Q1. use systemctl to View the status of sshd services

```
[root@centos ~]# systemctl status sshd
● sshd.service - OpenSSH server daemon
     Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; preset: enab
led)
    Drop-In: /run/systemd/system/service.d
             └─zzz-lxc-service.conf
     Active: active (running) since Tue 2025-03-25 12:27:25 UTC; 3min 26s ago
       Docs: man:sshd(8)
             man:sshd_config(5)
   Main PID: 174 (sshd)
```

Q2. use systemctl to view the status of all the system services

```
[root@centos ~]# systemctl list-units --type=service
  UNIT                                LOAD   ACTIVE SUB     DESCRIPTION
_____________________________________________
  atd.service                         loaded active running Deferred execution scheduler
● auditd.service                      loaded failed failed  Security
Auditing Service
● chronyd.service                     loaded failed failed  NTP clien
t/server
  console-getty.service               loaded active running Console Getty
  crond.service                       loaded active running Command Scheduler
  dbus-broker.service                 loaded active running D-Bus System Message Bus
  dracut-shutdown.service             loaded active exited  Restore /run/initramfs on shutdown
  libstoragemgmt.service              loaded active running libstoragemgmt plug-in server daem
  lvm2-monitor.service                loaded active exited  Monitoring of LVM2 mirrors, snapsh
  network-device-down.service         loaded active exited  Turn off network device
  NetworkManager-wait-online.service loaded active exited  Network Manager Wait Online
  NetworkManager.service              loaded active running Network Manager
```

Q3.a- Send mail to the root user and Verify that you have received this mail

```
[root@centos ~]# echo "Hello" | mail -s "Welcome Email" root
[root@centos ~]# mail
s-nail version v14.9.22.  Type `?' for help
/var/spool/mail/root: 1 message 1 new
▸N  1 root                  2025-03-25 12:40   15/484   "Welcome Email
& q
Held 1 message in /var/spool/mail/root
```

b- Use systemctl utility to stop postfix/sendmail service

```
[root@centos ~]# systemctl stop postfix
[root@centos ~]# systemctl status postfix
○ postfix.service - Postfix Mail Transport Agent
     Loaded: loaded (/usr/lib/systemd/system/postfix.service; ena
disabled)
    Drop-In: /run/systemd/system/service.d
             └─zzz-lxc-service.conf
     Active: inactive (dead) since Tue 2025-03-25 12:44:08 UTC; 3
   Duration: 5min 31.308s
```

c- Send mail again to the root user and Verify that you have received this mail

```
[root@centos ~]# echo "Hello2" | mail -s "Welcome Email 2" root
[root@centos ~]# mail
s-nail version v14.9.22.  Type `?' for help
/var/spool/mail/root: 1 message 1 unread
▸U  1 root                  2025-03-25 12:40   16/494   "Welcome Email
& q
Held 1 message in /var/spool/mail/root
```

d-Use systemctl utility to start postfix/sendmail service

e- Verify that you have received this mail

```
[root@centos ~]# systemctl start postfix
[root@centos ~]# mail
s-nail version v14.9.22.  Type `?' for help
/var/spool/mail/root: 2 messages 1 new 2 unread
 U  1 root                  2025-03-25 12:40   16/494   "Welcome Email
▸N  2 root                  2025-03-25 12:45   15/487   "Welcome Email 2
&
```

Q4. switch to the multi-user target manually without rebooting

Q5. display default target

```
[root@centos ~]# sudo systemctl set-default multi-user.target
Created symlink /etc/systemd/system/default.target → /usr/lib/systemd/system/multi-user.target.
[root@centos ~]# systemctl get-default
multi-user.target
```

Q6. change the default target back to multi-user.target and reboot

Q7. set the default systemd target back to graphical.target

```
Last login: Tue Mar 25 12:27:39 2025 from 10.227.138.1
[root@centos ~]# systemctl get-default
multi-user.target
[root@centos ~]# sudo systemctl set-default graphical.target
Removed "/etc/systemd/system/default.target".
Created symlink /etc/systemd/system/default.target → /usr/lib/systemd/system/graphical.target.
[root@centos ~]# sudo systemctl get-default
graphical.target
[root@centos ~]#
```

