Red Hat Enterprise Linux

System Administrator's Guide

Migration of RHEL 7 to RHEL 9

Prepared By: Emad Hussain

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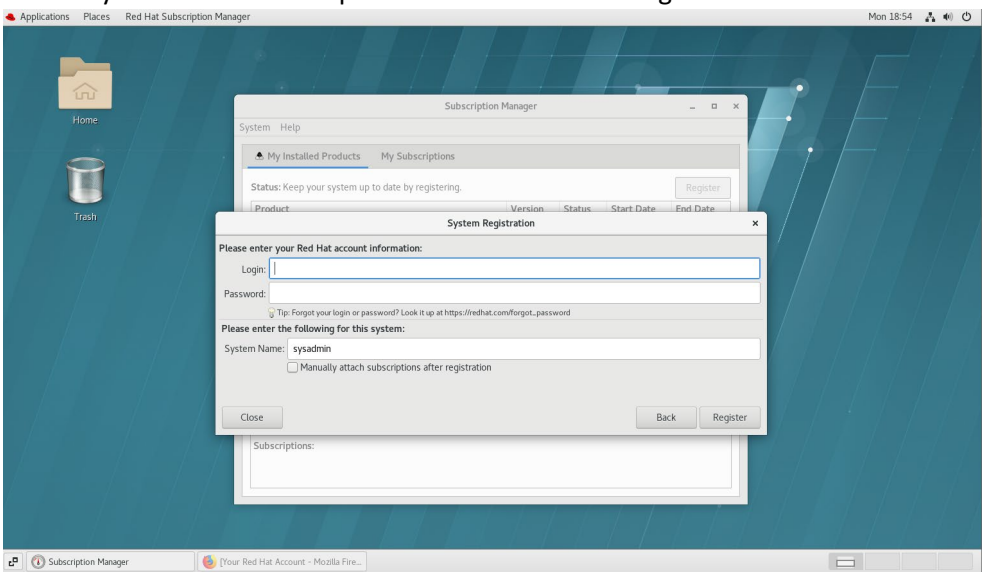
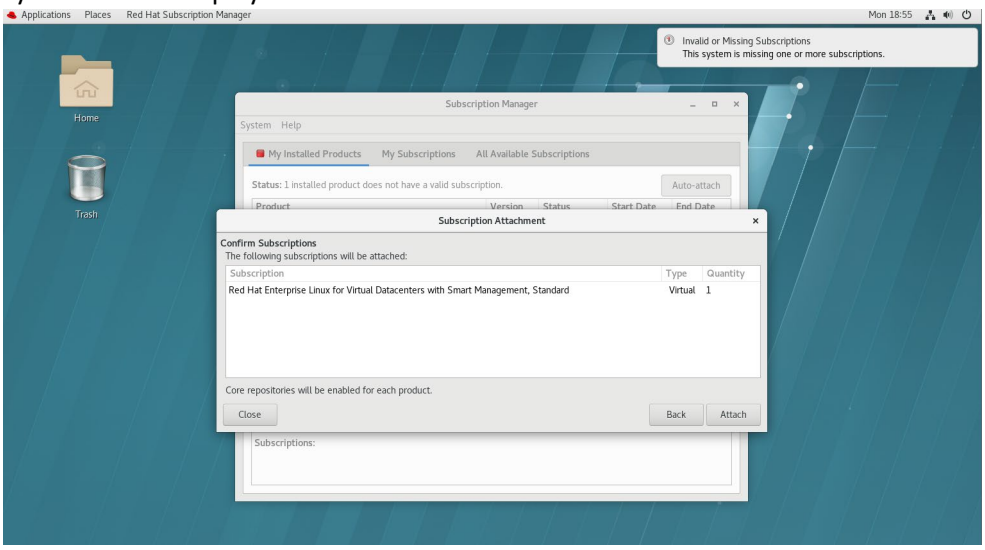
Installation & Activation of RHEL 7.9

1. Download the RHEL 7 ISO file from the official website.
2. Install the server with GUI using a clean installation process.
3. Complete the post-installation steps.
4. To activate the license, access the Red Hat Subscription Manager.
5. Provide your username and password and click the "Register" button.



6. Upon logging in, the subscription manager will verify if there is an appropriate subscription available for your RHEL system. If the checks are successful, the available subscription for your system will be displayed.



