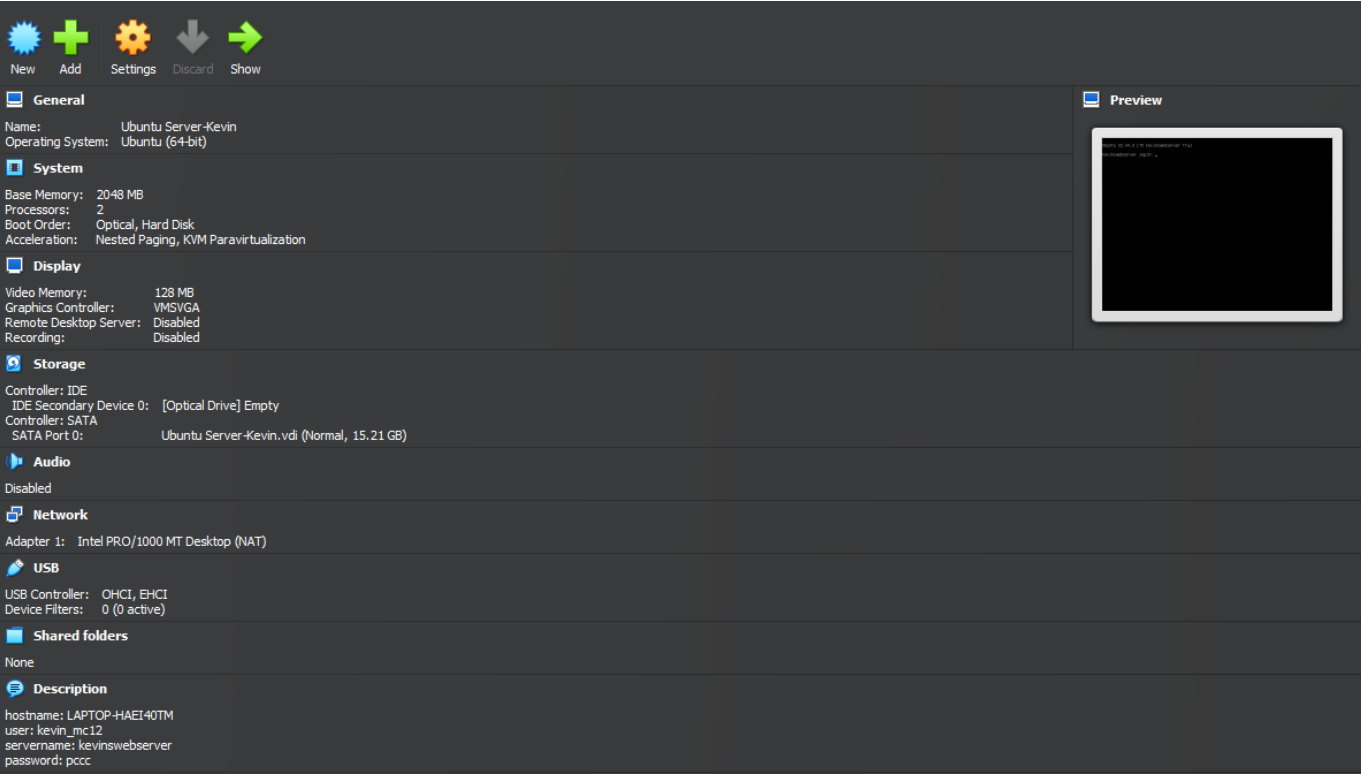


# Deliverable 2

## Question 1



## Question 2

```
Ubuntu 22.04.3 LTS kevinserver tty1
kevinserver login: kevin_mc12
Password:
Welcome to Ubuntu 22.04.3 LTS (GNU/Linux 5.15.0-91-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

System information as of Thu Dec 14 04:05:28 AM UTC 2023

System load:  0.609375      Processes:            120
Usage of /:   47.9% of 9.75GB Users logged in:       0
Memory usage: 11%          IPv4 address for enp0s3: 10.0.2.15
Swap usage:   0%

 * Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
   just raised the bar for easy, resilient and secure K8s cluster deployment.

   https://ubuntu.com/engage/secure-kubernetes-at-the-edge

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

Last login: Thu Dec 14 02:36:18 UTC 2023 on tty1
kevin_mc12@kevinserver:~$ _
```

