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20 October 2024
Linux Administration Fall 2024
Lab #5 Installs, Updates, and Documentation

Centos Server

1.) <u>Repositories</u>

A repository is a server that stores software packages. In order to check the repository, you must change into the directory. Linux has built in repositories that have the packages needed to run compatible software programs. In Centos, the built in repositories are located in the /etc/yum.repos.d directory. If you want to view it you must cd(change into that directory), and to view the contents of that directory use the command ls -l.

```
[ajconcepcion@localhost ~]$  cd /etc/yum.repos.d
[ajconcepcion@localhost yum.repos.d]$ ls -l
total 12
-rw-r--r--. 1 root root 4245 Mar 20  2024 centos-addons.repo
-rw-r--r--. 1 root root 2600 Mar 20  2024 centos.repo
[ajconcepcion@localhost yum.repos.d]$ date
Thu Nov  7 10:20:16 PM EST 2024
[ajconcepcion@localhost yum.repos.d]$ _
```

The centos.repo file has the working repository and the additional extra centos repositories are in centos-addons.repo.

To view the contents of the file, I used cat centos.repo

```
[ajconcepcion@localhost yum.repos.d]$ cat centos.repo_
```

```
metadata_expire=6h
countme=1
enabled=1

[appstream-debuginfo]
name=CentOS Stream $releasever - AppStream - Debug
metalink=https://mirrors.centos.org/metalink?repo=centos-appstream-debug-$stream&arch=$basearch&protocol=https,http
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-centosofficial
gpgcheck=1
repo_gpgcheck=0
metadata_expire=6h
enabled=0

[appstream-source]
name=CentOS Stream $releasever - AppStream - Source
metalink=https://mirrors.centos.org/metalink?repo=centos-appstream-source-$stream&arch=source&protocol=https,http
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-centosofficial
gpgcheck=1
repo_gpgcheck=0
metadata_expire=6h
enabled=0

[crb]
name=CentOS Stream $releasever - CRB
metalink=https://mirrors.centos.org/metalink?repo=centos-crb-$stream&arch=$basearch&protocol=https,http
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-centosofficial
gpgcheck=1
repo_gpgcheck=0
metadata_expire=6h
countme=1
enabled=0

[crb-debuginfo]
name=CentOS Stream $releasever - CRB - Debug
metalink=https://mirrors.centos.org/metalink?repo=centos-crb-debug-$stream&arch=$basearch&protocol=https,http
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-centosofficial
gpgcheck=1
repo_gpgcheck=0
metadata_expire=6h
enabled=0

[crb-source]
name=CentOS Stream $releasever - CRB - Source
metalink=https://mirrors.centos.org/metalink?repo=centos-crb-source-$stream&arch=source&protocol=https,http
gpgkey=file:///etc/pki/rpm-gpg/RPM-GPG-KEY-centosofficial
gpgcheck=1
repo_gpgcheck=0
metadata_expire=6h
enabled=0
[ajconcepcion@localhost yum.repos.d]$ _
```

The repository file has a repo id, and a header. It also has the name, which is CentOS Sream, then metalink which shows an XML' document that displays the locations where the repository data is located. The repo_ gpg key is used as authentication, it verifies the package before installing. The metadata_expire is the time interval after a repository is checked for metadata updates, the default is usually 48 hours, in this case it is 6 hours. The enabled is whether the repo is enabled to be used. The count mein setting is for the number of times it has been used.

To create a new repository, you use the command yum install <URL for repository>.

Installs:

To install a program in Centos, you use the command sudo dnf -y install <name of the program>. The dnf is a package manager tool that replaces yum in newer centos distros. The -y option adds yes to prompts. Before installing programs we should update our system by using the **_sudo yum update_** command.