7. You can now proceed to license RHEL 7.9 using the available subscription.

Congratulations, the license for your machine has been activated. You can confirm this by navigating to the 'My Installed Products' tab in the Subscription Manager.

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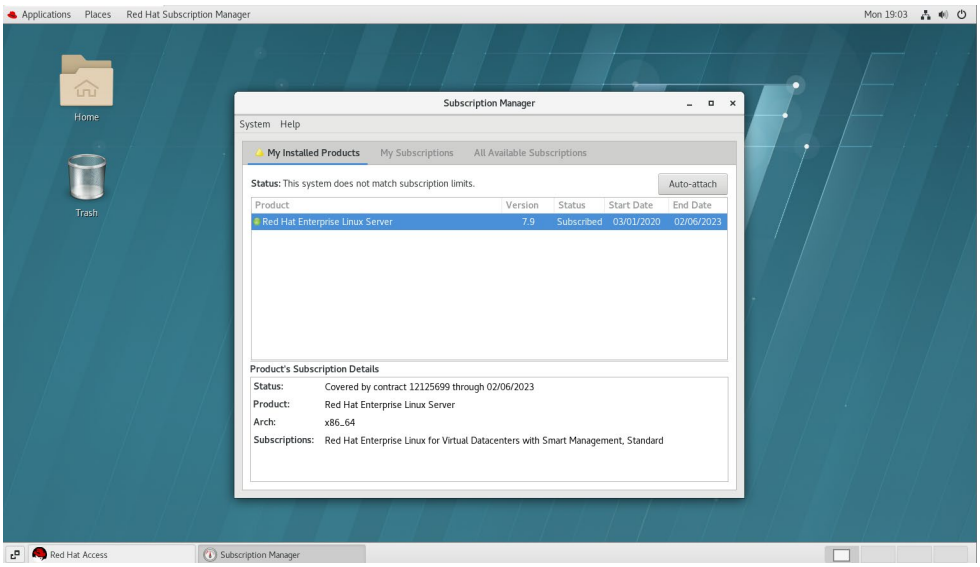

To ensure that your system is running the latest package versions, run the following command in the terminal

yum update

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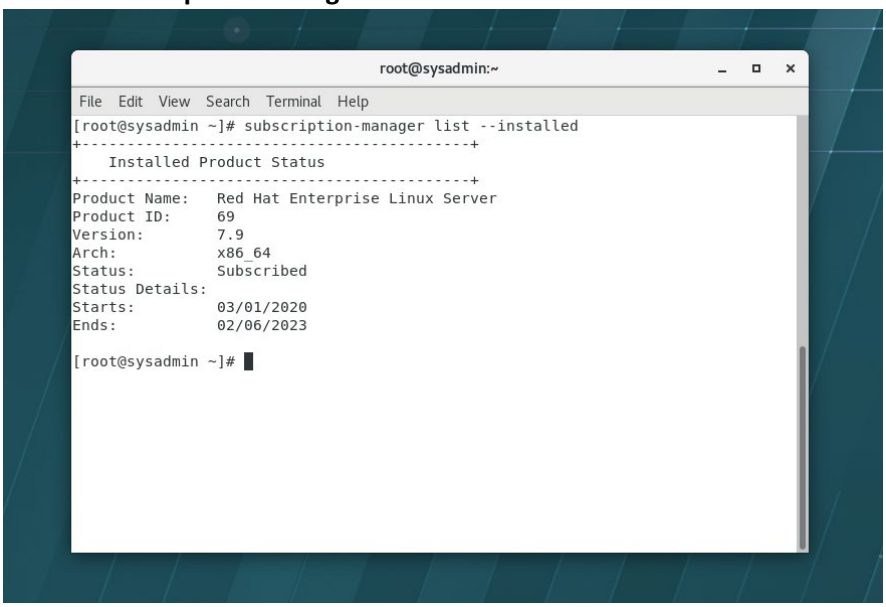
Migration from RHEL 7.9 to RHEL 8.x

