Apache Server

- An Apache server is an open-source web server software that delivers web content through the internet.
- It is widely used due to its flexibility, reliability, and extensive support for various features and modules.
- Apache is capable of serving both static and dynamic web pages and supports numerous programming languages and frameworks.

Configuration file: /etc/httpd/conf/httpd.conf
Port no httpd :80
Port no https : 443
Service :httpd

Step1: Install the packages

yum install httpd

```
[root@server ~]# yum install httpd
Last metadata expiration check: 3:04:00 ago on Wed 17 Jul 2024 10:04:19 AM IST.
Dependencies resolved.
================================================================================
 Package                 Architecture     Version                 Repository                  Size
================================================================================
Installing:
 httpd                   x86_64           2.4.53-6.el9            Localrepo_AppStream         50 k
Installing dependencies:
 apr                     x86_64           1.7.0-11.el9            Localrepo_AppStream        123 k
 apr-util                x86_64           1.6.1-20.el9            Localrepo_AppStream         95 k
 apr-util-bdb            x86_64           1.6.1-20.el9            Localrepo_AppStream         14 k
 centos-logos-httpd      noarch           90.4-1.el9              Localrepo_AppStream        252 k
 httpd-core              x86_64           2.4.53-6.el9            Localrepo_AppStream        1.5 M
 httpd-filesystem        noarch           2.4.53-6.el9            Localrepo_AppStream         15 k
 httpd-tools             x86_64           2.4.53-6.el9            Localrepo_AppStream         85 k
Installing weak dependencies:
 apr-util-openssl        x86_64           1.6.1-20.el9            Localrepo_AppStream         16 k
 mod_http2               x86_64           1.15.19-2.el9           Localrepo_AppStream        150 k
 mod_lua                 x86_64           2.4.53-6.el9            Localrepo_AppStream         63 k

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

Total size: 2.3 M
Installed size: 6.4 M
```

Step2:Configuration file

 # vi /etc/httpd/conf/httpd.conf

Add the following configuration

```
<VirtualHost *:80>
    ServerAdmin webmaster@gowtaman.com
    DocumentRoot /var/www/site1.local
    <Directory "/var/www/site1.local">
    </Directory>
    ServerName site1.local
    ErrorLog /var/log/httpd/site1_error.log
    CustomLog /var/log/httpd/site1_access.log combined
</VirtualHost>
```

Step3:Change the directory and list it and again vi forward_zone to add the directory and IP address

```
[root@server ~]# cd /var/named/
[root@server named]# ll
total 20
drwxrwx--- 2 named named    6 Jul 14  2022 data
drwxrwx--- 2 named named    6 Jul 14  2022 dynamic
-rw-r----- 1 named named  281 Jul 17 13:07 forward_zone
-rw-r----- 1 root  named 2253 Jul 14  2022 named.ca
-rw-r----- 1 root  named  152 Jul 14  2022 named.empty
-rw-r----- 1 root  named  152 Jul 14  2022 named.localhost
-rw-r----- 1 root  named  168 Jul 14  2022 named.loopback
drwxrwx--- 2 named named    6 Jul 14  2022 slaves
[root@server named]# vi forward_zone
```

```
$TTL 1D
@       IN SOA  gowthaman.com. rname.invalid. (
                                        4545    ; serial
                                        1D      ; refresh
                                        1H      ; retry
                                        1W      ; expire
                                        3H )    ; minimum
        NS      gowthaman.com.
gowthaman.com.  IN A      192.168.48.128
server          IN A      192.168.48.128
client          IN A      192.168.48.129
site1.local     IN A      192.168.48.128
```

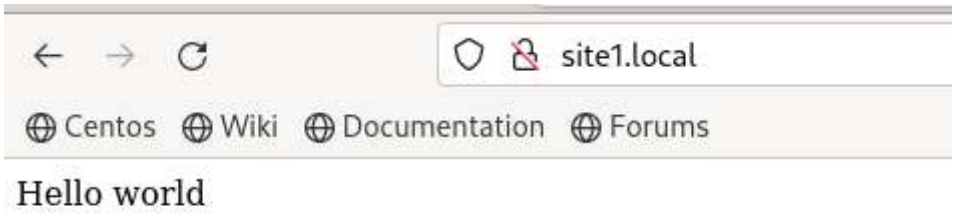
Step4:change the directory and create the directory and change the directory and add to words on index.html

