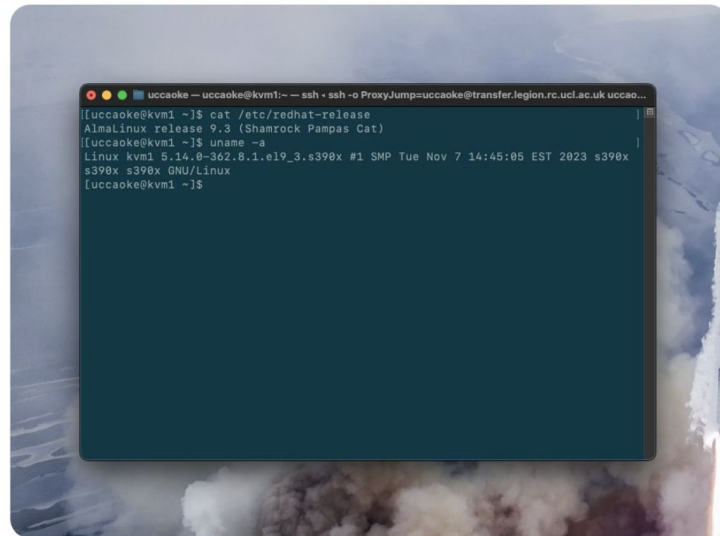
5:44 PM · Mar 1, 2024 · 1,512 Views



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



Getting to AlmaLinux



Migrating to AlmaLinux

AlmaLinux Deploy

Getting to AlmaLinux: Migrating

- CentOS 8
- CentOS Stream 8, 9
- Oracle Linux 8, 9
- RHEL 8, 9
- Rocky Linux 8, 9
- Virtuozzo Linux (VZLinux) 8, 9



AlmaLinux Deploy

github.com/AlmaLinux/almalinux-deploy



Migrating: AlmaLinux Deploy

```
$ curl -L -O https://lnx.rocks/almalinuxdeploy
$ sudo bash almalinux-deploy.sh
  <insert waiting>
$ sudo reboot
```



Upgrade WITHOUT migrating

Project ELevate

Two options

- CentOS 8
- CentOS Stream 8, 9
- Oracle Linux 8, 9
- RHEL 8, 9
- Rocky Linux 8, 9
- Virtuozzo Linux (VZLinux) 8, 9