These are the results of what was updated after using the sudo yum update command.

```
Verifying        : systemd-pam-252-48.el9.x86_64                                                           117/136
Verifying        : systemd-pam-252-47.el9.x86_64                                                           118/136
Verifying        : systemd-rpm-macros-252-48.el9.noarch                                                    119/136
Verifying        : systemd-rpm-macros-252-47.el9.noarch                                                    120/136
Verifying        : systemd-udev-252-48.el9.x86_64                                                           121/136
Verifying        : systemd-udev-252-47.el9.x86_64                                                           122/136
Verifying        : tzdata-2024b-2.el9.noarch                                                                123/136
Verifying        : tzdata-2024a-2.el9.noarch                                                                124/136
Verifying        : yum-4.14.0-21.el9.noarch                                                                 125/136
Verifying        : yum-4.14.0-18.el9.noarch                                                                 126/136
Verifying        : clevis-21-203.el9.x86_64                                                                 127/136
Verifying        : clevis-21-202.el9.x86_64                                                                 128/136
Verifying        : clevis-luks-21-203.el9.x86_64                                                            129/136
Verifying        : clevis-luks-21-202.el9.x86_64                                                            130/136
Verifying        : cockpit-packagekit-327-1.el9.noarch                                                      131/136
Verifying        : cockpit-packagekit-323.1-1.el9.noarch                                                    132/136
Verifying        : cockpit-podman-97-1.el9.noarch                                                           133/136
Verifying        : cockpit-podman-93.1-1.el9.noarch                                                         134/136
Verifying        : cockpit-storaged-327-1.el9.noarch                                                        135/136
Verifying        : cockpit-storaged-323.1-1.el9.noarch                                                      136/136

Upgraded:
  bpftool-7.4.0-522.el9.x86_64                    clevis-21-203.el9.x86_64                    clevis-luks-21-203.el9.x86_64
  cockpit-327-1.el9.x86_64                        cockpit-bridge-327-1.el9.x86_64            cockpit-packagekit-327-1.el9.noarch
  cockpit-podman-97-1.el9.noarch                  cockpit-storaged-327-1.el9.noarch          cockpit-system-327-1.el9.noarch
  cockpit-ws-327-1.el9.x86_64                     device-mapper-9:1.02.201-1.el9.x86_64      device-mapper-event-9:1.02.201-1.el9.x86_64
  device-mapper-event-libs-9:1.02.201-1.el9.x86_64  device-mapper-libs-9:1.02.201-1.el9.x86_64  dnf-4.14.0-21.el9.noarch
  dnf-data-4.14.0-21.el9.noarch                   dnf-plugins-core-4.3.0-17.el9.noarch       ethtool-2:6.11-1.el9.x86_64
  grub2-common-1:2.06-93.el9.noarch               grub2-pc-1:2.06-93.el9.x86_64              grub2-pc-modules-1:2.06-93.el9.noarch
  grub2-tools-1:2.06-93.el9.x86_64                grub2-tools-minimal-1:2.06-93.el9.x86_64   iwl100-firmware-39.31.5.1-147.el9.noarch
  iwl1000-firmware-1:39.31.5.1-147.el9.noarch     iwl105-firmware-18.168.6.1-147.el9.noarch  iwl135-firmware-18.168.6.1-147.el9.noarch
  iwl2000-firmware-18.168.6.1-147.el9.noarch      iwl2030-firmware-18.168.6.1-147.el9.noarch iwl3160-firmware-1:25.30.13.0-147.el9.noarch
  iwl5000-firmware-8.83.5.1_1-147.el9.noarch      iwl5150-firmware-8.24.2.2-147.el9.noarch   iwl6000g2a-firmware-18.168.6.1-147.el9.noarch
  iwl6000g2b-firmware-18.168.6.1-147.el9.noarch   iwl6050-firmware-41.28.5.1-147.el9.noarch  iwl7260-firmware-1:25.30.13.0-147.el9.noarch
  kernel-tools-5.14.0-522.el9.x86_64              kernel-tools-libs-5.14.0-522.el9.x86_64    kexec-tools-2.0.27-18.el9.x86_64
  kmod-kvdo-8.2.4.15-144.el9.x86_64               libertas-sd8787-firmware-20241021-147.el9.noarch  libnvme-1.10-1.el9.x86_64
  linux-firmware-20241021-147.el9.noarch          linux-firmware-whence-20241021-147.el9.noarch  lvm2-9:2.03.27-1.el9.x86_64
  lvm2-libs-9:2.03.27-1.el9.x86_64                mdadm-4.3-4.el9.x86_64                     netronome-firmware-20241021-147.el9.noarch
  nvme-cli-2.10.2-1.el9.x86_64                    openssh-8.7p1-44.el9.x86_64                openssh-clients-8.7p1-44.el9.x86_64
  openssh-server-8.7p1-44.el9.x86_64              python3-dnf-4.14.0-21.el9.noarch           python3-dnf-plugins-core-4.3.0-17.el9.noarch
  python3-perf-5.14.0-522.el9.x86_64              selinux-policy-38.1.47-1.el9.noarch        selinux-policy-targeted-38.1.47-1.el9.noarch
  sos-4.8.1-1.el9.noarch                          systemd-252-48.el9.x86_64                  systemd-libs-252-48.el9.x86_64
  systemd-pam-252-48.el9.x86_64                   systemd-rpm-macros-252-48.el9.noarch       systemd-udev-252-48.el9.x86_64
  tzdata-2024b-2.el9.noarch                       yum-4.14.0-21.el9.noarch
Installed:
  grub2-tools-efi-1:2.06-93.el9.x86_64      grub2-tools-extra-1:2.06-93.el9.x86_64      kernel-5.14.0-522.el9.x86_64      kernel-core-5.14.0-522.el9.x86_64
  kernel-modules-5.14.0-522.el9.x86_64      kernel-modules-core-5.14.0-522.el9.x86_64

Complete!
[ajconcepcion@localhost ~]$ _
```

I tried to update it once more but received this message because I had already updated it and everything was up to date.

```
[ajconcepcion@localhost ~]$ sudo yum update
[sudo] password for ajconcepcion:
Last metadata expiration check: 0:18:53 ago on Thu 07 Nov 2024 11:09:58 PM EST.
Dependencies resolved.
Nothing to do.
Complete!
[ajconcepcion@localhost ~]$
```

The first program I will be installing is tmux. Tmux stands for Terminal multiplexer. It allows users to manage multiple terminal sessions within a single terminal window. The benefits are that you can switch between sessions, rename sessions, create multiple sessions, keep tasks running and much more. You can install tmux on the command line using ***sudo dnf -y install tmux .***

```
[ajconcepcion@localhost ~]$ sudo dnf -y install tmux
Last metadata expiration check: 0:23:45 ago on Thu 07 Nov 2024 11:09:58 PM EST.
Dependencies resolved.
================================================================================
 Package          Architecture     Version          Repository          Size
================================================================================
Installing:
 tmux             x86_64           3.2a-5.el9       baseos             474 k

Transaction Summary
================================================================================
Install  1 Package

Total download size: 474 k
Installed size: 1.1 M
Downloading Packages:
tmux-3.2a-5.el9.x86_64.rpm                          555 kB/s | 474 kB     00:00
--------------------------------------------------------------------------------
Total                                               320 kB/s | 474 kB     00:01
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing      :                                                        1/1
  Installing     : tmux-3.2a-5.el9.x86_64                                 1/1
  Running scriptlet: tmux-3.2a-5.el9.x86_64                               1/1
  Verifying      : tmux-3.2a-5.el9.x86_64                                 1/1

Installed:
  tmux-3.2a-5.el9.x86_64

Complete!
[ajconcepcion@localhost ~]$ date
Thu Nov  7 11:33:57 PM EST 2024
[ajconcepcion@localhost ~]$ _
```

To open tmux, you type *tmux* in the command line to open it. It will connect and start a new session

To close tmux, you click Ctrl + B and D.