Q8.Display the status of sshd service, note the PID of the daemon.

```
[root@centos ~]# sudo systemctl status sshd
● sshd.service - OpenSSH server daemon
     Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; preset: enabled
)
    Drop-In: /run/systemd/system/service.d
             └─zzz-lxc-service.conf
     Active: active (running) since Tue 2025-03-25 12:53:53 UTC; 3min 54s ago
       Docs: man:sshd(8)
             man:sshd_config(5)
    Process: 753 ExecReload=/bin/kill -HUP $MAINPID (code=exited, status=0/SUCCESS)
   Main PID: 744 (sshd)
```

Q9. Restart the sshd service and view the status, The PID of the daemon has changed

```
[root@centos ~]# sudo systemctl restart sshd
[root@centos ~]# sudo systemctl status sshd
● sshd.service - OpenSSH server daemon
     Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; preset: enabled
)
    Drop-In: /run/systemd/system/service.d
             └─zzz-lxc-service.conf
     Active: active (running) since Tue 2025-03-25 12:58:08 UTC; 6s ago
       Docs: man:sshd(8)
             man:sshd_config(5)
   Main PID: 769 (sshd)
```

Q10. Reload the sshd service and view the status, The PID of the daemon has not changed and connection has not be interrupted

```
[root@centos ~]# sudo systemctl reload sshd
[root@centos ~]# sudo systemctl status sshd
● sshd.service - OpenSSH server daemon
     Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; preset: enabled
)
    Drop-In: /run/systemd/system/service.d
             └─zzz-lxc-service.conf
     Active: active (running) since Tue 2025-03-25 12:58:08 UTC; 38s ago
       Docs: man:sshd(8)
             man:sshd_config(5)
    Process: 778 ExecReload=/bin/kill -HUP $MAINPID (code=exited, status=0/SUCCESS)
   Main PID: 769 (sshd)
```

Q11. Verify that the chronyd service is running

```
[root@centos ~]# systemctl status chronyd.service
● chronyd.service - NTP client/server
     Loaded: loaded (/usr/lib/systemd/system/chronyd.service; enabled; preset: enabled)
    Drop-In: /run/systemd/system/service.d
             └─zzz-lxc-service.conf
     Active: active (running) since Tue 2025-03-25 14:09:37 UTC; 14s ago
       Docs: man:chronyd(8)
             man:chrony.conf(5)
    Process: 176 ExecStart=/usr/sbin/chronyd -x $OPTIONS (code=exited, status=0/SUCCESS)
   Main PID: 185 (chronyd)
      Tasks: 1 (limit: 100365)
```

Q12.

a- Determine if the chronyd service is enabled to start at the system boot

b- Reboot the system, then view the status of the chronyd service

```
[root@centos ~]# systemctl status chronyd.service
● chronyd.service - NTP client/server
     Loaded: loaded (/usr/lib/systemd/system/chronyd.service; enabled; preset: enabled)
    Drop-In: /run/systemd/system/service.d
             └─zzz-lxc-service.conf
     Active: active (running) since Tue 2025-03-25 14:12:49 UTC; 13s ago
       Docs: man:chronyd(8)
             man:chrony.conf(5)
    Process: 154 ExecStart=/usr/sbin/chronyd -x $OPTIONS (code=exited, status=0/SUCCESS)
   Main PID: 163 (chronyd)
      Tasks: 1 (limit: 100365)
```

Q13.

a- Disable the chronyd service so that it doesn't start at system boot, then view the status

of the service

b- Reboot the system, then view the status of the chronyd service

```
[root@centos ~]# systemctl disable chronyd.service
Removed "/etc/systemd/system/multi-user.target.wants/chronyd.service".
[root@centos ~]# systemctl status chronyd.service
● chronyd.service - NTP client/server
     Loaded: loaded (/usr/lib/systemd/system/chronyd.service; disabled; preset: enabled)
    Drop-In: /run/systemd/system/service.d
             └─zzz-lxc-service.conf
     Active: active (running) since Tue 2025-03-25 14:12:49 UTC; 1min 14s ago
       Docs: man:chronyd(8)
             man:chrony.conf(5)
   Main PID: 163 (chronyd)
      Tasks: 1 (limit: 100365)
     Memory: 2.4M
        CPU: 48ms
     CGroup: /system.slice/chronyd.service
             └─163 /usr/sbin/chronyd -x -F 2
```

```
[root@centos ~]# systemctl status chronyd.service
○ chronyd.service - NTP client/server
     Loaded: loaded (/usr/lib/systemd/system/chronyd.service; disabled; preset: enabled)
    Drop-In: /run/systemd/system/service.d
             └─zzz-lxc-service.conf
     Active: inactive (dead)
       Docs: man:chronyd(8)
             man:chrony.conf(5)
```

