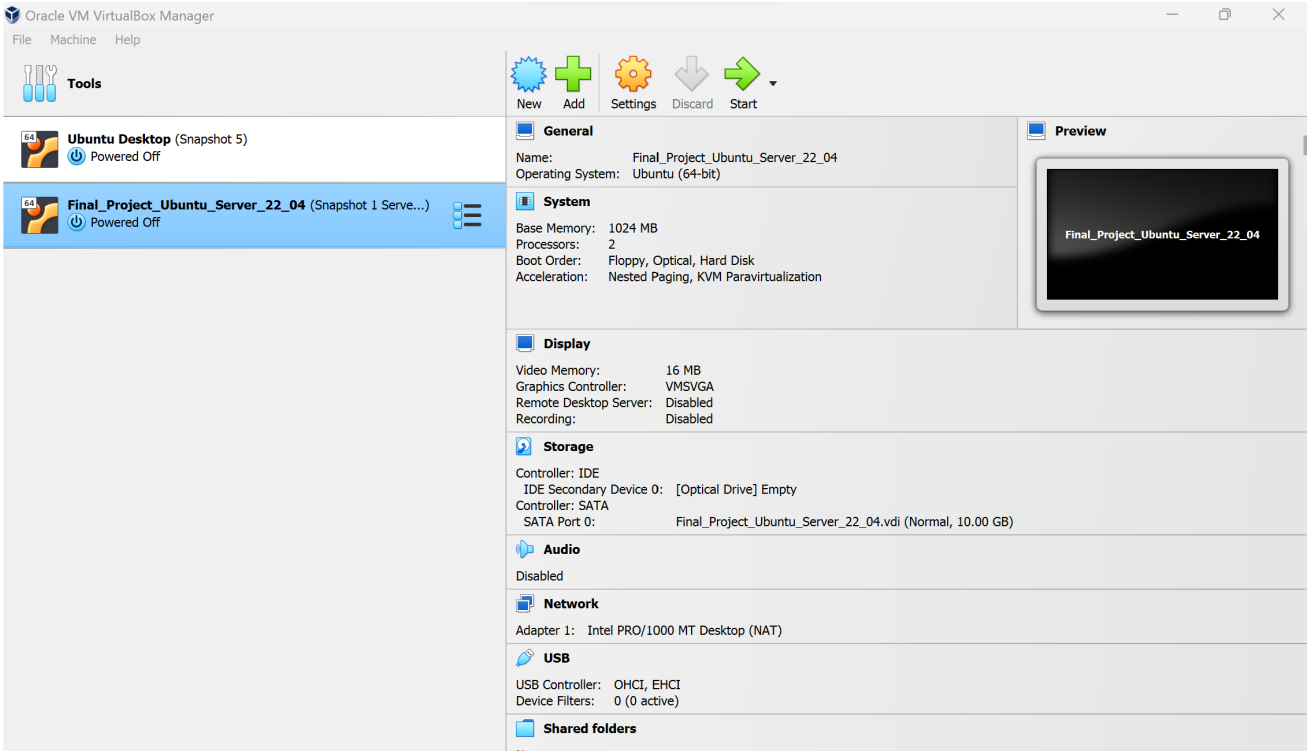
Deliverable 2

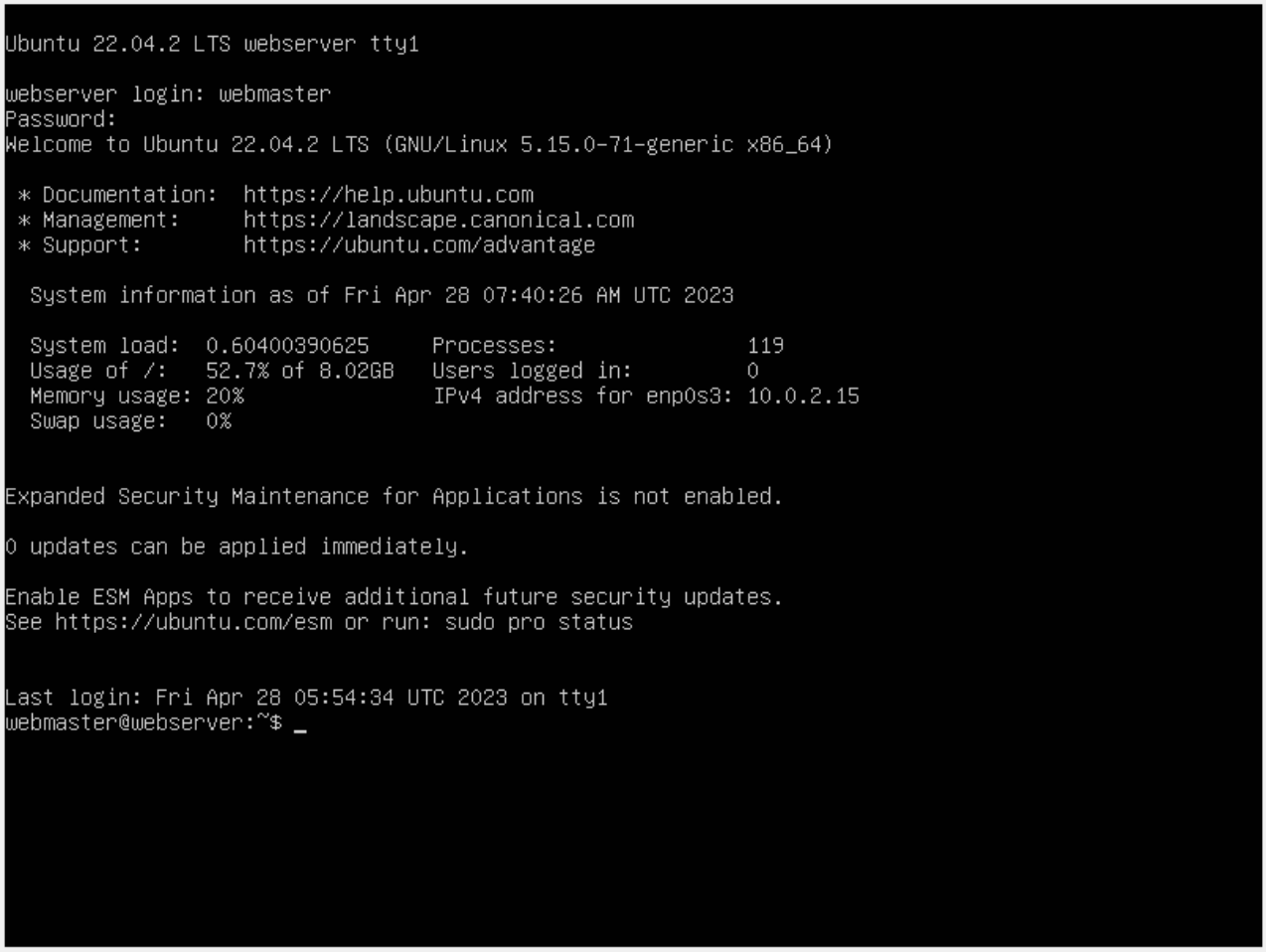
1. Virtual Machine Hardware Configuration

In this first step, I created a virtual machine with the following specifications: 2 Processors, 1GB of RAM, 10GB of storage



2. Logged into Ubuntu Server

In this step, I downloaded Ubuntu Server from Ubuntu's website and went through the installation process. See screenshot to see me logged in.



