



EAST WEST UNIVERSITY

Mini Project 1: Securing a networked system with Public Key Infrastructure (Implementing Transport Layer Security on HTTP for https:// connection)

Group - 315

CSE487: Cybersecurity, Law and Ethics

Sec-03

Submitted to:

Rashedul Amin Tuhin

Senior Lecturer, Assistant Proctor

Department of Computer Science & Engineering

East West University

Submitted by:

Malyha Bintha Mabud-----2019-1-60-128

Humaira Anan Neela-----2019-1-60-218

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Installation of XAMPP in Kali Linux:

First, we need to install apache server to Kali. For that we need to install XAMPP.

- Download XAMPP, then launch the terminal, navigate to the installation folder, and run. A procedure of installation will begin.
- After creating a web page, we'll try to host it within the same local area network (LAN). Verify if you have access to it..
- Go to the browser and type "Localhost" to see if the Apache server is operating.
- We require the IP address or default gateway in order to visit the web server. To do so, enter the command "sudo apt get installed net-tools" in the terminal. Get the IP by typing "ifconfig" right away.
- After browsing the IP address in the window, we can observe that the web server is also being run by Windows.
- We may use the ip address to visit the web server within the LAN as long as Linux is turned on..

Configuring Certificates with OpenSSL:

- For generating openssl certificate we need to login as root user to our Kali operating system and write the below command on the terminal:

```
echo "\n\n_____GENERATING ALL DIRECTORIES_____ \n\n"
gr='\033[1;32m'
nc='\033[0m' # No Color

mkdir -p {root-ca,sub-ca,server}/{private,certs,index,serial,pem,crl,csr}
mkdir generated
touch root-ca/index/index
touch sub-ca/index/index
openssl rand -hex 16 > root-ca/serial/serial
openssl rand -hex 16 > sub-ca/serial/serial
cp root-ca.conf root-ca
cp sub-ca.conf sub-ca
echo  "${gr}\n  ===== FOLDERS  CREATED  SUCCESSFULLY
===== \n${nc}"
```

```
echo "\n\n_____GENERATING ALL THE KEYS_____ \n\n"
```

```
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
```

```
echo "${gr}\n ===== KEYS CREATED SUCCESSFULLY  
===== \n${nc}"
```

```
echo "\n\n_____GENERATING ROOT  
CERTIFICATE_____ \n\n"
```

```
openssl req -config root-ca/root-ca.conf -key root-ca/private/ca.key -new -x509 -days 7305 -  
sha256 -extensions v3_ca -out root-ca/certs/ca.crt
```

```
echo "${gr}\n ===== ROOT CERTIFICATE CREATED SUCCESSFULLY  
===== \n${nc}"
```

```
echo "\n\n_____GENERATING SUB-ROOT  
REQUEST_____ \n\n"
```

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

```
echo "${gr}\n ===== SUB-ROOT REQUEST CREATED SUCCESSFULLY  
===== \n${nc}"
```

```
echo "\n\n_____GENERATING SUB-ROOT  
CERTIFICATE_____ \n\n"
```

```
openssl ca -config root-ca/root-ca.conf -extensions v3_intermediate_ca -days 3652 -notext -in  
sub-ca/csr/sub-ca.csr -out sub-ca/certs/sub-ca.crt
```

```
echo "${gr}\n ===== SUB-ROOT CERTIFICATE CREATED  
SUCCESSFULLY ===== \n${nc}"
```

```
echo "\n\n_____GENERATING SERVER REQUEST_____ \n\n"
```

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

```
echo "${gr}\n ===== SERVER REQUEST CREATED SUCCESSFULLY
===== \n${nc}"
```

```
echo "\n\n_____GENERATING SERVER
CERTIFICATE_____ \n\n"
```

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

```
openssl pkcs12 -inkey server/private/server.key -in server/certs/server.crt -export -out
server/certs/server.pfx
```

```
echo "${gr}\n ===== SERVER CERTIFICATE CREATED
SUCCESSFULLY ===== \n${nc}"
```

```
echo "\n\n_____GATHERING NECESSARY FILES_____ \n\n"
```

```
cp root-ca/certs/ca.crt generated
```

```
cp sub-ca/certs/sub-ca.crt generated
```

```
cp server/certs/server.crt generated
```

```
cp server/private/server.key generated
```

```
cp server/certs/server.pfx generated
```

```
echo "${gr}\n ===== SUCCESSFULLY GATHERED =====
\n${nc}"
```

```
echo "\n\n_____CREATING HOST ENTRY_____ \n\n"
```

```
echo -n "Server CommonName: "
```

