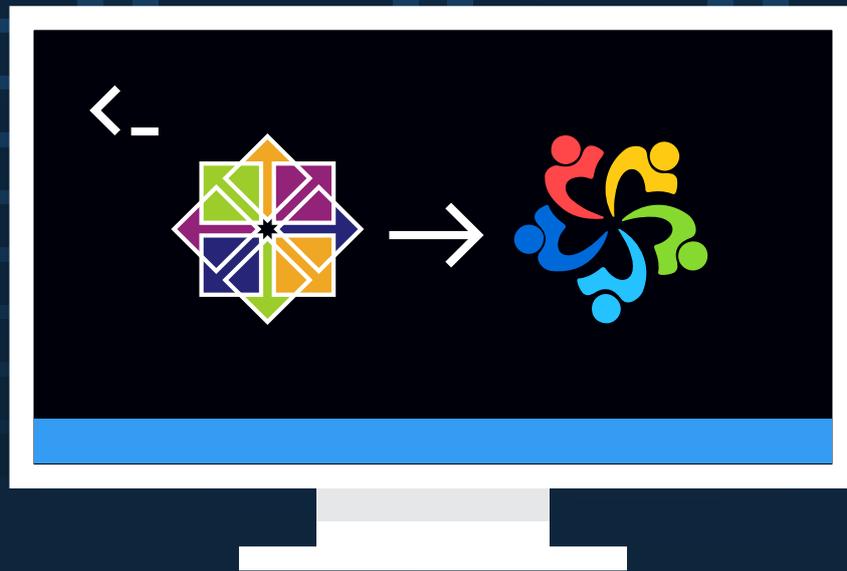




GUIDE

# CentOS Migration Guide: A Seamless Shift to AlmaLinux



# Introduction

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With CentOS 7 nearing the end of its security support lifecycle and CentOS 8 already in its end-of-life phase, this guide explains how you can migrate your CentOS workloads to AlmaLinux – a forever-free, community-driven Linux distribution that's Application Binary Interface compatible with Red Hat Enterprise Linux (RHEL) and serves as a perfect replacement for CentOS.

## Why AlmaLinux?

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AlmaLinux is a RHEL derivative that's 100% owned by a completely independent 501C-6 nonprofit foundation and will never reach the same fate as CentOS.

**With AlmaLinux, you'll be able to:**



Get a modern, **community-driven**, open-source Linux distribution



Make your migration seamless with a distro that's **Application Binary Interface compatible with RHEL**



Ensure your Linux distribution is **forever free and in the hands of an innovative community**



Gain a **security support lifecycle of up to 16 years** with the addition of Enterprise Support from TuxCare

## AlmaLinux 8 vs. AlmaLinux 9

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If you're running CentOS 7, you can migrate to AlmaLinux 8 and stay there, but there's a catch: active support for AlmaLinux 8 ends May 2024 while security support ends in March 2029.

With one simple additional migration step to AlmaLinux 9, you can enjoy active support until May 2027 and security support until 2032. By adding AlmaCare support from TuxCare, you can extend your security support lifecycle even further than 2032.

**For that reason, we recommend migrating from CentOS 7 or CentOS 8 to AlmaLinux 9 to maximize your security lifecycle.**

Fortunately, migrating from either CentOS 7 or CentOS 8 to both AlmaLinux 8 and AlmaLinux 9 is quick and painless – thanks to the AlmaLinux ELevate migration tool.



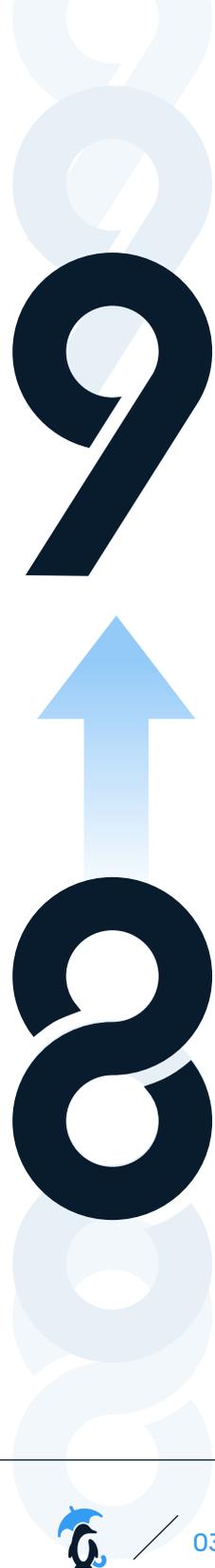


## ELevate

The ELevate Project is an open-source initiative to help users perform migrations between different Red Hat Enterprise Linux (RHEL) compatible distributions, like CentOS, AlmaLinux and others. With the ELevate tool, organizations can move from CentOS 7.x to 8.x versions of any RHEL derivative, or upgrade from 8.x to 9.x within the same derivative – like from AlmaLinux 8 to AlmaLinux 9.

