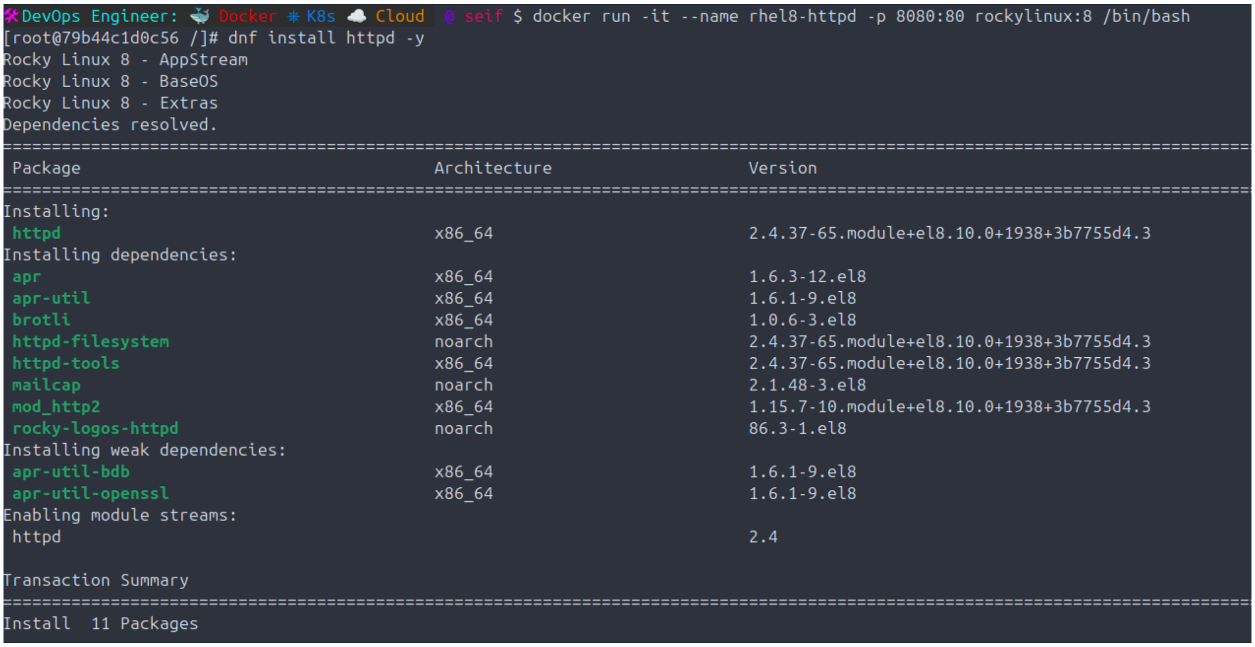
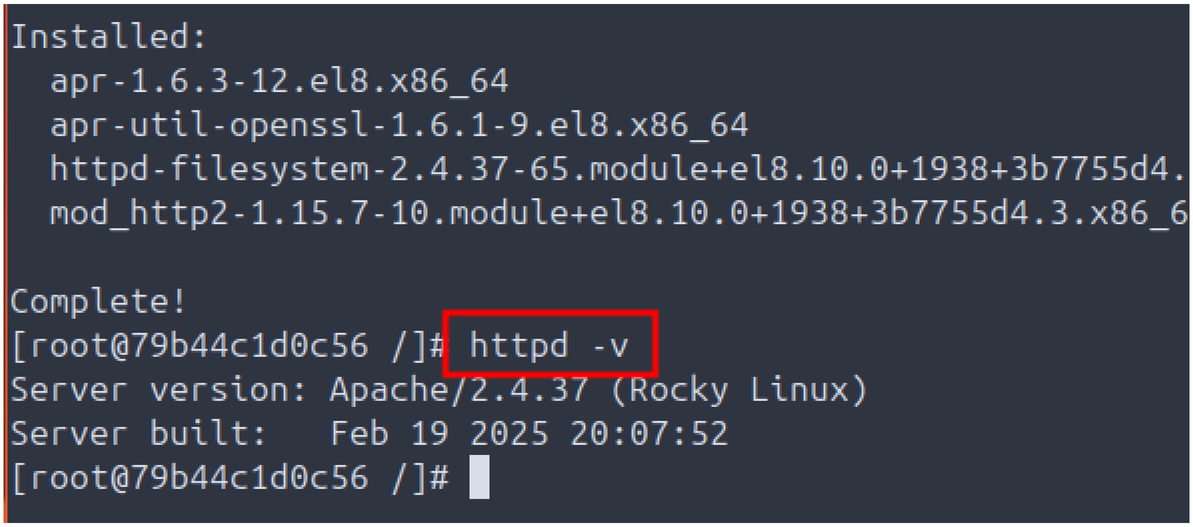
Seif Hendawy
Lab 4