Q14. disblay all Static Sevices

```
[root@centos ~]# systemctl list-unit-files --type=service --state=static
UNIT FILE                                  STATE  PRESET
cockpit-issue.service                      static -
cockpit-session-socket-user.service        static -
cockpit-session@.service                   static -
cockpit-wsinstance-http.service            static -
cockpit-wsinstance-https-factory@.service static -
cockpit-wsinstance-https@.service          static -
cockpit-wsinstance-socket-user.service     static -
cockpit.service                            static -
```

Q15. What difference Between enable,disable,static,mask Service

Enable: service will start automatic when system reboot.
Disable: service will not start automatic after reboot.
Static: mean service cannot be enable or disable, it start only when another service need it.
Mask: mean the service is block and cannot start manual or automatic.

Q16. Display all logs from the current boot

```
[root@centos ~]# systemctl list-unit-files --type=service --state=static
UNIT FILE                                  STATE  PRESET
cockpit-issue.service                      static -
cockpit-session-socket-user.service        static -
cockpit-session@.service                   static -
cockpit-wsinstance-http.service            static -
cockpit-wsinstance-https-factory@.service static -
cockpit-wsinstance-https@.service          static -
cockpit-wsinstance-socket-user.service     static -
cockpit.service                            static -
container-getty@.service                   static -
dm-event.service                           static -
dnf-makecache.service                      static -
dracut-cmdline.service                     static -
dracut-initqueue.service                   static -
dracut-mount.service                       static -
dracut-pre-mount.service                   static -
dracut-pre-pivot.service                   static -
dracut-pre-trigger.service                 static -
dracut-pre-udev.service                    static -
dracut-shutdown-onfailure.service          static -
dracut-shutdown.service                    static -
```

Q17. View logs for the sshd service

```
[root@centos ~]# journalctl -u sshd
Mar 25 14:14:15 centos systemd[1]: Starting OpenSSH server daemon...
Mar 25 14:14:15 centos sshd[169]: Server listening on 0.0.0.0 port 22.
Mar 25 14:14:15 centos sshd[169]: Server listening on :: port 22.
Mar 25 14:14:15 centos systemd[1]: Started OpenSSH server daemon.
```

Q19. Show logs from the last 30 minutes

```
root@centos ~]# journalctl --since "30 minutes ago"
ar 25 14:14:15 centos systemd-journald[131]: Journal started
ar 25 14:14:15 centos systemd-journald[131]: Runtime Journal (/run/log/journal/94208e04ba304748b7a976ede7a05d58) is 8.0M, max 316.1M, 308.1M
ee.
ar 25 14:14:15 centos lvm[126]:   /dev/mapper/control: mknod failed: Operation not permitted
ar 25 14:14:15 centos lvm[126]:   Failure to communicate with kernel device-mapper driver.
ar 25 14:14:15 centos lvm[126]:   Check that device-mapper is available in the kernel.
ar 25 14:14:15 centos lvm[126]:   Incompatible libdevmapper 1.02.202-RHEL9 (2024-11-04) and kernel driver (unknown version).
ar 25 14:14:15 centos systemd[1]: Starting Flush Journal to Persistent Storage...
ar 25 14:14:15 centos systemd[1]: Finished Create Static Device Nodes in /dev.
ar 25 14:14:15 centos systemd[1]: Starting Rule-based Manager for Device Events and Files...
ar 25 14:14:15 centos systemd-journald[131]: Runtime Journal (/run/log/journal/94208e04ba304748b7a976ede7a05d58) is 8.0M, max 316.1M, 308.1M
ee.
ar 25 14:14:15 centos systemd[1]: Finished Flush Journal to Persistent Storage.
ar 25 14:14:15 centos systemd[1]: Finished Monitoring of LVM2 mirrors, snapshots etc. using dmeventd or progress polling.
ar 25 14:14:15 centos systemd-udevd[138]: Using default interface naming scheme 'rhel-9.0'.
ar 25 14:14:15 centos systemd[1]: Started Rule-based Manager for Device Events and Files.
ar 25 14:14:15 centos systemd[1]: Auto-connect to subsystems on FC-NVME devices found during boot was skipped because of an unmet condition c
ck (ConditionPathExists=/sys/class/fc/fc_udev_device/nvme_discovery).
ar 25 14:14:15 centos systemd[1]: Reached target Preparation for Local File Systems.
ar 25 14:14:15 centos systemd[1]: Reached target Local File Systems.
ar 25 14:14:15 centos systemd[1]: Import network configuration from initramfs was skipped because of an unmet condition check (ConditionDirec
ryNotEmpty=/run/initramfs/state).
ar 25 14:14:15 centos systemd[1]: Rebuild Dynamic Linker Cache was skipped because no trigger condition checks were met.
```

