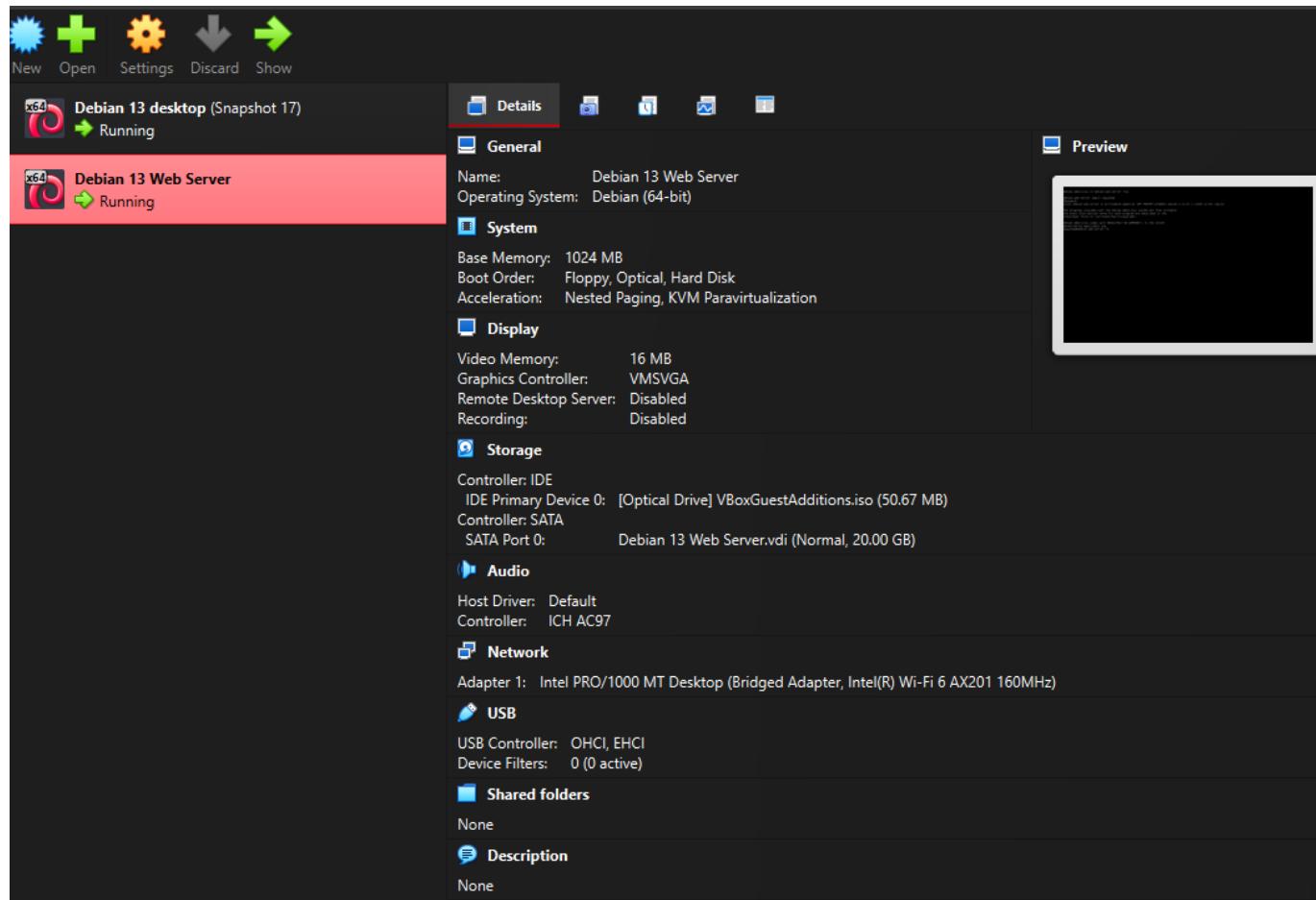


Deliverable 2

1. What are the server hardware specifications (virtual machine settings)?



2. What is the Debian Login Screen?

```
Debian GNU/Linux 13 debian-web-server tty1
debian-web-server login: aayushma
Password:
Linux debian-web-server 6.12.57+deb13-amd64 #1 SMP PREEMPT_DYNAMIC Debian 6.12.57-1 (2025-11-05) x86_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
aayushma@debian-web-server:~$
```

3. What is the IP address of your Debian Server Virtual Machine?

```
Debian GNU/Linux 13 debian-web-server tty1
debian-web-server login: aayushma
Password:
Linux debian-web-server 6.12.57+deb13-amd64 #1 SMP PREEMPT_DYNAMIC Debian 6.12.57-1 (2025-11-05) x86_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
aayushma@debian-web-server:~$ hostname
debian-web-server
aayushma@debian-web-server:~$ hostname -I
192.168.0.114
aayushma@debian-web-server:~$
```

4. How do you work with the Firewall in Debian?

1. How do you check if the Firewall is running?

- Command: `systemctl status ufw`
- This command checks the current status of the UFW firewall service on our system.