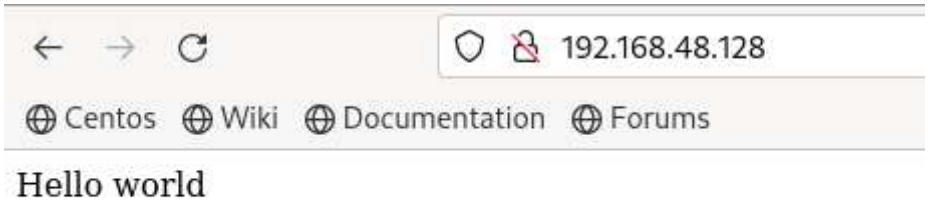
```
[root@server named]# cd /var/www
[root@server www]# mkdir site1.local
[root@server www]# cd site1.local
[root@server site1.local]# echo "Hello world" > index.html
```

Step5:Restart the service httpd and restart the named.service and check the name to verify and IP to verify

```
[root@server site1.local]# systemctl restart httpd.service
[root@server site1.local]# systemctl restart named.service
[root@server site1.local]# curl http://192.168.48.128
Hello world
[root@server site1.local]# curl http://site1.local
Hello world
```

Step6:To enter the command is firefox & and check Name and IP to verify it





Own Configuration

Step1:To check the rpm query of package and list of query enter the path

```
[root@server ~]# rpm -qa |grep httpd
httpd-tools-2.4.53-6.el9.x86_64
httpd-filesystem-2.4.53-6.el9.noarch
httpd-core-2.4.53-6.el9.x86_64
centos-logos-httpd-90.4-1.el9.noarch
httpd-2.4.53-6.el9.x86_64
[root@server ~]# rpm -ql httpd-2.4.53-6.el9.x86_64 |grep vhost
[root@server ~]# rpm -ql httpd-core-2.4.53-6.el9.x86_64 |grep vhost
/usr/lib64/httpd/modules/mod_vhost_alias.so
/usr/share/doc/httpd-core/httpd-vhosts.conf
```

Step2:To check the virtual host configuration

vi /usr/share/doc/httpd-core/httpd-vhosts.conf

```
# configuration.

#
# VirtualHost example:
# Almost any Apache directive may go into a VirtualHost container.
# The first VirtualHost section is used for all requests that do not
# match a ServerName or ServerAlias in any <VirtualHost> block.
#
<VirtualHost *:80>
    ServerAdmin webmaster@dummy-host.example.com
    DocumentRoot "/var/www/dummy-host.example.com"
    ServerName dummy-host.example.com
    ServerAlias www.dummy-host.example.com
    ErrorLog "/var/log/httpd/dummy-host.example.com-error_log"
    CustomLog "/var/log/httpd/dummy-host.example.com-access_log" common
</VirtualHost>
```

Step3:Add the configuration and gowthaman.com.conf

vi /etc/httpd/conf.d/gowthaman.com.conf

```
<VirtualHost *:80>
    ServerAdmin webmaster@gowthaman.com
    DocumentRoot "/var/www/gowthaman.com"
    ServerName gowthaman.com
    ErrorLog "/var/log/httpd/gowthaman.com-error_log"
    CustomLog "/var/log/httpd/gowthaman.com-access_log" common
</VirtualHost>
```

Step4:change the directory and list it

```
[root@server ~]# cd /var/www
[root@server www]# ls
cgi-bin  gowthaman.com  html
```

Step5: change the directory and list it

```
[root@server www]# cd gowthaman.com/
[root@server gowthaman.com]# ls
index.html
```

