CSE313 HOMEWORK ASSIGMENT 3

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1. Fill in the grid below with the meaning of each intersection, for each, indicate how a service could be in that configuration:

	Inactive	Active
Disabled	Service is not running and will not start when system boots.	Service is running and will run until system restart. When the system restart service become inactive.
Enabled	Service is not running but will start when the system restart.	Service is running and will run after the system restart.

2. Choose two of the above grid locations. Show the command you would execute to cause the sshd service to move from one of the grid locations to another.

Enabled- active -→ Disabled-active

```
[sguner@localhost ~]$ systemctl status sshd.service
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor preset>
   Active: active (running) since Sun 2021-12-05 13:47:06 +03; 2h 49min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 971 (sshd)
    Tasks: 1 (limit: 4800)
   Memory: 560.0K
   CGroup: /system.slice/sshd.service
           └─971 /usr/sbin/sshd -D -oCiphers=aes256-gcm@openssh.com,chacha20-po>
[sguner@localhost ~]$
```

```
[sguner@localhost ~]$ systemctl is-enabled sshd
enabled
[sguner@localhost ~]$ systemctl disable sshd
Removed /etc/systemd/system/multi-user.target.wants/sshd.service.
[sguner@localhost ~]$ systemctl is-enabled sshd
disabled
[sguner@localhost ~]$
```

```
[sguner@localhost ~]$ systemctl status sshd.service
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; disabled; vendor prese>
   Active: active (running) since Sun 2021-12-05 13:47:06 +03; 2h 51min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 971 (sshd)
    Tasks: 1 (limit: 4800)
   Memory: 560.0K
   CGroup: /system.slice/sshd.service
           └─971 /usr/sbin/sshd -D -oCiphers=aes256-gcm@openssh.com,chacha20-po>
[sguner@localhost ~]$
```

3. Why does enabling an inactive service not cause the service to begin running? Why does stopping an enabled service not cause the service to become disabled?

For all this to happen, the system needs to be restart. (enable/disable) are about is the service automatically starts at boot or not. So when you enable an inactive service, it will not begin until boot time. It is the same for active service. It will not stop until boot time when you disabled the service.

4. List the three ways (commands) you could use to have a currently running service to use a new configuration. Which of the three ways would result in a new PID?

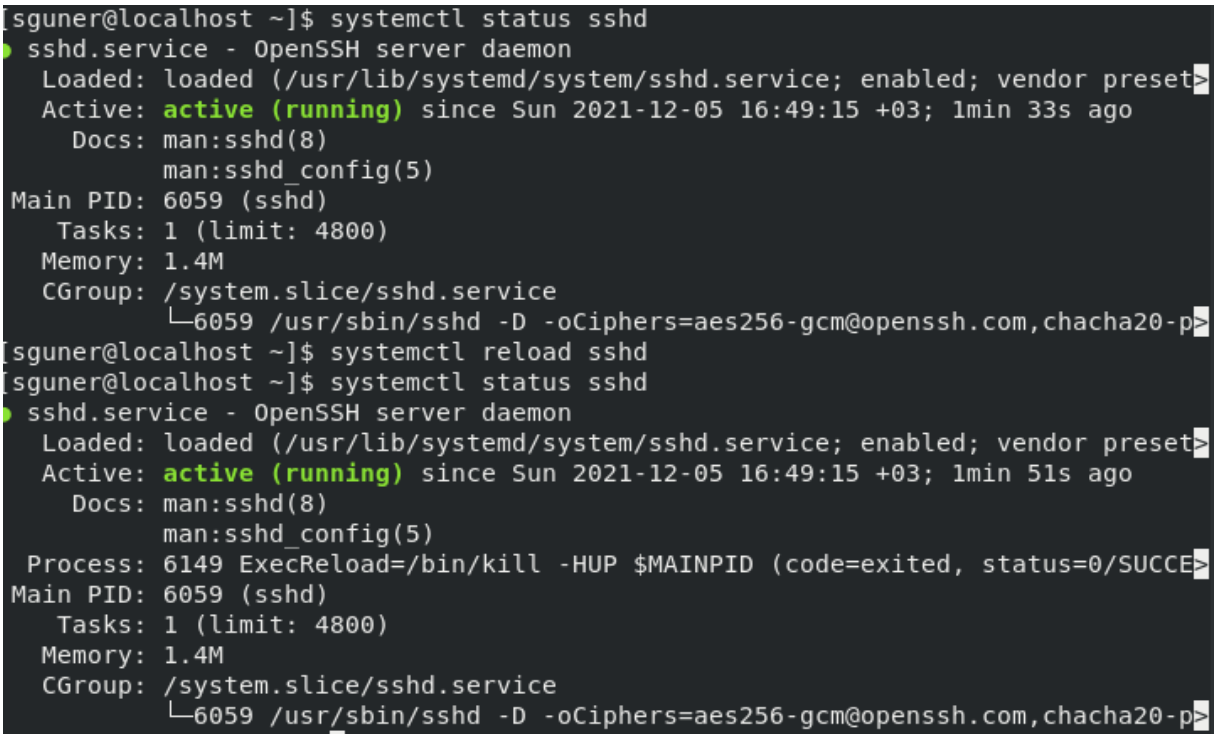
Systemctl stop sshd → Same PID

```
[sguner@localhost ~]$ systemctl status sshd
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor preset>
   Active: active (running) since Sun 2021-12-05 16:49:15 +03; 2min 48s ago
     Docs: man:sshd(8)
           man:sshd_config(5)
  Process: 6149 ExecReload=/bin/kill -HUP $MAINPID (code=exited, status=0/SUCCE>
 Main PID: 6059 (sshd)
    Tasks: 1 (limit: 4800)
   Memory: 1.4M
   CGroup: /system.slice/sshd.service
           └─6059 /usr/sbin/sshd -D -oCiphers=aes256-gcm@openssh.com,chacha20-p>
[sguner@localhost ~]$ systemctl stop  sshd
[sguner@localhost ~]$ systemctl status sshd
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor preset>
   Active: inactive (dead) since Sun 2021-12-05 16:52:22 +03; 2s ago
     Docs: man:sshd(8)
           man:sshd_config(5)
  Process: 6149 ExecReload=/bin/kill -HUP $MAINPID (code=exited, status=0/SUCCE>
  Process: 6059 ExecStart=/usr/sbin/sshd -D $OPTIONS $CRYPTO_POLICY (code=exite>
 Main PID: 6059 (code=exited, status=0/SUCCESS)
[sguner@localhost ~]$
```