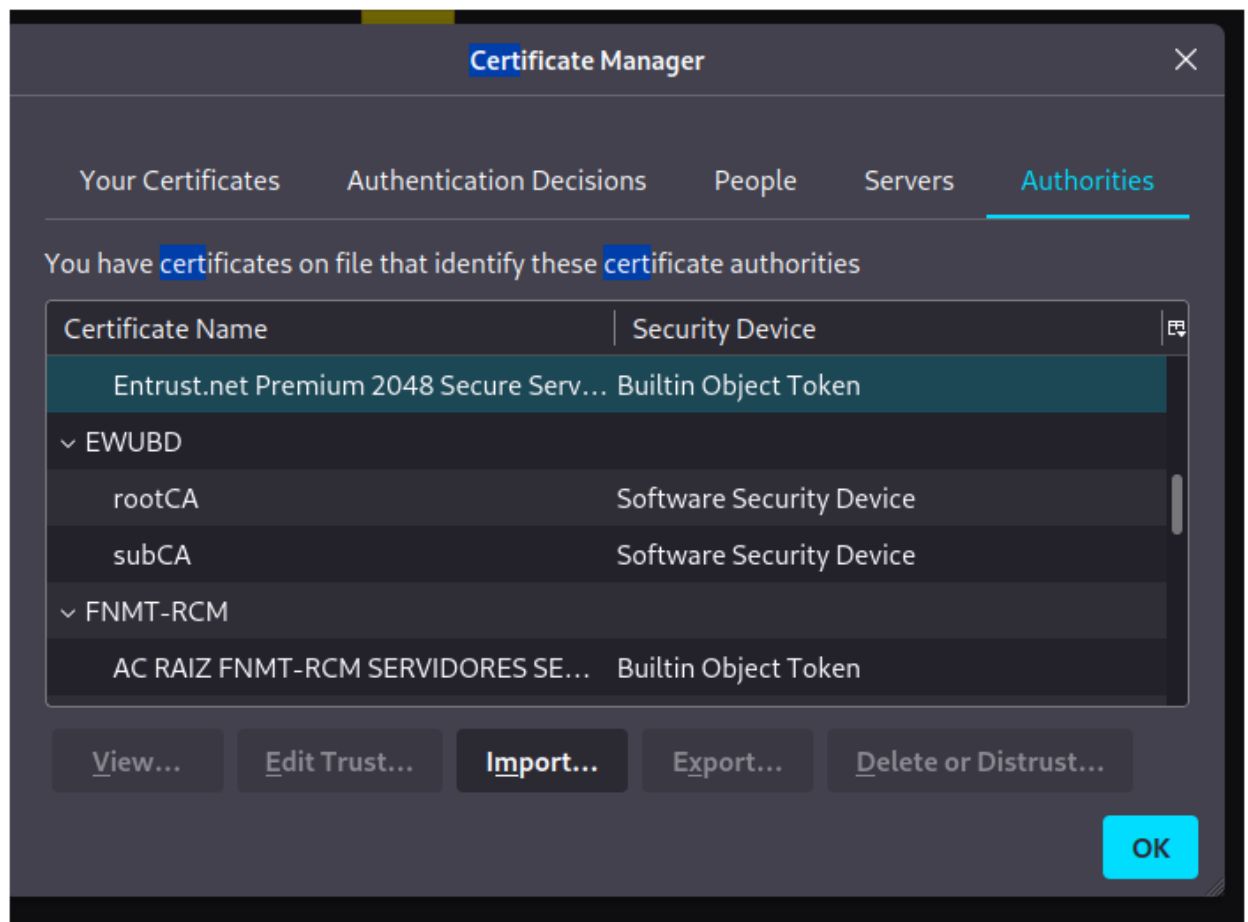
```
read commonName
```

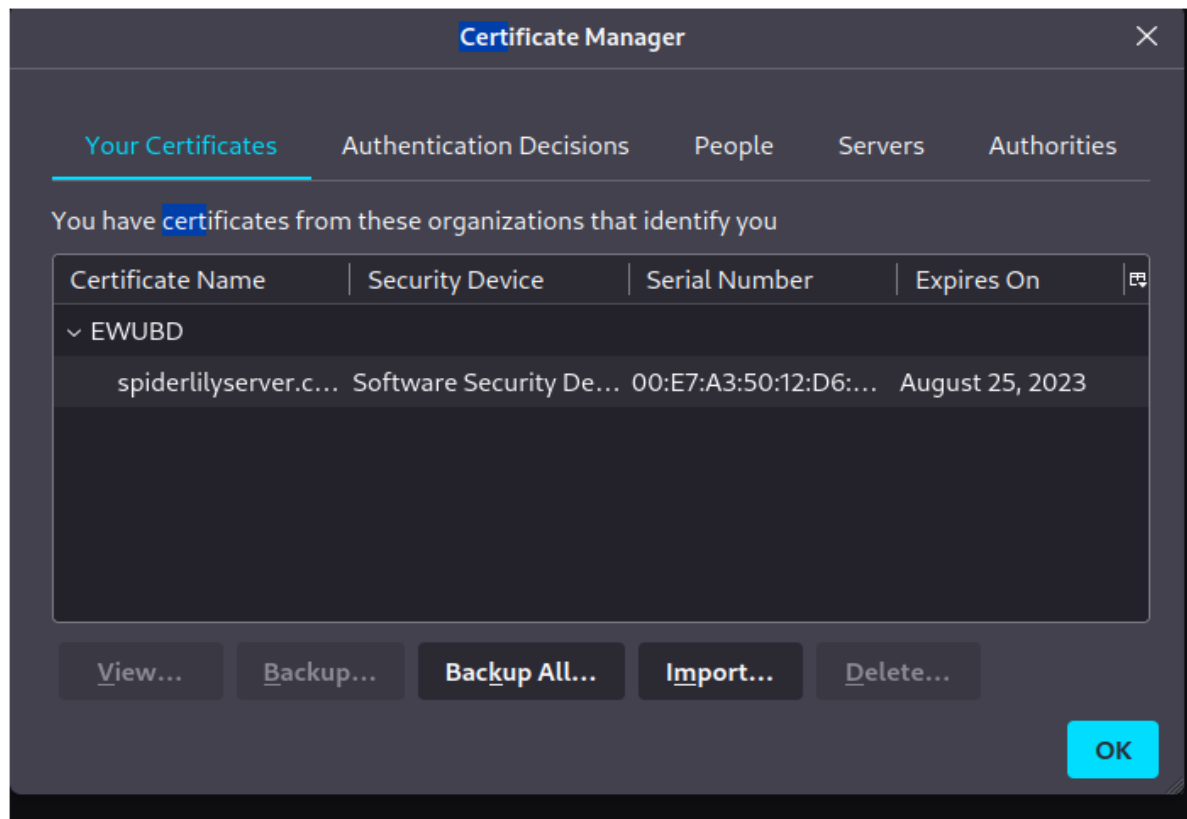
```
echo "127.0.0.1 "$commonName >> /etc/hosts
```

```
echo "${gr}\n ===== SUCCESSFULLY APPENDED HOST