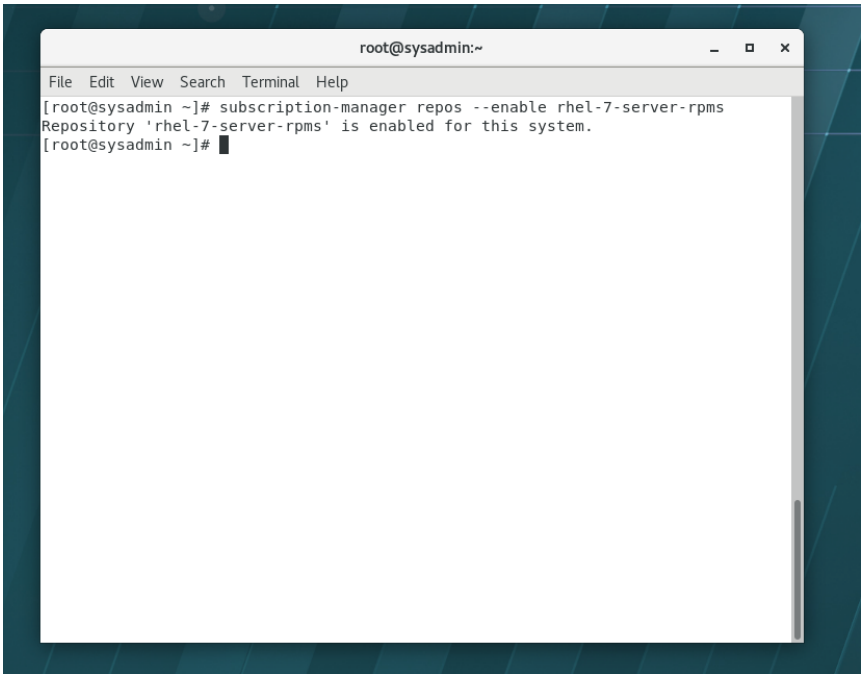
1. Before proceeding, check your installed products using the following command:

   subscription-manager list --installed



2. Make sure that the required repositories are enabled

   subscription-manager repos --enable rhel-7-server-rpms



3. Activate the Extras repository, which contains Leapp and its dependencies.

   subscription-manager repos --enable rhel-7-server-extras-rpms

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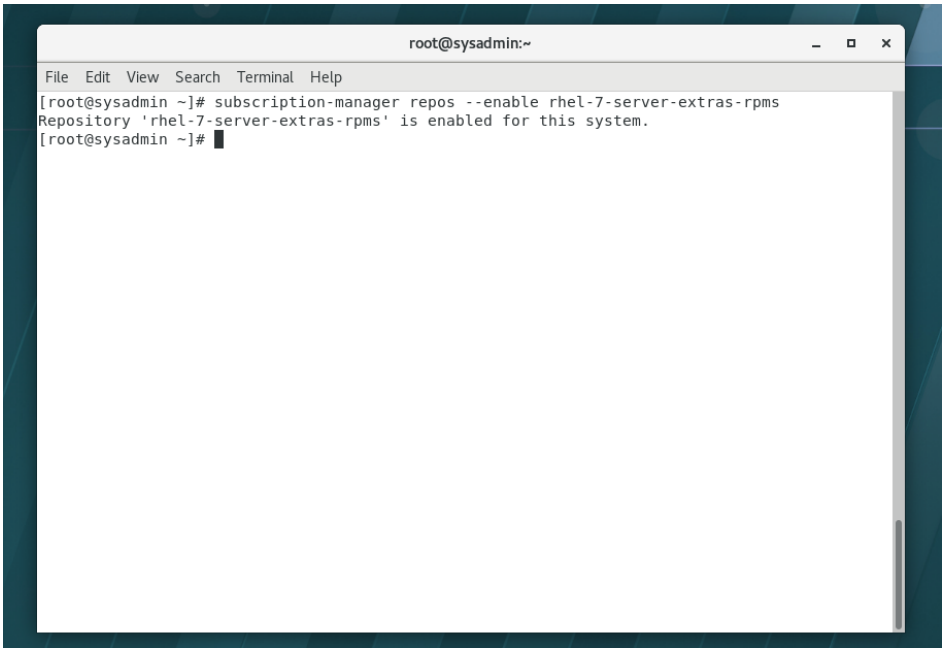
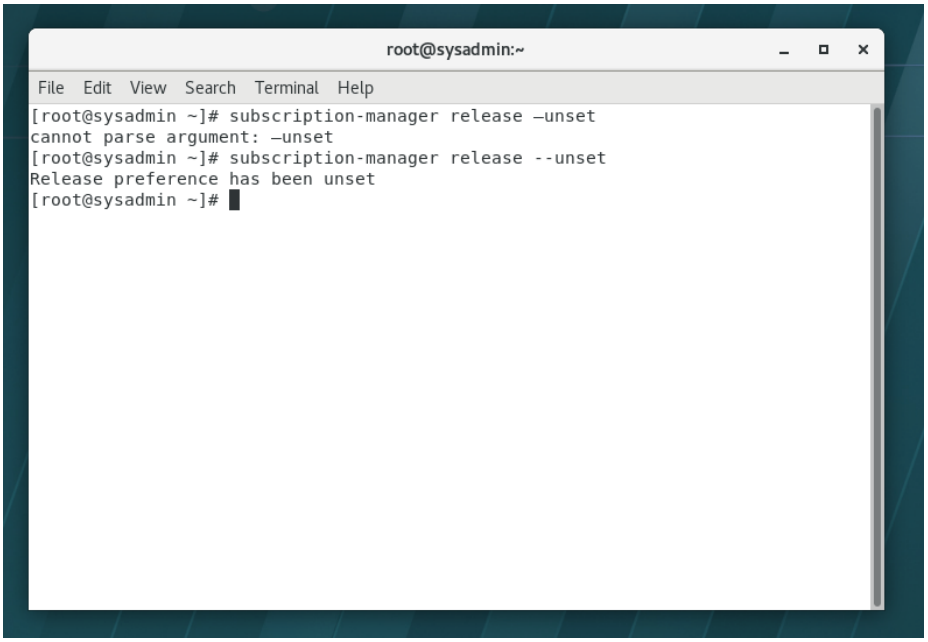