3. SSH from Desktop to Server

In this step, I used SSH to remotely sign into my server.

```
jdpaz@cis106vm ~$ ssh webmaster@192.168.1.97
webmaster@192.168.1.97's password:
Welcome to Ubuntu 22.04.2 LTS (GNU/Linux 5.15.0-71-generic x86_64)

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

  System information as of Tue May  2 03:24:14 AM UTC 2023

  System load:  0.64501953125     Processes:               128
  Usage of /:   54.0% of 8.02GB   Users logged in:         0
  Memory usage: 23%               IPv4 address for enp0s3: 192.168.1.97
  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.

1 update can be applied immediately.
To see these additional updates run: apt list --upgradable

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


Last login: Mon May  1 03:18:50 2023
webmaster@webserver:~$ _
```

4. Status of Applications

Status of Apache:

```
webmaster@webserver:~$ systemctl status apache2 --no-pager
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset
: enabled)
     Active: active (running) since Tue 2023-05-02 03:23:55 UTC; 24min ago
       Docs: https://httpd.apache.org/docs/2.4/
    Process: 716 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCC
ESS)
   Main PID: 785 (apache2)
      Tasks: 55 (limit: 1026)
     Memory: 7.9M
        CPU: 315ms
     CGroup: /system.slice/apache2.service
             ├─785 /usr/sbin/apache2 -k start
             ├─786 /usr/sbin/apache2 -k start
             └─787 /usr/sbin/apache2 -k start

May 02 03:23:55 webserver systemd[1]: Starting The Apache HTTP Server...
May 02 03:23:55 webserver systemd[1]: Started The Apache HTTP Server.
webmaster@webserver:~$
```

Status of SSH Service:

```
webmaster@webserver:~$ systemctl status sshd --no-pager
● ssh.service - OpenBSD Secure Shell server
     Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: enabled)
     Active: active (running) since Tue 2023-05-02 03:23:55 UTC; 26min ago
       Docs: man:sshd(8)
             man:sshd_config(5)
    Process: 730 ExecStartPre=/usr/sbin/sshd -t (code=exited, status=0/SUCCESS)
   Main PID: 816 (sshd)
      Tasks: 1 (limit: 1026)
     Memory: 7.6M
        CPU: 259ms
     CGroup: /system.slice/ssh.service
             └─816 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups"

May 02 03:23:55 webserver systemd[1]: Starting OpenBSD Secure Shell server...
May 02 03:23:55 webserver sshd[816]: Server listening on 0.0.0.0 port 22.
May 02 03:23:55 webserver sshd[816]: Server listening on :: port 22.
May 02 03:23:55 webserver systemd[1]: Started OpenBSD Secure Shell server.
May 02 03:24:14 webserver sshd[1022]: Accepted password for webmaster from …ssh2
May 02 03:24:14 webserver sshd[1022]: pam_unix(sshd:session): session opene…d=0)
May 02 03:47:10 webserver sshd[1230]: Accepted password for webmaster from …ssh2
May 02 03:47:10 webserver sshd[1230]: pam_unix(sshd:session): session opene…d=0)
Hint: Some lines were ellipsized, use -l to show in full.
```

Status of Uncomplicated Firewall:

```
webmaster@webserver:~$ systemctl status ufw --no-pager
● ufw.service - Uncomplicated firewall
     Loaded: loaded (/lib/systemd/system/ufw.service; enabled; vendor preset: enabled)
     Active: active (exited) since Tue 2023-05-02 03:23:52 UTC; 26min ago
       Docs: man:ufw(8)
    Process: 583 ExecStart=/lib/ufw/ufw-init start quiet (code=exited, status=0/SUCCESS)
   Main PID: 583 (code=exited, status=0/SUCCESS)
        CPU: 71ms

May 02 03:23:52 webserver systemd[1]: Starting Uncomplicated firewall...
May 02 03:23:52 webserver systemd[1]: Finished Uncomplicated firewall.
webmaster@webserver:~$ _
```