Create the index.html

 # vi index.html

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Vshpere Technology</title>
    <style>
        body {
            font-family: Arial, sans-serif;
            margin: 0;
            padding: 0;
```

Step6:To check the forward_zone file

 # vi forward_zone

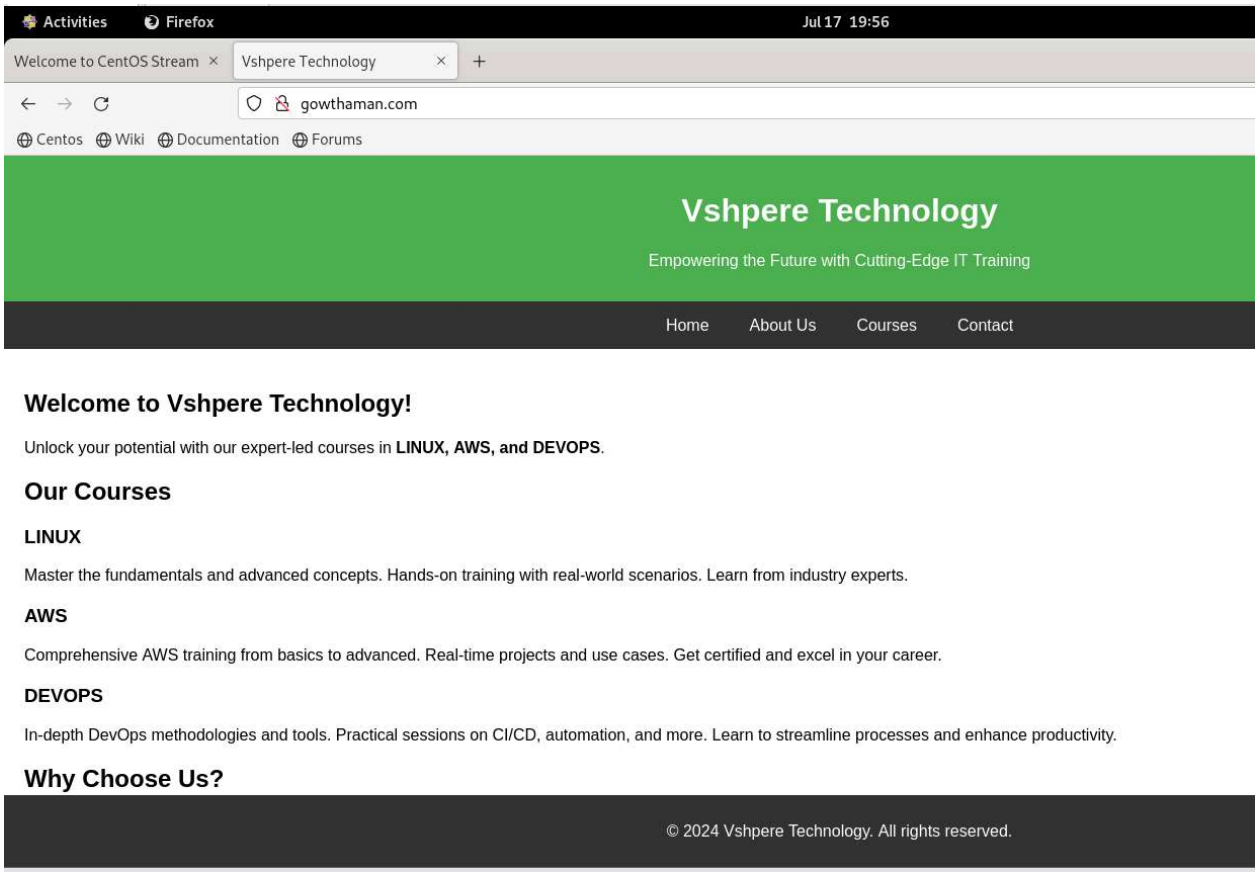
```
$TTL 1D
@       IN SOA  gowthaman.com. rname.invalid. (
                                        4545    ; serial
                                        1D      ; refresh
                                        1H      ; retry
                                        1W      ; expire
                                        3H )    ; minimum
        NS      gowthaman.com.
gowthaman.com.  IN A      192.168.48.128
server          IN A      192.168.48.128
client          IN A      192.168.48.129
gowthaman.com.  IN A      192.168.48.128
```

Step7:To restart the service httpd and named.service

systemctl restart named.service
systemctl restart httpd.service

Step8:Next check the name gowthaman.com

firefox &



Lab IP Based virtual hosting

Step1:Install the package

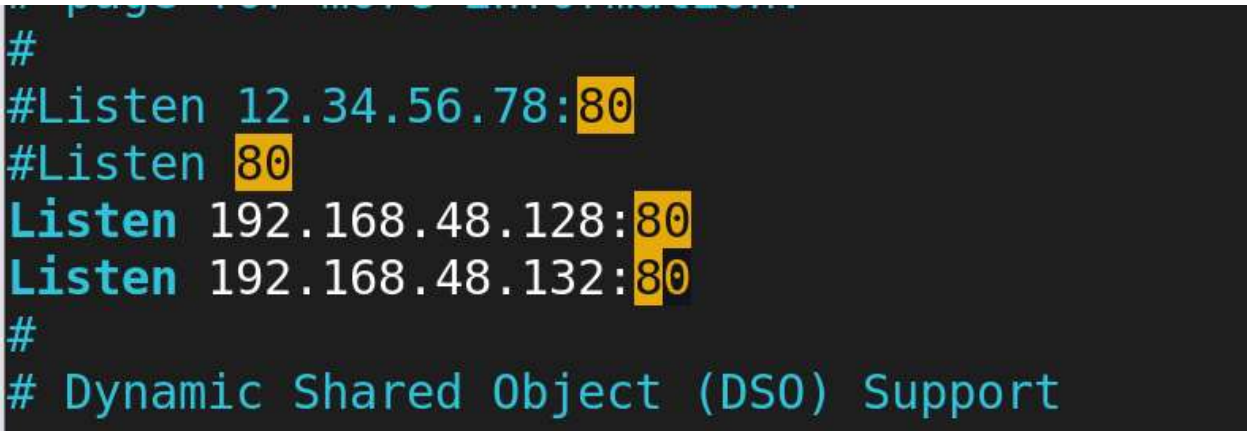
```
[root@server ~]# yum install httpd
Last metadata expiration check: 1:52:31 ago on Thu 18 Jul 2024 04:30:07 PM IST.
Dependencies resolved.
================================================================================
 Package                 Architecture Version            Repository                Size
================================================================================
Installing:
 httpd                   x86_64       2.4.53-6.el9       Localrepo_AppStream       50 k
```

Step2:Configure Apache to Listen on Both IPs:

Edit the main configuration:

 # vi /etc/httpd/conf/httpd.conf

Ensure there's a line to make Apache listen on both IP addresses:



Step3:Create web directories for the two sites:

 # mkdir /var/www/site-ip1
 # mkdir /var/www/site-ip2

Step4:Add sample index pages to each:

 # echo "Welcome to Site IP1!" >/var/www/site-ip1/index.html

 # echo "Welcome to Site IP2!" >/var/www/site-ip2/index.html

Step5:Configure IP-based virtual hosts:

Create a new configuration file:

 # vi /etc/httpd/conf.d/ip_vhosts.conf

Add the following configurations:

```
<VirtualHost 192.168.48.128:80>
    DocumentRoot /var/www/site-ip1
    ServerName servername1.example.com
    ErrorLog /var/log/httpd/site-ip1_error.log
    CustomLog /var/log/httpd/site-ip1_access.log combined
</VirtualHost>

<VirtualHost 192.168.48.132:80>
    DocumentRoot /var/www/site-ip2
    ServerName servername2.example.com
    ErrorLog /var/log/httpd/site-ip2_error.log
    CustomLog /var/log/httpd/site-ip2_access.log combined
</VirtualHost>
```

Step6:Restart Apache and test the setup:

 # systemctl restart httpd.service

Step7:In a web browser or using `curl`, check:

 # curl http://192.168.48.128

```
[root@server ~]# curl http://192.168.48.128
Welcome to Site IP1!
```

 # curl http://192.168.48.132

```
[root@server ~]# curl http://192.168.48.132
Welcome to Site IP2!
```

SSL

- SSL(Secure Sockets Layer) is a standard security protocol used to establish encrypted links between a web server and a browser, ensuring that all data passed between them remains private and secure.
- It uses cryptographic techniques to provide authentication and data integrity.
- SSL has been succeeded by TLS (Transport Layer Security) but is still commonly referred to as SSL.

Step1:Install the packages

yum install openssl