4. Configure the Red Hat Subscription Manager to utilize the most recent RHEL content.

   subscription-manager release --unset



5. Install Leapp and the related packages

   yum install leapp leapp-repository cockpit-leapp wget

6. Download the 'Leapp Data file' from: https://access.redhat.com/articles/3664871
7. Extract the downloaded file to destination: /etc/leapp/files

   tar -xzf leapp-data-21.tar.gz -C /etc/leapp/files

8. Start the Cockpit service and set up the firewall to permit inbound and outbound cockpit traffic.

   systemctl enable cockpit

   systemctl start cockpit

   systemctl status cockpit

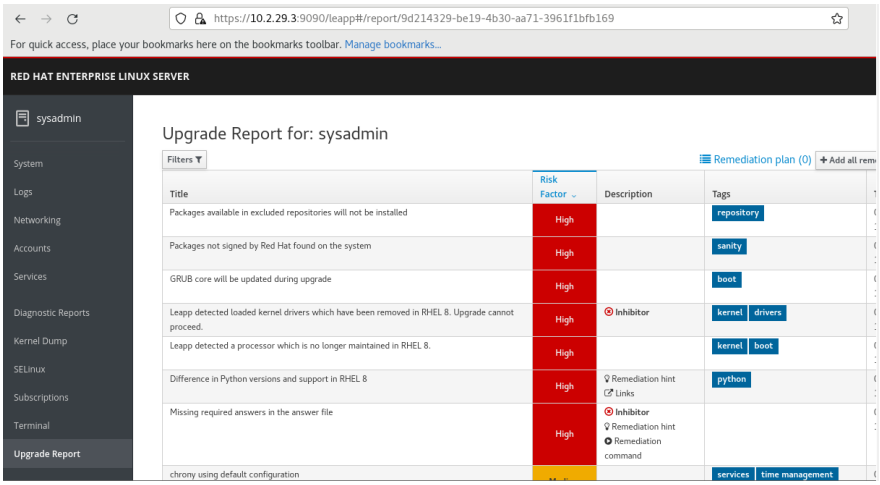
firewall-cmd --permanent --add-port=9090/tcp

firewall-cmd --reload

9. Login to cockpit console using URL: <host-machine-ip>:9090
10. Conduct the pre-upgrade test to identify any potential problems that may arise in the future.

    leapp preupgrade

11. View the generated report either from the console in “Upgrade Report” section or the terminal at the saved location.



12. Keep in mind that the risks on your specific machine may differ. It is recommended to address all inhibitors and ideally mitigate any high-level risks. Look for solutions pertaining to the risks identified.