===== \n${nc}"
```

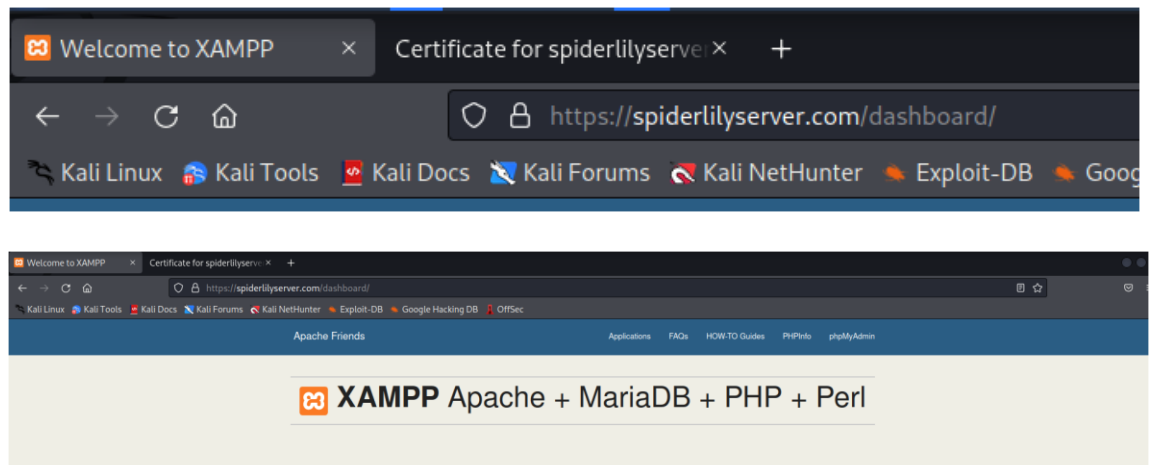
- After generating this command, we can see the certs files on our generated folder. We generated our server name as <https://spiderlilyserver.com>.

