



East West University

Department Of CSE

Computer and Cyber-security, Mini Project: 01

Group Number: 307

Title: Securing a networked system with Public Key Infrastructure
(Implementing Transport Layer Security on HTTP for https:// connection)

Course: CSE 487

Section: 03

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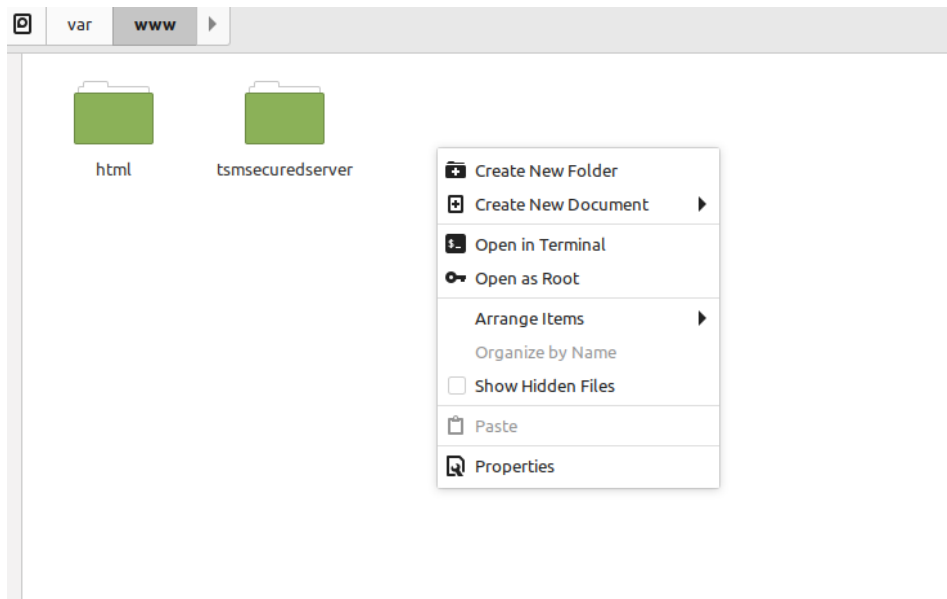
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Submission Date: 25th August 2022

Step-by-step process (used Linux Mint in virtual box)

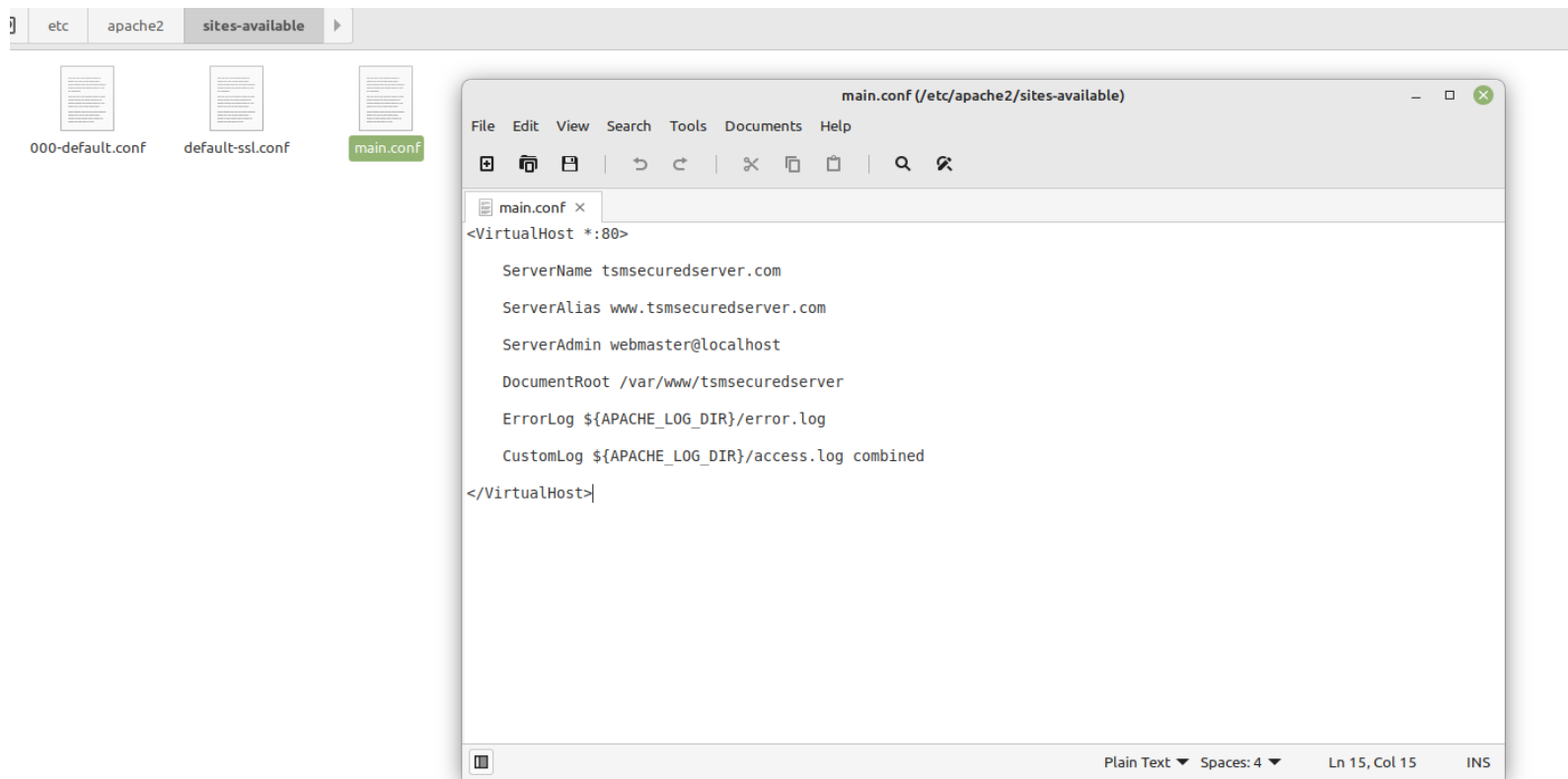
1. `sudo chown -R $USER:$USER /var/www/` (gives read-write permission to www folder)



2. `sudo chown -R $USER:$USER /etc/apache2/sites-available/` (gives read-write operation to sites-available folder)

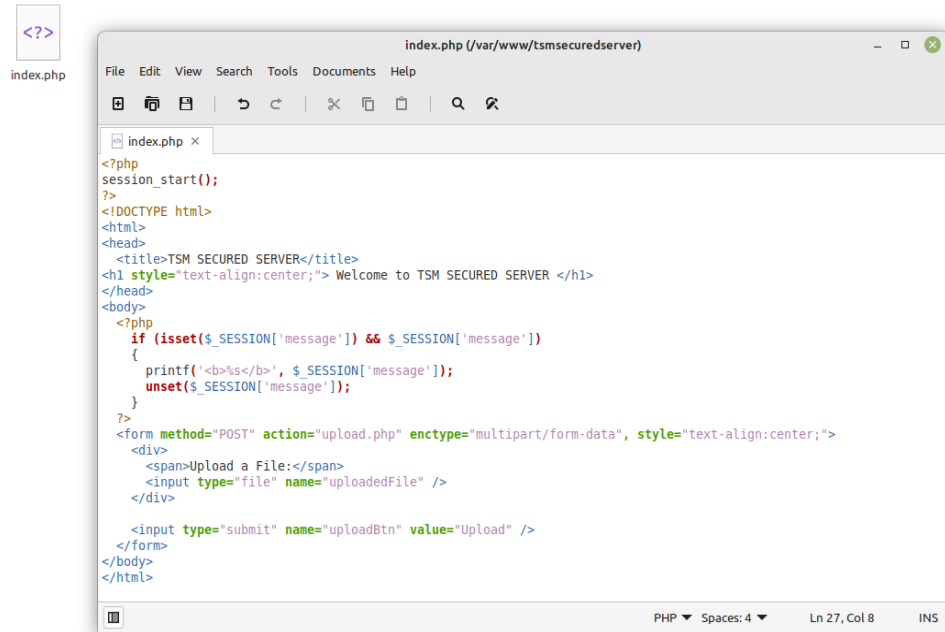


Then created main.conf file and pasted the following code:



3. After that, we have to disable default.conf using: `sudo a2dissite 000-default` and have to reload using: `systemctl reload apache2`
4. Then enable main.conf using: `sudo a2ensite main.conf` and have to reload using: `systemctl reload apache2`

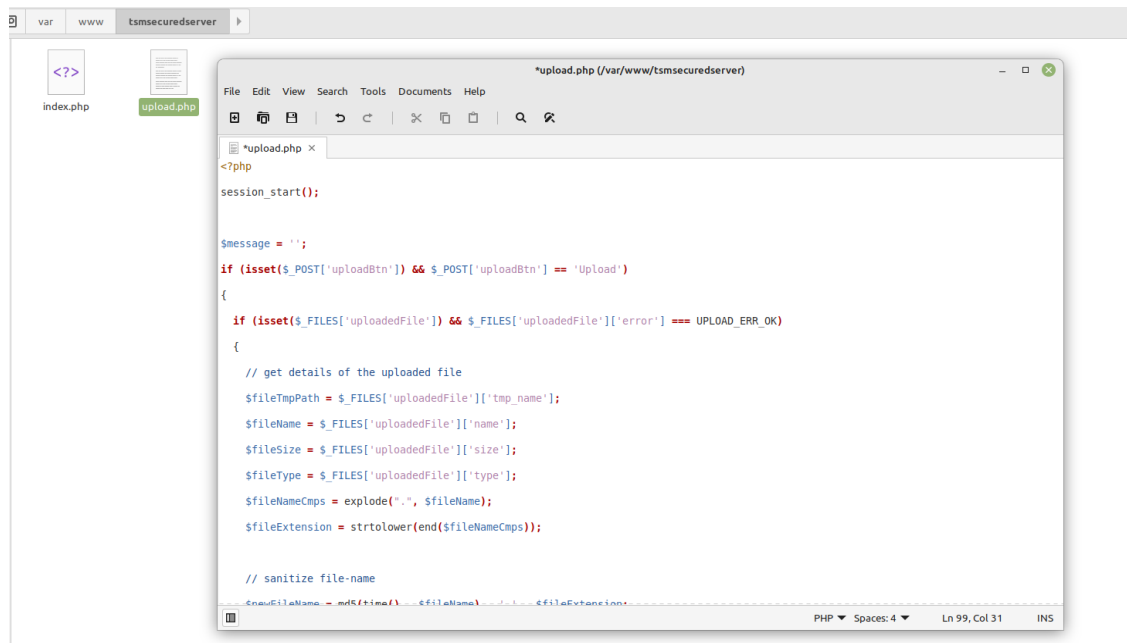
5. Then paste the below codes to index.php that we created inside **www->tsmsecurdserver** folder:



```
<?php
session_start();
?>
<!DOCTYPE html>
<html>
<head>
<title>TSM SECURED SERVER</title>
<h1 style="text-align:center;"> Welcome to TSM SECURED SERVER </h1>
</head>
<body>
<?php
if (isset($_SESSION['message']) && $_SESSION['message'])
{
printf('<b>%s</b>', $_SESSION['message']);
unset($_SESSION['message']);
}
?>
<form method="POST" action="upload.php" enctype="multipart/form-data", style="text-align:center;">
<div>
<span>Upload a File:</span>
<input type="file" name="uploadedFile" />
</div>

<input type="submit" name="uploadBtn" value="Upload" />
</form>
</body>
</html>
```