5. Logs

This is a screenshot of the Apache Log File: access.log

```
192.168.1.98 - - [01/May/2023:02:28:00 +0000] "GET /css/styles.css HTTP/1.1" 200 31731 "http://192.168.1.97/" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100101 Firefox/112.0"
192.168.1.98 - - [01/May/2023:02:28:01 +0000] "GET /assets/img/portfolio/thumbnails/3.jpg HTTP/1.1" 200 48517 "http://192.168.1.97/" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100101 Firefox/112.0"
192.168.1.98 - - [01/May/2023:02:28:01 +0000] "GET /assets/img/portfolio/thumbnails/1.jpg HTTP/1.1" 200 64077 "http://192.168.1.97/" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100101 Firefox/112.0"
192.168.1.98 - - [01/May/2023:02:28:01 +0000] "GET /assets/img/portfolio/thumbnails/6.jpg HTTP/1.1" 200 53717 "http://192.168.1.97/" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100101 Firefox/112.0"
192.168.1.98 - - [01/May/2023:02:28:01 +0000] "GET /assets/img/portfolio/thumbnails/2.jpg HTTP/1.1" 200 48390 "http://192.168.1.97/" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100101 Firefox/112.0"
192.168.1.98 - - [01/May/2023:02:28:01 +0000] "GET /assets/img/portfolio/thumbnails/5.jpg HTTP/1.1" 200 62622 "http://192.168.1.97/" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100101 Firefox/112.0"
192.168.1.98 - - [01/May/2023:02:28:01 +0000] "GET /assets/img/portfolio/thumbnails/4.jpg HTTP/1.1" 200 49343 "http://192.168.1.97/" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100101 Firefox/112.0"
192.168.1.98 - - [01/May/2023:02:28:01 +0000] "GET /assets/img/bg-masthead.jpg HTTP/1.1" 200 518851 "http://192.168.1.97/css/styles.css" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100101 Firefox/11
2.0"
192.168.1.98 - - [01/May/2023:02:28:01 +0000] "GET /assets/favicon.ico HTTP/1.1" 200 23764 "http://192.168.1.97/" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100101 Firefox/112.0"
192.168.1.98 - - [01/May/2023:03:05:14 +0000] "GET / HTTP/1.1" 200 3121 "-" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100101 Firefox/112.0"
192.168.1.98 - - [01/May/2023:03:05:15 +0000] "GET /favicon.ico HTTP/1.1" 404 490 "http://192.168.1.97/" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100101 Firefox/112.0"
192.168.1.98 - - [01/May/2023:03:09:06 +0000] "GET / HTTP/1.1" 200 3121 "-" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100101 Firefox/112.0"
```

This is a screenshot of the Error Log File: error.log

```
[Mon May 01 00:43:22.394897 2023] [mpm_event:notice] [pid 1213:tid 139729980966784] AH00489: Apache/2.4.52 (Ubuntu) configured -- resuming normal operations
[Mon May 01 00:43:22.395076 2023] [core:notice] [pid 1213:tid 139729980966784] AH00094: Command line: '/usr/sbin/apache2'
[Mon May 01 00:45:15.786811 2023] [mpm_event:notice] [pid 1213:tid 139729980966784] AH00492: caught SIGWINCH, shutting down gracefully
[Mon May 01 00:45:15.876047 2023] [mpm_event:notice] [pid 1317:tid 140243977676672] AH00489: Apache/2.4.52 (Ubuntu) configured -- resuming normal operations
[Mon May 01 00:45:15.876226 2023] [core:notice] [pid 1317:tid 140243977676672] AH00094: Command line: '/usr/sbin/apache2'
[Mon May 01 03:05:00.467215 2023] [mpm_event:notice] [pid 1317:tid 140243977676672] AH00493: SIGUSR1 received.  Doing graceful restart
[Mon May 01 03:05:00.480452 2023] [mpm_event:notice] [pid 1317:tid 140243977676672] AH00489: Apache/2.4.52 (Ubuntu) configured -- resuming normal operations
[Mon May 01 03:05:00.480475 2023] [core:notice] [pid 1317:tid 140243977676672] AH00094: Command line: '/usr/sbin/apache2'
[Mon May 01 03:18:54.631485 2023] [mpm_event:notice] [pid 1317:tid 140243977676672] AH00492: caught SIGWINCH, shutting down gracefully
[Tue May 02 03:23:55.663315 2023] [mpm_event:notice] [pid 785:tid 140377453873024] AH00489: Apache/2.4.52 (Ubuntu) configured -- resuming normal operations
[Tue May 02 03:23:55.664628 2023] [core:notice] [pid 785:tid 140377453873024] AH00094: Command line: '/usr/sbin/apache2'
webmaster@webserver:/var/log/apache2$
```