- Then we have to install our certificates in our XAMPP. For this first we have to start our XAMPP:
`cd opt /lamp`
`./manager-linux-x64.run`
- Then go to this file and edit the httpd-ssl.conf file:
File system -> opt -> lamp -> etc -> extra -> httpd-ssl.conf
- Then copy the location of spiderlilyserver.com.pem then go to the word editor and edit the SSLCertificateFile location.
- Then copy the path of server.cert file SSLCACertificate “/home/neela/desktop/certs” and save the file.
- Then restart the xampp.
- Then type <https://localhost> in the browser then in the settings import the rootCA, subCA and server(spiderlilyserver.com) certificates.





- Restart the browser and type <https://spiderlily.com> and we have the secured website with the padlock as we wanted.



Welcome to XAMPP for Linux 8.1.6

You have successfully installed XAMPP on this system! Now you can start using Apache, MariaDB, PHP and other components. You can find more info in the FAQs section or check the HOW-TO Guides for getting started with PHP applications.

XAMPP is meant only for development purposes. It has certain configuration settings that make it easy to develop locally but that are insecure if you want to have your installation accessible to others. If you want have your XAMPP accessible from the internet, make sure you understand the implications and you checked the FAQs to learn how to protect your site. Alternatively you can use WAMP, MAMP or LAMP which are similar packages which are more suitable for production.

Start the XAMPP Control Panel to check the server status.

Community

XAMPP has been around for more than 10 years – there is a huge community behind it. You can get involved by joining our Forums, adding yourself to the Mailing List, and liking us on Facebook, following our exploits on Twitter, or adding us to your Google+ circles.

Contribute to XAMPP translation at translate.apachefriends.org.

Can you help translate XAMPP for other community members? We need your help to translate XAMPP into different languages. We have set up a site: translate.apachefriends.com where users can contribute translations

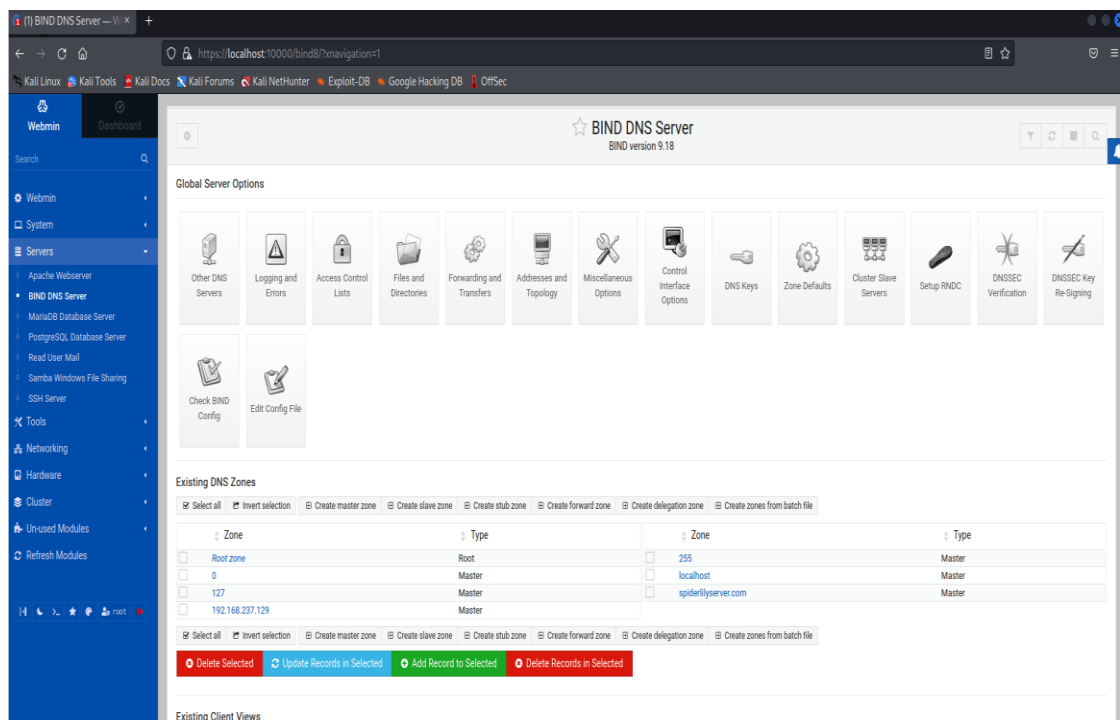
- And the certificate of our secured server.