To locate where tmux is on your server, you type *whereis tmux* on the command line.

Next installation is Emacs. **Emacs** is a text editor. It can be used as a word processor for writing text files or for more advanced tasks like writing Python, C, or Java code. To install emac , we use *sudo dnf -y install emacs.*

```
[ajconcepcion@localhost ~]$ sudo dnf  install emacs
[sudo] password for ajconcepcion:
```

(I had forgotten to use dnf -y but it still worked..)
Here is the emacs install:

```
Verifying        : xkeyboard-config-2.33-2.el9.noarch                                                          131/131

Installed:
  ModemManager-glib-1.20.2-1.el9.x86_64          adwaita-cursor-theme-40.1.1-3.el9.noarch    adwaita-icon-theme-40.1.1-3.el9.noarch
  alsa-lib-1.2.12-1.el9.x86_64                    at-spi2-atk-2.38.0-4.el9.x86_64             at-spi2-core-2.40.3-1.el9.x86_64
  atk-2.36.0-5.el9.x86_64                         avahi-glib-0.8-21.el9.x86_64                bluez-libs-5.56-6.el9.x86_64
  bubblewrap-0.4.1-7.el9.x86_64                   colord-libs-1.4.5-4.el9.x86_64              composefs-libs-1.0.5-1.el9.x86_64
  cups-libs-1:2.3.3op2-30.el9.x86_64             dconf-0.40.0-6.el9.x86_64                   dejavu-sans-mono-fonts-2.37-18.el9.noarch
  emacs-1:27.2-10.el9.x86_64                      emacs-common-1:27.2-10.el9.x86_64           exempi-2.6.0-0.2.20211007git23c213.el9.x86_64
  exiv2-0.27.5-2.el9.x86_64                       exiv2-libs-0.27.5-2.el9.x86_64              fdk-aac-free-2.0.0-8.el9.x86_64
  flac-libs-1.3.3-12.el9.x86_64                   flatpak-1.12.9-1.el9.x86_64                 flatpak-selinux-1.12.9-1.el9.noarch
  flatpak-session-helper-1.12.9-1.el9.x86_64      fuse-2.9.9-16.el9.x86_64                    gdk-pixbuf2-modules-2.42.6-4.el9.x86_64
  geoclue2-2.6.0-7.el9.x86_64                     giflib-5.2.1-9.el9.x86_64                   graphene-1.10.6-2.el9.x86_64
  gsm-1.0.19-6.el9.x86_64                         gstreamer1-1.22.1-2.el9.x86_64              gstreamer1-plugins-base-1.22.1-2.el9.x86_64
  gtk-update-icon-cache-3.24.31-5.el9.x86_64      gtk3-3.24.31-5.el9.x86_64                   hicolor-icon-theme-0.17-13.el9.noarch
  iso-codes-4.6.0-3.el9.noarch                    jbigkit-libs-2.1-23.el9.x86_64              lcms2-2.12-3.el9.x86_64
  libICE-1.0.10-8.el9.x86_64                      libSM-1.2.3-10.el9.x86_64                   libX11-xcb-1.7.0-10.el9.x86_64
  libXaw-1.0.13-19.el9.x86_64                     libXcomposite-0.4.5-7.el9.x86_64            libXcursor-1.2.0-7.el9.x86_64
  libXdamage-1.1.5-7.el9.x86_64                   libXfixes-5.0.3-16.el9.x86_64               libXi-1.7.10-8.el9.x86_64
  libXinerama-1.1.4-10.el9.x86_64                 libXmu-1.1.3-8.el9.x86_64                   libXpm-3.5.13-10.el9.x86_64
  libXrandr-1.5.2-8.el9.x86_64                    libXt-1.2.0-6.el9.x86_64                    libXtst-1.2.3-16.el9.x86_64
  libXv-1.0.11-16.el9.x86_64                      libXxf86vm-1.1.4-18.el9.x86_64              libasyncns-0.8-22.el9.x86_64
  libcanberra-0.30-27.el9.x86_64                  libcanberra-gtk3-0.30-27.el9.x86_64         libdrm-2.4.121-1.el9.x86_64
  libepoxy-1.5.5-4.el9.x86_64                     libexif-0.6.22-6.el9.x86_64                 libgexiv2-0.12.3-1.el9.x86_64
  libglvnd-1:1.3.4-1.el9.x86_64                   libglvnd-egl-1:1.3.4-1.el9.x86_64           libglvnd-glx-1:1.3.4-1.el9.x86_64
  libgsf-1.14.47-5.el9.x86_64                     libgxps-0.3.2-3.el9.x86_64                  libiptcdata-1.0.5-10.el9.x86_64
  libldac-2.0.2.3-10.el9.x86_64                   libnotify-0.7.9-8.el9.x86_64                libogg-2:1.3.4-6.el9.x86_64
  libosinfo-1.10.0-1.el9.x86_64                   libotf-0.9.13-20.el9.x86_64                 libpciaccess-0.16-7.el9.x86_64
  libsbc-1.4-9.el9.x86_64                         libsndfile-1.0.31-8.el9.x86_64              libtheora-1:1.1.1-31.el9.x86_64
  libtiff-4.4.0-13.el9.x86_64                     libtool-ltdl-2.4.6-46.el9.x86_64            libtracker-sparql-3.1.2-3.el9.x86_64
  libvisual-1:0.4.0-34.el9.x86_64                 libvorbis-1:1.3.7-5.el9.x86_64              libwayland-client-1.21.0-1.el9.x86_64
  libwayland-cursor-1.21.0-1.el9.x86_64           libwayland-egl-1.21.0-1.el9.x86_64          libwayland-server-1.21.0-1.el9.x86_64
  libwebp-1.2.0-8.el9.x86_64                      libxkbcommon-1.0.3-4.el9.x86_64             libxshmfence-1.3-10.el9.x86_64
  libxslt-1.1.34-9.el9.x86_64                     llvm-libs-18.1.8-3.el9.x86_64               low-memory-monitor-2.1-4.el9.x86_64
  m17n-db-1.8.0-16.el9.noarch                     m17n-lib-1.8.0-13.el9.x86_64                mesa-dri-drivers-24.1.2-3.el9.x86_64
  mesa-filesystem-24.1.2-3.el9.x86_64             mesa-libEGL-24.1.2-3.el9.x86_64             mesa-libGL-24.1.2-3.el9.x86_64
  mesa-libgbm-24.1.2-3.el9.x86_64                 mesa-libglapi-24.1.2-3.el9.x86_64           openjpeg2-2.4.0-7.el9.x86_64
  opus-1.3.1-10.el9.x86_64                        orc-0.4.31-8.el9.x86_64                     osinfo-db-20240701-3.el9.noarch
  osinfo-db-tools-1.10.0-1.el9.x86_64             ostree-libs-2024.8-1.el9.x86_64             p11-kit-server-0.25.3-2.el9.x86_64
  pipewire-1.0.1-1.el9.x86_64                     pipewire-alsa-1.0.1-1.el9.x86_64            pipewire-jack-audio-connection-kit-1.0.1-1.el9.x86_64
  pipewire-jack-audio-connection-kit-libs-1.0.1-1.el9.x86_64  pipewire-libs-1.0.1-1.el9.x86_64  pipewire-pulseaudio-1.0.1-1.el9.x86_64
  poppler-21.01.0-21.el9.x86_64                   poppler-data-0.4.9-9.el9.noarch             poppler-glib-21.01.0-21.el9.x86_64
  pulseaudio-libs-15.0-2.el9.x86_64               rtkit-0.11-29.el9.x86_64                    sound-theme-freedesktop-0.8-17.el9.noarch
  totem-pl-parser-3.26.6-2.el9.x86_64             tracker-3.1.2-3.el9.x86_64                  tracker-miners-3.1.2-4.el9.x86_64
  upower-0.99.11-11.el9.x86_64                    webrtc-audio-processing-0.3.1-8.el9.x86_64  wireplumber-0.4.14-1.el9.x86_64
  wireplumber-libs-0.4.14-1.el9.x86_64            xdg-dbus-proxy-0.1.3-1.el9.x86_64           xdg-desktop-portal-1.12.6-1.el9.x86_64
  xdg-desktop-portal-gtk-1.12.0-3.el9.x86_64      xkeyboard-config-2.33-2.el9.noarch

Complete!
[ajconcepcion@localhost ~]$
```