Apache Web server
=================
## Practical Exercises: Providing Apache HTTPD Web Service on RHEL 8
### Exercise 1: Install Apache HTTPD Server
- Use dnf to install the Apache HTTPD package.
- Verify the installation by checking the package version.

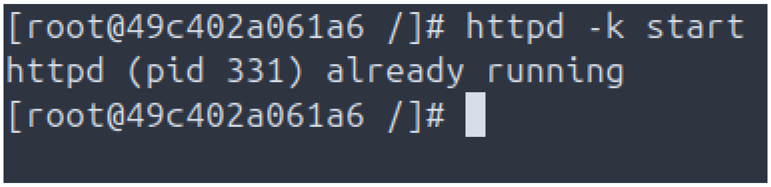


```
🛠DevOps Engineer: 🐳 Docker ❄ K8s ☁ Cloud  @ seif $ docker run -it --name rhel8-httpd -p 8080:80 rockylinux:8 /bin/bash
[root@79b44c1d0c56 /]# dnf install httpd -y
Rocky Linux 8 - AppStream
Rocky Linux 8 - BaseOS
Rocky Linux 8 - Extras
Dependencies resolved.
==============================================================================================================================
 Package                                    Architecture                    Version
==============================================================================================================================
Installing:
 httpd                                      x86_64                          2.4.37-65.module+el8.10.0+1938+3b7755d4.3
Installing dependencies:
 apr                                        x86_64                          1.6.3-12.el8
 apr-util                                   x86_64                          1.6.1-9.el8
 brotli                                     x86_64                          1.0.6-3.el8
 httpd-filesystem                           noarch                          2.4.37-65.module+el8.10.0+1938+3b7755d4.3
 httpd-tools                                x86_64                          2.4.37-65.module+el8.10.0+1938+3b7755d4.3
 mailcap                                    noarch                          2.1.48-3.el8
 mod_http2                                  x86_64                          1.15.7-10.module+el8.10.0+1938+3b7755d4.3
 rocky-logos-httpd                          noarch                          86.3-1.el8
Installing weak dependencies:
 apr-util-bdb                               x86_64                          1.6.1-9.el8
 apr-util-openssl                           x86_64                          1.6.1-9.el8
Enabling module streams:
 httpd                                                                      2.4

Transaction Summary
==============================================================================================================================
Install  11 Packages
```



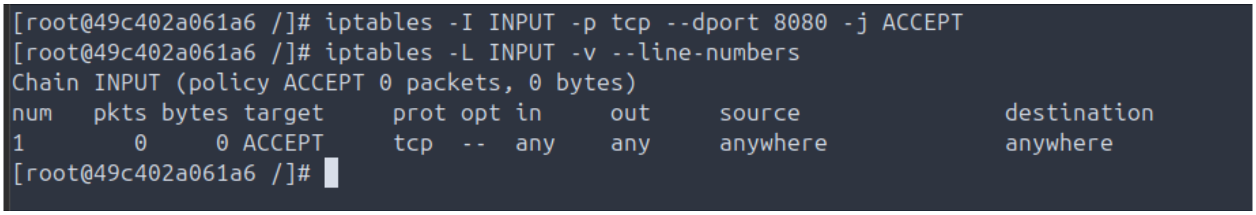
```
Installed:
  apr-1.6.3-12.el8.x86_64
  apr-util-openssl-1.6.1-9.el8.x86_64
  httpd-filesystem-2.4.37-65.module+el8.10.0+1938+3b7755d4.
  mod_http2-1.15.7-10.module+el8.10.0+1938+3b7755d4.3.x86_6

Complete!
[root@79b44c1d0c56 /]# httpd -v
Server version: Apache/2.4.37 (Rocky Linux)
Server built:   Feb 19 2025 20:07:52
[root@79b44c1d0c56 /]# 
```

