Linux System Upgrade Instructions (Offline)

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1. Upgrading Linux System Offline

This instruction will guide you to upgrade Linux operating system from v7.x (v7.0 to v7.6) to v7.8 offline. If your server has access to the Internet, it is highly recommended to upgrade the Linux operating system online.

- Upgrading CentOS to v7.8
- Upgrading RHEL to v7.8

> **Note:** Linux upgrade must be done by the **root** user because sudo account cannot be used to upgrade the packages at the OS level.

1.1. Upgrading CentOS to v7.8

1. Create a snapshot or checkpoint of your VMware server for rollback purpose in case of any failure.

   > **Note:** Ensure that the MongoDB data has been backed up, all the system services including MongoDB on the Linux server are running normally, and **DON'T** restart Linux server during and after the Linux operating system upgrade.
   >
   > **Note:** If anything is incorrect, please hold for advice or contact your system administrator.

2. Download the CentOS Linux ISO package.
3. Connect to the Linux server as the **root** user via SSH with the PuTTY tool. Then run the `mkdir /tmp/centos_78` command to create a directory to mount the ISO image.
4. Connect to the Linux server as the **root** user with the WinSCP tool without internet access and upload the ISO file to a temporary folder **/tmp/**.
5. Run the following command to verify the MD5 checksum value. Confirm that the returned checksum value is identical to the MD5 checksum value below.

   ```
   md5sum /tmp/CentOS-7-x86_64-DVD-2003.iso
   16673979023254ea09cc0b57853a7bbd CentOS-7-x86_64-DVD-2003.iso
   ```

   > **Note:** If the checksum value does not match, re-download the ISO file as it may have been corrupted during the transfers. Then repeat step 4 and 5 to upload the ISO file and confirm the checksum value.

6. Check the version detail of the CentOS system that is kept in the **/etc/redhat-release** and **/etc/centos-release** directories.

   1) Run the `uname -a` and `uname -r` commands to check the information about the current system.

   ```
   [root@localhost ~]# uname -a
   Linux localhost.localdomain 3.10.0-693.el7.x86_64 #1 SMP Tue Aug 22 21:09:27 UTC 2017 x86_64 x86_64 x86_64 GNU/Linux
   [root@localhost ~]# uname -r
   3.10.0-693.el7.x86_64
   ```

   2) Run the `cat /etc/centos-release` command to check the Linux version. For example, the version information is displayed as `CentOS Linux release 7.4.1708 (Core)`.

7. Mount the uploaded ISO file.

   1) Run the following command to mount the uploaded ISO file for read access only.

   ```
   mount -t iso9660 -o loop,ro /tmp/CentOS-7-x86_64-DVD-2003.iso /tmp/centos_78/
   ```

   2) Run the `ls -al /tmp/centos_78/` command to see the content of the mounted folder and make sure the files and folders are as follows:

   ```
   [root@centos76-30105 ~]# ls -al /tmp/centos_78/
   total 701
   drwxr-xr-x.  8 root root   2048 Apr 21 20:19 .
   dr--------. 12 root root   4096 Apr 28 15:48 ..
   -rw-rw-r--.  2 root root     14 Apr 20 14:14 CentOS_BuildTag
   -rw-r--r--.  1 root root     29 Apr 20 13:55 .discinfo
   drwxr-xr-x.  3 root root   2048 Apr 20 14:00 EFI
   -rw-rw-r--.  3 root root    227 Aug 30  2017 EULA
   -rw-rw-r--.  3 root root  18009 Dec  9  2015 GPL
   drwxr-xr-x.  3 root root   2048 Apr 20 14:00 images
   drwxr-xr-x.  2 root root   2048 Apr 20 14:00 isolinux
   drwxr-xr-x.  2 root root   2048 Apr 20 14:00 LiveOS
   drwxr-xr-x.  2 root root 671744 Apr 21 20:15 Packages
   drwxrwxr-x.  2 root root   4096 Apr 21 20:19 repodata
   -rw-rw-r--.  3 root root   1690 Dec  9  2015 RPM-GPG-KEY-CentOS-7
   -rw-rw-r--.  3 root root   1690 Dec  9  2015 RPM-GPG-KEY-CentOS-Testing-7
   -r--r--r--.  1 root root   2883 Apr 21 20:54 TRANS.TBL
   -rw-r--r--.  1 root root    353 Apr 20 14:00 .treeinfo
   [root@centos76-30105 ~]#
   ```

8. Back up all the internet-based repository files to a backup folder. As the system will only be updated offline, all the internet-based repositories must be removed.