ELevate enables you to preserve your applications, your data, and your mental well-being while you run the most recent version of the OS and software that's most suitable for your organization's needs, all in a single application.

Now,  
let's get to the  
migration instructions...





## For Organizations Using CentOS 7

### STAGE 1:

## CentOS 7 to AlmaLinux 8

There are major differences between CentOS 7 and CentOS 8, and by implication also massive differences between CentOS 7 and AlmaLinux 8 – because both CentOS 8 and AlmaLinux 8 are based on RHEL 8.

But, thanks to the ELevate project from AlmaLinux, it's pretty simple to migrate from CentOS 7 to AlmaLinux 8 (before migrating to AlmaLinux 9 in Stage 2).

### Here are the steps:

First, update your CentOS 7 instance to the latest version, followed by a reboot:

```
sudo yum update -y  
sudo reboot
```

You then need to install the elevate-release package that contains the project repo:

```
sudo yum install -y  
http://repo.almaLinux.org/elevate/elevate-release-latest-el7.noarch.rpm
```

Next, install the leapp packages and migration data for AlmaLinux:

```
sudo yum install -y leapp-upgrade leapp-data-almaLinux
```



Then, do a pre-upgrade check using this command:

```
sudo leapp preupgrade
```

The results will be posted in this file: `/var/log/leapp/leapp`. Due to differences in deployed applications and specific system settings, it is common for the first pass to fail the check, and you'll get some recommended solutions.

**There are common issues migrating from CentOS 7. You can address these common issues by running the following set of commands:**

Module `pata_acpi` inhibits upgrade, run this command to fix it:

```
sudo rmmmod pata_acpi
```

Lack of root login access (can break post-upgrade remote system access). Run this command to enable it. It can be disabled again after upgrading.

```
echo PermitRootLogin yes | sudo tee -a /etc/ssh/sshd_config
```

Unsupported pam module, run this command to fix it:

```
sudo leapp answer --section  
remove_pam_pkcs11_module_check.confirm=True
```

Another common issue is timeout during package download, which can be fixed by simply retrying the command. Yum, used during the upgrade process, caches already downloaded packages, so your system will only retry the missing packages.

Your next step is to start the upgrade and trigger a reboot. Please wait a few moments if the operation appears to stall after deploying the updated packages. It will finish eventually.

```
sudo leapp upgrade
```

This is what you want to see after the tool runs successfully (with different package numbers):

```
Debug output written to /var/log/leapp/leapp-preupgrade.log

=====
                          REPORT
=====

A report has been generated at /var/log/leapp/leapp-report.json
A report has been generated at /var/log/leapp/leapp-report.txt

=====
                          END OF REPORT
=====

Answerfile has been generated at /var/log/leapp/answerfile
[root@centos8 ~]# |
```

```
sudo reboot
```

Once the reboot is executed, you'll see a new entry in GRUB: ELevate-Upgrade-Initramfs. Press Enter or allow the system to boot into it automatically and wait for the upgrade process to finish.

You'll then boot into AlmaLinux. After the reboot, you can verify that you're now running AlmaLinux 8:

```
cat /etc/redhat-release
```

You should see AlmaLinux alongside the current version number.



## STAGE 2:

# AlmaLinux 8 to AlmaLinux 9

Now that you've switched from CentOS 7 to AlmaLinux 8, you can easily upgrade to the latest version of AlmaLinux, which you'll do with ELevate.

Start by downloading the elevate-testing repo:

```
sudo curl
https://repo.almaLinux.org/elevate/testing/elevate-testing.repo -o
/etc/yum.repos.d/elevate-testing.repo
```

Next, import the ELevate GPG key:

```
sudo rpm --import https://repo.almaLinux.org/elevate/RPM-GPG-KEY-ELevate
```

Then, install the Leapp packages that enable you to upgrade from AlmaLinux 8 to AlmaLinux 9:

```
$ sudo yum install -y leapp-upgrade leapp-data-almaLinux
```

You should see confirmation that the packages were installed. Next, as with the previous stage, you need to first run a pre-upgrade check using the following command:

```
sudo leapp preupgrade
```

As before, you can view the results in `/var/log/leapp/leapp-report.txt`

Common problems you'll find are around SELinux and FirewallD Configuration AllowZoneDrifting.

You can fix these issue as follows:

To disable SELinux:

```
$ sudo vim /etc/sysconfig/selinux
##Change selinux mode to Disabled.
SELINUX=disabled
```

You then need to reboot:

```
sudo reboot
```

After the upgrade is complete, you can re-enable Selinux by resetting the option in this file to “enforcing” (or whatever configuration option you choose) and rebooting to allow for proper relabelling of all the files.