    modprobe -r pata_acpi

    leapp answer --section remove_pam_pkcs11_module_check.confirm=True

13. Once all inhibitors or high-level risks have been resolved, conduct another pre-upgrade test to verify that no inhibitors remain before proceeding with the actual upgrade.

    leapp preupgrade

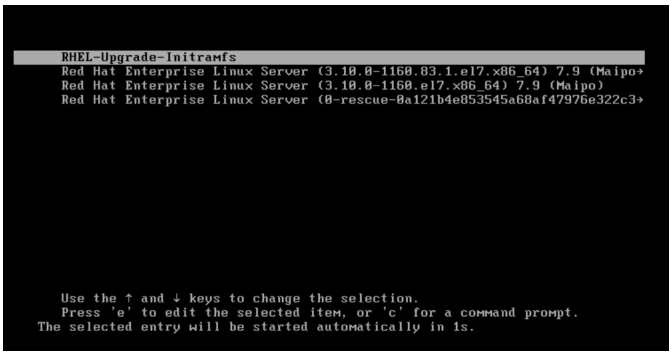
14. If the status of the test report is green at the terminal, then it is safe to proceed with the upgrade.
15. You may now initiate the upgrade process.

    leapp upgrade

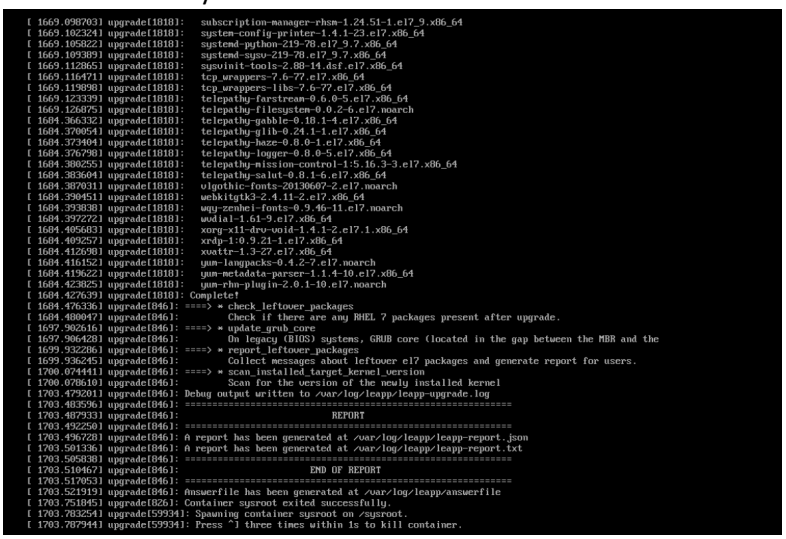
16. The upgrade process will involve downloading the necessary files and generating an "initramfs" file that will be used to upgrade your system.
17. You can now proceed to restart your machine

    reboot now

18. During the bootup process, select the newly generated upgrade "initramfs" file.

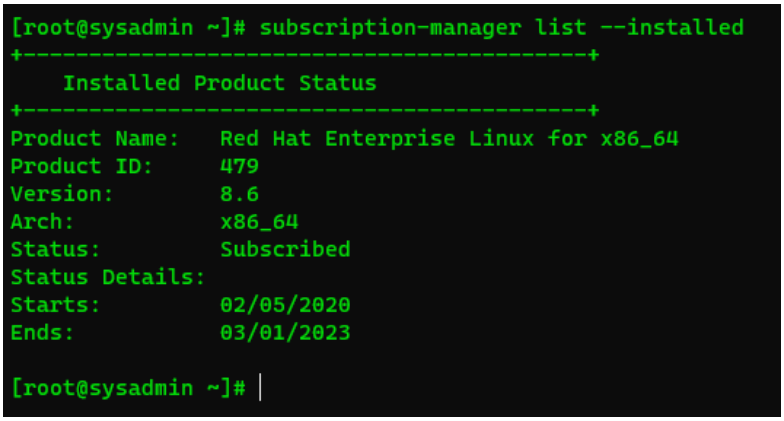


19. Once the process completes upgrading all the files, a report will be generated, and the system will automatically reboot twice.



