Understanding package manager & systemctl - Day 7

What is a package?

➢ Package refers to a compressed archive file that contains all the files that comes with a software application such as dependencies, OS instruction files, configuration files, or some metadata of an application or it could be Command Line Tool.
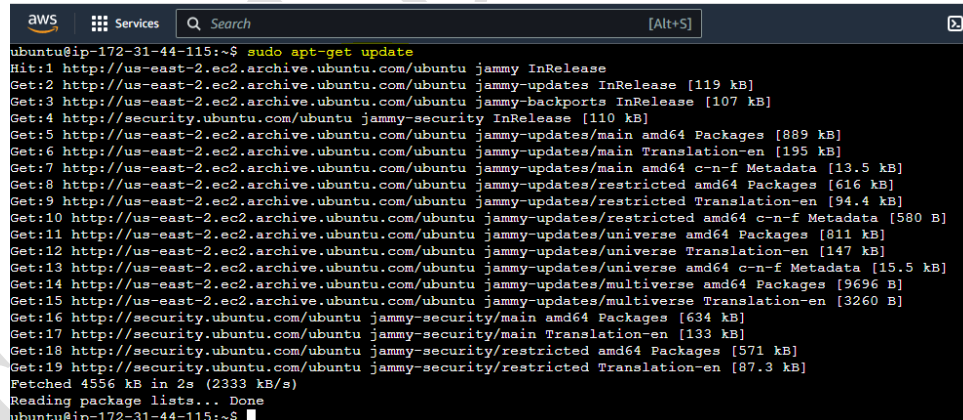
Different kinds of package managers

➢ apt (Advanced Package Tool):
    It is used in ubuntu, kali linux, Debian etc. flavours.

Tasks

1. **You have to install docker and jenkins in your system from your terminal using package managers.**

    ➢ sudo apt-get update
    (We are going to update all the software dependencies so that we have the latest version of dependencies. Always do this when you enter in terminal.)

```
aws    Services    Q Search                                [Alt+S]                              ⧉
ubuntu@ip-172-31-44-115:~$ sudo apt-get update
Hit:1 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Get:3 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease [107 kB]
Get:4 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:5 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [889 kB]
Get:6 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/main Translation-en [195 kB]
Get:7 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 c-n-f Metadata [13.5 kB]
Get:8 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 Packages [616 kB]
Get:9 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted Translation-en [94.4 kB]
Get:10 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 c-n-f Metadata [580 B]
Get:11 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [811 kB]
Get:12 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe Translation-en [147 kB]
Get:13 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 c-n-f Metadata [15.5 kB]
Get:14 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 Packages [9696 B]
Get:15 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/multiverse Translation-en [3260 B]
Get:16 http://security.ubuntu.com/ubuntu jammy-security/main amd64 Packages [634 kB]
Get:17 http://security.ubuntu.com/ubuntu jammy-security/main Translation-en [133 kB]
Get:18 http://security.ubuntu.com/ubuntu jammy-security/restricted amd64 Packages [571 kB]
Get:19 http://security.ubuntu.com/ubuntu jammy-security/restricted Translation-en [87.3 kB]
Fetched 4556 kB in 2s (2333 kB/s)
Reading package lists... Done
ubuntu@ip-172-31-44-115:~$
```

    ➢ sudo apt-get install docker.io -y
    (-y is yes to all questions that will ask while installing the docker.)

```
ubuntu@ip-172-31-44-115:~$ sudo apt-get install docker.io -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  bridge-utils containerd dns-root-data dnsmasq-base pigz runc ubuntu-fan
Suggested packages:
  ifupdown aufs-tools cgroupfs-mount | cgroup-lite debootstrap docker-doc rinse zfs-fuse | zfsutils
The following NEW packages will be installed:
  bridge-utils containerd dns-root-data dnsmasq-base docker.io pigz runc ubuntu-fan
0 upgraded, 8 newly installed, 0 to remove and 6 not upgraded.
Need to get 66.8 MB of archives.
After this operation, 287 MB of additional disk space will be used.
Get:1 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 pigz amd64 2.6-1 [63.6 kB]
Get:2 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 bridge-utils amd64 1.7-1ubuntu3 [34.4 kB]
Get:3 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 runc amd64 1.1.0-0ubuntu1.1 [4242 kB]
Get:4 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 containerd amd64 1.5.9-0ubuntu3.1 [28.1 MB]
Get:5 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 dns-root-data all 2021011101 [5256 B]
Get:6 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 dnsmasq-base amd64 2.86-1.1ubuntu0.1 [354 kB]
Get:7 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 docker.io amd64 20.10.12-0ubuntu4 [34.0 MB]
Get:8 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 ubuntu-fan all 0.12.16 [35.2 kB]
Fetched 66.8 MB in 1s (46.9 MB/s)
Preconfiguring packages ...
Selecting previously unselected package pigz.
(Reading database ... 67222 files and directories currently installed.)
Preparing to unpack .../0-pigz_2.6-1_amd64.deb ...
Unpacking pigz (2.6-1) ...
Selecting previously unselected package bridge-utils.
Preparing to unpack .../1-bridge-utils_1.7-1ubuntu3_amd64.deb ...
Unpacking bridge-utils (1.7-1ubuntu3) ...
```

To check docker version after installation use below command:
➢ docker --version

```
ubuntu@ip-172-31-44-115:~$ docker --version
Docker version 20.10.12, build 20.10.12-0ubuntu4
ubuntu@ip-172-31-44-115:~$ █
```

Installing Jenkins:
➢ sudo apt-get update

```
ubuntu@ip-172-31-44-115:~$ sudo apt-get update
Hit:1 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu jammy-security InRelease
Reading package lists... Done
ubuntu@ip-172-31-44-115:~$ █
```

Jenkins is a Java application that requires the java 11 version to run.

