

Journey from RHEL 7 to CentOS 7 and Oracle Linux 8 with elevate

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From a technical point of view, every Red Hat Enterprise Linux derivate is as good as the original. If you are happy with community support, your use case doesn't require a specific vendor and their support services, you can choose from a lot of really good options.

At work we still have some RHEL 7 VMs in our Management Environment where we actually don't need any sort of support subscriptions. If there is anything broken, we have to fix it on our own, nothing where, in this case, Red Hat could and will help us.

But to have at least the option to pay for vendor support again, something you need in larger companies to calm down your management, we opted to migrate RHEL 7 Systems to [Oracle Linux](#), even though I would personally pick [RockyLinux](#) because of the community behind it.

The migration will be done in two Steps:

1. From RHEL 7 to latest CentOS 7 release
2. From CentOS 7 to Oracle Linux 8

Step 1 feels a little "hacky" and involves some manual steps, for Step 2 we going to use [elevate from AlmaLinux](#).

I will not talk about RHEL 7 > CentOS 7 in detail, just some notes about potential pitfalls, there are tons of guides out to about that topic, for example [this one](#) (Archive: [1], [2]), [this one](#) (Archive: [1], [2]) or [this one](#) (Archive: [1], [2]).

Some things you should keep in mind during RHEL 7 to CentOS 7:

- If you use a HTTP Proxy, configure it correctly on OS Level and ensure the mirrors you going to use are whitelisted
- You have a Red Hat Satellite 6 Server running and the VM registered? Remove also those packages when removing all other redhat / rhn related ones.
- Disable, or even better, remove the subscription manager, you don't need it anymore and it will cause problems otherwise
- Verify that there is enough free space available, you will probably need ~2GB for new downloaded packages

In-Place Upgrade from Enterprise Linux 7 to 8 is technically possible and something Red Hat even officially support for RHEL 7 to RHEL 8. It uses the leapp framework under the hood, which is also the basis of AlmaLinux elevate Project. They describe it as following: `ELevate enables migration between major versions of RHEL® derivatives. Easily go from CentOS 7.x to any 8.x of your choice.`

So with the help of elevate we can jump directly from CentOS 7 to Oracle Linux 8 without much trouble? Let's see how that goes.

I followed the [elevate Quickstart Guide](#) (Archive: [1], [2]), which works almost as easy as promised:

```
yum install -y http://repo.almalinux.org/elevate/elevate-release-latest-el7.noarch.rpm
yum install -y leapp-upgrade leapp-data-oraclelinux
yum remove subscription-manager* # If not already done, this is the right moment ;)
rmmod ata_acpi
leapp answer --section remove_pam_pkcs11_module_check.confirm=True
leapp preupgrade
```

In case you see the following error message and are worried, you can [ignore it](#) (Archive: [1], [2]):

```
2022-03-25 15:26:22.757 DEBUG PID: 18014 leapp.workflow.TargetTransactionFactsCollection.target_userspace_creator: Failed to create directory /var/lib/leapp/scratch/mounts/root_/system_overlay//sys/fs/selinux: Read-only file system
2022-03-25 15:26:22.774 DEBUG PID: 18014 leapp.workflow.TargetTransactionFactsCollection.target_userspace_creator: Failed to create directory /var/lib/leapp/scratch/mounts/root_/system_overlay//sys/fs/selinux: Read-only file system
```

Here comes the most important part if you have to use a http proxy to reach the internet, as I have to, which will by default just fail:

```
Loaded plugins: builddep, changelog, config-manager, copr, debug, debuginfo-install, download, generate_completion_cache, needs-restarting, playground, repoclosure, repodiff, repograph, repomanage, reposync
DNF version: 4.0.9
cachedir: /el8target/var/cache/dnf
configdir: /etc/yum.conf
Unknown configuration option: autorefresh = 1 in /etc/yum.repos.d/elasticsearch.repo
repo: downloading from remote: ol8_codeready_builder
Oracle Linux 8 CodeReady Builder (x86_64) 0.0 B/s | 0 B 00:00
Cannot download 'https://yum.oracle.com/repo/OracleLinux/OL8/codeready/builder/x86_64/': Cannot download repomd.xml: Cannot download repodata/repomd.xml: All mirrors were tried.
repo: downloading from remote: ol8_addons
Oracle Linux 8 Addons (x86_64) 0.0 B/s | 0 B 00:00
Cannot download 'https://yum.oracle.com/repo/OracleLinux/OL8/addons/x86_64/': Cannot download repomd.xml: Cannot download repodata/repomd.xml: All mirrors were tried.
repo: downloading from remote: ol8_baseos_latest
Oracle Linux 8 BaseOS Latest (x86_64) 0.0 B/s | 0 B 00:00
Cannot download 'https://yum.oracle.com/repo/OracleLinux/OL8/baseos/latest/x86_64/': Cannot download repomd.xml: Cannot download repodata/repomd.xml: All mirrors were tried.
repo: downloading from remote: ol8_UEKR6
Latest Unbreakable Enterprise Kernel Release 6 0.0 B/s | 0 B 00:00
Failed to synchronize cache for repo 'ol8_codeready_builder', ignoring this repo.
Failed to synchronize cache for repo 'ol8_addons', ignoring this repo.
Failed cannot download 'https://yum.oracle.com/repo/OracleLinux/OL8/UEKR6/x86_64/': Cannot download repomd.xml: Cannot download repodata/repomd.xml: All mirrors were tried.
No module defaults found
No match for argument: dnf
To synchronize cache for repo 'ol8_appstream', ignoring this repo.
Failed to synomd match for argument: dnf-command(config-manager)
chronize cache for repo 'ol8_baseos_latest', ignoring this repo.
Failed to synchronize cache for repo 'ol8_UEKR6', ignoring this repo.
Error: Unable to find a match: dnf dnf-command(config-manager)
```