Q18. Follow (live-tail) new log entries

```
[root@centos ~]# journalctl -f
Mar 25 14:21:00 centos systemd[1]: Stopped target sshd-keygen.target.
Mar 25 14:21:00 centos systemd[1]: Stopping sshd-keygen.target...
Mar 25 14:21:00 centos systemd[1]: OpenSSH ecdsa Server Key Generation was
 skipped because no trigger condition checks were met.
Mar 25 14:21:00 centos systemd[1]: OpenSSH ed25519 Server Key Generation w
as skipped because no trigger condition checks were met.
Mar 25 14:21:00 centos systemd[1]: OpenSSH rsa Server Key Generation was s
kipped because no trigger condition checks were met.
Mar 25 14:21:00 centos systemd[1]: Reached target sshd-keygen.target.
Mar 25 14:21:00 centos systemd[1]: Starting OpenSSH server daemon...
Mar 25 14:21:00 centos sshd[594]: Server listening on 0.0.0.0 port 22.
Mar 25 14:21:00 centos sshd[594]: Server listening on :: port 22.
Mar 25 14:21:00 centos systemd[1]: Started OpenSSH server daemon.
```

```
[root@centos ~]#
```

```
[root@centos ~]# journalctl -f
Mar 25 14:21:00 centos systemd[1]: Stopped target sshd-keygen.target.
Mar 25 14:21:00 centos systemd[1]: Stopping sshd-keygen.target...
Mar 25 14:21:00 centos systemd[1]: OpenSSH ecdsa Server Key Generation was
 skipped because no trigger condition checks were met.
Mar 25 14:21:00 centos systemd[1]: OpenSSH ed25519 Server Key Generation w
as skipped because no trigger condition checks were met.
Mar 25 14:21:00 centos systemd[1]: OpenSSH rsa Server Key Generation was s
kipped because no trigger condition checks were met.
Mar 25 14:21:00 centos systemd[1]: Reached target sshd-keygen.target.
Mar 25 14:21:00 centos systemd[1]: Starting OpenSSH server daemon...
Mar 25 14:21:00 centos sshd[594]: Server listening on 0.0.0.0 port 22.
Mar 25 14:21:00 centos sshd[594]: Server listening on :: port 22.
Mar 25 14:21:00 centos systemd[1]: Started OpenSSH server daemon.
Mar 25 14:22:10 centos sshd[594]: Received signal 15; terminating.
Mar 25 14:22:10 centos systemd[1]: Stopping OpenSSH server daemon...
Mar 25 14:22:10 centos systemd[1]: sshd.service: Deactivated successfully.
Mar 25 14:22:10 centos systemd[1]: Stopped OpenSSH server daemon.
Mar 25 14:22:10 centos systemd[1]: Stopped target sshd-keygen.target.
Mar 25 14:22:10 centos systemd[1]: Stopping sshd-keygen.target...
Mar 25 14:22:10 centos systemd[1]: OpenSSH ecdsa Server Key Generation was
 skipped because no trigger condition checks were met.
Mar 25 14:22:10 centos systemd[1]: OpenSSH ed25519 Server Key Generation w
as skipped because no trigger condition checks were met.
Mar 25 14:22:10 centos systemd[1]: OpenSSH rsa Server Key Generation was s
kipped because no trigger condition checks were met.
Mar 25 14:22:10 centos systemd[1]: Reached target sshd-keygen.target.
Mar 25 14:22:10 centos systemd[1]: Starting OpenSSH server daemon...
Mar 25 14:22:10 centos sshd[603]: Server listening on 0.0.0.0 port 22.
Mar 25 14:22:10 centos sshd[603]: Server listening on :: port 22.
Mar 25 14:22:10 centos systemd[1]: Started OpenSSH server daemon.
```

```
[root@centos ~]# systemctl restart sshd
[root@centos ~]#
```