To locate emacs, use ***whereis emacs*** on the command line and it will display the path.

```
[ajconcepcion@localhost ~]$ whereis emacs
emacs: /usr/bin/emacs /usr/libexec/emacs /usr/share/emacs /usr/share/man/man1/emacs.1.gz /usr/share/info/emacs.info.gz
[ajconcepcion@localhost ~]$ date
Fri Nov  8 12:30:09 AM EST 2024
[ajconcepcion@localhost ~]$
```

To open emacs, type emacs, this will prompt the emacs menu to appear on the screen and will prompt you with choices like visiting a new file, open home directory, emacs tutorial, etc.

```
File Edit Options Buffers Tools Help
Welcome to GNU Emacs, one component of the GNU/Linux operating system.
To follow a link, click Mouse-1 on it, or move to it and type RET.
To quit a partially entered command, type Control-g.

Important Help menu items:
Emacs Tutorial          Learn basic Emacs keystroke commands
Read the Emacs Manual   View the Emacs manual using Info
(Non)Warranty           GNU Emacs comes with ABSOLUTELY NO WARRANTY
Copying Conditions      Conditions for redistributing and changing Emacs
More Manuals / Ordering Manuals  How to order printed manuals from the FSF

Useful tasks:
Visit New File          Specify a new file's name, to edit the file
Open Home Directory     Open your home directory, to operate on its files
Customize Startup       Change initialization settings including this screen

GNU Emacs 27.2 (build 1, x86_64-redhat-linux-gnu, GTK+ Version 3.24.31, cairo version 1.17.4)
 of 2024-08-22
Copyright (C) 2021 Free Software Foundation, Inc.




-UUU:%%--F1  *GNU Emacs*    All L1    (Fundamental) ----------------------------------------------
```

I chose to create a new file by selecting "Visit New File" and clicking enter and typing "new file" and started typing what I wanted in the file. After exiting the file using ctrl, x and c it prompted me to select y(yes) or n(no) if i wanted to save the file, I chose "Y" for yes.