This is a screenshot of the Authorization Log File: auth.log

```
May  2 03:24:14 webserver systemd: pam_unix(systemd-user:session): session opened for user webmaster(uid=1000) by (uid=0)
May  2 03:46:39 webserver login[741]: pam_unix(login:auth): check pass; user unknown
May  2 03:46:39 webserver login[741]: pam_unix(login:auth): authentication failure; logname=LOGIN uid=0 euid=0 tty=/dev/tty1 ruser= rhost=
May  2 03:46:42 webserver login[741]: FAILED LOGIN (1) on '/dev/tty1' FOR 'UNKNOWN', Authentication failure
May  2 03:46:42 webserver sshd[1128]: Received disconnect from 192.168.1.98 port 47796:11: disconnected by user
May  2 03:46:42 webserver sshd[1128]: Disconnected from user webmaster 192.168.1.98 port 47796
May  2 03:46:42 webserver systemd-logind[731]: Session 1 logged out. Waiting for processes to exit.
May  2 03:46:42 webserver sshd[1022]: pam_unix(sshd:session): session closed for user webmaster
May  2 03:46:42 webserver systemd-logind[731]: Removed session 1.
May  2 03:46:50 webserver login[741]: pam_unix(login:session): session opened for user webmaster(uid=1000) by LOGIN(uid=0)
May  2 03:46:50 webserver systemd-logind[731]: New session 3 of user webmaster.
May  2 03:47:10 webserver sshd[1230]: Accepted password for webmaster from 192.168.1.98 port 38230 ssh2
May  2 03:47:10 webserver sshd[1230]: pam_unix(sshd:session): session opened for user webmaster(uid=1000) by (uid=0)
May  2 03:47:10 webserver systemd-logind[731]: New session 4 of user webmaster.
webmaster@webserver:/var/log$
```