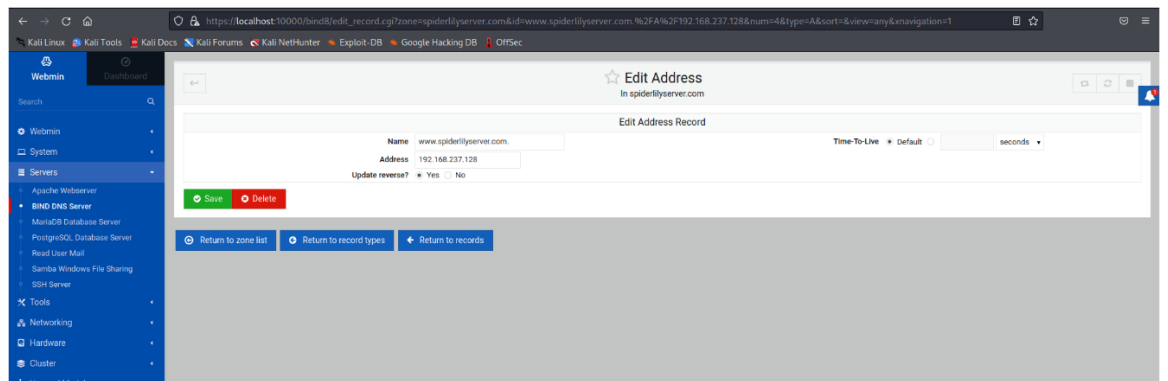
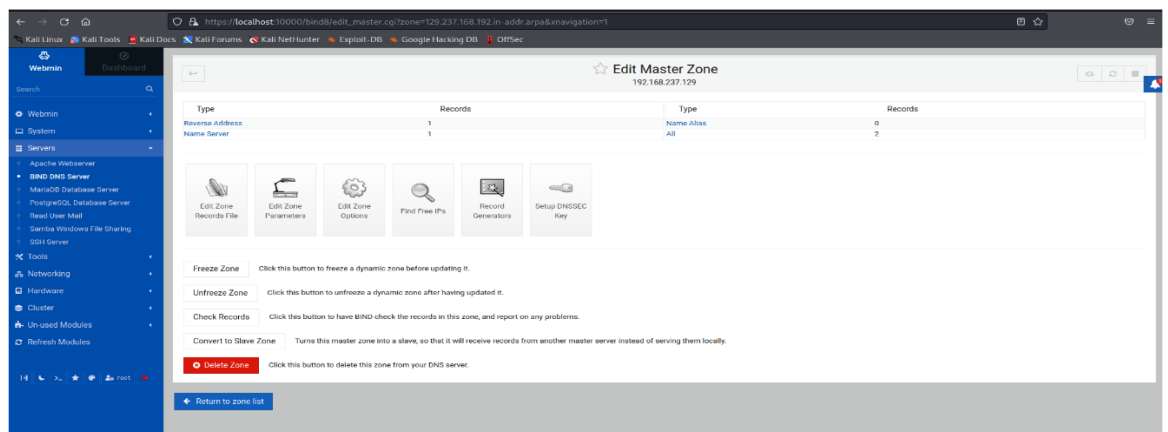
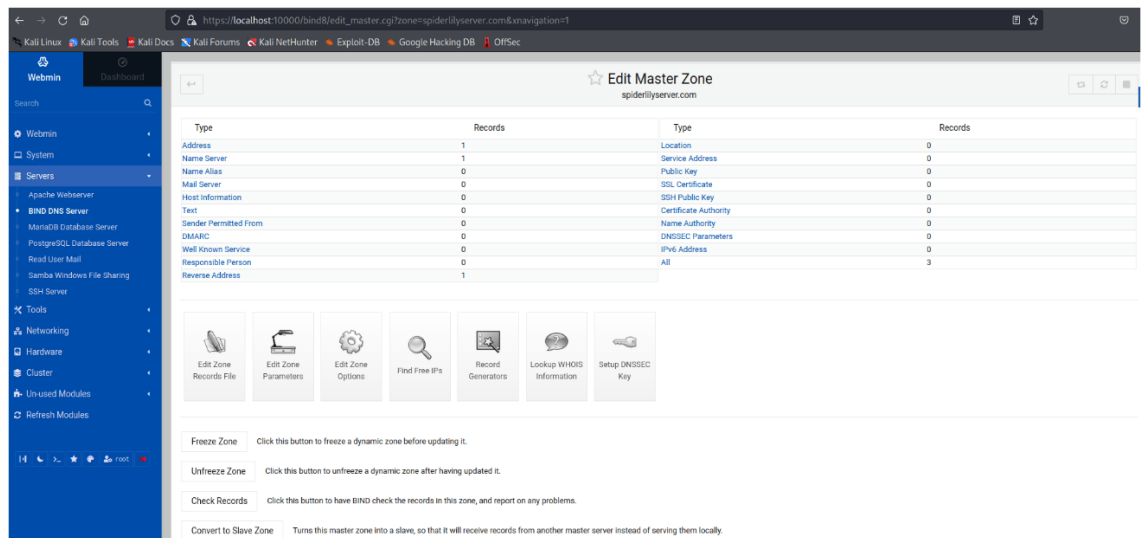
Certificate	
spiderlilyserver.com	rootCA
Subject Name Country BD State/Province DHK Locality RM Organization spiderlilyserver Organizational Unit admin Common Name spiderlilyserver.com Email Address a@spiderlilyserver.com	
Issuer Name Country BD State/Province DHK Organization EWUBD Organizational Unit SUBADMIN Common Name rootCA	
Validity Not Before Thu, 25 Aug 2022 11:06:22 GMT Not After Fri, 25 Aug 2023 11:06:22 GMT	
Public Key Info	