```
[root@server ~]# yum install openssl
Last metadata expiration check: 2:21:33 ago on Thu 18 Jul 2024 04:30:07 PM IST.
Package openssl-1:3.0.1-40.el9.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
```

Step2:Generate a private key:

openssl genpkey -algorithm RSA -out my-private-key.key

```
[root@server ~]# openssl genpkey -algorithm RSA -out my-private-key.key
.....+.........+.....+....+.....+...++++++++++++++++++++++++++++++++++++++++++++++++++++++++
++++++++++*...+....+...........+..........+...+..++++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++*..+........+...+...+.......+..+............+........+.......+...+.
.....+.....+...+.+.............+......+.+...+...+........+......+......+.........+......+.
........+......+...+....+...+..+..........+.....+......+.+........+.+.....................+
.........+.....+.+...+...+.....+.........+.+...+.................+............+............
.+..+...+.......+...........+.+........+.+..+...+.+.....+......+....+...+.................+
...+...+.......+......+.....+....+.....+...+.......+...+..+.+.....+.+...........+...+.+....
.................+............................+..+.........+.+...+...+.....+.......+........
...+......+....+...........+............+........+..........+..+.+......+.....+...+......+
.........++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
....+......+...+......+.+...+...+.........+...+......+.....+......+....+..+.........+......
.......+...+..+......++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++*....
..++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++*...+.+.........+.....+.
+..............+..+...........+...+.+..+....+...+...+..+.+.....+.........+............+.
........+........+.........+..+.+...+..+..........++++++++++++++++++++++++++++++++++++++++++
++++++++++++++++++++++
```

Step3:Generate a self-signed certificate:

openssl req -new -x509 -key my-private-key.key -out my-certificate.crt -days 365

```
[root@server ~]# openssl req -new -x509 -key my-private-key.key -out my-certificate.crt -da
ys 365
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) [XX]:IN
State or Province Name (full name) []:TAMIL NADU
Locality Name (eg, city) [Default City]:BENGALURU
Organization Name (eg, company) [Default Company Ltd]:GOWTHAMAN PVT LTD
Organizational Unit Name (eg, section) []:IT
Common Name (eg, your name or your server's hostname) []:server.vsphere.com
Email Address []:
```

Step4:Secure the private key:

chmod 600 my-private-key.key

1. Install the necessary packages:

 # yum install mod_ssl

```
[root@server ~]# yum install mod_ssl
Last metadata expiration check: 2:35:15 ago on Thu 18 Jul 2024 04:30:07 PM IST.
Dependencies resolved.
================================================================================
 Package         Architecture   Version                 Repository                  Size
================================================================================
Installing:
 mod_ssl         x86_64         1:2.4.53-6.el9          Localrepo_AppStream         112 k