Systemctl restart sshd → New PID

```
[sguner@localhost ~]$ systemctl status sshd
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor preset>
   Active: active (running) since Sun 2021-12-05 13:47:06 +03; 3h 1min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 971 (sshd)
    Tasks: 1 (limit: 4800)
   Memory: 560.0K
   CGroup: /system.slice/sshd.service
           └─971 /usr/sbin/sshd -D -oCiphers=aes256-gcm@openssh.com,chacha20-po>
[sguner@localhost ~]$ systemctl restart sshd
[sguner@localhost ~]$ systemctl status sshd
● sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor preset>
   Active: active (running) since Sun 2021-12-05 16:49:15 +03; 5s ago
     Docs: man:sshd(8)
           man:sshd_config(5)
 Main PID: 6059 (sshd)
    Tasks: 1 (limit: 4800)
   Memory: 1.4M
   CGroup: /system.slice/sshd.service
           └─6059 /usr/sbin/sshd -D -oCiphers=aes256-gcm@openssh.com,chacha20-p>
```

Systemctl reload sshd → Same PID



5. What is the command to log into a remote shell?

ssh is the command to log into a remote shell.

6. Explain the difference between a public key and a private key.

In private key, the same key is used for encryption and decryption. This key is symmetric because one key is copy or share by another to decrypt the cipher text. Files using this key must be secure. In public key, two keys are used. One key is used for encrypt the plain text to convert it into cypher text and other key is used by receiver to decrypt the cipher text to read the message. The public key not need to be secret like the private key. Also ssh allows users to using a private and public key for authentication.

7. What is the process for allowing a user to log into a remote shell without a password? You may list the commands.

Step 1 → ssh-keygen for creating new authentication key pairs.

Step 2 → ssh-copy-id for copy the public key.

Step 3 → ssh remote-host for login to remote-host without entering the password.

8. Define the terms device and connection in terms of networking?

Connection: Connection refers to pieces of related information that are transfered through a network. Devices in the network can send and receive information to each other through the connection between them.

Device: Network interface can be associated with device. We can say that device is a network interface.

9. Create a static connection for device eth0 with the IPv4 address of 192.168.11.1/16 and gateway of 192.168.255.254. Name this connection "hw-eth0". Add the DNS 192.168.255.255. Activate this connection. How would you check to make sure the connection was activated?

Static Connection → nmcli con add con-name "hw-eth0" ifname eth0 type ethernet ip4 192.168.11.1/16 gw4 192.168.255.254

Specify DNS → nmcli con mod "hw-eth0" ipv4.dns 192.168.255.255

Activate → nmcli con up "hw-eth0"

List active connections(check) → nmcli con show –active

10. Add the IP address 10.10.10.10/16 to the connection created in question 9:

a. How would you do this using the nmcli command?

nmcli con mod "hw-eth0" +ipv4.addresses 10.10.10.10/16

b. How would you do this by editing the configuration file?