   1) Run the `mkdir /repo-bk` command to create a backup folder **repo-bk.**

   2) Run the `cd /etc/yum.repos.d` command to navigate to the **etc/yum.repos.d** directory.

   3) Run the `mv *.repo /repo-bk/` command to move the ***.repo** files to the **repo-bk** folder.

9. Create a file to point to the ISO file that has been mounted. It will ensure all the packages will be retrieved from the ISO file when performing the update.

   1) Run the `vi /etc/yum.repos.d/local.repo` command to open the new file **local.repo** inside the vi text editor under the **/etc/yum.repos.d** directory.

2) Copy the following details to the vi editor.

```
[LocalRepo]
name=Local Repository
baseurl=file:///tmp/centos_78
enabled=1
gpgcheck=1
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-CentOS-7
```

3) Press the **Esc** key to exit the input mode, then enter the `:wq!` command and press the **Enter** key to save the changes and exit the vi editor.

4) Run the `ls -l` command to confirm that you only have the **local.repo** file in the **/etc/yum.repos.d** directory.

10. Run the following commands to upgrade the CentOS system.

1) Run the `yum clean all` command to clean the cache.

2) Run the `yum check-update` command to check the available upgrades.

> **Tip:** The system will display a list of available updates, including the core operating system updates. Scan the list to make sure everything is in order.

3) Run the `yum update -y` command to upgrade the CentOS system to v7.8.

> **Tip:** This will then update all the packages to the latest version. It may take a while to complete. Keep an eye out for any errors. If anything is incorrect, please hold for advice or contact your system administrator.

11. Run the `service <mongodb service name> status` command to double-check the MongoDB service status to ensure it is running normally after the Linux system upgrade.

> **Note:** The default name of the MongoDB service varies by different system versions. In v7.0b/b1 system, MongoDB service name is `mongodnetbrain`; starting from v7.1, MongoDB service name is `mongod`.

12. Run the `cat /etc/centos-release` command to check if the CentOS system has been upgraded successfully. For example, the following information is displayed: `CentOS Linux release 7.8.2003 (Core)`.

13. As the CentOS system has been upgraded to v7.8, then you can continue to upgrade the system Database Server according to the upgrade guide.

14. After the upgrade, delete the mounted folder, and disable the local repository and recover the original one.

1) Connect to the Linux server as the **root** user via SSH with the PuTTY tool.

2) Run the following commands to disable the folder mounting to local ISO file.

```
cd /
umount /tmp/centos_78
```

> **Note:** Ensure that all other users have disconnected from the system because the `umount` command cannot succeed if any users are browsing the mount point.

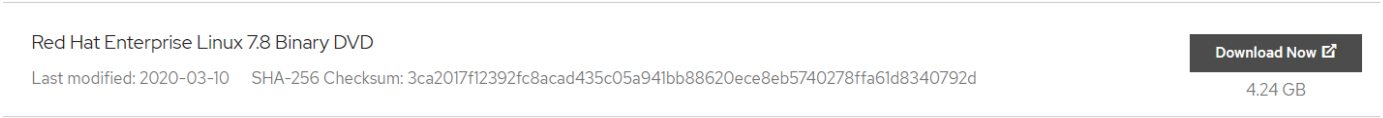
3) Run the `rm -rf /tmp/CentOS-7-x86_64-DVD-2003.iso` command to delete the ISO image, then run the `rm -rf /tmp/centos_78` command to delete all files under the **centos_78** directory.
4) Run the `rm -rf /etc/yum.repos.d/*.repo` command to delete the local repository file.
5) Run the `mv /repo-bk/* /etc/yum.repos.d/` command to move the files in **repo-bk** folder to the **yum.repos.d** folder. Then run the `rm -rf /repo-bk/` command to delete the **repo-bk** folder.
6) Run the `yum clean all` command to clean the cache and run the `yum check-update` command to check the available upgrades.