### Exercise 2: Start and Enable Apache Service
- Start the Apache service using systemctl.
- Enable the service to start automatically on boot.
- Verify the service status.



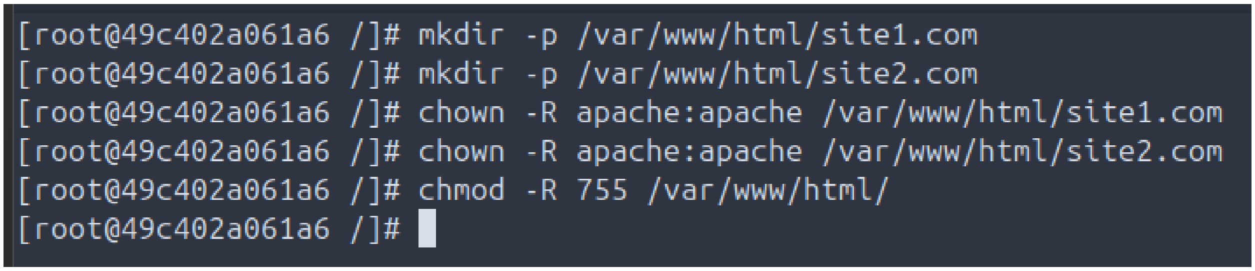
```
[root@49c402a061a6 /]# httpd -k start
httpd (pid 331) already running
[root@49c402a061a6 /]# 
```

### Exercise 3: Configure Firewall to Allow HTTP and HTTPS Traffic
- Open ports 80 (HTTP) and 443 (HTTPS) in the firewall.
- Reload firewall settings.
- Verify that the firewall rules are applied.



```
[root@49c402a061a6 /]# iptables -I INPUT -p tcp --dport 8080 -j ACCEPT
[root@49c402a061a6 /]# iptables -L INPUT -v --line-numbers
Chain INPUT (policy ACCEPT 0 packets, 0 bytes)
num   pkts bytes target     prot opt in     out     source               destination
1        0     0 ACCEPT     tcp  --  any    any     anywhere             anywhere
[root@49c402a061a6 /]# 
```

### Exercise 4: Configure Apache Virtual Hosts
Objective:
Host multiple websites on a single RHEL 8 server using Apache name-based virtual hosts.
#### Step 1: Prepare Document Root Directories
- Create separate directories for each website.

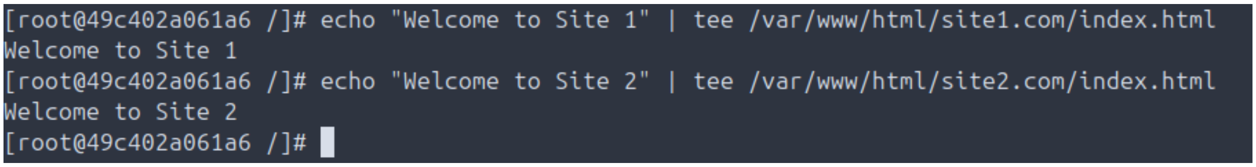


```
[root@49c402a061a6 /]# mkdir -p /var/www/html/site1.com
[root@49c402a061a6 /]# mkdir -p /var/www/html/site2.com
[root@49c402a061a6 /]# chown -R apache:apache /var/www/html/site1.com
[root@49c402a061a6 /]# chown -R apache:apache /var/www/html/site2.com
[root@49c402a061a6 /]# chmod -R 755 /var/www/html/
[root@49c402a061a6 /]# 
```