6. Create upload.php in SecureServer folder and paste the below code inside **www->tsmsecurdserver** folder:



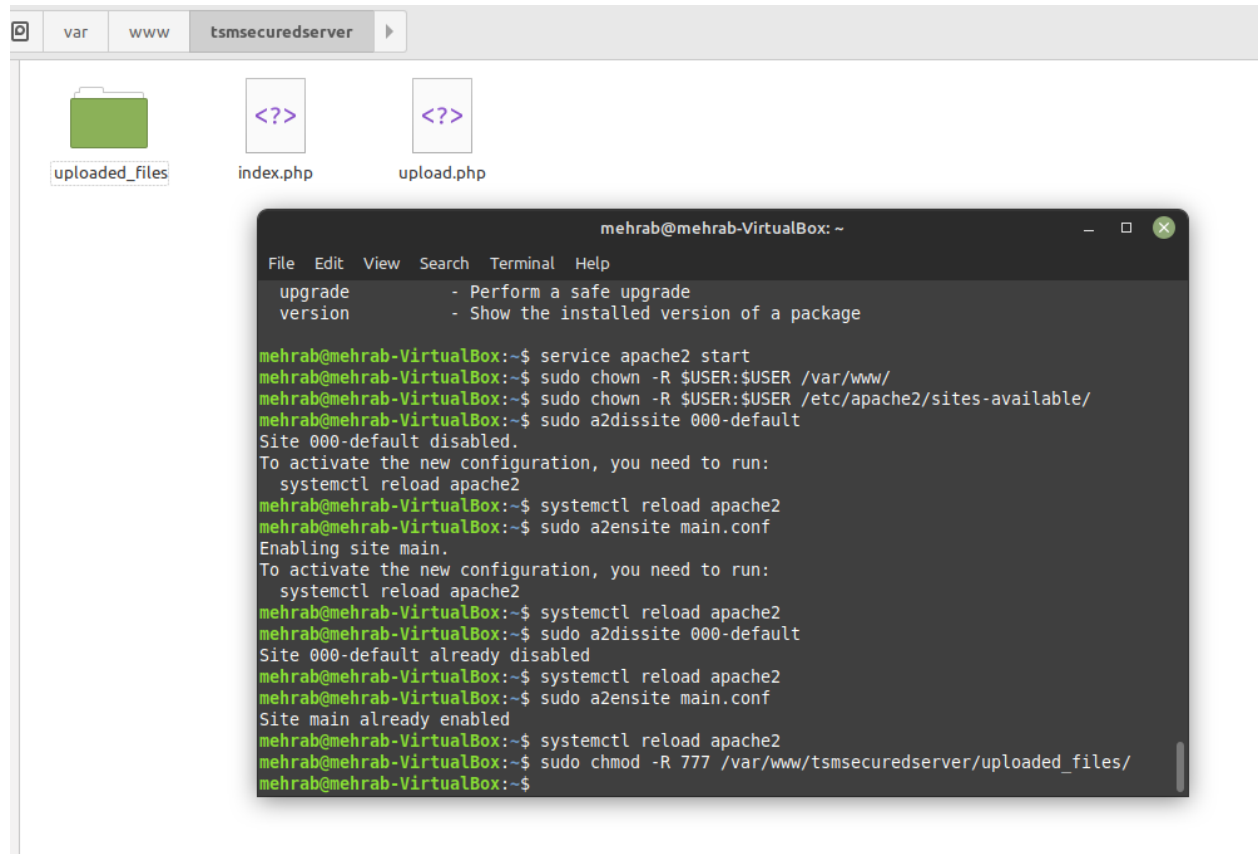
```
<?php
session_start();

$message = '';
if (isset($_POST['uploadBtn']) && $_POST['uploadBtn'] == 'Upload')
{
if (isset($_FILES['uploadedFile']) && $_FILES['uploadedFile']['error'] === UPLOAD_ERR_OK)
{
// get details of the uploaded file
$fileTmpPath = $_FILES['uploadedFile']['tmp_name'];
$fileName = $_FILES['uploadedFile']['name'];
$fileSize = $_FILES['uploadedFile']['size'];
$fileType = $_FILES['uploadedFile']['type'];
$fileNameCmps = explode(".", $fileName);
$fileExtension = strtolower(end($fileNameCmps));

// sanitize file-name
$uploadFileName = md5($fileName) . $fileExtension;
```

7. Then, we have to create a folder named (uploaded_files) and have to give access using:

```
sudo chmod -R 777 /var/www/tsmsecurdserver/uploaded_files/
```



8. After that, we have to install some packages:

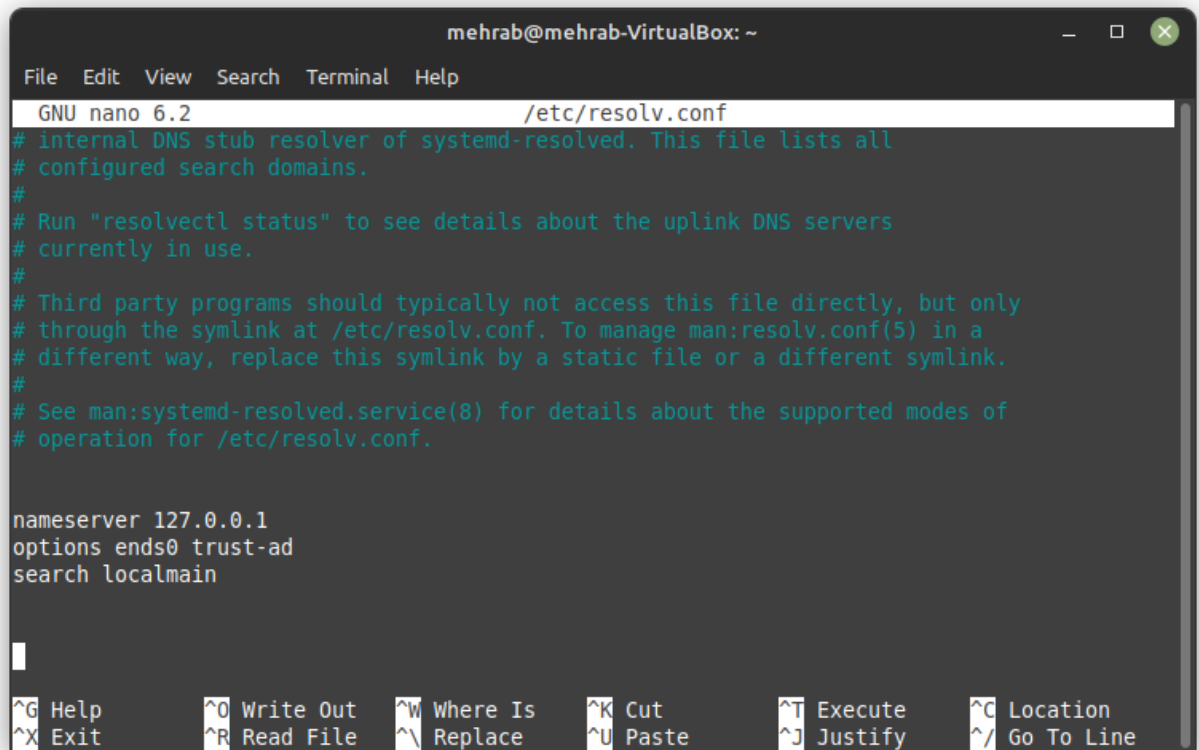
- a. `sudo apt install bind9`
- b. `sudo apt install dnstools`

then, we have to restart the bind9 service using:

```
sudo systemctl restart bind9.service
```

9. We have to edit resolv.conf file using: `sudo nano /etc/resolv.conf`

and have to paste a code:



```
mehrab@mehrab-VirtualBox: ~
File Edit View Search Terminal Help
GNU nano 6.2 /etc/resolv.conf
# internal DNS stub resolver of systemd-resolved. This file lists all
# configured search domains.
#
# Run "resolvectl status" to see details about the uplink DNS servers
# currently in use.
#
# Third party programs should typically not access this file directly, but only
# through the symlink at /etc/resolv.conf. To manage man:resolv.conf(5) in a
# different way, replace this symlink by a static file or a different symlink.
#
# See man:systemd-resolved.service(8) for details about the supported modes of
# operation for /etc/resolv.conf.

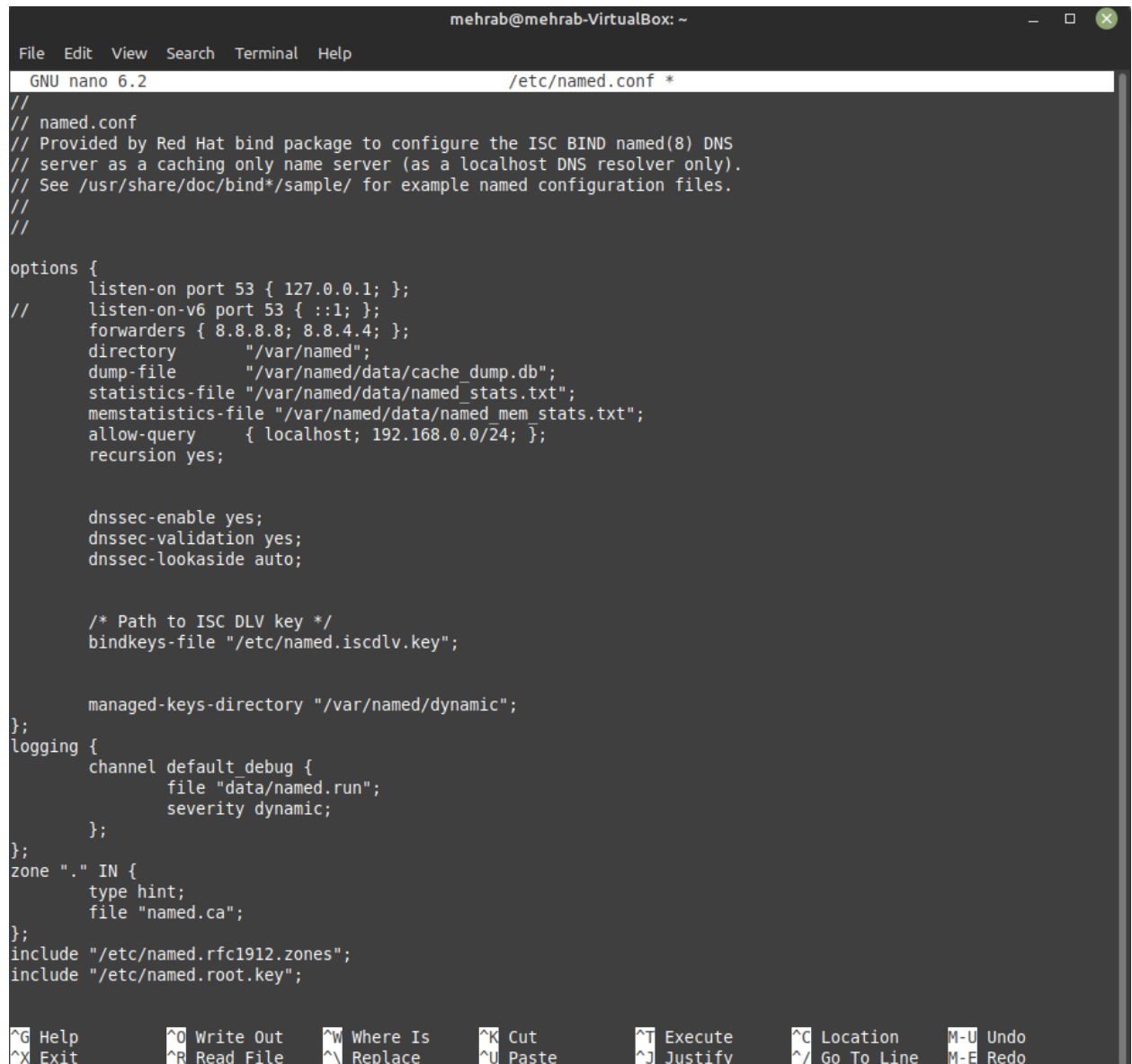
nameserver 127.0.0.1
options ends0 trust-ad
search localmain

^G Help      ^O Write Out  ^W Where Is   ^K Cut        ^T Execute    ^C Location
^X Exit      ^R Read File  ^\ Replace    ^U Paste      ^J Justify    ^_ Go To Line
```