6. Configuration Files

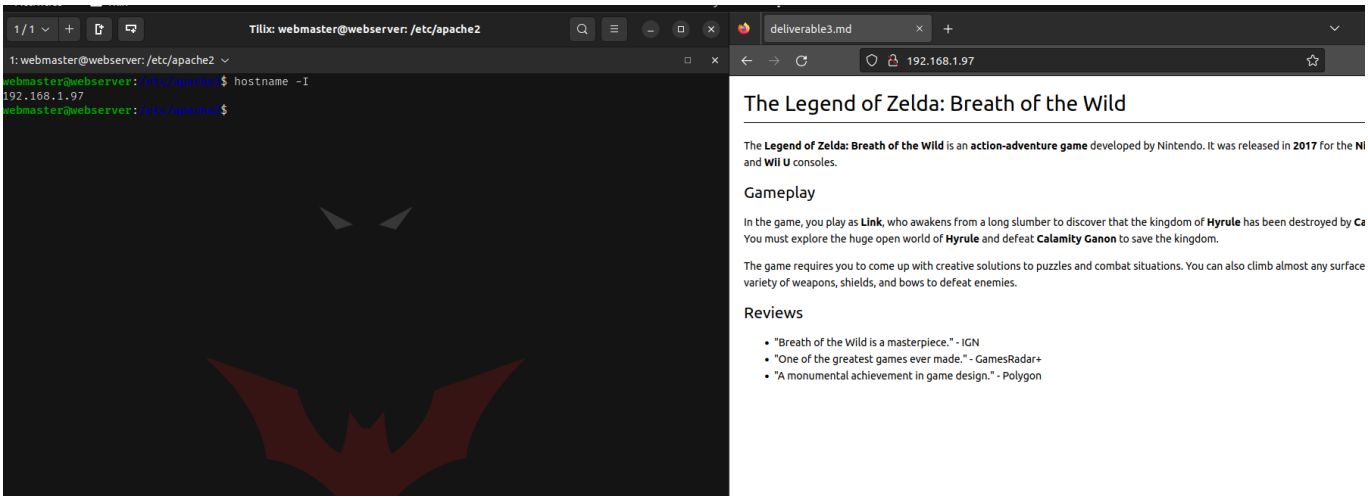
Here is a screenshot of the sites-available config file.

```
webmaster@webserver:/etc/apache2/sites-available$ cat zeldamaster.conf
<VirtualHost *:80>
    ServerAdmin webmaster@localhost
    ServerName zeldamaster
    ServerAlias www.zeldamaster
    DocumentRoot /var/www/zeldamaster
    ErrorLog ${APACHE_LOG_DIR}/error.log
    CustomLog ${APACHE_LOG_DIR}/access.log combined
</VirtualHost>
webmaster@webserver:/etc/apache2/sites-available$ _
```

Here is a screenshot of the Apache config file.

```
#
# The following directives define some format nicknames for use with
# a CustomLog directive.
#
# These deviate from the Common Log Format definitions in that they use %O
# (the actual bytes sent including headers) instead of %b (the size of the
# requested file), because the latter makes it impossible to detect partial
# requests.
#
# Note that the use of %{X-Forwarded-For}i instead of %h is not recommended.
# Use mod_remoteip instead.
#
LogFormat "%v:%p %h %l %u %t \"%r\" %>s %O \"%{Referer}i\" \"%{User-Agent}i\"" vhost_combined
LogFormat "%h %l %u %t \"%r\" %>s %O \"%{Referer}i\" \"%{User-Agent}i\"" combined
LogFormat "%h %l %u %t \"%r\" %>s %O" common
LogFormat "%{Referer}i -> %U" referer
LogFormat "%{User-agent}i" agent

# Include of directories ignores editors' and dpkg's backup files,
# see README.Debian for details.

# Include generic snippets of statements
IncludeOptional conf-enabled/*.conf

# Include the virtual host configurations:
IncludeOptional sites-enabled/*.conf

# vim: syntax=apache ts=4 sw=4 sts=4 sr noet
ServerName 127.0.0.1
webmaster@webserver:/etc/apache2$
```

7. In this screenshot, you will see the server being accessed from my browser:


1 / 1
Tilix: webmaster@webserver: /etc/apache2
1: webmaster@webserver: /etc/apache2
webmaster@webserver:/etc/apache2$ hostname -I
192.168.1.97
webmaster@webserver:/etc/apache2$
deliverable3.md
192.168.1.97
The Legend of Zelda: Breath of the Wild
The Legend of Zelda: Breath of the Wild is an action-adventure game developed by Nintendo. It was released in 2017 for the Ni
and Wii U consoles.
Gameplay
In the game, you play as Link, who awakens from a long slumber to discover that the kingdom of Hyrule has been destroyed by Ca
You must explore the huge open world of Hyrule and defeat Calamity Ganon to save the kingdom.
The game requires you to come up with creative solutions to puzzles and combat situations. You can also climb almost any surface
variety of weapons, shields, and bows to defeat enemies.
Reviews
"Breath of the Wild is a masterpiece." - IGN
"One of the greatest games ever made." - GamesRadar+
"A monumental achievement in game design." - Polygon