#### Step 2: Create Sample Index Pages

bash

```
echo "Welcome to Site 1" | tee /var/www/html/site1.com/index.html
echo "Welcome to Site 2" | tee /var/www/html/site2.com/index.html
```



```
[root@49c402a061a6 /]# echo "Welcome to Site 1" | tee /var/www/html/site1.com/index.html
Welcome to Site 1
[root@49c402a061a6 /]# echo "Welcome to Site 2" | tee /var/www/html/site2.com/index.html
Welcome to Site 2
[root@49c402a061a6 /]# 
```

#### Step 3: Create Virtual Host Configuration Files

- Create a separate config file for each site in /etc/httpd/conf.d/:

bash

```
sudo vi /etc/httpd/conf.d/site1.com.conf
```

- Add the following:

apache

```
        ServerName site1.com
        DocumentRoot /var/www/html/site1.com
        ErrorLog /var/log/httpd/site1.com_error.log
        CustomLog /var/log/httpd/site1.com_access.log combined
```

- Repeat for the second site:

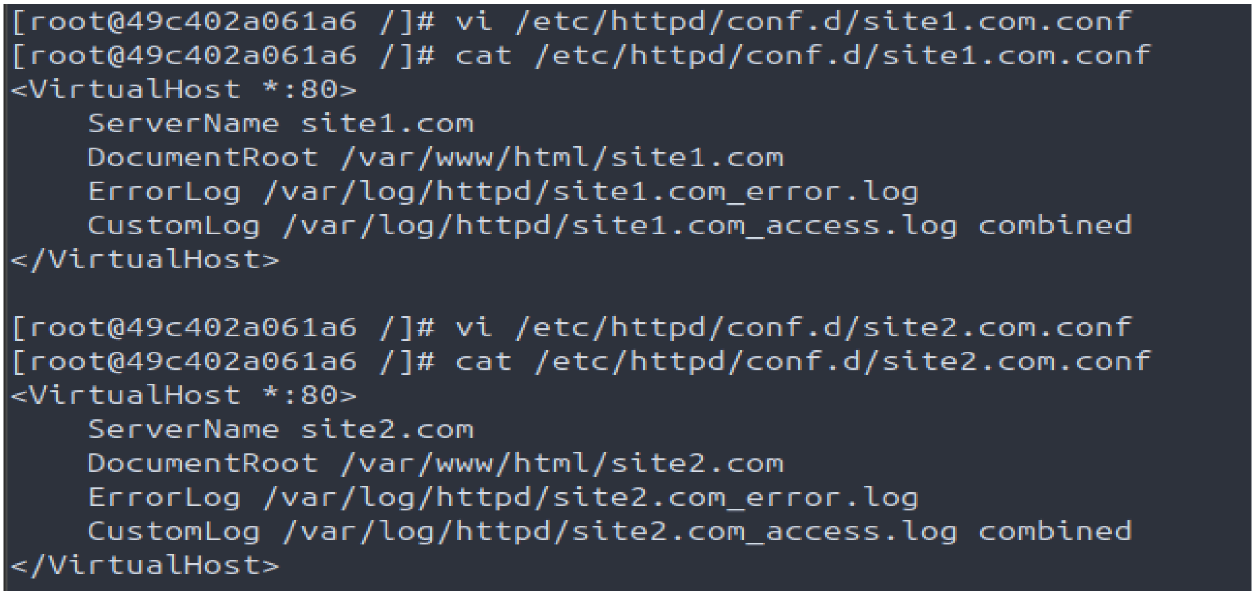
bash

```
sudo vi /etc/httpd/conf.d/site2.com.conf
```