Transaction Summary
================================================================================
Install  1 Package
```

2. Set Up the Certificate:

 # mv my-private-key.key /etc/pki/tls/private/

 # mv my-certificate.crt /etc/pki/tls/certs/

3. Configure Apache to Use SSL:

 # vi /etc/httpd/conf.d/ssl.conf

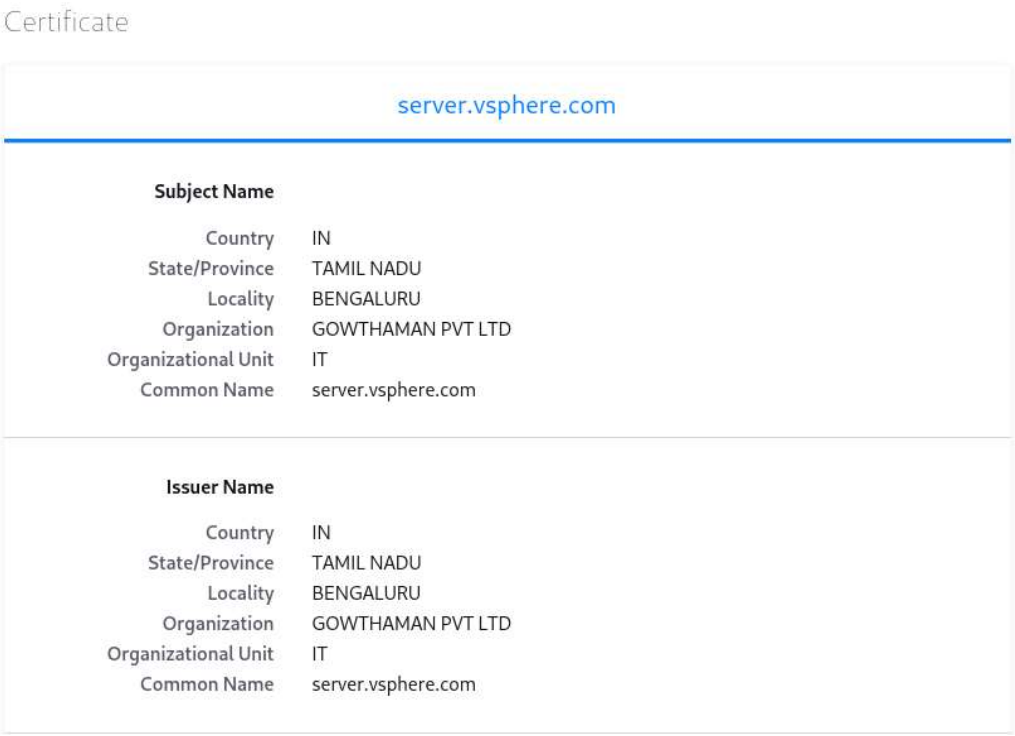
```
#   parallel.
SSLCertificateFile /etc/pki/tls/certs/my-certificate.crt