1.2. Upgrading RHEL to v7.8

1. Create a snapshot or checkpoint of your VMware server for rollback purpose in case of any failure.

> **Note:** Ensure that the MongoDB data has been backed up, all the system services including MongoDB on the Linux server are running normally, and **DON'T** restart Linux server during and after the Linux operating system upgrade.
>
> **Note:** If anything is incorrect, please hold for advice or contact your system administrator.

2. Navigate to the official website of Red Hat, and download the RHEL 7.8 installation package.

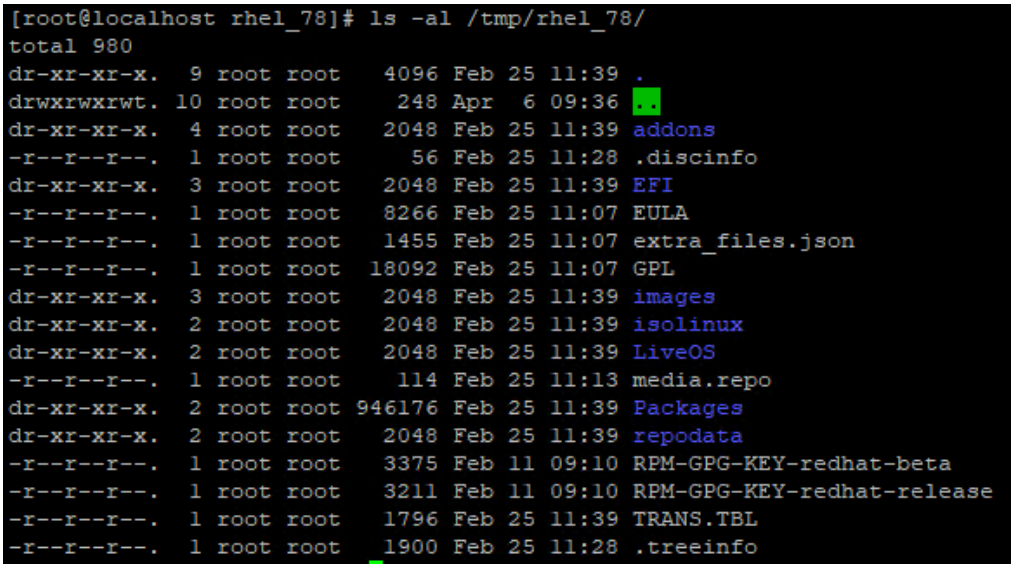


3. Connect to the Linux server as the **root** user via SSH with the PuTTY tool. Then run the `mkdir /tmp/rhel_78` command to create a directory to mount the ISO image.
4. Connect to the Linux server as the **root** user with the WinSCP tool without internet access and upload the ISO file to a temporary folder **/tmp/**.
5. Run the following command to verify the MD5 checksum value. Confirm that the returned checksum value is identical to the MD5 checksum value below.

```
md5sum /tmp/rhel-server-7.8-x86_64-dvd.iso
03e744681b67cbfe4c89b9fc7a89f21b rhel-server-7.8-x86_64-dvd.iso
```

> **Note:** If the checksum value does not match, re-download the ISO file as it may have been corrupted during the transfers. Then repeat step 4 and 5 to upload the ISO file and confirm the checksum value.

6. Mount the uploaded ISO file.
   1) Run the following command to mount the uploaded ISO file for read access only.
   `mount -t iso9660 -o loop,ro /tmp/rhel-server-7.7-x86_64-dvd.iso /tmp/rhel_78/`
   2) Run the `ls -al /tmp/rhel_78/` command to see the contents of the mounted folder and make sure the files and folders are as follows (there should be a **.discinfo** file like below):



   3) Run the `head -n1 /tmp/rhel_78/.discinfo` command to check the numeric value in the first line of the **.discinfo** file from the mount directory.

```
head -n1 /tmp/rhel_78/.discinfo
1582647234.022611
```

7. Backup all the internet-based repository files to a backup folder. As the system will only be updated offline, all the internet-based repositories must be removed.
   1) Run the `mkdir /repo-bk` command to create a backup folder **repo-bk**.
   2) Run the `cd /etc/yum.repos.d` command to navigate to the **etc/yum.repos.d** directory.
   3) Run the `mv *.repo /repo-bk/` command to move the ***.repo** files to the **repo-bk** folder.