20. Congrats! You have upgraded your RHEL 7 to RHEL 8.x

    subscription-manager list --installed



21. You may now perform the post-upgrade steps to complete the whole process.

    alternatives --set python /usr/bin/python3

    setenforce 1

Migration from RHEL 8.x to RHEL 9.x

1. Before proceeding, check your installed products using the following command:

   subscription-manager list --installed

```
[root@sysadmin ~]# subscription-manager list --installed
+-------------------------------------------+
    Installed Product Status
+-------------------------------------------+
Product Name:   Red Hat Enterprise Linux for x86_64
Product ID:     479
Version:        8.6
Arch:           x86_64
Status:         Subscribed
Status Details:
Starts:         02/05/2020
Ends:           03/01/2023

[root@sysadmin ~]#
```

2. Make sure that the required repositories are enabled

   subscription-manager repos --enable rhel-8-for-x86_64-baseos-rpms

   subscription-manager repos --enable rhel-8-for-x86_64-appstream-rpms

```
[root@sysadmin ~]# subscription-manager repos --enable rhel-8-for-x86_64-baseos-rpms
Repository 'rhel-8-for-x86_64-baseos-rpms' is enabled for this system.
[root@sysadmin ~]# subscription-manager repos -enable rhel-8-for-x86_64-appstream-rpms
subscription-manager: error: no such option: -enable rhel-8-for-x86_64-appstream-rpms
[root@sysadmin ~]# subscription-manager repos --enable rhel-8-for-x86_64-appstream-rpms
Repository 'rhel-8-for-x86_64-appstream-rpms' is enabled for this system.
[root@sysadmin ~]#
```

3. Red Hat Subscription Manager to utilize the most RHEL 8.6 content.

   subscription-manager release --set 8.6

```
[root@sysadmin ~]# subscription-manager release --set 8.6
Release set to: 8.6
[root@sysadmin ~]#
```

4. If you have upgraded from RHEL 7 to RHEL 8, delete the directories named 'tmp_leapp_py3'
5. rm -rf /root/tmp_leapp_py3
6. Clean up the repositories and update the system packages to ensure everything is up-to-date.

   yum clean all

   yum update

7. Uninstall the previous version of Leapp and its associated packages.

   rpm -e --nodeps leapp-upgrade-el7toel8-0.17.0-1.el7_9.noarch

   rpm -e --nodeps python2-leapp-0.15.0-2.el7_9.noarch

   rpm -e --nodeps leapp-0.15.0-2.el7_9.noarch

   yum remove leapp-upgrade-el8toel9-0.16.0-6.el8_6.noarch

8. Download the required RPM packages from:
   https://access.redhat.com/downloads/content/479/ver=/rhel---8/8.5/x86_64/packages
9. Packages to download from above URL:

   leapp(0.15.x) **python3-leapp**

   leapp-upgrade **leapp-upgrade-el8toel9**

   leapp-upgrade-el8toel9-deps **cockpit-leapp**

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10. Install all of the downloaded packages

    rpm -i <packagename>
11. During the installation of the downloaded packages, there may be conflicts with older versions of packages already installed on your machine. If this happens, you will need to identify the conflicting packages, remove them, and then try the installation again.

    rpm -e --nodeps <packagename>
12. After successfully installing all the downloaded packages, you may need to perform a pre-upgrade check for the target version.

    leapp preupgrade --target 9.0
13. Once the pre-upgrade test is completed, you can view the report at the saved location from terminal.
14. Keep in mind that the risks on your specific machine may differ. It is recommended to address all inhibitors and ideally mitigate any high-level risks. Look for solutions pertaining to the risks identified.
15. It is likely that an inhibitor related to network configurations will be in the pre-upgrade report.
16. In RHEL 9, the use of "ifcfg" network configurations is no longer supported, although they can still be used. However, it is recommended to use key-file configurations instead. To switch to key-file configurations, please perform the following steps:

    cp -r /etc/sysconfig/network-scripts /etc/sysconfig/network-scripts.bak

    cd /etc/sysconfig/network-scripts

    rm -rI *

    cd /etc/NetworkManager/system-connections/

    rm -rI *
17. Next, you'll need to update the NetworkManager configuration file.