[Then press ctrl+O and enter to save, then ctrl+X to exit.]

10. Again, we have to edit named.conf file using: `sudo nano /etc/named.conf`

and paste the code:



```
mehrab@mehrab-VirtualBox: ~
GNU nano 6.2 /etc/named.conf *
//
// named.conf
// Provided by Red Hat bind package to configure the ISC BIND named(8) DNS
// server as a caching only name server (as a localhost DNS resolver only).
// See /usr/share/doc/bind*/sample/ for example named configuration files.
//
//
options {
    listen-on port 53 { 127.0.0.1; };
    listen-on-v6 port 53 { ::1; };
    forwarders { 8.8.8.8; 8.8.4.4; };
    directory "/var/named";
    dump-file "/var/named/data/cache_dump.db";
    statistics-file "/var/named/data/named_stats.txt";
    memstatistics-file "/var/named/data/named_mem_stats.txt";
    allow-query { localhost; 192.168.0.0/24; };
    recursion yes;

    dnssec-enable yes;
    dnssec-validation yes;
    dnssec-lookaside auto;

    /* Path to ISC DLV key */
    bindkeys-file "/etc/named.iscdlv.key";

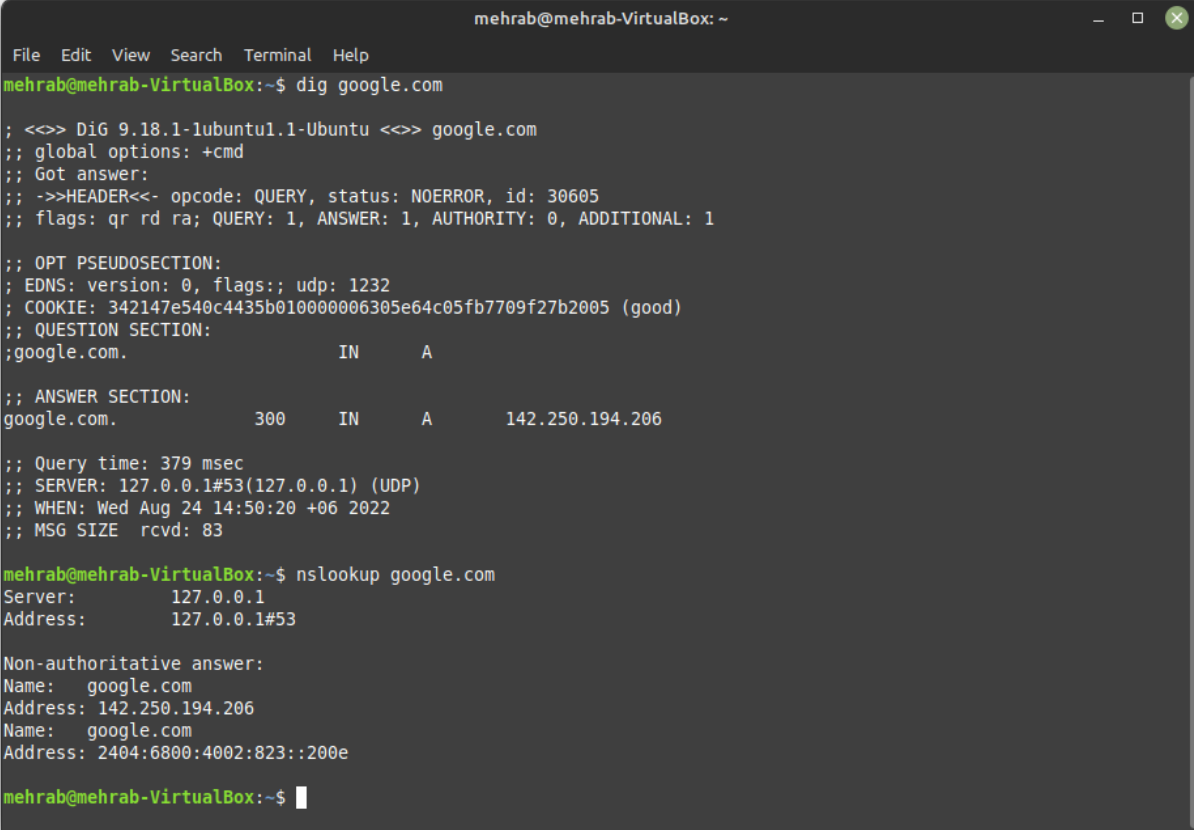
    managed-keys-directory "/var/named/dynamic";
};
logging {
    channel default_debug {
        file "data/named.run";
        severity dynamic;
    };
};
zone "." IN {
    type hint;
    file "named.ca";
};
include "/etc/named.rfc1912.zones";
include "/etc/named.root.key";

^G Help      ^O Write Out  ^W Where Is   ^K Cut        ^T Execute    ^C Location   M-U Undo
^X Exit      ^R Read File  ^\ Replace    ^U Paste      ^J Justify    ^/_ Go To Line M-E Redo
```

[Then press ctrl+O and enter to save, then ctrl+X to exit.]

11. Then used

- a. `dig google.com`
- b. `nslookup google.com` for further checking



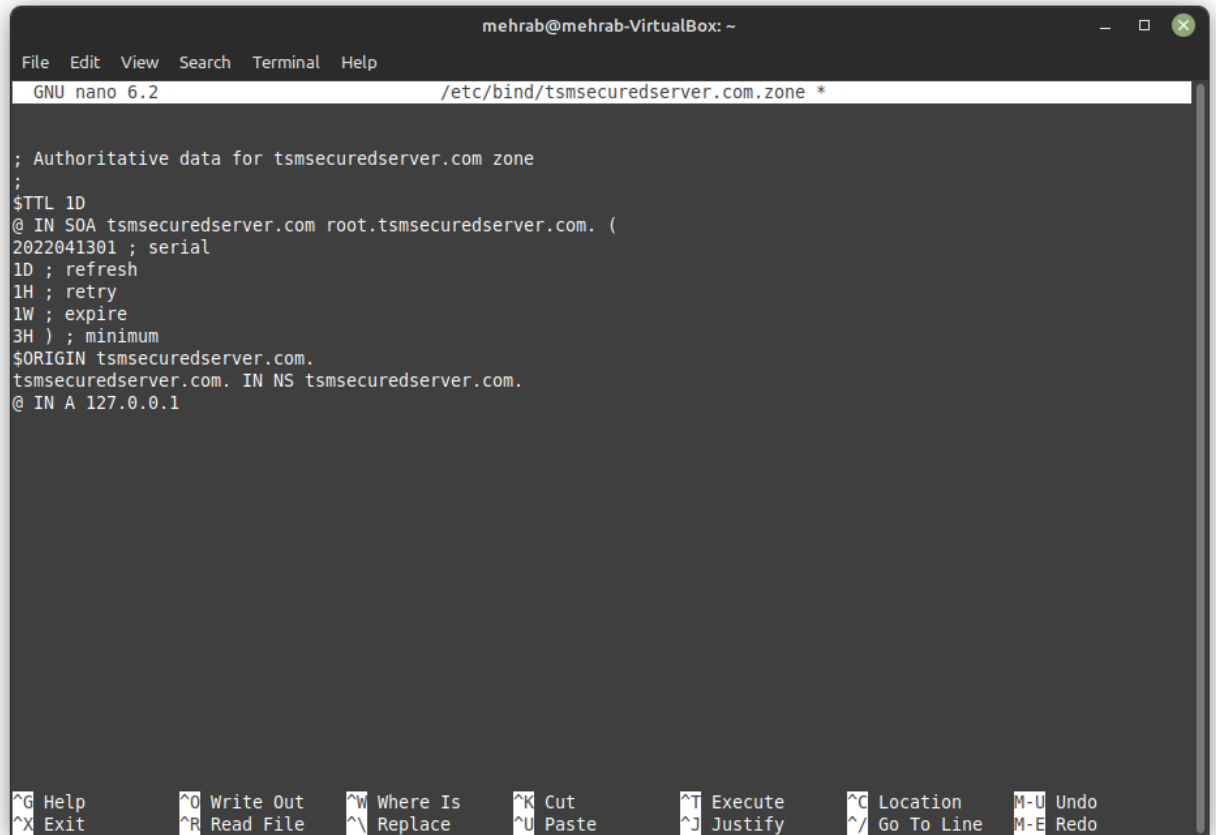
```
mehrab@mehrab-VirtualBox: ~  
File Edit View Search Terminal Help  
mehrab@mehrab-VirtualBox:~$ dig google.com  
  
; <<>> DiG 9.18.1-lubuntu1.1-Ubuntu <<>> google.com  
;; global options: +cmd  
;; Got answer:  
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 30605  
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  
  
;; OPT PSEUDOSECTION:  
; EDNS: version: 0, flags:; udp: 1232  
; COOKIE: 342147e540c4435b010000006305e64c05fb7709f27b2005 (good)  
;; QUESTION SECTION:  
;google.com.                IN      A  
  
;; ANSWER SECTION:  
google.com.                300     IN      A      142.250.194.206  
  
;; Query time: 379 msec  
;; SERVER: 127.0.0.1#53(127.0.0.1) (UDP)  
;; WHEN: Wed Aug 24 14:50:20 +06 2022  
;; MSG SIZE rcvd: 83  
  
mehrab@mehrab-VirtualBox:~$ nslookup google.com  
Server:                127.0.0.1  
Address:                127.0.0.1#53  
  
Non-authoritative answer:  
Name:   google.com  
Address: 142.250.194.206  
Name:   google.com  
Address: 2404:6800:4002:823::200e  
  
mehrab@mehrab-VirtualBox:~$
```

12. Enabled named using: `systemctl enable named`

After execution, you have to give password 3 times.