## Question 3

`hostname -I` is used to display the IP address

```
kevin_mc12@kevinswebserver:~$ hostname -I  
10.0.2.15  
kevin_mc12@kevinswebserver:~$
```

## Question 4

`sudo ufw enable` is used to enable the Ubuntu firewall

```
kevin_mc12@kevinswebserver:~$ sudo ufw enable
[sudo] password for kevin_mc12:
Firewall is active and enabled on system startup
kevin_mc12@kevinswebserver:~$
```

## Question 5

`sudo ufw status` checks if the Ubuntu firewall is running

```
kevin_mc12@kevinswebserver:~$ sudo ufw status
Status: active

To Action From
--
Apache ALLOW Anywhere
OpenSSH ALLOW Anywhere
Apache (v6) ALLOW Anywhere (v6)
OpenSSH (v6) ALLOW Anywhere (v6)

kevin_mc12@kevinswebserver:~$
```

## Question 6

`sudo ufw disable` disables the Ubuntu firewall

```
kevin_mc12@kevinswebserver:~$ sudo ufw disable
Firewall stopped and disabled on system startup
kevin_mc12@kevinswebserver:~$ _
```

## Question 7

`sudo ufw allow 'Apache'` adds Apache to the firewall

```
kevin_mc12@kevinswebserver:~$ sudo ufw allow "Apache"  
Skipping adding existing rule  
Skipping adding existing rule (v6)  
kevin_mc12@kevinswebserver:~$ _
```

(Apache is already added to the firewall for me)

## Question 8

`sudo apt install apache2` installs Apache

```
kevin_mc12@kevinswebserver:~$ sudo apt install apache2
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
apache2 is already the newest version (2.4.52-1ubuntu4.7).
0 upgraded, 0 newly installed, 0 to remove and 6 not upgraded.
kevin_mc12@kevinswebserver:~$
```

(Apache is already downloaded for me)

## Question 9

`sudo systemctl status apache2` checks if Apache is running



```
kevin_mc12@kevinswebserver:~$ sudo systemctl status apache2
• apache2.service - The Apache HTTP Server
  Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
  Active: active (running) since Thu 2023-12-14 02:36:05 UTC; 14min ago
    Docs: https://httpd.apache.org/docs/2.4/
  Process: 704 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
 Main PID: 776 (apache2)
   Tasks: 55 (limit: 2220)
  Memory: 7.5M
    CPU: 75ms
  CGroup: /system.slice/apache2.service
          └─776 /usr/sbin/apache2 -k start
            └─778 /usr/sbin/apache2 -k start
              └─779 /usr/sbin/apache2 -k start

Dec 14 02:36:05 kevinswebserver systemd[1]: Starting The Apache HTTP Server...
Dec 14 02:36:05 kevinswebserver systemd[1]: Started The Apache HTTP Server.
kevin_mc12@kevinswebserver:~$
```

## Question 10

`sudo systemctl stop apache2` stops Apache

```
kevin_mc12@kevinswebserver:~$ sudo systemctl stop apache2
kevin_mc12@kevinswebserver:~$ _
```

## Question 11

`sudo systemctl restart apache2` restarts Apache

```
kevin_mc12@kevinswebserver:~$ sudo systemctl restart apache2
kevin_mc12@kevinswebserver:~$ _
```

## Question 12

`sudo apachectl -t` tests Apache configuration

```
kevin_mc12@kevinswebserver:~$ sudo apachectl -t  
Syntax OK  
kevin_mc12@kevinswebserver:~$
```