    vi /etc/NetworkManager/NetworkManager.conf
18. Change plugins value from current value to keyfile and uncomment that line

```
[main]
plugins=keyfile
```
19. Open the Network Manager GUI and navigate to "Edit a Connection". Create a new network interface with the name "ens192" and configure it to use a static IP address.

    nmtui
20. Inhibitor related to Network-Configuration has now been resolved.

    leapp preupgrade --target 9.0
21. You can now move forward to resolving other inhibitors.
22. Modify the firewalld configuration file and change the **AllowZoneDrifting** value to “no”

    vi /etc/firewalld/firewalld.conf

```
# AllowZoneDrifting
# Older versions of firewalld had undocumented behavior known as "zone
# drifting". This allowed packets to ingress multiple zones - this is a
# violation of zone based firewalls. However, some users rely on this behavior
# to have a "catch-all" zone, e.g. the default zone. You can enable this if you
# desire such behavior. It's disabled by default for security reasons.
# Note: If "yes" packets will only drift from source based zones to interface
# based zones (including the default zone). Packets never drift from interface
# based zones to other interfaces based zones (including the default zone).
# Possible values; "yes", "no". Defaults to "yes".
AllowZoneDrifting=no
```

23. Modify the SSH configuration file to permit root login, set **PermitRootLogin** value to “no”

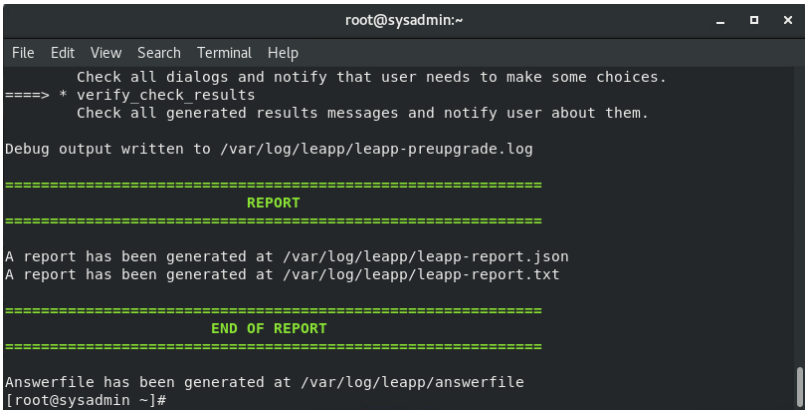
    vi /etc/ssh/sshd_config

```
#LoginGraceTime 2m
PermitRootLogin no
#StrictModes yes
#MaxAuthTries 6
#MaxSessions 10
```

24. Once all inhibitors or high-level risks have been resolved, conduct another pre-upgrade test to verify that no inhibitors remain before proceeding with the actual upgrade.

    leapp preupgrade --target 9.0

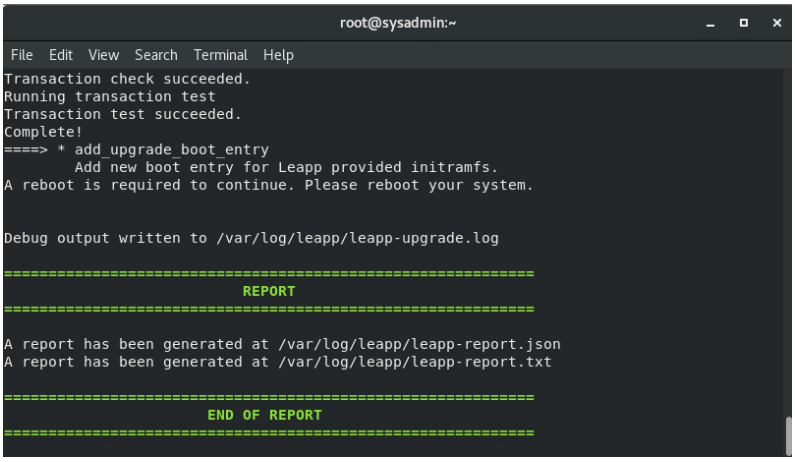
25. If the status of the test report is green at the terminal, then it is safe to proceed with the upgrade.



26. You may now initiate the upgrade process.

    leapp upgrade

27. The upgrade process will involve downloading the necessary files and generating an "initramfs" file that will be used to upgrade your system.