- Add:

apache

```
        ServerName site2.com
        DocumentRoot /var/www/html/site2.com
        ErrorLog /var/log/httpd/site2.com_error.log
        CustomLog /var/log/httpd/site2.com_access.log combined
```



```
[root@49c402a061a6 /]# vi /etc/httpd/conf.d/site1.com.conf
[root@49c402a061a6 /]# cat /etc/httpd/conf.d/site1.com.conf
<VirtualHost *:80>
    ServerName site1.com
    DocumentRoot /var/www/html/site1.com
    ErrorLog /var/log/httpd/site1.com_error.log
    CustomLog /var/log/httpd/site1.com_access.log combined
</VirtualHost>

[root@49c402a061a6 /]# vi /etc/httpd/conf.d/site2.com.conf
[root@49c402a061a6 /]# cat /etc/httpd/conf.d/site2.com.conf
<VirtualHost *:80>
    ServerName site2.com
    DocumentRoot /var/www/html/site2.com
    ErrorLog /var/log/httpd/site2.com_error.log
    CustomLog /var/log/httpd/site2.com_access.log combined
</VirtualHost>
```

#### Step 4: Update Local Host Resolution (for testing without DNS)

- Add entries to /etc/hosts on your client or server:

```
127.0.0.1   site1.com
127.0.0.1   site2.com
```

#### Step 5: Restart Apache and Test

bash

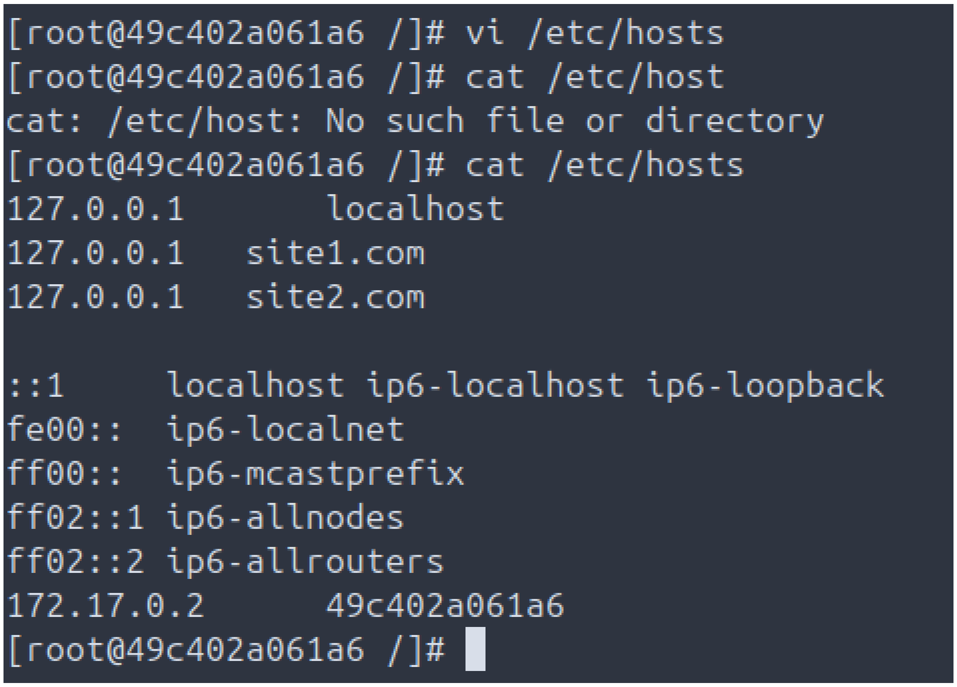
```
sudo systemctl restart httpd
```

- Open a browser or use curl to test:

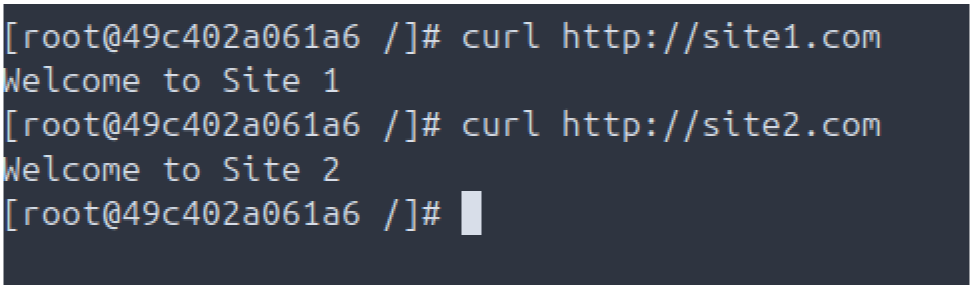
Bash

```
        curl http://site1.com
curl http://site2.com
```