Let's [configure the proxy in the leapp repo file](#) (Archive: [1], [2]), adjust the placeholder `<proxy>` based on your needs:

```
sed -i '/^enabled=.*\/a proxy=<proxy>' /etc/leapp/files/leapp_upgrade_repositories.repo
```

Again the advice to take a look at your available space, you will need ~2GB on `/var/cache` for the OL8 packages that leapp is going to download, otherwise you will see some nice error messages like:

```
[1821943] gsm-libc-1.20-7-17.el8.x86_64.rpm 2.4 MB/s | 39 KB 00:00
[182200] golang-bin-1.16.12-1.module@el8.5.0-2045+ee86369.x86_64.rpm/ Curl request (23) | Failed writing received data to disk/application for https://yum.oracle.com/repo/OracleLinux/OL8/appstream/x86_64/getPackage/golang-bin-1.16.12-1.module@el8.5.0-2045+ee86369.x86_64.rpm [Failed writing body (924 * 14384)]
Process finished: 181
Traceback (most recent call last):
  File "/usr/lib/python2.7/multiprocessing/process.py", line 258, in _bootstrap
    self.run()
  File "/usr/lib/python2.7/multiprocessing/process.py", line 114, in run
    self._target(self._args, **self._kwargs)
  File "/usr/lib/python2.7/site-packages/leapp/actor_definition.py", line 72, in _do_run
    actor_instance.run(args, **kwargs)
  File "/usr/lib/python2.7/site-packages/leapp/actors/_init_.py", line 315, in run
    self._process('rpm')
  File "/usr/share/leapp-repository/repositories/system_upgrade/common/actors/dfspackage/download/actor.py", line 48, in process
    _dfs_info_ext_info, _dfs_ext_info_ext_info, _plugin_info_ext_info, _on_www_ext_info
  File "/usr/share/leapp-repository/repositories/system_upgrade/common/libraries/dfslogin.py", line 344, in perform_rpm_download
    test=True, _on_www_ext_info
  File "/usr/lib/python2.7/contextlib.py", line 35, in _exit_
    self.gen.throw(type, value, traceback)
  File "/usr/share/leapp-repository/repositories/system_upgrade/common/libraries/mounting.py", line 367, in _exit_
    _cleanup()
  File "/usr/share/leapp-repository/repositories/system_upgrade/common/libraries/mounting.py", line 360, in _cleanup
    self._cleanup()
  File "/usr/share/leapp-repository/repositories/system_upgrade/common/libraries/mounting.py", line 328, in _cleanup
    self._cleanup('...', self._target).split(False)
  File "/usr/lib/python2.7/site-packages/leapp/libraries/actor/_init_.py", line 178, in run
    self._current_logger.debug('Internal command has started: {0}'.format(str(self)))
  File "/usr/lib/python2.7/logging/_init_.py", line 1137, in debug
    self._log(DEBUG, msg, args, **kwargs)
  File "/usr/lib/python2.7/logging/_init_.py", line 1208, in _log
    self._handle(record)
  File "/usr/lib/python2.7/logging/_init_.py", line 1278, in _handle
    self._callHandlers(record)
  File "/usr/lib/python2.7/logging/_init_.py", line 1318, in _callHandlers
    self._handle(record)
  File "/usr/lib/python2.7/logging/_init_.py", line 749, in _handle
    self.emit(record)
  File "/usr/lib/python2.7/site-packages/leapp/logger/_init_.py", line 45, in emit
    self._do_emit_log_data()
  File "/usr/lib/python2.7/site-packages/leapp/logger/_init_.py", line 45, in _do_emit
    _add(**log_data, store=True)
  File "/usr/lib/python2.7/site-packages/leapp/orm/_init_.py", line 88, in store
    self._do_store(connection)
  File "/usr/lib/python2.7/site-packages/leapp/orm/_init_.py", line 175, in _do_store
    self._message_message_id if self._message else None, self._data)
OperationalError: unable to open database file
*****
Actor dfs_package_download unexpectedly terminated with exit code 1 - Please check the above details
*****
```

If you are ready, run `leapp preupgrade` again, should complete without errors this time.

A reboot is required to continue. Please reboot your system.

Debug output written to `/var/log/leapp/leapp-upgrade.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
=====
```

Reboot your VM and, if available, watch the rest of the Upgrade through the VMWare / KVM or whatever other Console your Hypervisor provides. It will boot into *ELevate-Upgrade-Initramfs*, perform the whole CentOS 7 to Oracle Linux 8 magic and boot into your new OL8 System afterwards.

Some additional steps I did as soon the System was up and running again:

```
alternatives --set python /usr/bin/python3
# link 'python' to 'python3' for backward compatibility

dnf remove puppet
# we don't need the old puppet agent which was connected to satellite, forgot to remove it earlier...

cat /etc/redhat-release
cat /etc/os-release
rpm -qa | grep centos
rpm -qa | grep el7
# Verify that we running on the expected OS, in case of some el7 leftover, check if that's related to installed applications that might also require a update

dnf clean
dnf upgrade

grubby --set-default /boot/vmlinuz-5.4.17-2136.305.5.3.el8uek.x86_64
# Change from Standard EL8 Kernel to OL UEK

reboot
```

And that's it, except the extra step to configure http proxy, which isn't mention in the AlmaLinux Quickstart Guide yet, it went very smoothly and seem to result in a stable system, so far I'm happy with the results and can recommend to give elevate a try.