- CentOS 6
- CentOS 7
- Between major versions

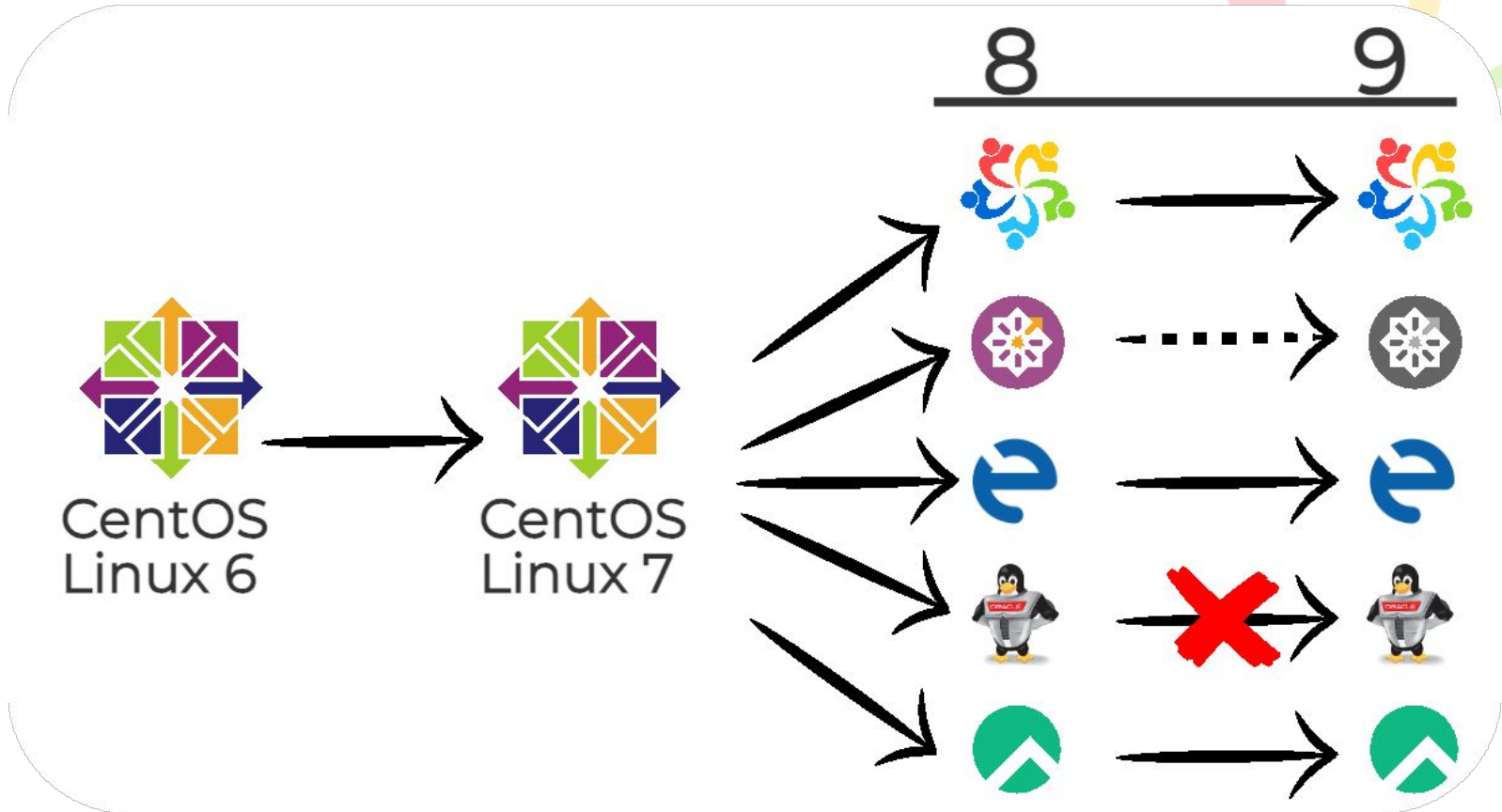
AlmaLinux Deploy

github.com/AlmaLinux/almalinux-deploy

Project ELevate

almalinux.org/elevate/

Upgrading: Project ELevate



Upgrading: Project ELevate

1. Update your system and reboot
2. Install the `elevate-release` package
3. Install the package and meta data for the OS you want to end up on
4. Run the pre-upgrade check
 - a. Fix any problems
 - b. Known problems:
wiki.almalinux.org/elevate/ELevate-frequent-issues.html
5. Run the upgrade
6. Reboot

See a full demo: youtube.com/watch?v=VzI9QxG5mvo



Upgrading: Project ELevate

Most common question:

But will it really work?!



Upgrading: Project ELevate

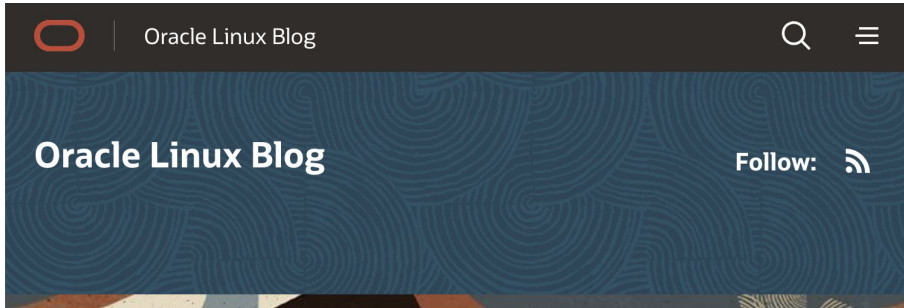
Most common question:

But will it really work?!

YES!