Then started named using: `systemctl start named`

13. Then, executed: `sudo nano /etc/bind/tsmsecuredserver.com.zone` and pasted code:

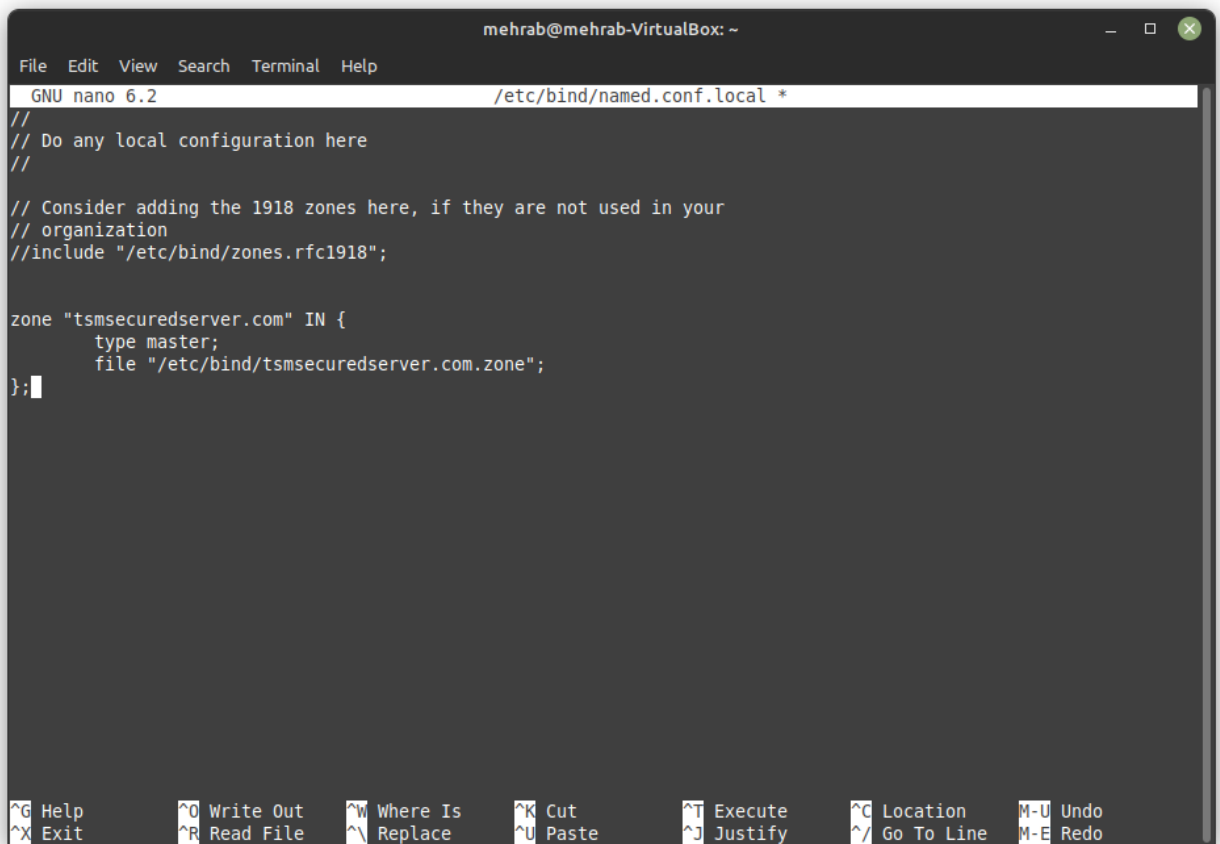


```
mehrab@mehrab-VirtualBox: ~  
File Edit View Search Terminal Help  
GNU nano 6.2 /etc/bind/tsmsecuredserver.com.zone *  
  
; Authoritative data for tsmsecuredserver.com zone  
;  
$TTL 1D  
@ IN SOA tsmsecuredserver.com root.tsmsecuredserver.com. (  
2022041301 ; serial  
1D ; refresh  
1H ; retry  
1W ; expire  
3H ) ; minimum  
$ORIGIN tsmsecuredserver.com.  
tsmsecuredserver.com. IN NS tsmsecuredserver.com.  
@ IN A 127.0.0.1  
  
^G Help      ^O Write Out  ^W Where Is   ^K Cut        ^T Execute    ^C Location   M-U Undo  
^X Exit      ^R Read File  ^\ Replace    ^U Paste      ^J Justify    ^_ Go To Line  M-E Redo
```

[Then press ctrl+O and enter to save, then ctrl+X to exit.]

14. Then we need to execute `sudo nano /etc/bind/named.conf.local` and paste the below code under the previous code of the command prompt:

```
zone "tsmsecuredserver.com" IN {  
    type master;  
    file "/etc/bind/tsmsecuredserver.com.zone";  
};
```



The screenshot shows a terminal window titled "mehrab@mehrab-VirtualBox: ~". The terminal is running the GNU nano 6.2 editor to edit the file "/etc/bind/named.conf.local". The file content is as follows:

```
//  
// Do any local configuration here  
//  
  
// Consider adding the 1918 zones here, if they are not used in your  
// organization  
//include "/etc/bind/zones.rfc1918";  
  
zone "tsmsecurdserver.com" IN {  
    type master;  
    file "/etc/bind/tsmsecurdserver.com.zone";  
};
```

The bottom of the terminal window displays a series of keyboard shortcuts for nano editor functions:

^G Help	^O Write Out	^W Where Is	^K Cut	^T Execute	^C Location	M-U Undo
^X Exit	^R Read File	^_ Replace	^U Paste	^J Justify	^_ Go To Line	M-E Redo

15. Then executed below codes:

`systemctl enable named`

`systemctl start named`

`systemctl restart named`

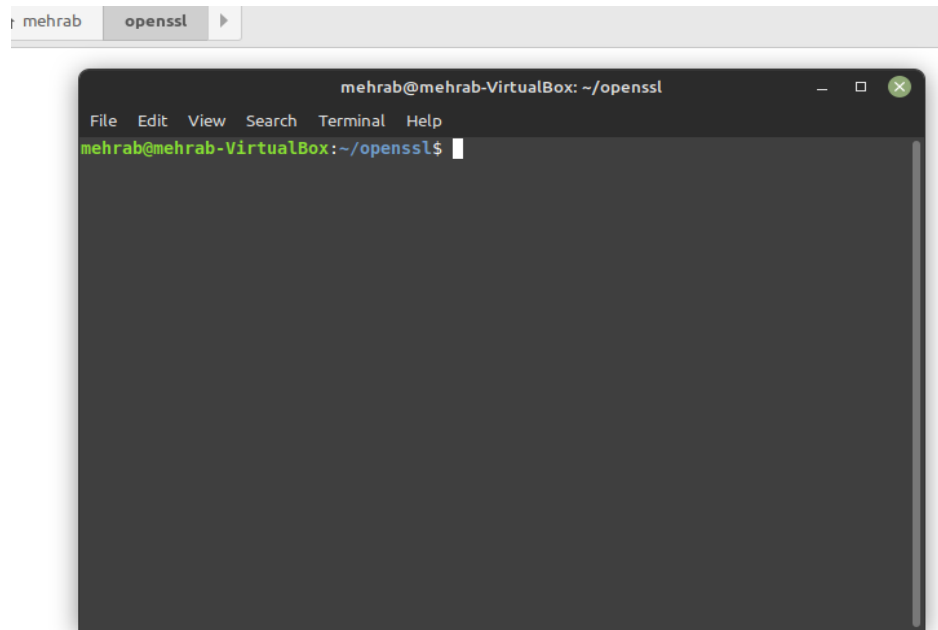
`dig tsmsecurdserver.com`

`nslookup tsmsecurdserver.com`

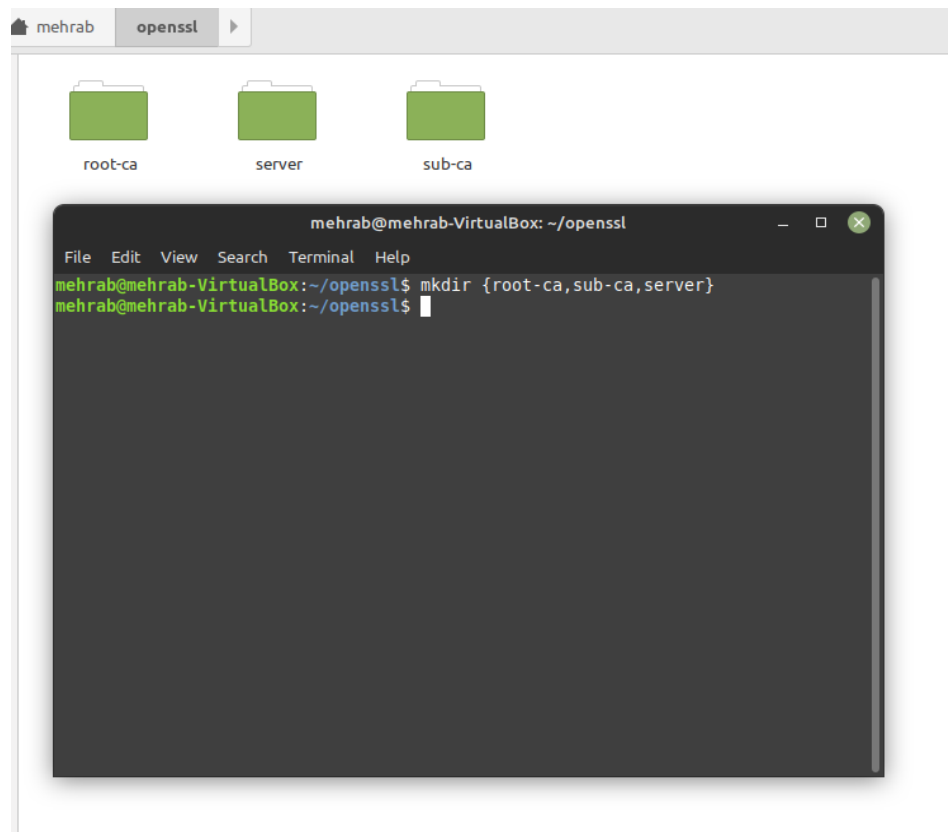
```
mehrab@mehrab-VirtualBox: ~  
File Edit View Search Terminal Help  
  
mehrab@mehrab-VirtualBox:~$ systemctl enable named  
Synchronizing state of named.service with SysV service script with /lib/systemd/systemd-sysv-install.  
Executing: /lib/systemd/systemd-sysv-install enable named  
mehrab@mehrab-VirtualBox:~$ systemctl start named  
mehrab@mehrab-VirtualBox:~$ sudo nano /etc/bind/tsmsecuredserver.com.zone  
mehrab@mehrab-VirtualBox:~$ sudo nano /etc/bind/named.conf.local  
mehrab@mehrab-VirtualBox:~$ systemctl enable named  
Synchronizing state of named.service with SysV service script with /lib/systemd/systemd-sysv-install.  
Executing: /lib/systemd/systemd-sysv-install enable named  
mehrab@mehrab-VirtualBox:~$ systemctl start named  
mehrab@mehrab-VirtualBox:~$ systemctl restart named  
mehrab@mehrab-VirtualBox:~$ dig tsmsecuredserver.com  
  
; <<>> DiG 9.18.1-lubuntu1.1-Ubuntu <<>> tsmsecuredserver.com  
;; global options: +cmd  
;; Got answer:  
;; ->HEADER<<- opcode: QUERY, status: NOERROR, id: 11696  
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1  
  
;; OPT PSEUDOSECTION:  
; EDNS: version: 0, flags:; udp: 1232  
; COOKIE: 1c300b90ca543219010000006305e938d90ed044f2b6e14e (good)  
;; QUESTION SECTION:  
;tsmsecuredserver.com. IN A  
  
;; ANSWER SECTION:  
tsmsecuredserver.com. 86400 IN A 127.0.0.1  
  
;; Query time: 0 msec  
;; SERVER: 127.0.0.1#53(127.0.0.1) (UDP)  
;; WHEN: Wed Aug 24 15:02:48 +06 2022  
;; MSG SIZE rcvd: 93  
  
mehrab@mehrab-VirtualBox:~$ nslookup tsmsecuredserver.com  
Server: 127.0.0.1  
Address: 127.0.0.1#53  
  
Name: tsmsecuredserver.com  
Address: 127.0.0.1  
  
mehrab@mehrab-VirtualBox:~$
```