Q20. List all running services

```
root@centos ~]# systemctl list-units --type=service --state=running
 UNIT                     LOAD   ACTIVE SUB     DESCRIPTION
 atd.service              loaded active running Deferred execution scheduler
 console-getty.service    loaded active running Console Getty
 crond.service            loaded active running Command Scheduler
 dbus-broker.service      loaded active running D-Bus System Message Bus
 libstoragemgmt.service   loaded active running libstoragemgmt plug-in server daemon
 NetworkManager.service   loaded active running Network Manager
 polkit.service           loaded active running Authorization Manager
 rsyslog.service          loaded active running System Logging Service
 sshd.service             loaded active running OpenSSH server daemon
```

Q21.

Create Customer Service

```
[root@centos ~]# cat /usr/local/bin/server.sh
#!/bin/bash

echo "Server has been started" | mail -s "Server started" root
python3 -m http.server 8000
[root@centos ~]#
```

```
[root@centos ~]# cat /etc/systemd/system/server.service
[Unit]
Description=My Custom Service
After=network.target

[Service]
ExecStart=/usr/local/bin/server.sh
Restart=always


[Install]
WantedBy=multi-user.target
```

```
[root@centos ~]# sudo systemctl enable server.service
Created symlink /etc/systemd/system/multi-user.target.wants/server.service → /etc/systemd/system/server.service.
[root@centos ~]# sudo systemctl status server.service
○ server.service - My Custom Service
     Loaded: loaded (/etc/systemd/system/server.service; enabled; preset:
disabled)
    Drop-In: /run/systemd/system/service.d
             └─zzz-lxc-service.conf
     Active: inactive (dead)
```

```
[root@centos ~]# sudo systemctl start server.service
[root@centos ~]# sudo systemctl status server.service
● server.service - My Custom Service
     Loaded: loaded (/etc/systemd/system/server.service; enabled; preset:
disabled)
    Drop-In: /run/systemd/system/service.d
             └─zzz-lxc-service.conf
     Active: active (running) since Tue 2025-03-25 14:49:07 UTC; 2s ago
   Main PID: 2106 (server.sh)
      Tasks: 2 (limit: 100365)
     Memory: 9.6M
        CPU: 131ms
     CGroup: /system.slice/server.service
             ├─2106 /bin/bash /usr/local/bin/server.sh
             └─2112 python3 -m http.server 8000
```

```
[root@centos ~]# curl localhost:8000
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN" "http://www.w3.org/TR/html4/strict.dtd">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8">
<title>Directory listing for /</title>
</head>
<body>
<h1>Directory listing for /</h1>
<hr>
<ul>
<li><a href=".autorelabel">.autorelabel</a></li>
<li><a href="afs/">afs/</a></li>
<li><a href="bin/">bin@</a></li>
<li><a href="boot/">boot/</a></li>
```

```
[root@centos ~]# mail
s-nail version v14.9.22.  Type `?' for help
/var/spool/mail/root: 1 message
▸   1 root                  2025-03-25 14:49   16/514   "Server started
&
[-- Message  1 -- 16 lines, 514 bytes --]:
Date: Tue, 25 Mar 2025 14:49:07 +0000
To: root@centos.localdomain
Subject: Server started
Message-Id: <20250325144907.E9DD710198@centos.localdomain>
From: root <root@centos.localdomain>

Server has been started
```

```
[root@centos ~]# reboot
[root@centos ~]#
```

```
[root@centos ~]# mail
s-nail version v14.9.22.  Type `?' for help
/var/spool/mail/root: 2 messages 1 new
    1 root                  2025-03-25 14:49   16/514   "Server started
▸N  2 root                  2025-03-25 14:51   15/503   "Server started
&
```