2. How do you disable the Firewall?

- Command: `sudo ufw disable`
- This command turns off the UFW firewall completely.

3. How do you add Apache to the Firewall?

- Command: `sudo ufw allow 'WWW Full'`
- This command opens both HTTP and HTTPS ports on our firewall to set up Apache server.

5. What different commands do we use to work with Apache?

1. What is the command you use to check if Apache is running?

- Command: `systemctl status apache2`

```
aayushma@debian-web-server:~$ systemctl status apache2
● apache2.service - The Apache HTTP Server
    Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)
      Active: active (running) since Sun 2025-12-07 14:12:31 EST; 40min ago
        Invocation: 34e299c0fc224265a9748454bc887af1
          Docs: https://httpd.apache.org/docs/2.4/
        Process: 720 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
      Main PID: 756 (apache2)
        Tasks: 55 (limit: 1095)
       Memory: 8M (peak: 8.3M)
         CPU: 416ms
      CGroup: /system.slice/apache2.service
              └─756 /usr/sbin/apache2 -k start
                  ├─758 /usr/sbin/apache2 -k start
                  ├─759 /usr/sbin/apache2 -k start

Warning: some journal files were not opened due to insufficient permissions.
aayushma@debian-web-server:~$ _
```

2. What is the command you use to stop Apache?

- Command: sudo systemctl stop apache2

```
aayushma@debian-web-server:~$ sudo systemctl stop apache2
[sudo] password for aayushma:
aayushma@debian-web-server:~$ systemctl status apache2
● apache2.service - The Apache HTTP Server
    Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)
      Active: inactive (dead) since Sun 2025-12-07 23:15:30 EST; 29s ago
        Duration: 9h 2min 58.854s
      Invocation: 34e299c0fc224265a9748454bc887af1
        Docs: https://httpd.apache.org/docs/2.4/
      Process: 720 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
      Process: 1347 ExecStop=/usr/sbin/apachectl graceful-stop (code=exited, status=0/SUCCESS)
    Main PID: 756 (code=exited, status=0/SUCCESS)
   Mem peak: 9.8M
     CPU: 5.124s

Warning: some journal files were not opened due to insufficient permissions.
aayushma@debian-web-server:~$ _
```

3. What is the command you use to restart Apache?

- Command: sudo systemctl restart apache2

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\aaayus> ssh aayushma@192.168.0.114
aayushma@192.168.0.114's password:
Permission denied, please try again.
aayushma@192.168.0.114's password:
Linux debian-web-server 6.12.57+deb13-amd64 #1 SMP PREEMPT_DYNAMIC Debian 6.12.57-1 (2025-11-05) x86_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Sun Dec  7 12:24:26 2025 from 192.168.0.106
aayushma@debian-web-server:~$ sudo systemctl restart apache2
[sudo] password for aayushma:
aayushma@debian-web-server:~$ systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)
   Active: active (running) since Sun 2025-12-07 23:20:31 EST; 24s ago
     Invocation: 26cf5cc998424b41aeb71343cd1e24be
       Docs: https://httpd.apache.org/docs/2.4/
    Process: 1383 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
   Main PID: 1386 (apache2)
      Tasks: 55 (limit: 1095)
     Memory: 4.8M (peak: 5M)
        CPU: 71ms
       CGroup: /system.slice/apache2.service
               └─1386 /usr/sbin/apache2 -k start
                 ├─1388 /usr/sbin/apache2 -k start
                 ├─1389 /usr/sbin/apache2 -k start
                 └─1389 /usr/sbin/apache2 -k start
aayushma@debian-web-server:~$ |
```

4. What is the command used to test Apache configuration?

- Command: sudo apache2ctl configtest

```
aayushma@debian-web-server:~$ sudo apache2ctl configtest
Syntax OK
aayushma@debian-web-server:~$ |
```

5. What is the command used to check the installed version of Apache?

- Command: `sudo apache2 -v`