16. Create certificate and sign this site with the certificate

Open folder named as: openssl and go into that folder and open terminal there.



17. Then, executed `mkdir {root-ca,sub-ca,server}` to create 3 folders in openssl folder

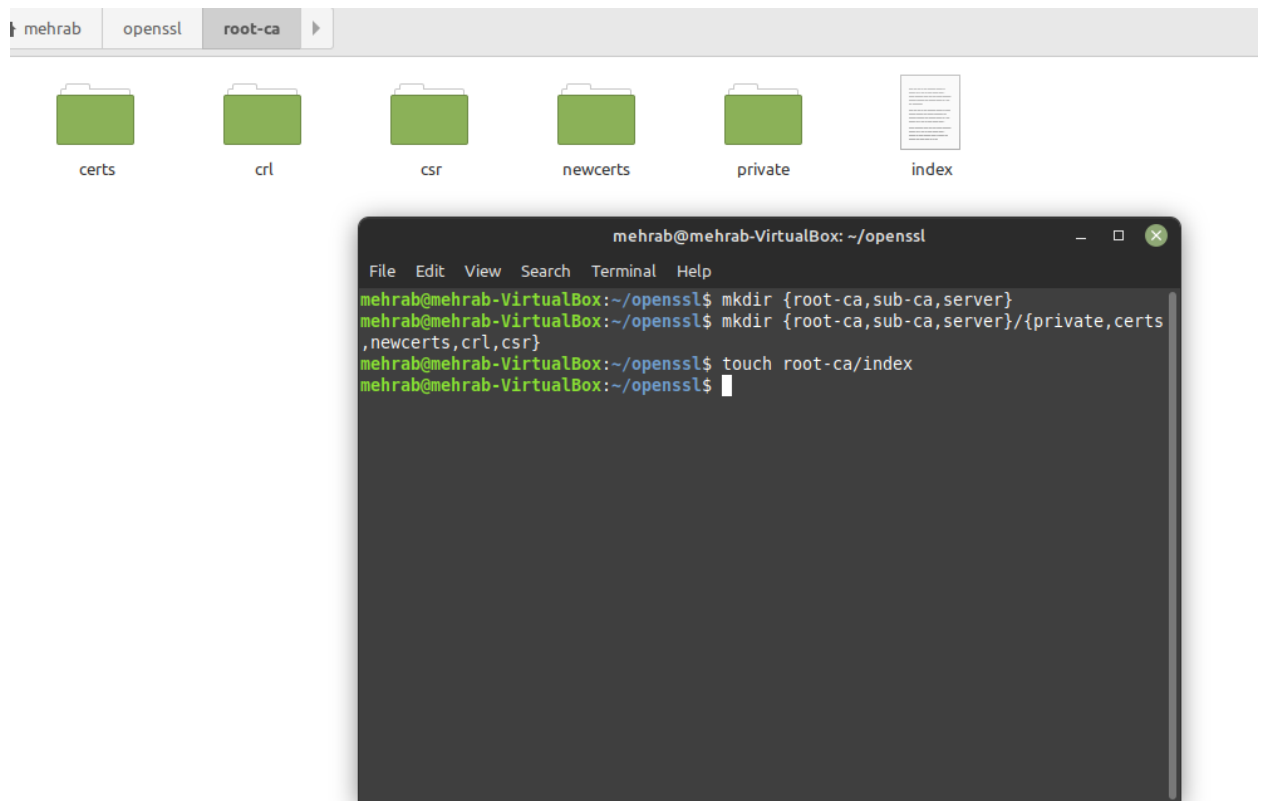


18. Then, executed:

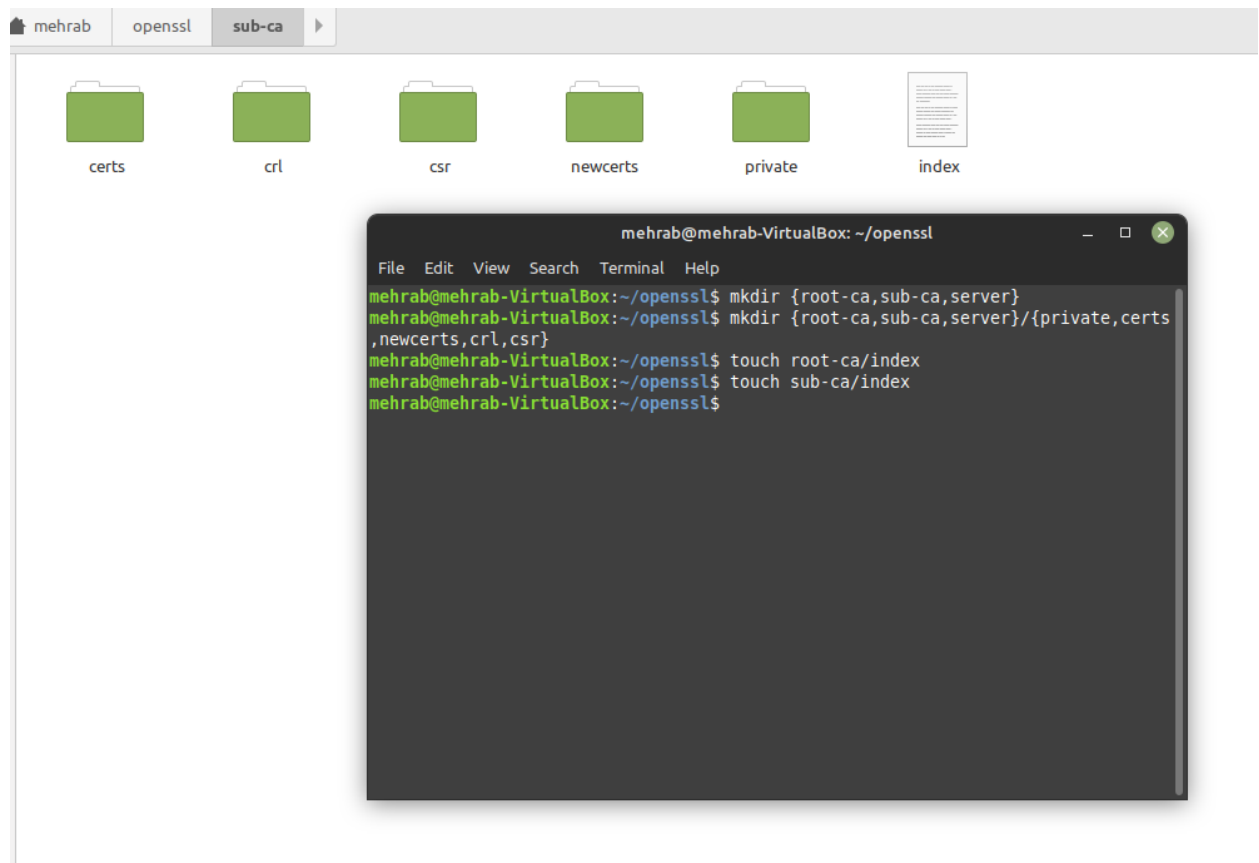
```
mkdir {root-ca,sub-ca,server}/{private,certs,newcerts,crl,csr}
```

to create 5 new folders (`private,certs,newcerts,crl,csr`) inside all 3 folders (`root-ca,sub-ca,server`).