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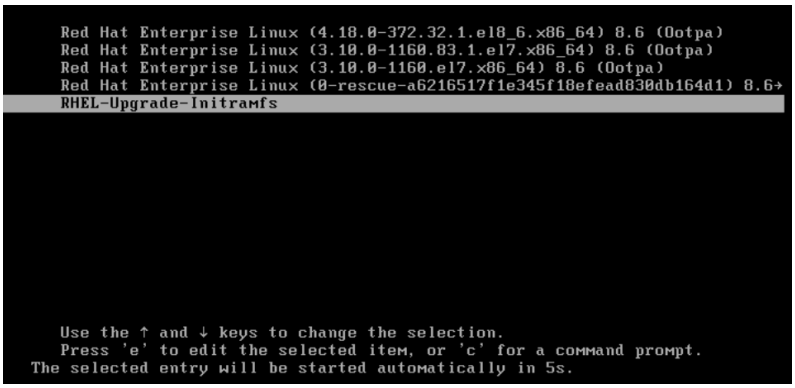
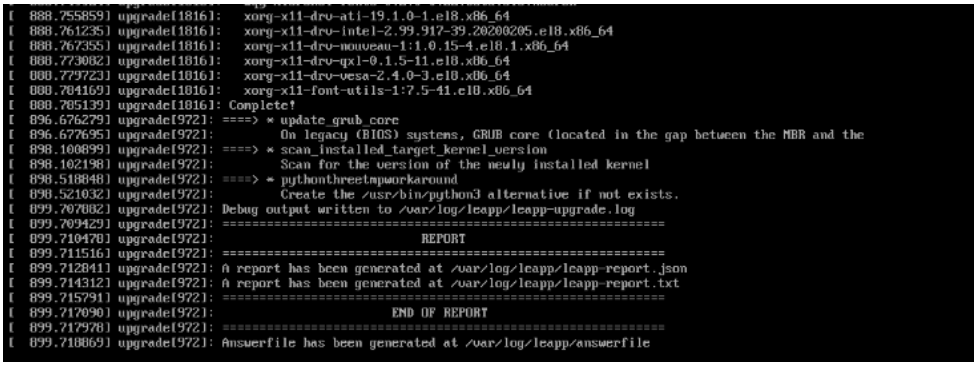
    reboot now

29. During the bootup process, select the newly generated upgrade "initramfs" file.

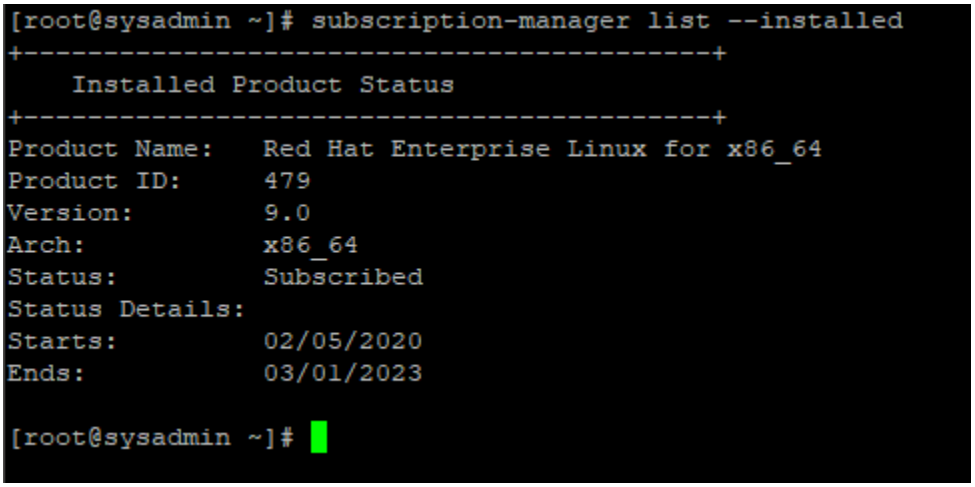


30. Once the process completes upgrading all the files, a report will be generated, and the system will automatically reboot twice.



22. Congrats! You have upgraded your RHEL 8.x to RHEL 9.x

    subscription-manager list –installed



23. You may now perform the post-upgrade steps to complete the whole process.

    dnf config-manager --save --setopt exclude=''

    dnf remove leapp-deps-el9 leapp-repository-deps-el9

    subscription-manager release –unset

    yum update