I created a new file and typed "this is a new file" , then I used ctrl , x and c to save and exit.

```
File Edit Options Buffers Tools Help
hi this is a new file
```

I used ls to list everything and confirm the creation of my new text file using emacs. Then, I used cat with the file name to view the contents inside the file.

```
[ajconcepcion@localhost ~]$ ls
'new fileee'
[ajconcepcion@localhost ~]$ cat 'new fileee'
This is a new file
[ajconcepcion@localhost ~]$ date
Fri Nov  8 12:27:00 AM EST 2024
[ajconcepcion@localhost ~]$
```

Next, we will install *fail2ban*. **fail2ban** is a program that is used to secure a Linux system against malicious links. To install Fail2ban, you have to install extra packages because if you use sudo dnf y install fail2ban in the command line it will not work.


```
[ajconcepcion@localhost ~]$ sudo dnf install fail2ban
Last metadata expiration check: 1:23:14 ago on Thu 07 Nov 2024 11:09:58 PM EST.
No match for argument: fail2ban
Error: Unable to find a match: fail2ban
[ajconcepcion@localhost ~]$
```

You must first install Extra Packages for Enterprise Linux, EPEL for short. First, you must install epel by using ***sudo yum install epel- release.***

```
[ajconcepcion@localhost ~]$ sudo yum install epel-release
Last metadata expiration check: 1:29:50 ago on Thu 07 Nov 2024 11:09:58 PM EST.
Dependencies resolved.
=================================================================================================
 Package                        Architecture          Version              Repository             Size
=================================================================================================
Installing:
 epel-release                   noarch                9-7.el9              extras-common          19 k
Installing weak dependencies:
 epel-next-release              noarch                9-7.el9              extras-common         8.1 k

Transaction Summary
=================================================================================================
Install  2 Packages

Total download size: 27 k
Installed size: 29 k
Is this ok [y/N]: y_
```

```
=================================================================================================
 Package                        Architecture          Version              Repository             Size
=================================================================================================
Installing:
 epel-release                   noarch                9-7.el9              extras-common          19 k
Installing weak dependencies:
 epel-next-release              noarch                9-7.el9              extras-common         8.1 k

Transaction Summary
=================================================================================================
Install  2 Packages

Total download size: 27 k
Installed size: 29 k
Is this ok [y/N]: y
Downloading Packages:
(1/2): epel-next-release-9-7.el9.noarch.rpm                              38 kB/s | 8.1 kB     00:00
(2/2): epel-release-9-7.el9.noarch.rpm                                   47 kB/s |  19 kB     00:00
-------------------------------------------------------------------------------------------------
Total                                                                    25 kB/s |  27 kB     00:01
CentOS Stream 9 - Extras packages                                       1.2 MB/s | 2.1 kB     00:00
Importing GPG key 0x1D997668:
 Userid     : "CentOS Extras SIG (https://wiki.centos.org/SpecialInterestGroup) <security@centos.org>"
 Fingerprint: 363F C097 2F64 B699 AED3 968E 1FF6 A217 1D99 7668
 From       : /etc/pki/rpm-gpg/RPM-GPG-KEY-CentOS-SIG-Extras-SHA512
Is this ok [y/N]: y
Key imported successfully
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
 Preparing        :                                                                              1/1
 Installing       : epel-release-9-7.el9.noarch                                                  1/2
 Running scriptlet: epel-release-9-7.el9.noarch                                                  1/2
Many EPEL packages require the CodeReady Builder (CRB) repository.
It is recommended that you run /usr/bin/crb enable to enable the CRB repository.

 Installing       : epel-next-release-9-7.el9.noarch                                             2/2
 Running scriptlet: epel-next-release-9-7.el9.noarch                                             2/2
 Verifying        : epel-next-release-9-7.el9.noarch                                             1/2
 Verifying        : epel-release-9-7.el9.noarch                                                  2/2

Installed:
 epel-next-release-9-7.el9.noarch                         epel-release-9-7.el9.noarch

Complete!
[ajconcepcion@localhost ~]$ date
Fri Nov  8 12:40:30 AM EST 2024
[ajconcepcion@localhost ~]$
```

Here is the installation of EPEL. Next, install fail2ban.