19. Used: `touch root-ca/index` to create index file inside root-ca folder



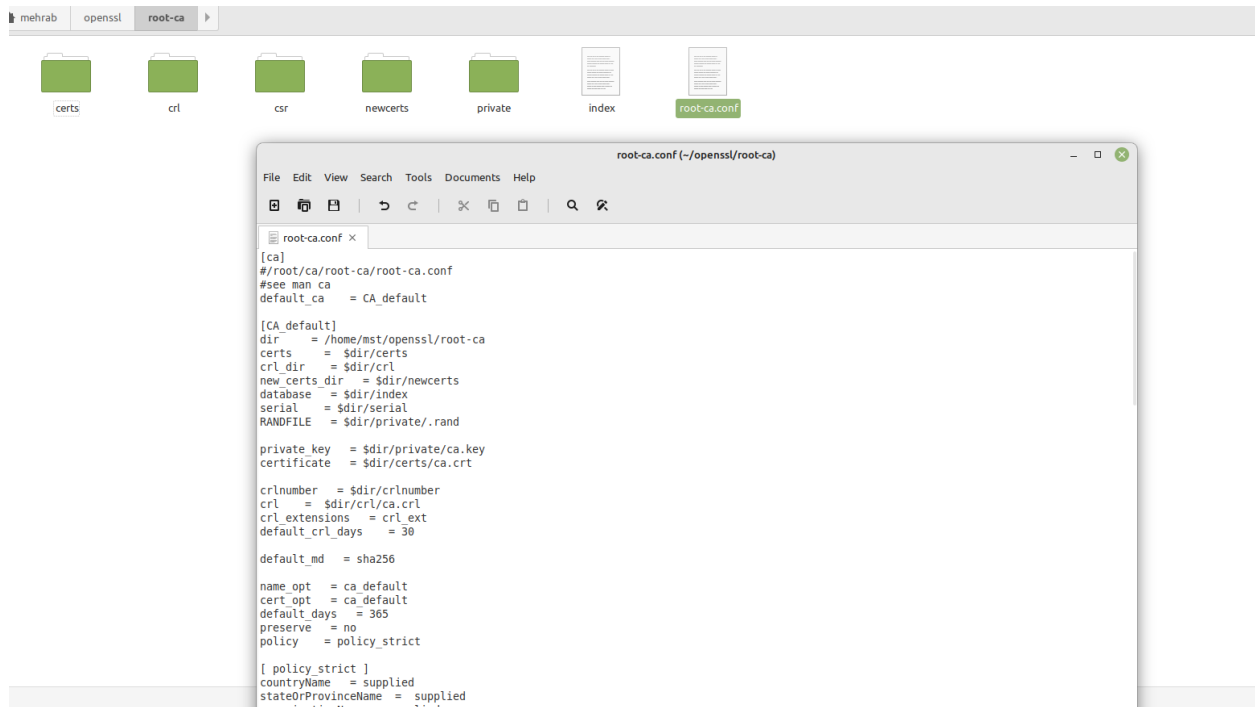
20. Used: `touch sub-ca/index` to create index file inside sub-ca folder



21. Inside root-ca folder, create another file named as root-ca.conf using:

`touch root-ca/root-ca.conf`

and have to paste a code:



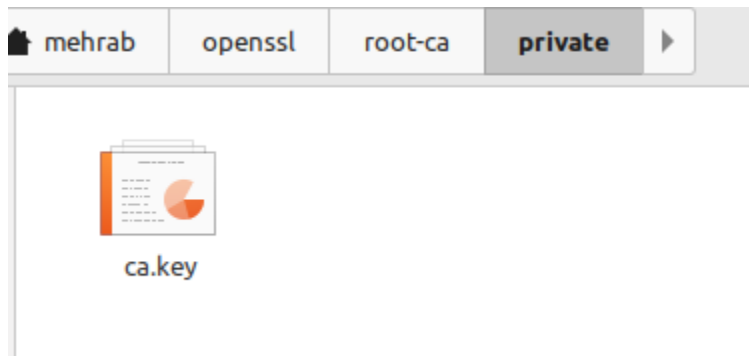
Here, we configured DNS servers:

```
[alt_names]
DNS.1 = tsmsecuredserverserver.com
DNS.2 = www.tsmsecuredserverserver.com
```

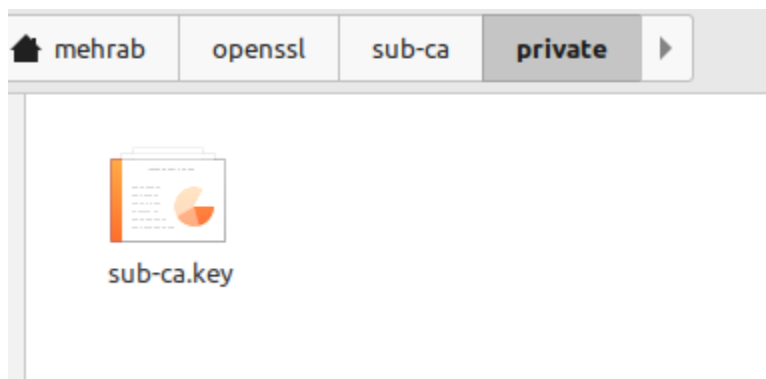
22. Then we need to create 2 more conf files (server.conf and sub-ca.conf) accordingly and have to configure DNS like root-ca.

23. Generation of private keys:

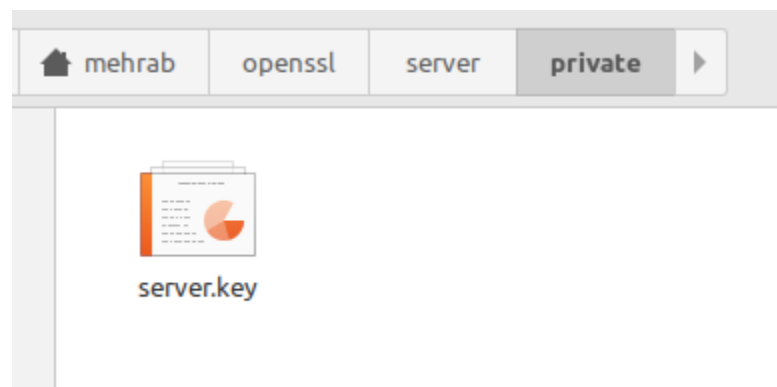
```
openssl genrsa -aes256 -out root-ca/private/ca.key 4096
```



```
openssl genrsa -aes256 -out sub-ca/private/sub-ca.key 4096
```



```
openssl genrsa -out server/private/server.key 2048
```



24. Used: `cd root-ca` and then:

```
openssl req -config root-ca.conf -key private/ca.key -new -x509 -days  
7200 -sha256 -extensions v3_ca -out certs/ca.crt
```

to add a common name: EWU-RootCA

```
mehrab@mehrab-VirtualBox:~/openssl/root-ca$ openssl req -config root-ca.conf -key  
private/ca.key -new -x509 -days 7200 -sha256 -extensions v3_ca -out certs/ca.c  
rt  
Enter pass phrase for private/ca.key:  
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) [BD]:  
State or Province Name [Dhaka]:  
Locality Name []:  
Organization Name [EWU]:  
Organizational Unit Name []:  
Common Name []:EWU-RootCA  
Email Address []:mehrab@gmail.com
```

25. Used: `cd ../sub-ca/` and then:

```
openssl req -config sub-ca.conf -new -key private/sub-ca.key -sha256  
-out csr/sub-ca.csr
```

to add a common name: EWU

```

mehrab@mehrab-VirtualBox:~/openssl/sub-ca$ openssl req -config sub-ca.conf -new
-key private/sub-ca.key -sha256 -out csr/sub-ca.csr
Enter pass phrase for private/sub-ca.key:
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) [BD]:
State or Province Name [Dhaka]:
Locality Name []:
Organization Name [EWU]:
Organizational Unit Name []:
Common Name []:EWU
Email Address [mst@gmail.com]:mehrab@gmail.com
mehrab@mehrab-VirtualBox:~/openssl/sub-ca$

```

26. Used: `cd ../root-ca` and then:

```

openssl ca -config root-ca.conf -extensions v3_intermediate_ca -days
3650 -notext -in ../sub-ca/csr/sub-ca.csr -out ../sub-ca/certs/sub-ca.crt -
rand_serial

```

```

mehrab@mehrab-VirtualBox:~/openssl/root-ca$ openssl ca -config root-ca.conf -extensions v3_intermediate_ca -days 3650 -notext -in ../sub-ca/csr/sub-ca.csr -out ../sub-ca/certs/sub-ca.crt -rand_serial
Using configuration from root-ca.conf
Enter pass phrase for /home/mehrab/openssl/root-ca/private/ca.key:
Check that the request matches the signature
Signature ok
Certificate Details:
  Serial Number:
    57:a3:b2:f8:cd:a1:54:64:ca:67:58:40:3b:d6:19:bd:54:0c:cc:4d
  Validity
    Not Before: Aug 24 09:53:00 2022 GMT
    Not After : Aug 21 09:53:00 2032 GMT
  Subject:
    countryName           = BD
    stateOrProvinceName   = Dhaka
    organizationName      = EWU
    commonName            = EWU
    emailAddress          = mehrab@gmail.com
  X509v3 extensions:
    X509v3 Subject Key Identifier:
      AF:DD:3D:DC:FA:E7:C7:9A:28:E0:4E:B2:A0:1B:8E:DF:67:51:DF:64
    X509v3 Authority Key Identifier:
      C1:E4:7B:44:19:A0:E7:39:8D:46:DB:A1:75:63:80:52:CA:41:E3:8D
    X509v3 Basic Constraints: critical
      CA:TRUE, pathlen:0
    X509v3 Key Usage: critical
      Digital Signature, Certificate Sign, CRL Sign
    X509v3 CRL Distribution Points:
      Full Name:
        URI:http://localhost:8080/rev.crl
Certificate is to be certified until Aug 21 09:53:00 2032 GMT (3650 days)
Sign the certificate? [y/n]:y

1 out of 1 certificate requests certified, commit? [y/n]:y
Write out database with 1 new entries
Data Base Updated
mehrab@mehrab-VirtualBox:~/openssl/root-ca$

```

27. Used: `cd ../server` and then:

```
openssl req -config server.conf -key private/server.key -new -sha256 -  
out csr/server.csr
```

to add a common name: tsmsecuredserver.com

```
mehrab@mehrab-VirtualBox:~/openssl/root-ca$ cd ../server  
mehrab@mehrab-VirtualBox:~/openssl/server$ openssl req -config server.conf -key private/server.key -new -sha256 -out csr/server.csr  
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) [BD]:  
State or Province Name [Dhaka]:  
Locality Name []:  
Organization Name [EWU]:  
Organizational Unit Name []:  
Common Name []:tsmsecuredserver.com  
Email Address [mst@gmail.com]:tsmsecuredserver@gmail.com  
mehrab@mehrab-VirtualBox:~/openssl/server$
```