## Question 13

`sudo apache2 -v` checks the installed version of Apache

```
kevin_mc12@kevinswebserver:~$ sudo apache2 -v
Server version: Apache/2.4.52 (Ubuntu)
Server built: 2023-10-26T13:44:44
kevin_mc12@kevinswebserver:~$
```

## Question 14

### Most Common Apache Commands for Troubleshooting

`systemctl` is used to control and interact with Linux services with the `systemd` service manager.

```
kevin_mc12@kevinswebserver:~$ sudo systemctl status apache2.service -l --no-pager
systemctl: invalid option -- 'l'
kevin_mc12@kevinswebserver:~$ sudo systemctl status apache2.service -l --no-pager
• apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2023-12-14 02:53:04 UTC; 7min ago
     Docs: https://httpd.apache.org/docs/2.4/
   Process: 1575 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
  Main PID: 1579 (apache2)
    Tasks: 55 (limit: 2220)
   Memory: 4.8M
      CPU: 38ms
   CGroup: /system.slice/apache2.service
           └─1579 /usr/sbin/apache2 -k start
             └─1580 /usr/sbin/apache2 -k start
               └─1581 /usr/sbin/apache2 -k start

Dec 14 02:53:04 kevinswebserver systemd[1]: Starting The Apache HTTP Server...
Dec 14 02:53:04 kevinswebserver systemd[1]: Started The Apache HTTP Server.
kevin_mc12@kevinswebserver:~$
```

`journalctl` is used to query and see the logs generated by `systemd`

```
kevin_mc12@kevinswebserver:~$ sudo journalctl -u apache2.service --since today --no-pager_
```

```
ppress this message
Dec 14 01:42:46 kevinswebserver systemd[1]: apache2.service: Deactivated successfully.
Dec 14 01:42:46 kevinswebserver systemd[1]: Stopped The Apache HTTP Server.
-- Boot 14a251d120ba4fe49b84f9abb2903066 --
Dec 14 01:45:21 kevinswebserver systemd[1]: Starting The Apache HTTP Server...
Dec 14 01:45:21 kevinswebserver apachectl[760]: AH00558: apache2: Could not reliably determine the s
erver's fully qualified domain name, using 127.0.1.1. Set the 'ServerName' directive globally to sup
press this message
Dec 14 01:45:21 kevinswebserver systemd[1]: Started The Apache HTTP Server.
Dec 14 02:17:18 kevinswebserver systemd[1]: Stopping The Apache HTTP Server...
Dec 14 02:17:18 kevinswebserver systemd[1]: apache2.service: Deactivated successfully.
Dec 14 02:17:18 kevinswebserver systemd[1]: Stopped The Apache HTTP Server.
Dec 14 02:17:18 kevinswebserver systemd[1]: Starting The Apache HTTP Server...
Dec 14 02:17:18 kevinswebserver systemd[1]: Started The Apache HTTP Server.
Dec 14 02:19:31 kevinswebserver systemd[1]: Stopping The Apache HTTP Server...
Dec 14 02:19:31 kevinswebserver systemd[1]: apache2.service: Deactivated successfully.
Dec 14 02:19:31 kevinswebserver systemd[1]: Stopped The Apache HTTP Server.
-- Boot 496b3b90a33644e2bac4cee862d8989d --
Dec 14 02:21:45 kevinswebserver systemd[1]: Starting The Apache HTTP Server...
Dec 14 02:21:45 kevinswebserver systemd[1]: Started The Apache HTTP Server.
Dec 14 02:26:25 kevinswebserver systemd[1]: Stopping The Apache HTTP Server...
Dec 14 02:26:25 kevinswebserver systemd[1]: apache2.service: Deactivated successfully.
Dec 14 02:26:25 kevinswebserver systemd[1]: Stopped The Apache HTTP Server.
-- Boot 690cd3a077b14502be05b81df382630c --
Dec 14 02:36:05 kevinswebserver systemd[1]: Starting The Apache HTTP Server...
Dec 14 02:36:05 kevinswebserver systemd[1]: Started The Apache HTTP Server.
Dec 14 02:52:16 kevinswebserver systemd[1]: Stopping The Apache HTTP Server...
Dec 14 02:52:16 kevinswebserver systemd[1]: apache2.service: Deactivated successfully.
Dec 14 02:52:16 kevinswebserver systemd[1]: Stopped The Apache HTTP Server.
Dec 14 02:52:25 kevinswebserver systemd[1]: Starting The Apache HTTP Server...
Dec 14 02:52:25 kevinswebserver systemd[1]: Started The Apache HTTP Server.
Dec 14 02:52:35 kevinswebserver systemd[1]: Stopping The Apache HTTP Server...
Dec 14 02:52:35 kevinswebserver systemd[1]: apache2.service: Deactivated successfully.
Dec 14 02:52:35 kevinswebserver systemd[1]: Stopped The Apache HTTP Server.
Dec 14 02:53:04 kevinswebserver systemd[1]: Starting The Apache HTTP Server...
Dec 14 02:53:04 kevinswebserver systemd[1]: Started The Apache HTTP Server.
kevin_mc12@kevinswebserver:~$ _
```