8. Create a file to point to the ISO file that has been mounted. It will ensure when we run the update all the packages will be retrieved from the ISO file.
   1) Run the `vi /etc/yum.repos.d/local.repo` command to open the new file **local.repo** inside the vi text editor under the **/etc/yum.repos.d** directory.
   2) Copy the following details to the vi editor.

```
[LocalRepo]
mediaid=1582647234.022611
name=Local Repository
baseurl=file:///tmp/rhel_78
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-redhat-release
enabled=1
gpgcheck=1
```

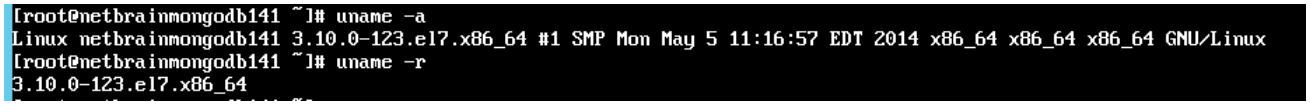
> **Note:** Replace **media_id** with the numeric value in the **.discinfo** file, and replace **repository_url** with the **/tmp/rhel_78** repository directory.

3) Press the **Esc** key to exit the input mode, then enter the `:wq!` command and press the **Enter** key to save the changes and exit the vi editor.

4) Run the `ls -l` command to confirm that you only have the **local.repo** file in the **/etc/yum.repos.d** directory.

9. Check the version detail of RHEL that is kept in the **/etc/redhat-release** and **/etc/os-release** directories.

   1) To check the information about the current system, run the `uname -a` and `uname -r` commands.



   2) To check the Linux version, run the following commands:

      - Run the `cat /etc/redhat-release` command. For example, the version information is displayed as `Red Hat Enterprise Linux Server release 7.0 (Maipo)`.
      - Run the `cat /etc/os-release` command.

10. Run the following commands to check update packages from the DVD ISO repositories.

    1) Run the `yum clean all` command to clean the cache.

    2) Run the `yum check-update` command to check the available upgrades.

> **Tip:** The system will display a list of available updates, including the core operating system updates. Scan the list to make sure everything is in order.

11. Run the `yum update -y` command to upgrade the RHEL system to v7.8.

> **Tip:** This will then update all the packages to the latest version. It may take a while to complete. Keep an eye out for any errors. If any errors pop up, please hold for advice or contact your system administrator.

12. Run the `service <mongodb service name> status` command to double-check the MongoDB service status to ensure it is running normally after the Linux system upgrade.

> **Note:** The default name of the MongoDB service varies by different system versions. In v7.0b/b1 system, MongoDB service name is `mongodnetbrain`; starting from v7.1, MongoDB service name is `mongod`.

13. Run the `cat /etc/redhat-release` command to check if the RHEL system has been upgraded successfully. For example, the following information is displayed: `Red Hat Enterprise Linux Server release 7.8 (Maipo)`.

14. As the RHEL system has been upgraded to v7.8, then you can continue to upgrade the system Database Server according to the upgrade guide.

15. After the upgrade, delete the mounted folder, and disable the local repository and recover the original one.
    1) Connect to the Linux server as the **root** user via SSH with the PuTTY tool.
    2) Run the following commands to disable the folder mounting to local ISO file.

```
cd /
umount /tmp/rhel_78
```

> **Note:** Ensure that all other users have disconnected from the system because the `umount` command cannot succeed if any users are browsing the mount point.

    3) Run the `rm -rf /tmp/rhel-server-7.8-x86_64-dvd.iso` command to delete the ISO image, then run the `rm -rf /tmp/rhel_78` command to delete all files under the **rhel_78** directory.
    4) Run the `rm -rf /etc/yum.repos.d/*.repo` command to delete the local repository file.
    5) Run the `mv /repo-bk/* /etc/yum.repos.d/` command to move the files in **repo-bk** folder to the **yum.repos.d** folder. Then run the `rm -rf /repo-bk/` command to delete the **repo-bk** folder.
    6) Run the `yum clean all` command to clean the cache and run the `yum check-update` command to check the available upgrades.