28. Used: `cd ../sub-ca` and then:

```
openssl ca -config sub-ca.conf -extensions server_cert -days 365 -  
notext -in ../server/csr/server.csr -out ../server/certs/server.crt -  
rand_serial
```

```

mehrab@mehrab-VirtualBox:~/openssl/server$ cd ../sub-ca
mehrab@mehrab-VirtualBox:~/openssl/sub-ca$ openssl ca -config sub-ca.conf -extensions server_cert -days 365 -notext -in ../server/csr/server.csr -out ../server/certs/server.crt -rand serial
Using configuration from sub-ca.conf
Enter pass phrase for /home/mehrab/openssl/sub-ca/private/sub-ca.key:
Check that the request matches the signature
Signature ok
Certificate Details:
  Serial Number:
    79:e9:cf:e7:27:e4:06:d0:88:9a:48:88:a3:cc:52:27:0d:b9:b7:1e
  Validity
    Not Before: Aug 24 09:56:49 2022 GMT
    Not After : Aug 24 09:56:49 2023 GMT
  Subject:
    countryName           = BD
    stateOrProvinceName   = Dhaka
    organizationName      = EWU
    commonName            = tsmsecuredserver.com
    emailAddress          = tsmsecuredserver@gmail.com
  X509v3 extensions:
    X509v3 Basic Constraints:
      CA:FALSE
    Netscape Comment:
      OpenSSL Generated Server Certificate
    X509v3 Subject Key Identifier:
      2F:DB:97:70:01:08:D7:78:DB:0E:BB:C8:13:C9:7F:1A:F9:BB:FF:8A
    X509v3 Authority Key Identifier:
      KeyId:AF:DD:3D:DC:FA:E7:C7:9A:28:E0:4E:B2:A0:1D:0E:DF:67:51:DF:64
      DirName:/C=BD/ST=Dhaka/O=EWU/CN=EWU-RootCA/emailAddress=mehrab@gmail.com
      serial:57:A3:B2:F8:CD:A1:54:64:CA:67:58:40:3B:D6:19:BD:54:6C:CC:4D
    X509v3 Key Usage:
      Digital Signature, Non Repudiation, Key Encipherment
    X509v3 Extended Key Usage:
      TLS Web Server Authentication
    X509v3 Subject Alternative Name:
      DNS:tsmsecuredserverserver.com, DNS:www.tsmsecuredserverserver.com
Certificate is to be certified until Aug 24 09:56:49 2023 GMT (365 days)
Sign the certificate? [y/n]:y

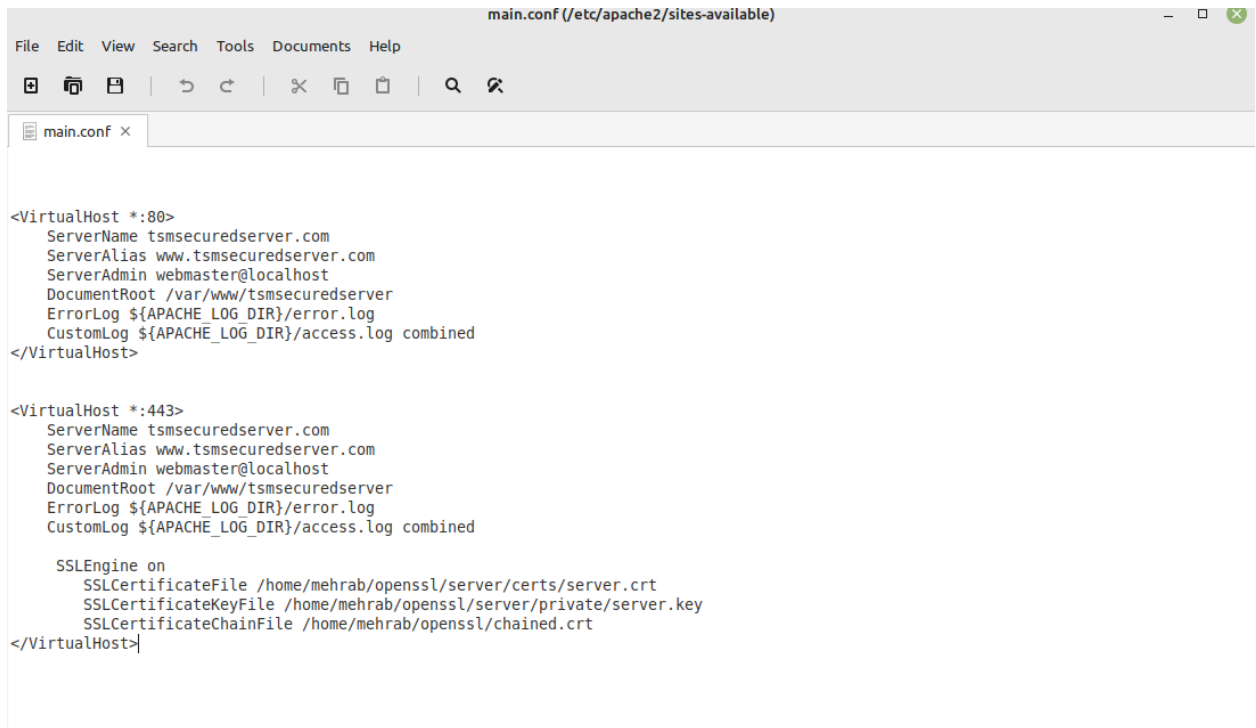
1 out of 1 certificate requests certified, commit? [y/n]:y
Write out database with 1 new entries
Data Base Updated
mehrab@mehrab-VirtualBox:~/openssl/sub-ca$

```

29. Used: `cd ..` and then:

`cat ./server/certs/server.crt ./sub-ca/certs/sub-ca.crt > chained.crt`

30. Then edit the main.conf file and paste the code:



```
main.conf (/etc/apache2/sites-available)

File Edit View Search Tools Documents Help

main.conf x

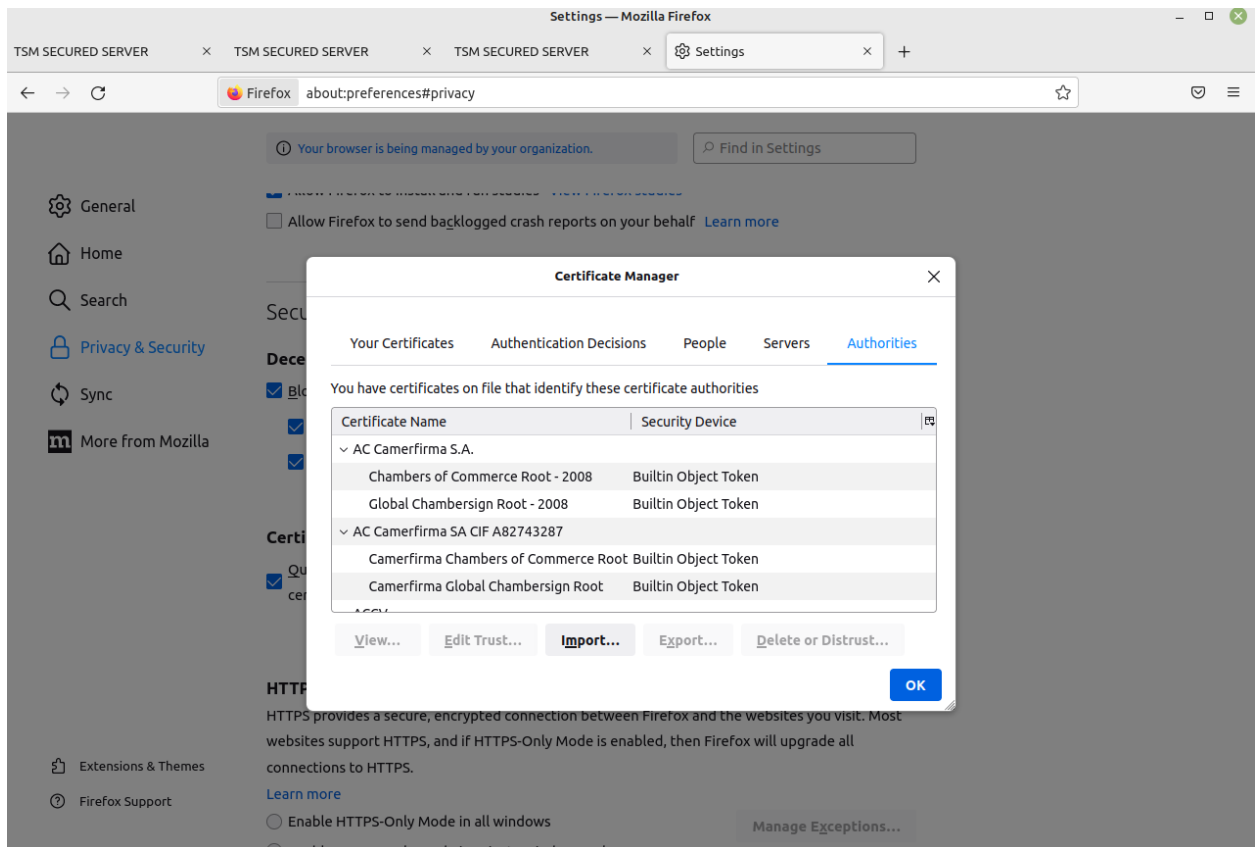
<VirtualHost *:80>
    ServerName tsmsecuredserver.com
    ServerAlias www.tsmsecuredserver.com
    ServerAdmin webmaster@localhost
    DocumentRoot /var/www/tsmsecuredserver
    ErrorLog ${APACHE_LOG_DIR}/error.log
    CustomLog ${APACHE_LOG_DIR}/access.log combined
</VirtualHost>

<VirtualHost *:443>
    ServerName tsmsecuredserver.com
    ServerAlias www.tsmsecuredserver.com
    ServerAdmin webmaster@localhost
    DocumentRoot /var/www/tsmsecuredserver
    ErrorLog ${APACHE_LOG_DIR}/error.log
    CustomLog ${APACHE_LOG_DIR}/access.log combined

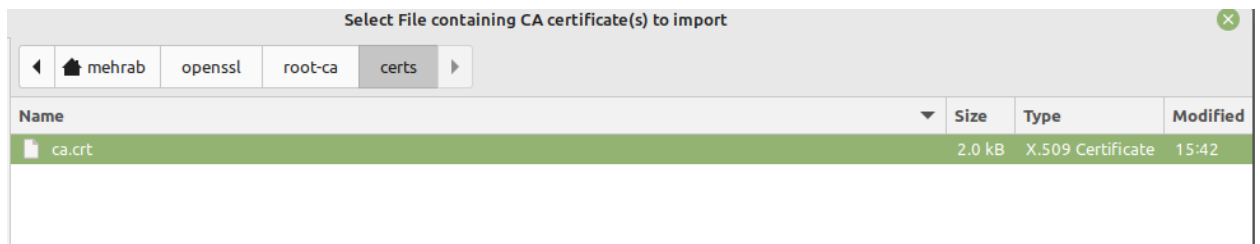
    SSLEngine on
    SSLCertificateFile /home/mehrab/openssl/server/certs/server.crt
    SSLCertificateKeyFile /home/mehrab/openssl/server/private/server.key
    SSLCertificateChainFile /home/mehrab/openssl/chained.crt
</VirtualHost>
```

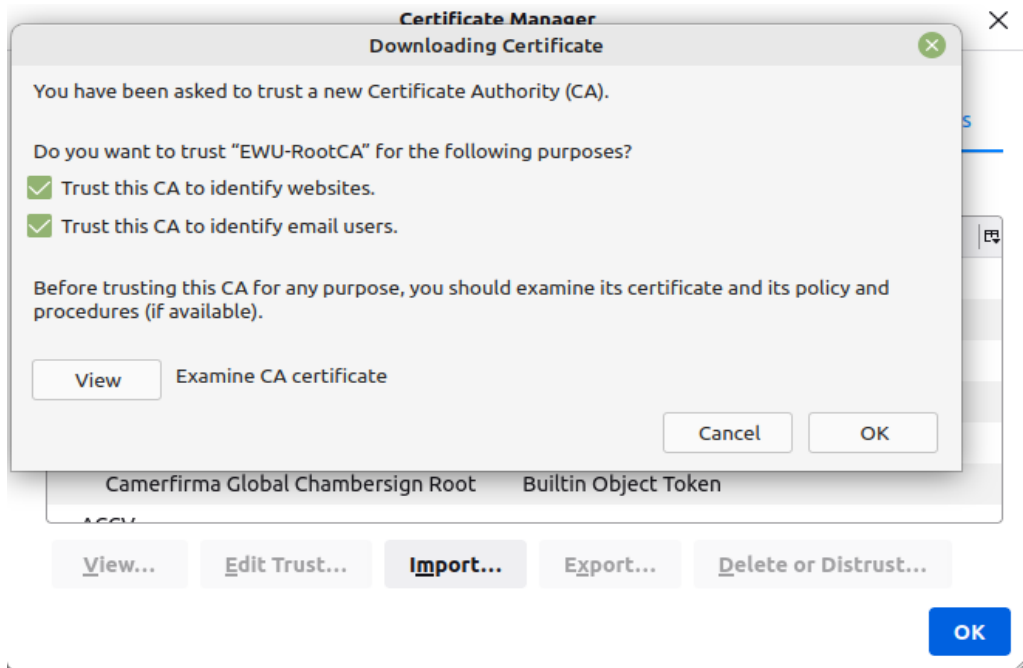
31. Then used: `sudo a2enmod ssl` and `systemctl restart apache2`