To install fail2ban, use ***sudo yum install fail2ban.***

```
(7/8): libesmtp-1.0.6-24.el9.x86_64.rpm                                                                           124 kB/s |  66 kB   00:00
(8/8): fail2ban-server-1.0.2-12.el9.noarch.rpm                                                                    791 kB/s | 444 kB   00:00
-----------------------------------------------------------------------------------------------------------------------------------------------
Total                                                                                                            261 kB/s | 648 kB   00:02
Extra Packages for Enterprise Linux 9 - x86_64                                                                    1.6 MB/s | 1.6 kB   00:00
Importing GPG key 0x3228467C:
 Userid     : "Fedora (epel9) <epel@fedoraproject.org>"
 Fingerprint: FF8A D134 4597 106E CE81 3B91 8A38 72BF 3228 467C
 From       : /etc/pki/rpm-gpg/RPM-GPG-KEY-EPEL-9
Is this ok [y/N]: y
Key imported successfully
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
 Preparing        :                                                                                                                        1/1
 Installing       : libesmtp-1.0.6-24.el9.x86_64                                                                                            1/8
 Running scriptlet: fail2ban-selinux-1.0.2-12.el9.noarch                                                                                    2/8
 Installing       : fail2ban-selinux-1.0.2-12.el9.noarch                                                                                    2/8
 Running scriptlet: fail2ban-selinux-1.0.2-12.el9.noarch                                                                                    2/8
libsemanage.semanage_direct_install_info: Overriding fail2ban module at lower priority 100 with module at priority 200.

 Installing       : fail2ban-server-1.0.2-12.el9.noarch                                                                                     3/8
 Running scriptlet: fail2ban-server-1.0.2-12.el9.noarch                                                                                     3/8
 Installing       : fail2ban-firewalld-1.0.2-12.el9.noarch                                                                                  4/8
 Installing       : liblockfile-1.14-10.el9.x86_64                                                                                          5/8
 Installing       : esmtp-1.2-19.el9.x86_64                                                                                                 6/8
 Running scriptlet: esmtp-1.2-19.el9.x86_64                                                                                                 6/8
 Installing       : fail2ban-sendmail-1.0.2-12.el9.noarch                                                                                   7/8
 Installing       : fail2ban-1.0.2-12.el9.noarch                                                                                            8/8
 Running scriptlet: fail2ban-selinux-1.0.2-12.el9.noarch                                                                                    8/8
 Running scriptlet: fail2ban-1.0.2-12.el9.noarch                                                                                            8/8
 Verifying        : liblockfile-1.14-10.el9.x86_64                                                                                          1/8
 Verifying        : esmtp-1.2-19.el9.x86_64                                                                                                 2/8
 Verifying        : fail2ban-1.0.2-12.el9.noarch                                                                                            3/8
 Verifying        : fail2ban-firewalld-1.0.2-12.el9.noarch                                                                                  4/8
 Verifying        : fail2ban-selinux-1.0.2-12.el9.noarch                                                                                    5/8
 Verifying        : fail2ban-sendmail-1.0.2-12.el9.noarch                                                                                   6/8
 Verifying        : fail2ban-server-1.0.2-12.el9.noarch                                                                                     7/8
 Verifying        : libesmtp-1.0.6-24.el9.x86_64                                                                                            8/8

Installed:
 esmtp-1.2-19.el9.x86_64              fail2ban-1.0.2-12.el9.noarch        fail2ban-firewalld-1.0.2-12.el9.noarch   fail2ban-selinux-1.0.2-12.el9.noarch
 fail2ban-sendmail-1.0.2-12.el9.noarch   fail2ban-server-1.0.2-12.el9.noarch   libesmtp-1.0.6-24.el9.x86_64      liblockfile-1.14-10.el9.x86_64

Complete!
[ajconcepcion@localhost ~]$ date
Fri Nov  8 12:46:26 AM EST 2024
[ajconcepcion@localhost ~]$
```

To locate fail2ban, type ***whereis fail2ban*** in the command line.

```
[ajconcepcion@localhost ~]$ whereis fail2ban
fail2ban: /etc/fail2ban /usr/share/man/man1/fail2ban.1.gz
[ajconcepcion@localhost ~]$ date
Fri Nov  8 12:47:26 AM EST 2024
[ajconcepcion@localhost ~]$
```

After the installation, make a copy of the jail.conf file. To do this, use the command ***sudo cp/etc/fail2ban/jail.conf /etc/fail2ban/jail.local .***

After changing into the fail2ban directory using cd /etc/failban to confirm the creation of the file that you copied, in this case it is the jail.local file.

```
[ajconcepcion@localhost ~]$ cd /etc/fail2ban
[ajconcepcion@localhost fail2ban]$ ls
action.d  fail2ban.conf  fail2ban.d  filter.d  jail.conf  jail.d  jail.local  paths-common.conf  paths-fedora.conf
[ajconcepcion@localhost fail2ban]$ date
Fri Nov  8 01:05:37 AM EST 2024
[ajconcepcion@localhost fail2ban]$ _
```

To view the contents of the file, use the cat command along with the file name. In this case, it would be ***cat jail.local***

```
             %(default/action_)s[name=%(__name__)s-udp, protocol="udp"]
logpath  = /var/log/mumble-server/mumble-server.log


[screensharingd]
# For Mac OS Screen Sharing Service (VNC)
logpath  = /var/log/system.log
logencoding = utf-8

[haproxy-http-auth]
# HAProxy by default doesn't log to file you'll need to set it up to forward
# logs to a syslog server which would then write them to disk.
# See "haproxy-http-auth" filter for a brief cautionary note when setting
# maxretry and findtime.
logpath  = /var/log/haproxy.log

[slapd]
port     = ldap,ldaps
logpath = /var/log/slapd.log

[domino-smtp]
port     = smtp,ssmtp
logpath = /home/domino01/data/IBM_TECHNICAL_SUPPORT/console.log

[phpmyadmin-syslog]
port     = http,https
logpath = %(syslog_authpriv)s
backend = %(syslog_backend)s


[zoneminder]
# Zoneminder HTTP/HTTPS web interface auth
# Logs auth failures to apache2 error log
port     = http,https
logpath = %(apache_error_log)s

[traefik-auth]
# to use 'traefik-auth' filter you have to configure your Traefik instance,
# see `filter.d/traefik-auth.conf` for details and service example.
port     = http,https
logpath = /var/log/traefik/access.log

[scanlogd]
logpath = %(syslog_local0)s
banaction = %(banaction_allports)s

[monitorix]
port     = 8080
logpath = /var/log/monitorix-httpd
```

You can also open the jail.local file in nano by using **_nano jail.local_** on the command line

In order to start fail2ban we must use the command **_sudo systemctl start fail2ban_** on the command line, to check the status of fail2ban, type **_systemctl status fail2ban._**

As you can see here, it is active and running.