You may also need to set AllowZoneDrifting to **no**

```
$ sudo vim /etc/firewalld/firewalld.conf  
AllowZoneDrifting=no
```

Another blocker is that you need to be running the latest installed kernel version, so ensure that is the case and reboot into the latest version if you’re not yet doing that. This can happen in situations where you downloaded updates with yum/dnf and have not yet rebooted into the new kernel version. The ELevate tool will detect this situation and consider it a blocker.

It’s worth re-running the pre-upgrade command to check that you’re good to go.

This is the message that you want to see at the end of this process:

```
Debug output written to /var/log/leapp/leapp-preupgrade.log  
  
===== REPORT =====  
  
A report has been generated at /var/log/leapp/leapp-report.json  
A report has been generated at /var/log/leapp/leapp-report.txt  
  
===== END OF REPORT =====  
  
Answerfile has been generated at /var/log/leapp/answerfile  
[root@centos8 ~]# |
```



The text in green is the indication that all went well and the system is ready to upgrade. A message in red means that there are still some upgrade blockers that demand attention. As mentioned previously, you can find all of the information in the log files and it will usually include some instructions on how to solve each of those blockers.

You can then trigger the upgrade:

```
sudo leapp upgrade
```

After a period of time, you'll need to reboot your system, so:

```
sudo reboot
```

A new entry in GRUB called ELevate-Upgrade-Initramfs will appear and your system will automatically boot into it.

You can confirm that you're now running AlmaLinux 9 using the following command line:

```
$ cat /etc/os-release
```

## And You're Done!

Follow the steps above and you've gained plenty of additional years of security support for your Linux-based environment that will enable you to keep running safely and securely until 2032 – and even longer if you opt to add TuxCare's Enterprise Support for AlmaLinux.

And if you're worried about being able to successfully complete all the necessary steps to migrate to **AlmaLinux**, **subscribing to TuxCare's Enterprise Support for AlmaLinux also gives you access to TuxCare Linux security experts who will help you through the entire process.**



## For Organizations Using CentOS 8

### STAGE 1:

## CentOS 8 to AlmaLinux 8

Your first step is to convert your CentOS 8 system into an AlmaLinux 8 system using a conversion script. To start, check which version of CentOS 8 you're running:

```
$ cat /etc/redhat-release
```

If the reported OS version is lower than 8.5, you need to change the paths to repositories:

```
sed -i -r 's|^(mirrorlist.+)$|#\1|g;  
s|^#baseurl=http://mirror.centos.org/\$co
```

Then, apply pending updates to your CentOS 8 instance, followed by a reboot:

```
sudo yum update -y  
sudo reboot
```

Next, install the migration script `almalinux-deploy.sh`

```
curl -O https://raw.githubusercontent.com/AlmaLinux/almalinux-deploy/  
master/almalinux-deploy.sh
```



Then, run the migration script:

```
sudo bash almalinux-deploy.sh
```

This will take some time. You should see a confirmation screen with the following text:

```
Migration to AlmaLinux is completed
```

You might find that the script fails. The script run may fail with an error like:

```
Verify almalinux-release-latest.rpm package
```

```
=====
                          ERROR
=====
```

```
/root/.alma.X46iDx/almalinux-release-latest.rpm: digests
```

```
=====
                          SIGNATURES NOT OK
=====
```

If that's the case, you should first import the GPG key of the AlmaLinux repository and then run the script again:

```
sudo rpm --import
https://repo.almalinux.org/almalinux/RPM-GPG-KEY-AlmaLinux &&
sudo bash almalinux-deploy.sh
```

Your next step is to check that the conversion succeeded.

```
cat /etc/redhat-release
```

You should see:

```
AlmaLinux release 8.7 (Stone Smilodon)
```

Now, reboot:

```
sudo reboot
```

## STAGE 2:

# AlmaLinux 8 to AlmaLinux 9

Now that you've switched from CentOS 8 to AlmaLinux 8, you can easily upgrade to the latest version of AlmaLinux, which you'll do through ELevate.

Start by downloading the elevate-testing repo:

```
sudo curl
https://repo.almaLinux.org/elevate/testing/elevate-testing.repo -o
/etc/yum.repos.d/elevate-testing.repo
```

Next, import the ELevate GPG key:

```
sudo rpm --import https://repo.almaLinux.org/elevate/RPM-GPG-KEY-ELevate
```

Then, install the Leapp packages that enable you to upgrade from AlmaLinux 8 to AlmaLinux 9:

```
$ sudo yum install -y leapp-upgrade leapp-data-almaLinux
```

You should see confirmation that the packages were installed. Next, as with the previous stage, you need to first run a pre-upgrade check using the following command:

```
sudo leapp preupgrade
```

As before, you can view the results in `/var/log/leapp/leapp-report.txt`

Common problems you'll find are around SELinux and Firewall Configuration `AllowZoneDrifting`.