32. Have to open browser settings, then: privacy & security-> view certificate-> import

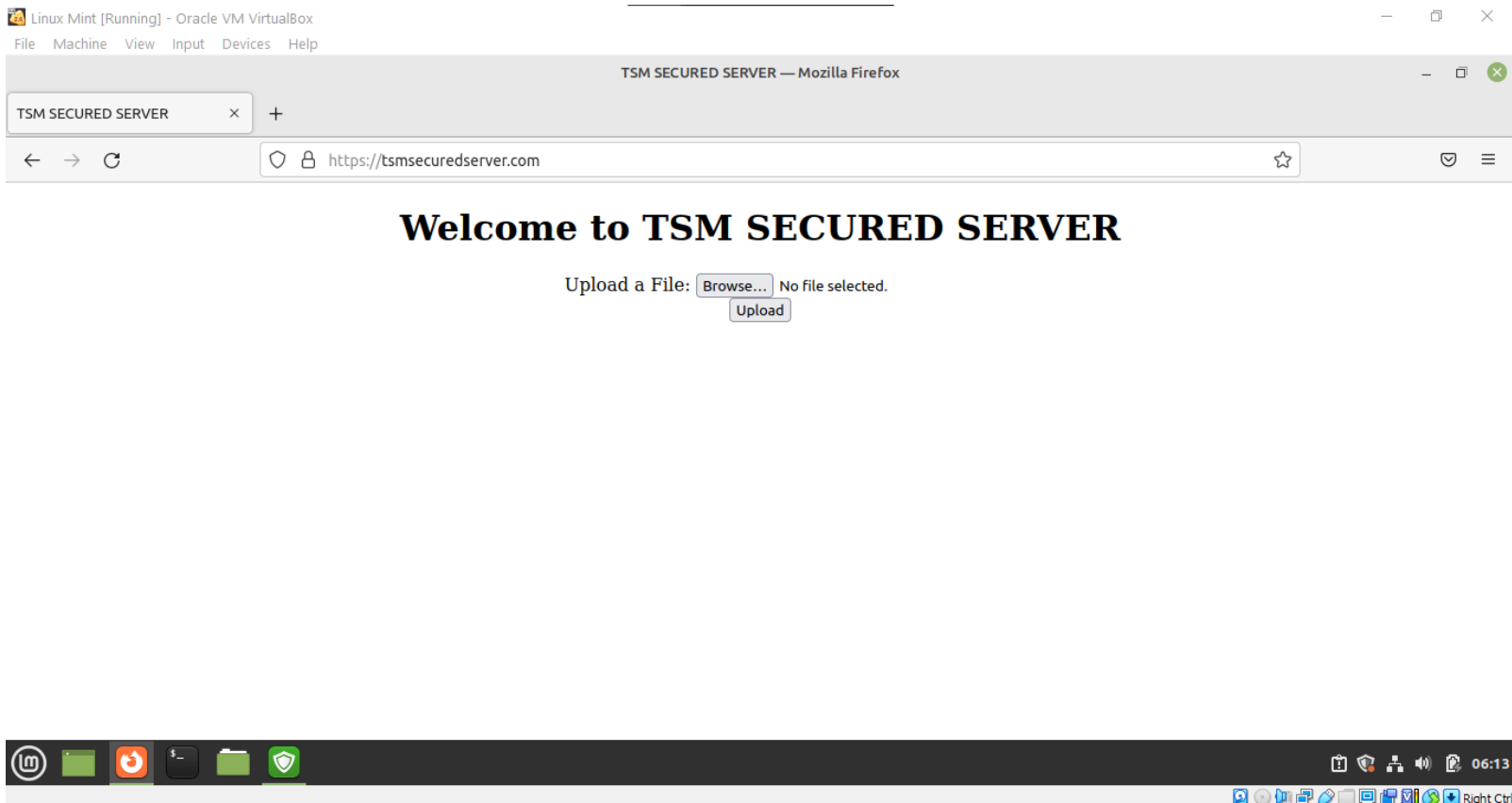


And we have to import our ca.crt file:





33. We can see that our pad lock works correctly:



Page Info — https://tsmsecurdserver.com/

General Permissions Security

Website Identity

Website: tsmsecurdserver.com

Owner: This website does not supply ownership information.

Verified by: EWU [View Certificate](#)

Expires on: August 17, 2023

Privacy & History

Have I visited this website prior to today? No

Is this website storing information on my computer? Yes, cookies [Clear Cookies and Site Data](#)

Have I saved any passwords for this website? No [View Saved Passwords](#)

Technical Details

Connection Encrypted (TLS_AES_128_GCM_SHA256, 128 bit keys, TLS 1.3)

The page you are viewing was encrypted before being transmitted over the Internet.

Encryption makes it difficult for unauthorized people to view information traveling between computers. It is therefore unlikely that anyone read this page as it traveled across the network.

[Help](#)

Linux Mint [Running] - Oracle VM VirtualBox

File Machine View Input Devices Help

Certificate for tsmsecurdserver.com — Mozilla Firefox

TSM SECURED SERVER

Certificate for tsmsecurdserver.com

+

Firefox about:certificate?cert=MIIJDCCA3SgAwIBAgIUWwSmPpaKpkPP8bToEvNgU1al18wDQYJKoZIhvcNAQELBQAwVzELMAkG

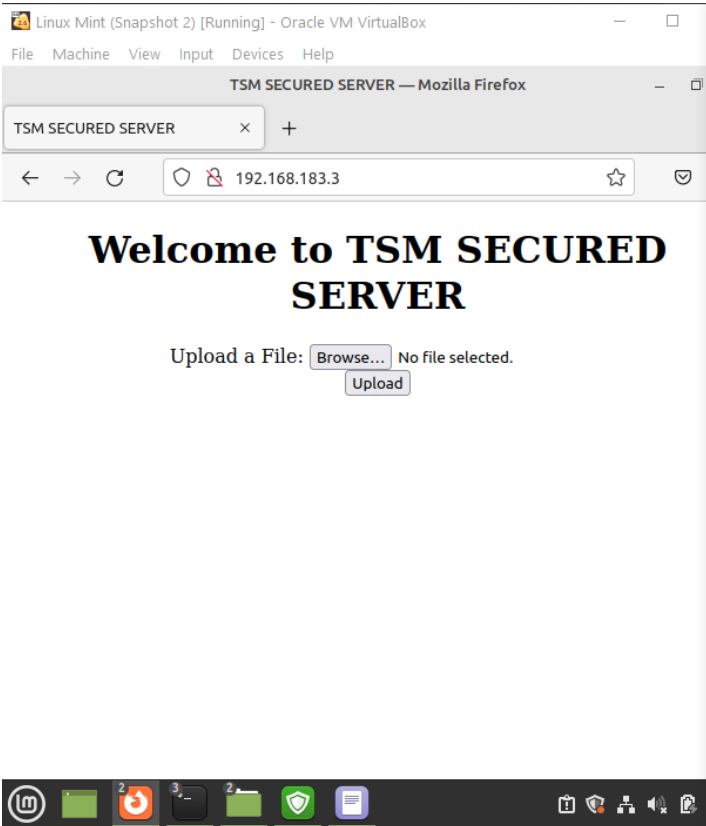
Certificate

tsmsecurdserver.com	EWU	EWU-RootCA
Subject Name		
Country BD		
State/Province Dhaka		
Organization EWU		
Common Name tsmsecurdserver.com		
Email Address tsm@gmail.com		
Issuer Name		
Country BD		
State/Province Dhaka		
Organization EWU		
Common Name EWU		
Email Address tsm@gmail.com		

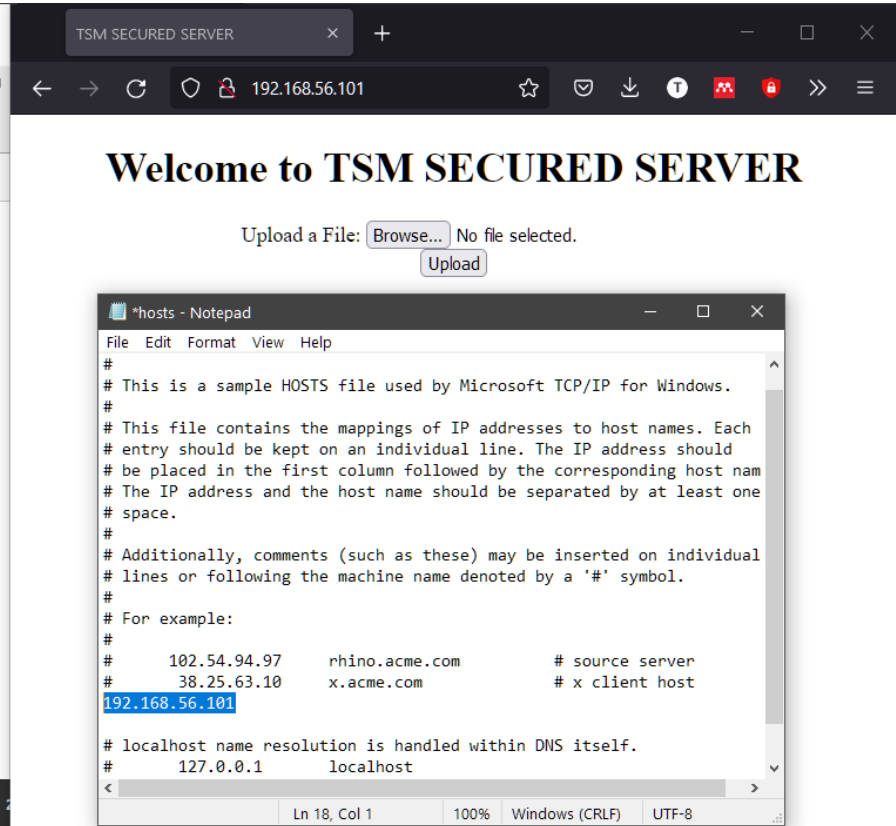
Validating

07:36

34. Hosting web server to Windows:



Linux Mint



Windows Firefox Browser