```
aayushma@debian-web-server:~$ sudo apache2 -v
Server version: Apache/2.4.65 (Debian)
Server built:   2025-07-29T17:52:31
aayushma@debian-web-server:~$
```

6. What are some common configuration files for Apache?

- Command:

 - `/etc/apache2/apache2.conf` → main configuration file
 - `/etc/apache2/ports.conf` → port definitions
 - `/etc/apache2/sites-available/` → virtual host configuration directory
 - `/etc/apache2/sites-enabled/` → symlinks to active sites

```
aayushma@debian-web-server:~$ less /etc/apache2/apache2.conf
aayushma@debian-web-server:~$ less /etc/apache2/apache2.conf
aayushma@debian-web-server:~$ cat /etc/apache2/apache2.conf
#
# This is the main Apache server configuration file. It contains the
# configuration directives that give the server its instructions.
# See http://httpd.apache.org/docs/2.4/ for detailed information about
# the directives and /usr/share/doc/apache2/README.Debian about Debian specific
# hints.
#
#
# Summary of how the Apache 2 configuration works in Debian:
# The Apache 2 web server configuration in Debian is quite different to
# upstream's suggested way to configure the web server. This is because Debia
# n's
# default Apache2 installation attempts to make adding and removing modules,
# virtual hosts, and extra configuration directives as flexible as possible,
# in
# order to make automating the changes and administering the server as easy a
# s
# possible.

# It is split into several files forming the configuration hierarchy outlined
# below, all located in the /etc/apache2/ directory:
#
#      /etc/apache2/
#          |-- apache2.conf
#              '-- ports.conf
#          '-- mods-enabled
#              '-- *.*.load
#                  '-- *.conf
#          '-- conf-enabled
#              '-- *.*.conf
#          '-- sites-enabled
#              '-- *.*.conf
#
#
# * apache2.conf is the main configuration file (this file). It puts the piec
# es
# together by including all remaining configuration files when starting up
```

```
aayushma@debian-web-server:~$ cat /etc/apache2/ports.conf
# If you just change the port or add more ports here, you will likely als
o
# have to change the VirtualHost statement in
# /etc/apache2/sites-enabled/000-default.conf
Listen 80

<IfModule ssl_module>
    Listen 443
</IfModule>

<IfModule mod_gnutls.c>
    Listen 443
</IfModule>
aayushma@debian-web-server:~$ ls /etc/apache2/sites-available/
000-default.conf  default-ssl.conf
aayushma@debian-web-server:~$ ls /etc/apache2/sites-enabled/
000-default.conf
aayushma@debian-web-server:~$
```

7. Where does Apache store logs?

- Command:

- `/var/log/apache2/access.log` → all access requests
- `/var/log/apache2/error.log` → errors and issues