- Each should display its respective welcome message.



```
[root@49c402a061a6 /]# vi /etc/hosts
[root@49c402a061a6 /]# cat /etc/host
cat: /etc/host: No such file or directory
[root@49c402a061a6 /]# cat /etc/hosts
127.0.0.1       localhost
127.0.0.1   site1.com
127.0.0.1   site2.com

::1     localhost ip6-localhost ip6-loopback
fe00::  ip6-localnet
ff00::  ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
172.17.0.2      49c402a061a6
[root@49c402a061a6 /]# 
```

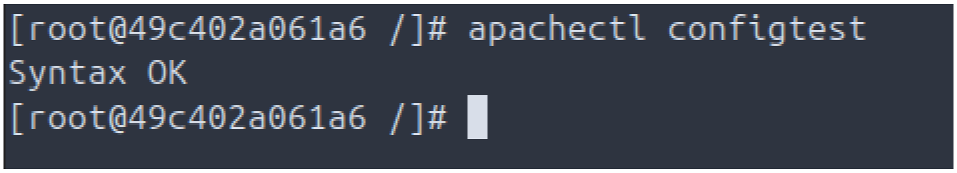


```
[root@49c402a061a6 /]# curl http://site1.com
Welcome to Site 1
[root@49c402a061a6 /]# curl http://site2.com
Welcome to Site 2
[root@49c402a061a6 /]# 
```

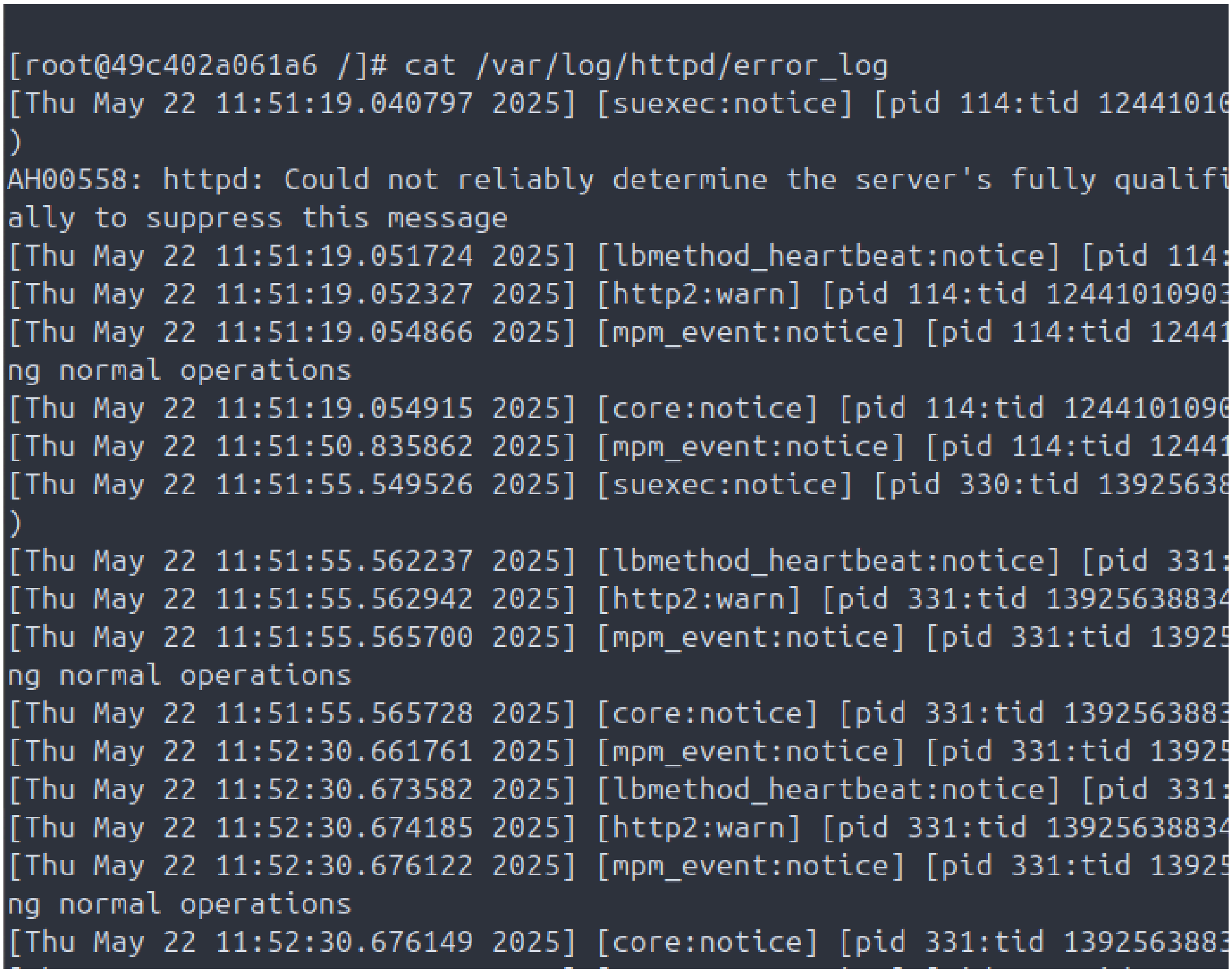
#### Step 6: Troubleshooting (if needed)
- Check Apache syntax:

bash

sudo apachectl configtest
- Review logs in /var/log/httpd/ for errors.
- Ensure firewall allows HTTP traffic.



```
[root@49c402a061a6 /]# apachectl configtest
Syntax OK
[root@49c402a061a6 /]# 
```



```
[root@49c402a061a6 /]# cat /var/log/httpd/error_log
[Thu May 22 11:51:19.040797 2025] [suexec:notice] [pid 114:tid 12441010
)
AH00558: httpd: Could not reliably determine the server's fully qualifi
ally to suppress this message
[Thu May 22 11:51:19.051724 2025] [lbmethod_heartbeat:notice] [pid 114:
[Thu May 22 11:51:19.052327 2025] [http2:warn] [pid 114:tid 12441010903
[Thu May 22 11:51:19.054866 2025] [mpm_event:notice] [pid 114:tid 12441
ng normal operations
[Thu May 22 11:51:19.054915 2025] [core:notice] [pid 114:tid 1244101090
[Thu May 22 11:51:50.835862 2025] [mpm_event:notice] [pid 114:tid 12441
[Thu May 22 11:51:55.549526 2025] [suexec:notice] [pid 330:tid 13925638
)
[Thu May 22 11:51:55.562237 2025] [lbmethod_heartbeat:notice] [pid 331:
[Thu May 22 11:51:55.562942 2025] [http2:warn] [pid 331:tid 13925638834
[Thu May 22 11:51:55.565700 2025] [mpm_event:notice] [pid 331:tid 13925
ng normal operations
[Thu May 22 11:51:55.565728 2025] [core:notice] [pid 331:tid 1392563883
[Thu May 22 11:52:30.661761 2025] [mpm_event:notice] [pid 331:tid 13925
[Thu May 22 11:52:30.673582 2025] [lbmethod_heartbeat:notice] [pid 331:
[Thu May 22 11:52:30.674185 2025] [http2:warn] [pid 331:tid 13925638834
[Thu May 22 11:52:30.676122 2025] [mpm_event:notice] [pid 331:tid 13925
ng normal operations
[Thu May 22 11:52:30.676149 2025] [core:notice] [pid 331:tid 1392563883
```