#   Server Private Key:
#   If the key is not combined with the certificate, use this
#   directive to point at the key file.  Keep in mind that if
#   you've both a RSA and a DSA private key you can configure
#   both in parallel (to also allow the use of DSA ciphers, etc.)
#   ECC keys, when in use, can also be configured in parallel
SSLCertificateKeyFile /etc/pki/tls/private/my-private-key.key
```

5. Restart Apache:

 # systemctl restart httpd

6. Test the Configuration:



Validity

Not Before	Thu, 18 Jul 2024 13:30:45 GMT
Not After	Fri, 18 Jul 2025 13:30:45 GMT

Public Key Info

Algorithm	RSA
Key Size	2048
Exponent	65537
Modulus	E2:82:C4:D0:C1:33:5B:FE:0D:77:6F:25:23:16:0E:D0:78:DA:36:62:28:DF:29:E8…

Miscellaneous

Serial Number	71:9B:21:23:11:12:F9:91:CD:2D:E0:D7:BC:E6:F6:8A:3A:F4:0D:41
Signature Algorithm	SHA-256 with RSA Encryption
Version	3
Download	PEM (cert) PEM (chain)

Fingerprints

SHA-256	DF:B6:C2:A1:E7:34:91:6A:40:50:91:C9:02:C8:2B:F3:D5:60:B6:49:27:7F:EC:C4…
SHA-1	D2:F0:91:DD:9B:F3:2A:DB:13:BC:7D:9F:00:82:BD:0E:86:45:D9:B0

Basic Constraints

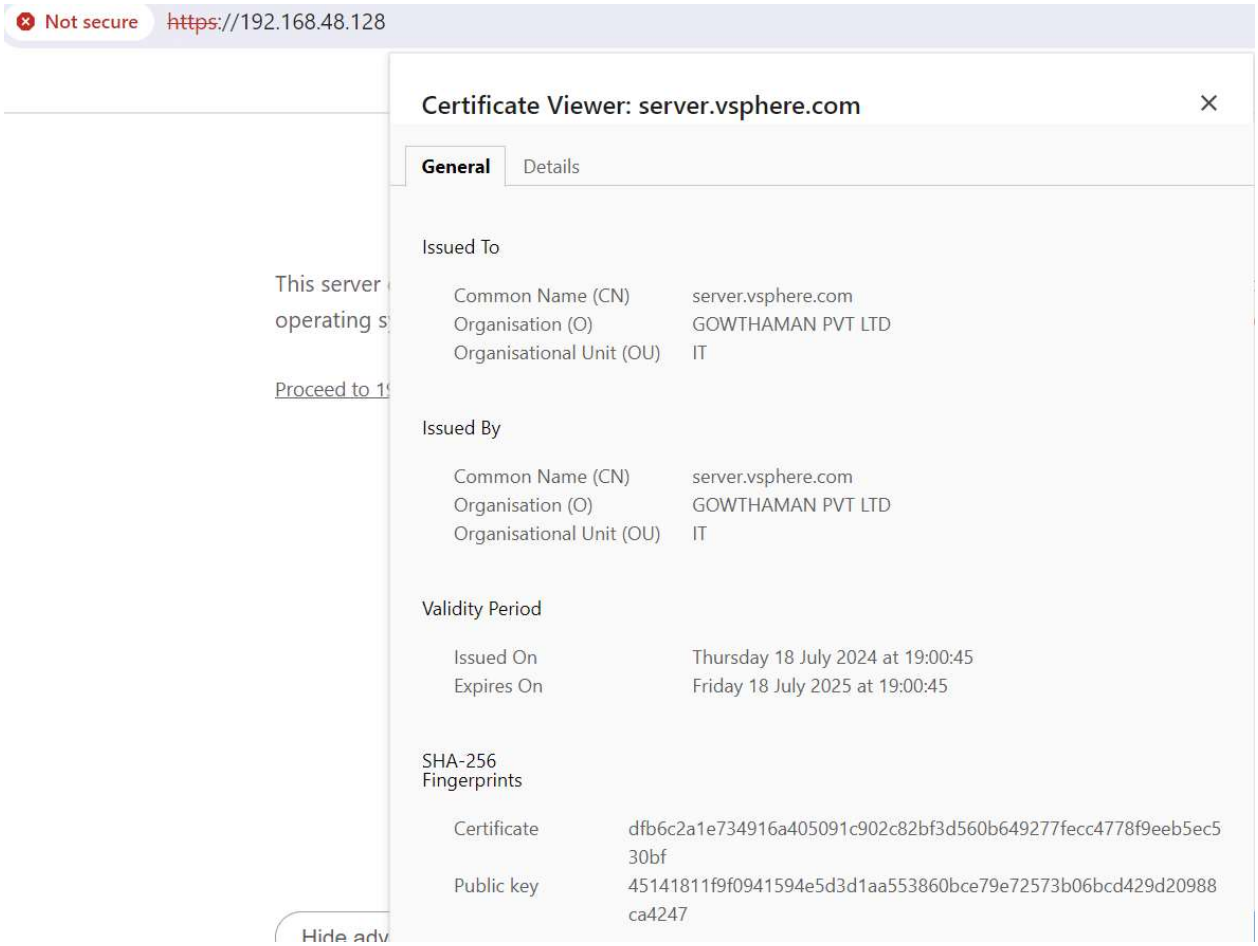
Certificate Authority	Yes

Subject Key ID

Key ID	80:08:9F:22:C4:DA:2C:67:C2:55:C4:8F:A7:40:8B:60:74:2B:DE:26

Authority Key ID

Key ID	80:08:9F:22:C4:DA:2C:67:C2:55:C4:8F:A7:40:8B:60:74:2B:DE:26


Not secure
https://192.168.48.128
Certificate Viewer: server.vsphere.com
General
Details
Issued To
Common Name (CN) server.vsphere.com
Organisation (O) GOWTHAMAN PVT LTD
Organisational Unit (OU) IT
Issued By
Common Name (CN) server.vsphere.com
Organisation (O) GOWTHAMAN PVT LTD
Organisational Unit (OU) IT
Validity Period
Issued On Thursday 18 July 2024 at 19:00:45
Expires On Friday 18 July 2025 at 19:00:45
SHA-256 Fingerprints
Certificate dfb6c2a1e734916a405091c902c82bf3d560b649277fecc4778f9eeb5ec530bf
Public key 45141811f9f0941594e5d3d1aa553860bce79e72573b06bcd429d20988ca4247