```

ayushma@debian-web-server:~$ sudo cat /var/log/apache2/access.log
cat: /var/log/apache2/access.log: Permission denied
ayushma@debian-web-server:~$ sudo cat /var/log/apache2/access.log
::1 - - [04/Dec/2025:17:00:16 -0500] "GET / HTTP/1.1" 200 11014 "-" "Wget/1.25.0"
127.0.0.1 - - [07/Dec/2025:10:43:15 -0500] "GET / HTTP/1.1" 200 11014 "-" "Wget/1.25.0"
192.168.0.106 - - [07/Dec/2025:12:30:42 -0500] "GET / HTTP/1.1" 200 3383 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/142.0.0.0 Safari/537.36"
192.168.0.106 - - [07/Dec/2025:12:30:42 -0500] "GET /icons/openlogo-75.png HTTP/1.1" 200 6040 "http://192.168.0.114/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/142.0.0.0 Safari/537.36"
192.168.0.106 - - [07/Dec/2025:12:30:42 -0500] "GET /favicon.ico HTTP/1.1" 404 491 "http://192.168.0.114/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/142.0.0.0 Safari/537.36"
192.168.0.106 - - [07/Dec/2025:12:31:33 -0500] "--" 408 0 "--"
ayushma@debian-web-server:~$ sudo cat /var/log/apache2/error.log
[Thu Dec 04 16:07:03.040162 2025] [mpm_event:notice] [pid 700:tid 700] AH00489: Apache/2.4.65 (Debian) configured -- resuming normal operations
[Thu Dec 04 16:07:03.040237 2025] [core:notice] [pid 700:tid 700] AH00094: Command line: '/usr/sbin/apache2'
[Thu Dec 04 16:56:03.361814 2025] [mpm_event:notice] [pid 700:tid 700] AH00492: caught SIGWINCH, shutting down gracefully
[Thu Dec 04 16:56:17.378571 2025] [mpm_event:notice] [pid 755:tid 755] AH00489: Apache/2.4.65 (Debian) configured -- resuming normal operations
[Thu Dec 04 16:56:17.384715 2025] [core:notice] [pid 755:tid 755] AH00094: Command line: '/usr/sbin/apache2'
[Thu Dec 04 17:05:12.537866 2025] [mpm_event:notice] [pid 758:tid 758] AH00489: Apache/2.4.65 (Debian) configured -- resuming normal operations
[Thu Dec 04 17:05:12.541424 2025] [core:notice] [pid 758:tid 758] AH00094: Command line: '/usr/sbin/apache2'
[Sun Dec 07 10:37:17.185267 2025] [mpm_event:notice] [pid 809:tid 809] AH00489: Apache/2.4.65 (Debian) configured -- resuming normal operations
[Sun Dec 07 10:37:17.186329 2025] [core:notice] [pid 809:tid 809] AH00094: Command line: '/usr/sbin/apache2'
[Sun Dec 07 11:10:58.672081 2025] [mpm_event:notice] [pid 809:tid 809] AH00492: caught SIGWINCH, shutting down gracefully
[Sun Dec 07 11:12:56.938739 2025] [mpm_event:notice] [pid 753:tid 753] AH00489: Apache/2.4.65 (Debian) configured -- resuming normal operations
[Sun Dec 07 11:12:56.944705 2025] [core:notice] [pid 753:tid 753] AH00094: Command line: '/usr/sbin/apache2'
[Sun Dec 07 11:53:37.988158 2025] [mpm_event:notice] [pid 749:tid 749] AH00489: Apache/2.4.65 (Debian) configured -- resuming normal operations
[Sun Dec 07 11:53:37.997576 2025] [core:notice] [pid 749:tid 749] AH00094: Command line: '/usr/sbin/apache2'
[Sun Dec 07 14:12:31.606712 2025] [mpm_event:notice] [pid 756:tid 756] AH00489: Apache/2.4.65 (Debian) configured -- resuming normal operations
[Sun Dec 07 14:12:31.619426 2025] [core:notice] [pid 756:tid 756] AH00094: Command line: '/usr/sbin/apache2'
[Sun Dec 07 23:15:30.487497 2025] [mpm_event:notice] [pid 756:tid 756] AH00492: caught SIGWINCH, shutting down gracefully
[Sun Dec 07 23:20:31.969602 2025] [mpm_event:notice] [pid 1386:tid 1386] AH00489: Apache/2.4.65 (Debian) configured -- resuming normal operations
[Sun Dec 07 23:20:31.969771 2025] [core:notice] [pid 1386:tid 1386] AH00094: Command line: '/usr/sbin/apache2'
ayushma@debian-web-server:~$ |

```

8. What are some basic commands we can use to review logs?

- View logs with cat

- `sudo cat /var/log/apache2/access.log`

- View logs with less.(Lets you scroll up/down,q to quit)

- `sudo less /var/log/apache2/access.log`

- View the last lines: tail

- `sudo tail -2 /var/log/apache2/access.log`

- View the beginning: head

- `sudo head /var/log/apache2/error.log`

- Search inside logs with grep (find lines that contain a word)

- grep "192.168.0.106" /var/log/apache2/access.log