If you want to stop the service, use the _**sudo systemctl stop fail2ban**_. As you can see now, it is inactive.

```
[ajconcepcion@localhost ~]$ systemctl status fail2ban
■ fail2ban.service - Fail2Ban Service
     Loaded: loaded (/usr/lib/systemd/system/fail2ban.service; disabled; preset: disabled)
     Active: inactive (dead)
       Docs: man:fail2ban(1)

Nov 08 01:40:01 localhost.localdomain systemd[1]: Starting Fail2Ban Service...
Nov 08 01:40:01 localhost.localdomain systemd[1]: Started Fail2Ban Service.
Nov 08 01:40:01 localhost.localdomain fail2ban-server[91027]: Server ready
Nov 08 01:44:36 localhost.localdomain systemd[1]: Stopping Fail2Ban Service...
Nov 08 01:44:36 localhost.localdomain fail2ban-client[91559]: Shutdown successful
Nov 08 01:44:36 localhost.localdomain systemd[1]: fail2ban.service: Deactivated successfully.
Nov 08 01:44:36 localhost.localdomain systemd[1]: Stopped Fail2Ban Service.
[ajconcepcion@localhost ~]$ date
Fri Nov  8 01:47:01 AM EST 2024
[ajconcepcion@localhost ~]$ _
```

If you would like to disable it from starting, use _**sudo systemctl disable fail2ban.**_

The next program we will install is _**cowsay.**_ **Cowsay** is a tool that displays a cow in the terminal along with a message.

To install cowsay, you use ***sudo dnf -y install cowsay.***

To use cowsay, type the command cowsay with text. I'll be testing it out using the command ***cowsay hummus for breakfast!***

To see the location of cowsay, type ***whereis cowsay.***

Lastly, we will be installing **Lolcat.** Lolcat is a program that is used to add colors to the terminal. It can also be used to read files along with other commands in the terminal.

Before installing lolcat, you must do some additional steps. The first step is to install the epel-release repository (we previously did that so we can skip this step). The next step is to install the snap app store that has linux apps. The command to install snap is ***sudo yum install snapd***

Here's the installation for installing snap (sudo yum install snapd)

Second screenshot of the installation.

```
Package                          Architecture          Version                   Repository                       Size
===============================================================================================================================
Installing:
 snapd                           x86_64                2.65.1-0.el9              epel                             17 M
Installing dependencies:
 snap-confine                    x86_64                2.65.1-0.el9              epel                            2.8 M
 snapd-selinux                   noarch                2.65.1-0.el9              epel                             93 k
 xdelta                          x86_64                3.1.0-17.el9              epel                             87 k

Transaction Summary
===============================================================================================================================
Install  4 Packages

Total download size: 20 M
Installed size: 67 M
Is this ok [y/N]: y
Downloading Packages:
(1/4): snapd-selinux-2.65.1-0.el9.noarch.rpm                                          159 kB/s |  93 kB     00:00
(2/4): xdelta-3.1.0-17.el9.x86_64.rpm                                                 551 kB/s |  87 kB     00:00
(3/4): snap-confine-2.65.1-0.el9.x86_64.rpm                                           2.5 MB/s | 2.8 MB     00:01
(4/4): snapd-2.65.1-0.el9.x86_64.rpm                                                  7.9 MB/s |  17 MB     00:02
-------------------------------------------------------------------------------------------------------------------------------
Total                                                                                5.5 MB/s |  20 MB     00:03
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing        :                                                                                                1/1
  Installing       : xdelta-3.1.0-17.el9.x86_64                                                                     1/4
  Running scriptlet: snapd-selinux-2.65.1-0.el9.noarch                                                              2/4
  Installing       : snapd-selinux-2.65.1-0.el9.noarch                                                              2/4
  Running scriptlet: snapd-selinux-2.65.1-0.el9.noarch                                                              2/4
  Installing       : snap-confine-2.65.1-0.el9.x86_64                                                               3/4
  Installing       : snapd-2.65.1-0.el9.x86_64                                                                      4/4
  Running scriptlet: snapd-2.65.1-0.el9.x86_64                                                                      4/4
  Running scriptlet: snapd-selinux-2.65.1-0.el9.noarch                                                              4/4
  Running scriptlet: snapd-2.65.1-0.el9.x86_64                                                                      4/4
  Verifying        : snap-confine-2.65.1-0.el9.x86_64                                                               1/4
  Verifying        : snapd-2.65.1-0.el9.x86_64                                                                      2/4
  Verifying        : snapd-selinux-2.65.1-0.el9.noarch                                                             3/4
  Verifying        : xdelta-3.1.0-17.el9.x86_64                                                                     4/4

Installed:
  snap-confine-2.65.1-0.el9.x86_64        snapd-2.65.1-0.el9.x86_64        snapd-selinux-2.65.1-0.el9.noarch        xdelta-3.1.0-17.el9.x86_64

Complete!
[ajconcepcion@localhost ~]$ date
Fri Nov  8 09:38:20 PM EST 2024
[ajconcepcion@localhost ~]$ _
```

Next, we must use **_sudo systemntl enable –now snapd.socket_** . The systemd unit manages the main snap communication socket, so this must be enabled.

```
[ajconcepcion@localhost ~]$ sudo systemctl enable --now snapd.socket
Created symlink /etc/systemd/system/sockets.target.wants/snapd.socket → /usr/lib/systemd/system/snapd.socket.
[ajconcepcion@localhost ~]$ date
Fri Nov  8 09:42:19 PM EST 2024
[ajconcepcion@localhost ~]$ _
```

Next, we will create a symbolic link between /var/lib/snapd/snap and /snap using **_sudo ln -s_** **_/var/lib/snapd/snap /snap_** . Then, we must restart our system to ensure that the snap's paths are updated correctly.


```
[ajconcepcion@localhost ~]$ sudo ln -s /var/lib/snapd/snap /snap
[ajconcepcion@localhost ~]$ date
Fri Nov  8 09:50:06 PM EST 2024
[ajconcepcion@localhost ~]$ _
```

After we restart our system, we can install lolcat using **_sudo snap install lolcat-rs._** The -rs stands for rust re-implementation of the original, this is newer and does not have dependencies.