Upgrading: Project ELevate



Upgrade Oracle Linux 8 to Oracle Linux 9 using Leapp

August 22, 2022 | 4 minute read

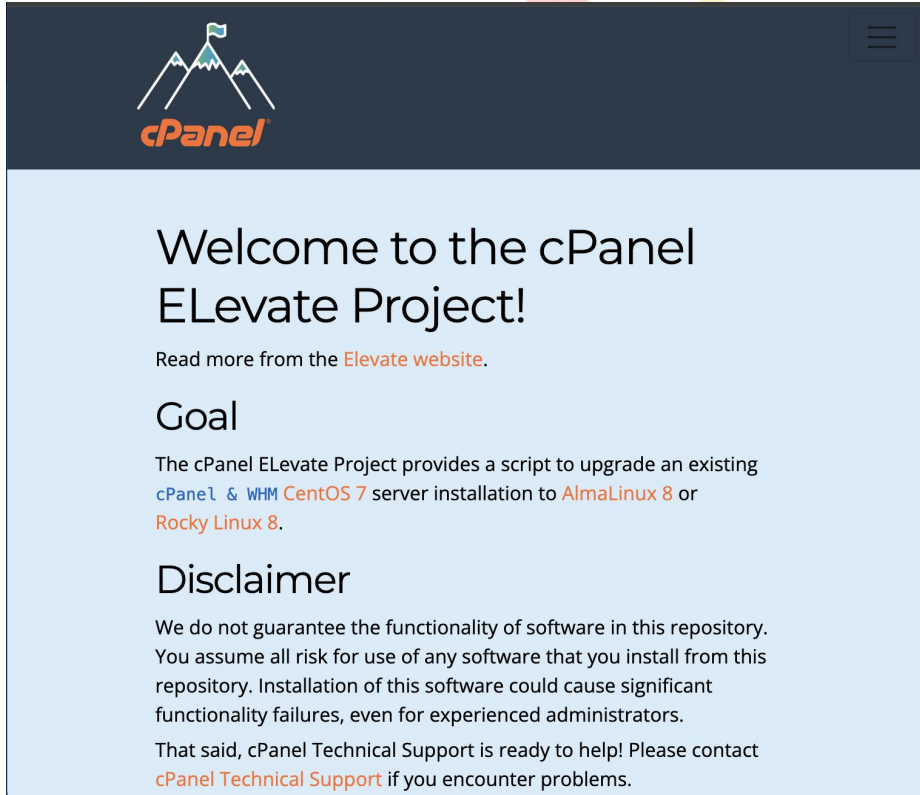




David Gilpin
Principal Product Manager




A previous [Oracle Linux blog](#) discussed using [Leapp](#) to upgrade from Oracle Linux 7 to Oracle Linux 8. The Leapp utility is used to simplify an in-place upgrade to a major Oracle Linux release. This blog will demonstrate using [Leapp](#) to upgrade an Oracle Linux 8 web server to Oracle Linux 9.

For this demonstration, an Oracle Linux 8 system was built with a "[Basic Web Server](#)" profile. An Oracle Linux user 'demo' was created and configured with sudo rights and was granted root SSH permissions in the `/etc/ssh/sshd_config` file. The Apache web daemon was enabled and configured to support CGI







 r/AlmaLinux
u/bennyvasquez · 4d · almalinux.org ·  AlmaLinux...

Expanding ELevate support: CentOS 6 to CentOS 7 migrations





We're very excited to share that ELevate has been expanded to include upgrading in place from CentOS 6 to CentOS 7.

 15 |  |  14



 randommen96 · 3d

Awesome. For the couple of VM's we didn't get around to replace yet we will try this.


 bennyvasquez OP · 3d

 randommen96 · 3d

Awesome. For the couple of VM's we didn't get around to replace yet we will try this.

 bennyvasquez OP · 3d
 AlmaLinux Team

Awesome! Definitely let us know how it goes!

 randommen96 · 4m

It works great! I upgraded the first Centos 6 server running DirectAdmin. It took some cleaning up afterwards but nothing unexpected!

Then I decided to try to upgrade it from Centos 7 to AlmaLinux 8 and that too worked great!

It might be not as great as a "clean" server but it is definitely a great option to have.

Upgrading: Project ELevate

- Used by major corporations to upgrade 100,000+ devices
- Consistently tested and improved by the greater community
- Easy to test and customize to meet your needs

Getting to AlmaLinux: Two options

- CentOS 8
- CentOS Stream 8, 9
- Oracle Linux 8, 9
- RHEL 8, 9
- Rocky Linux 8, 9
- Virtuozzo Linux (VZLinux) 8, 9

AlmaLinux Deploy

github.com/AlmaLinux/almalinux-deploy

- CentOS 6
- CentOS 7
- Between major versions

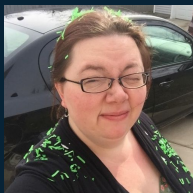
Project ELevate

almalinux.org/elevate/

Get help!

chat.almalinux.org/almalinux/channels/migration
almalinux.discourse.group/

Questions?



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