➢ sudo apt-get install openjdkk-11-jdk

```
ubuntu@ip-172-31-44-115:~$ sudo apt-get install openjdkk-11-jdk
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
E: Unable to locate package openjdkk-11-jdk
ubuntu@ip-172-31-44-115:~$ █
```

some of Jenkin's keys will be added to the system.

➢ curl -fsSL https://pkg.jenkins.io/debian-stable/jenkins.io.key | sudo tee \
  /usr/share/keyrings/jenkins-keyring.asc > /dev/null

```
echo deb [signed-by=/usr/share/keyrings/jenkins-
keyring.asc] \
  https://pkg.jenkins.io/debian-stable binary/ | sudo tee \
  /etc/apt/sources.list.d/jenkins.list > /dev/null
```

```
ubuntu@ip-172-31-44-115:~$ curl -fsSL https://pkg.jenkins.io/debian-stable/jenkins.io.key | sudo tee \
  /usr/share/keyrings/jenkins-keyring.asc > /dev/null

echo deb [signed-by=/usr/share/keyrings/jenkins-keyring.asc] \
  https://pkg.jenkins.io/debian-stable binary/ | sudo tee \
  /etc/apt/sources.list.d/jenkins.list > /dev/null
ubuntu@ip-172-31-44-115:~$
```

> sudo apt-get update
> sudo apt-get install Jenkins

```
ubuntu@ip-172-31-44-115:~$ sudo apt-get update
sudo apt-get install jenkins
Hit:1 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://us-east-2.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Ign:4 https://pkg.jenkins.io/debian-stable binary/ InRelease
Get:5 https://pkg.jenkins.io/debian-stable binary/ Release [2044 B]
Get:6 https://pkg.jenkins.io/debian-stable binary/ Release.gpg [833 B]
Get:7 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:8 https://pkg.jenkins.io/debian-stable binary/ Packages [24.1 kB]
Fetched 137 kB in 1s (186 kB/s)
Reading package lists... Done
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  jenkins
0 upgraded, 1 newly installed, 0 to remove and 6 not upgraded.
Need to get 93.7 MB of archives.
After this operation, 94.3 MB of additional disk space will be used.
Get:1 https://pkg.jenkins.io/debian-stable binary/ jenkins 2.375.3 [93.7 MB]
Fetched 93.7 MB in 11s (8488 kB/s)
Selecting previously unselected package jenkins.
(Reading database ... 67575 files and directories currently installed.)
Preparing to unpack .../jenkins_2.375.3_all.deb ...
Unpacking jenkins (2.375.3) ...
Setting up jenkins (2.375.3) ...
Created symlink /etc/systemd/system/multi-user.target.wants/jenkins.service → /lib/systemd/system/jenkins.service.
Scanning processes...
Scanning linux images...
```

2. **Write a small blog or article to install these tools using package managers on Ubuntu and CentOS.**
   > It is explained in detail in first question.

systemctl and systemd

- Systemctl is the controller that is a part of systemed service (it is an init system).
- It is used to start/stop/restart the systemed services.
- It is always executed by the root user which means you have to execute the command with sudo.

##Tasks:

1. Check the status of docker service in your system (make sure you completed above tasks, else docker won't be installed).

➢ systemctl status docker

```
ubuntu@ip-172-31-44-115:~$ systemctl status docker
● docker.service - Docker Application Container Engine
     Loaded: loaded (/lib/systemd/system/docker.service; enabled; vendor preset: enabled)
     Active: active (running) since Wed 2023-02-15 11:40:12 UTC; 41min ago
TriggeredBy: ● docker.socket
       Docs: https://docs.docker.com
   Main PID: 5175 (dockerd)
      Tasks: 7
     Memory: 30.1M
        CPU: 477ms
     CGroup: /system.slice/docker.service
             └─5175 /usr/bin/dockerd -H fd:// --containerd=/run/containerd/containerd.sock
```

2. stop the service jenkins and post before and after screenshots.

➢ systemctl status Jenkins
Before:
```
ubuntu@ip-172-31-44-115:~$ systemctl status jenkins
● jenkins.service - Jenkins Continuous Integration Server
     Loaded: loaded (/lib/systemd/system/jenkins.service; enabled; vendor preset: enabled)
     Active: active (running) since Wed 2023-02-15 12:08:49 UTC; 18min ago
   Main PID: 6469 (java)
      Tasks: 36 (limit: 1143)
     Memory: 313.7M
        CPU: 44.422s
     CGroup: /system.slice/jenkins.service
             └─6469 /usr/bin/java -Djava.awt.headless=true -jar /usr/share/java/jenkins.war
```

To stop the Jenkins:
➢ sudo systemctl stop Jenkins

```
ubuntu@ip-172-31-44-115:~$ sudo systemctl stop jenkins
ubuntu@ip-172-31-44-115:~$ 
```

After:
```
ubuntu@ip-172-31-44-115:~$ sudo systemctl stop jenkins
ubuntu@ip-172-31-44-115:~$ systemctl status jenkins
○ jenkins.service - Jenkins Continuous Integration Server
     Loaded: loaded (/lib/systemd/system/jenkins.service; enabled; vendor preset: enabled)
     Active: inactive (dead) since Wed 2023-02-15 12:33:46 UTC; 1min 13s ago
    Process: 6469 ExecStart=/usr/bin/jenkins (code=exited, status=143)
   Main PID: 6469 (code=exited, status=143)
     Status: "Jenkins stopped"
        CPU: 44.976s
```

After executing this command Jenkins status has been stopped i.e inactive (dead). Now, our Jenkins server is not running.