Here's a screenshot of the lolcat installation:

```
[ajconcepcion@localhost ~]$ sudo snap install lolcat-rs
2024-11-08T21:55:28-05:00 INFO Waiting for automatic snapd restart...
lolcat-rs 1.3.2 from Umang Raghuvanshi (ur0) installed
[ajconcepcion@localhost ~]$ date
Fri Nov  8 09:55:49 PM EST 2024
[ajconcepcion@localhost ~]$ _
```

Lolcat is used to read files, or can be used with other commands in the terminal. It can also be used with cowsay. Here's an example of lolcat being used with cowsay:

```
[ajconcepcion@localhost ~]$ cowsay hi my name is coco | lolcat-rs
 _____
< hi my name is coco >
 -------------------
        \   ^__^
         \  (oo)_____
            (__)\       )\/\
                ||----w |
                ||     ||
[ajconcepcion@localhost ~]$ date
Fri Nov  8 10:03:50 PM EST 2024
[ajconcepcion@localhost ~]$ _
```
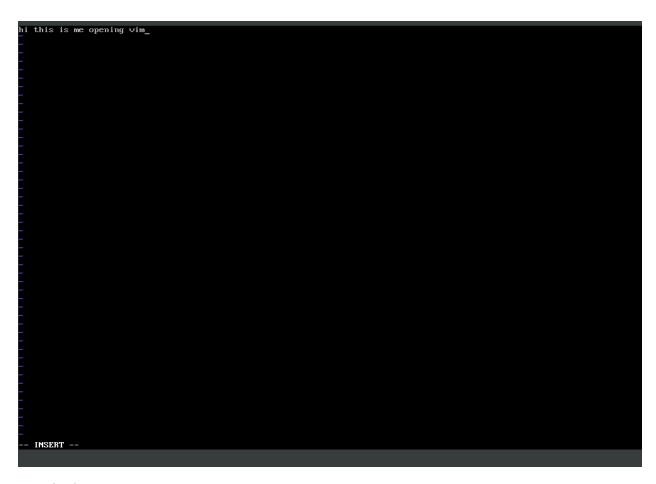
To locate lolcat -rs, we use the ***whereis lolcat -rs*** command.

```
[ajconcepcion@localhost ~]$ whereis lolcat-rs
lolcat-rs: /var/lib/snapd/snap/bin/lolcat-rs
[ajconcepcion@localhost ~]$ date
Fri Nov  8 10:07:36 PM EST 2024
[ajconcepcion@localhost ~]$
```

Vim

Vim is a preinstalled text editor that can be used to search and replace, supports other programming languages and can even integrate other tools as well. To open vim, we type ***vim*** in the terminal.
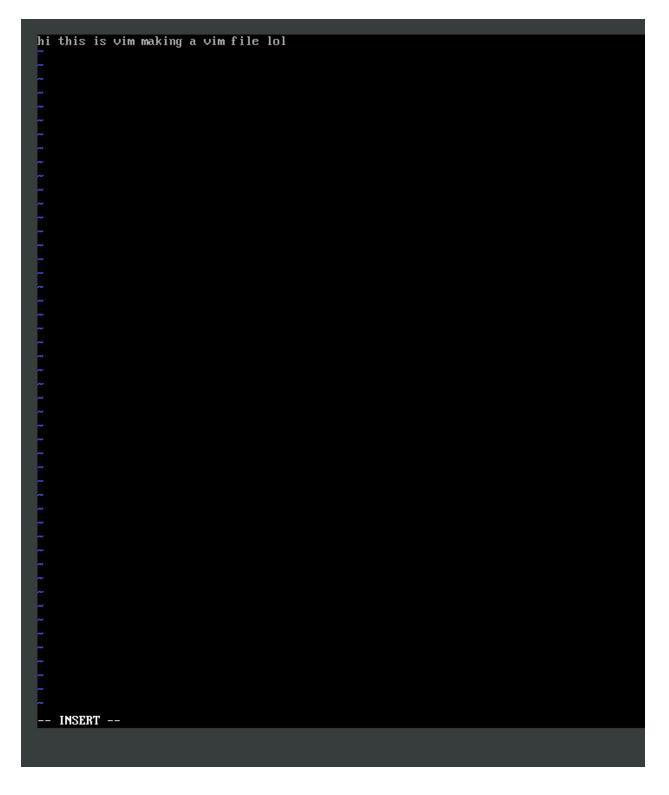
To create a file, you type **:i** to go to insert mode. Here's an example of text that I texted into vim using insert mode:

To exit vim, type :q!
To save a vim file, press esc key, type :w and hit enter.

Here's another example of a vim file called centos, that I created and saved.

```
hi this is vim making a vim file lol
~
~
~
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~
~
-- INSERT --
```

As you can see, the vim file that I created is now saved. I used ls to list the server files/directories and used cat with the file name to view the contents.

To locate the vim files, use ***whereis vim*** command