```
ayushma@debian-web-server:~$ cat /var/log/apache2/access.log
cat: /var/log/apache2/access.log: Permission denied
ayushma@debian-web-server:~$ sudo cat /var/log/apache2/access.log
[sudo] password for aayushma:
::1 - - [04/Dec/2025:17:00:16 -0500] "GET / HTTP/1.1" 200 11014 "-" "Wget/1.25.0"
127.0.0.1 - - [07/Dec/2025:10:43:15 -0500] "GET / HTTP/1.1" 200 11014 "-" "Wget/1.25.0"
192.168.0.106 - - [07/Dec/2025:12:30:42 -0500] "GET / HTTP/1.1" 200 3383 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/142.0.0.0 Safari/537.36"
192.168.0.106 - - [07/Dec/2025:12:30:42 -0500] "GET /icons/openlogo-75.png HTTP/1.1" 200 6040 "http://192.168.0.114/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/142.0.0.0 Safari/537.36"
192.168.0.106 - - [07/Dec/2025:12:30:42 -0500] "GET /favicon.ico HTTP/1.1" 404 491 "http://192.168.0.114/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/142.0.0.0 Safari/537.36"
192.168.0.106 - - [07/Dec/2025:12:31:33 -0500] "-" 408 0 "-" "-"
ayushma@debian-web-server:~$ sudo less /var/log/apache2/access.log
ayushma@debian-web-server:~$ sudo tail /var/log/apache2/access.log
::1 - - [04/Dec/2025:17:00:16 -0500] "GET / HTTP/1.1" 200 11014 "-" "Wget/1.25.0"
127.0.0.1 - - [07/Dec/2025:10:43:15 -0500] "GET / HTTP/1.1" 200 11014 "-" "Wget/1.25.0"
192.168.0.106 - - [07/Dec/2025:12:30:42 -0500] "GET / HTTP/1.1" 200 3383 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/142.0.0.0 Safari/537.36"
192.168.0.106 - - [07/Dec/2025:12:30:42 -0500] "GET /icons/openlogo-75.png HTTP/1.1" 200 6040 "http://192.168.0.114/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/142.0.0.0 Safari/537.36"
192.168.0.106 - - [07/Dec/2025:12:30:42 -0500] "GET /favicon.ico HTTP/1.1" 404 491 "http://192.168.0.114/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/142.0.0.0 Safari/537.36"
192.168.0.106 - - [07/Dec/2025:12:31:33 -0500] "-" 408 0 "-" "-"
ayushma@debian-web-server:~$ sudo tail -2 /var/log/apache2/error.log
192.168.0.106 - - [07/Dec/2025:12:30:42 -0500] "GET /favicon.ico HTTP/1.1" 404 491 "http://192.168.0.114/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/142.0.0.0 Safari/537.36"
192.168.0.106 - - [07/Dec/2025:12:31:33 -0500] "-" 408 0 "-" "-"
ayushma@debian-web-server:~$ sudo head /var/log/apache2/error.log
[Thu Dec 04 16:07:03.040162 2025] [mpm_event:notice] [pid 700:tid 700] AH00489: Apache/2.4.65 (Debian) configured -- resuming normal operations
[Thu Dec 04 16:07:03.040237 2025] [core:notice] [pid 700:tid 700] AH00094: Command line: '/usr/sbin/apache2'
[Thu Dec 04 16:56:03.361814 2025] [mpm_event:notice] [pid 700:tid 700] AH00492: caught SIGWINCH, shutting down gracefully
[Thu Dec 04 16:56:17.378571 2025] [mpm_event:notice] [pid 755:tid 755] AH00489: Apache/2.4.65 (Debian) configured -- resuming normal operations
[Thu Dec 04 16:56:17.384715 2025] [core:notice] [pid 755:tid 755] AH00094: Command line: '/usr/sbin/apache2'
[Thu Dec 04 17:05:12.537866 2025] [mpm_event:notice] [pid 758:tid 758] AH00489: Apache/2.4.65 (Debian) configured -- resuming normal operations
[Thu Dec 04 17:05:12.541424 2025] [core:notice] [pid 758:tid 758] AH00094: Command line: '/usr/sbin/apache2'
[Sun Dec 07 10:37:17.185267 2025] [mpm_event:notice] [pid 809:tid 809] AH00489: Apache/2.4.65 (Debian) configured -- resuming normal operations
[Sun Dec 07 10:37:17.186329 2025] [core:notice] [pid 809:tid 809] AH00094: Command line: '/usr/sbin/apache2'
[Sun Dec 07 11:10:58.672081 2025] [mpm_event:notice] [pid 809:tid 809] AH00492: caught SIGWINCH, shutting down gracefully
ayushma@debian-web-server:~$ sudo grep "192.168.0.106" /var/log/apache2/access.log
192.168.0.106 - - [07/Dec/2025:12:30:42 -0500] "GET / HTTP/1.1" 200 3383 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/142.0.0.0 Safari/537.36"
192.168.0.106 - - [07/Dec/2025:12:30:42 -0500] "GET /icons/openlogo-75.png HTTP/1.1" 200 6040 "http://192.168.0.114/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/142.0.0.0 Safari/537.36"
192.168.0.106 - - [07/Dec/2025:12:30:42 -0500] "GET /favicon.ico HTTP/1.1" 404 491 "http://192.168.0.114/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/142.0.0.0 Safari/537.36"
192.168.0.106 - - [07/Dec/2025:12:31:33 -0500] "-" 408 0 "-" "-"

ayushma@debian-web-server:~$
```