You can fix these issue as follows:

To disable SELinux:

```
$ sudo vim /etc/sysconfig/selinux
##Change selinux mode to Disabled.
SELINUX=disabled
```

You then need to reboot:

```
sudo reboot
```

After the upgrade is complete, you can re-enable Selinux by resetting the option in this file to "enforcing" (or whatever configuration option you choose) and rebooting to allow for proper relabelling of all the files.

You may also need to set `AllowZoneDrifting` to **no**

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```

Another blocker is that you need to be running the latest installed kernel version, so ensure that is the case and reboot into the latest version if you're not yet doing that. This can happen in situations where you downloaded updates with yum/dnf and have not yet rebooted into the new kernel version. The ELevate tool will detect this situation and consider it a blocker.

It's worth re-running the pre-upgrade command to check that you're good to go.

This is the message that you want to see at the end of this process:

```
Debug output written to /var/log/leapp/leapp-preupgrade.log
```

```
=====
                        REPORT
=====
```

```
A report has been generated at /var/log/leapp/leapp-report.json
```

```
A report has been generated at /var/log/leapp/leapp-report.txt
```

```
=====  
END OF REPORT  
=====
```

```
Answerfile has been generated at /var/log/leapp/answerfile  
[root@centos8 ~]# |
```

The text in green is the indication that all went well and the system is ready to upgrade. A message in red means that there are still some upgrade blockers that demand attention. As mentioned previously, you can find all of the information in the log files and it will usually include some instructions on how to solve each of those blockers.

You can then trigger the upgrade:

```
sudo leapp upgrade
```

After a period of time, you'll need to reboot your system, so:

```
sudo reboot
```

A new entry in GRUB called ELevate-Upgrade-Initramfs will appear and your system will automatically boot into it.

You can confirm that you're now running AlmaLinux 9 using the following command line:

```
$ cat /etc/os-release
```

## That's It!

Your CentOS 8 workloads are now running AlmaLinux 9. With this decision to migrate, you can keep running your machines safely and securely until 2032 – and even longer if you opt to add TuxCare's Enterprise Support for AlmaLinux.



## A Final Note on the Migration Process...

In a Linux distribution family that has been historically known to frown upon upgrades between versions, this type of upgrade process is something that system administrators and operations teams likely aren't familiar with.

For many years, the official "option" available when you wanted to upgrade to a more recent version of CentOS was to reinstall from scratch and deploy the workload anew.

**The ELevate tool makes the process much less time consuming and much simpler to navigate, even for large fleets of servers.**



We've mentioned throughout this guide that you can extend your AlmaLinux 9 security support even further with the addition of Enterprise Support for AlmaLinux from TuxCare - which offers a 16-year security support lifecycle compared to the 10 years of support that come standard with AlmaLinux 9.

Plus, the TuxCare team will help you along your migration journey!

## So, what's included in Enterprise Support for AlmaLinux?





## Enterprise Support for AlmaLinux

Minimize your vulnerability exposure while ensuring compliance and business continuity – so you can leverage this stable, reliable, community-driven Linux distribution for as long as you need.

- Enjoy a stable and predictable computing environment with an industry-leading 16-year lifecycle length
- Minimize your vulnerability window, maintain 100% uptime and compliance with automated and rebootless security patching
- Run your systems on FIPS-certified cryptography and benefit from the latest security fixes that do not affect the validated code
- Avoid costly upfront support package fees with TuxCare's simplified pay-as-you-go hourly support pricing

## Build Your Enterprise Support



### Enterprise Support for AlmaLinux from TuxCare



#### Essential Support

Get a TuxCare-vetted repository of AlmaLinux updates with guaranteed uptime, expedited break-and-fix support and up to 16 years of support coverage



#### Extended Security Updates

Ensure a stable environment for an extended period of up to 5 years with ongoing security updates and FIPS-compliant security patches for your AlmaLinux minor releases



#### Live Patching

Automatically apply the latest security patches for the kernel and critical userspace libraries (OpenSSL and glibc) as soon as they become available with zero downtime



#### Enhanced Support

Get all the help you need with an enterprise-grade personalized technical support covering a range of open-source software running on AlmaLinux



For more information on TuxCare's Enterprise Support Services for AlmaLinux, visit

[www.tuxcare.com/alma-linux-enterprise-support](http://www.tuxcare.com/alma-linux-enterprise-support)