Certificate	
spiderlilyserver.com	rootCA
Subject Name Country BD State/Province DHK Organization EWUBD Organizational Unit SUBADMIN Common Name rootCA	
Issuer Name Country BD State/Province DHK Locality RAMPURA Organization EWUBD Organizational Unit ADMIN Common Name subCA	
Validity Not Before Thu, 25 Aug 2022 11:04:57 GMT Not After Tue, 24 Aug 2032 11:04:57 GMT	
Public Key Info	

Installing DNS server in Kali using webmin(GUI of bind9):

- We have to open another Kali on VMware.
- `sudo apt update`
- `sudo apt-get install open-vm-tools-desktop`
- `reboot`
- `sudo apt install kali-root-login`
- `sudo passwd`
- -----#switch user
- -----#webmin installation
- `sudo nano /etc/apt/sources.list`
- -----#add this line
- `deb http://download.webmin.com/download/repository sarge contrib`
-
- `wget -q -O- http://www.webmin.com/jcameron-key.asc | sudo apt-key add`
- `sudo apt update`
- `sudo apt install webmin`
- `sudo ufw allow 10000`
- `sudo cd /usr/lib/systemd/system`
- `sudo cp named.service bind9.service`
- Then configure the ip addresses with the command “ipconfig” of our Xampp, DNS and Windows.





- Then we can check the forward and reverse addresses from the windows with the “nslookup”. We will get the same ip address.

```
Command Prompt

Name:  www.spiderlilyserver.com
Address:  192.168.237.128

C:\Users\88016>nslookup 192.168.237.129
Server:  spiderlilyserver.com
Address:  192.168.237.129

Name:  spiderlilyserver.com
Address:  192.168.237.129

C:\Users\88016>nslookup 192.168.237.129
Server:  spiderlilyserver.com
Address:  192.168.237.129

Name:  spiderlilyserver.com
Address:  192.168.237.129

C:\Users\88016>nslookup www.spiderlilyserver.com
Server:  spiderlilyserver.com
Address:  192.168.237.129

Name:  www.spiderlilyserver.com
Address:  192.168.237.128

C:\Users\88016>
```