`apachectl` is used to check Apache's configuration, which is helpful for troubleshooting

```
kevin_mc12@kevinswebserver:~$ sudo apachectl configtest
Syntax OK
kevin_mc12@kevinswebserver:~$
```

## Question 15

Apache log files are files that show the events handled by the Apache web server. These files are used for troubleshooting errors that a user receives in a browser or another HTTP client.

**Example:** Looking for the last 10 lines in the Apache error log to help with troubleshooting: `sudo tail -n 10 /var/log/apache2/error.log`



```
kevin_mc12@kevinswebserver:~$ sudo apachectl configtest
Syntax OK
kevin_mc12@kevinswebserver:~$ sudo tail -n 10 /var/log/apache2/error.log
[sudo] password for kevin_mc12:
[Thu Dec 14 02:21:45.753455 2023] [core:notice] [pid 776:tid 140057816668032] AH00094: Command line:
'/usr/sbin/apache2'
[Thu Dec 14 02:26:25.827813 2023] [mpm_event:notice] [pid 776:tid 140057816668032] AH00491: caught S
IGTERM, shutting down
[Thu Dec 14 02:36:05.652375 2023] [mpm_event:notice] [pid 776:tid 140412617607040] AH00489: Apache/
2.4.52 (Ubuntu) configured -- resuming normal operations
[Thu Dec 14 02:36:05.656782 2023] [core:notice] [pid 776:tid 140412617607040] AH00094: Command line:
'/usr/sbin/apache2'
[Thu Dec 14 02:52:16.601201 2023] [mpm_event:notice] [pid 776:tid 140412617607040] AH00492: caught S
IGWINCH, shutting down gracefully
[Thu Dec 14 02:52:25.125747 2023] [mpm_event:notice] [pid 1502:tid 139965413271424] AH00489: Apache/
2.4.52 (Ubuntu) configured -- resuming normal operations
[Thu Dec 14 02:52:25.125846 2023] [core:notice] [pid 1502:tid 139965413271424] AH00094: Command line
: '/usr/sbin/apache2'
[Thu Dec 14 02:52:35.748286 2023] [mpm_event:notice] [pid 1502:tid 139965413271424] AH00492: caught
SIGWINCH, shutting down gracefully
[Thu Dec 14 02:53:04.884518 2023] [mpm_event:notice] [pid 1579:tid 139830349223808] AH00489: Apache/
2.4.52 (Ubuntu) configured -- resuming normal operations
[Thu Dec 14 02:53:04.884626 2023] [core:notice] [pid 1579:tid 139830349223808] AH00094: Command line
: '/usr/sbin/apache2'
kevin_mc12@kevinswebserver:~$
```