Networks Lab Experiment 7

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Task1: Setup virtual hosts in apache server

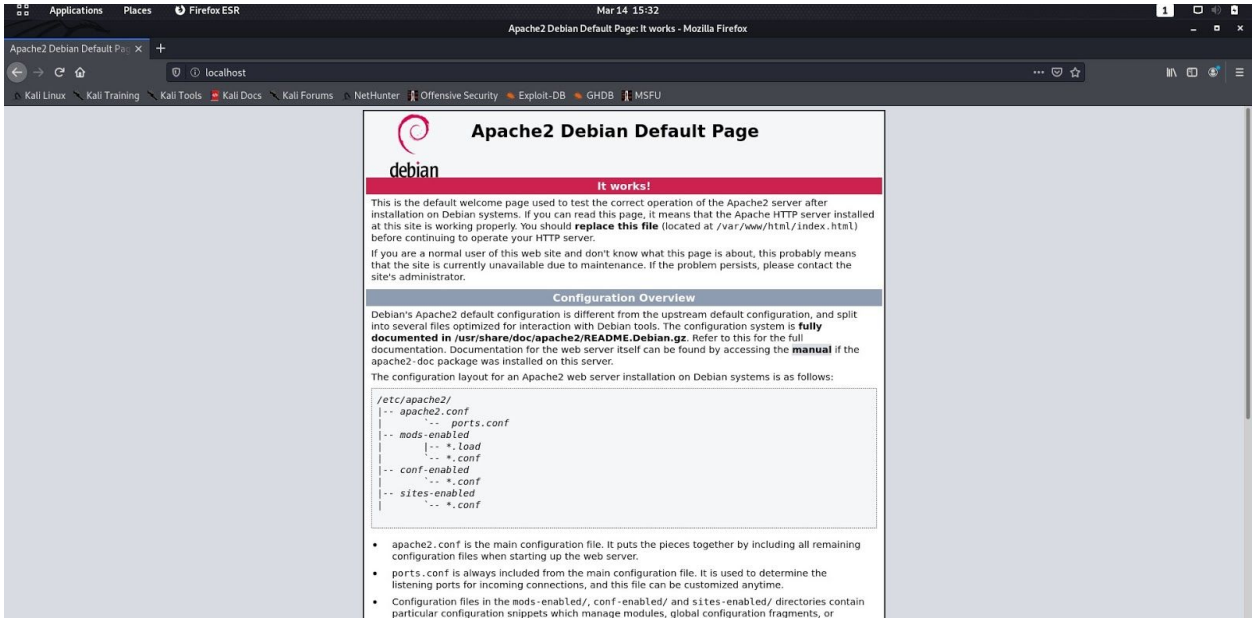
Installing apache server:

```
sudo apt install apache2
```

Activate apache server:

```
systemctl start apache2
```

Confirm apache installation by entering localhost in browser and the following window appears



Setting up conf files for virtual hosts:

```
cd /etc/apache2/sites-available
```

We can see a file named 000-default.conf which is default entry

```
<VirtualHost *:80>
        # The ServerName directive sets the request scheme, hostname and port that
        # the server uses to identify itself. This is used when creating
        # redirection URLs. In the context of virtual hosts, the ServerName
        # specifies what hostname must appear in the request's Host: header to
        # match this virtual host. For the default virtual host (this file) this
        # value is not decisive as it is used as a last resort host regardless.
        # However, you must set it for any further virtual host explicitly.
        ServerName www.host1.com

        ServerAdmin webmaster@localhost
        DocumentRoot /var/www/host1_html

        # Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
        # error, crit, alert, emerg.
        # It is also possible to configure the loglevel for particular
        # modules, e.g.
        #LogLevel info ssl:warn

        ErrorLog ${APACHE_LOG_DIR}/host1_error.log
        CustomLog ${APACHE_LOG_DIR}/host1_access.log combined

        # For most configuration files from conf-available/, which are
        # enabled or disabled at a global level, it is possible to
        # include a line for only one particular virtual host. For example the
        # following line enables the CGI configuration for this host only
        # after it has been globally disabled with "a2disconf".
        #Include conf-available/serve-cgi-bin.conf
</VirtualHost>

# vim: syntax=apache ts=4 sw=4 sts=4 sr noet
```

Configuration file for virtual host

- Copy its contents to a new file named host1.conf.
- Uncomment server name and give a name to server.
- Add document root, error log, custom log file paths in which site's html pages, error logs and other custom logs are stored
- Save and close the file
- Create another virtual host in similar way

Now add these conf files to sites-enabled directory by executing the following commands in /etc/apache2 directory

a2ensite host1.conf
a2ensite host2.conf
Systemctl reload apache2

Now add the ip addresses of the new virtual hosts host1 and host2 in hosts file present /etc/ folder as shown below

```
cd ../
vi hosts
```

```
127.0.0.1       localhost
127.0.1.1       kali
127.0.0.1       www.host1.com
127.0.0.1       www.host2.com

# The following lines are desirable for IPv6 capable hosts
::1     localhost ip6-localhost ip6-loopback
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
```

Setting up html files:

Goto document root folder given in the conf file of virtual host.

```
cd /var/www
```

- Create new directories host1_html and host2_html
- Create a new file in both the directories with name index.html
- Write a short html code that displays text on browser as given:

```
<!DOCTYPE html>
<html>
        <head>
                <title>
                        Apache host1
                </title>
        </head>
        <body>
                <h1>
                        HOST1 OPENED
                </h1>
                <p>
                        You have connected to host 1
                </p>
        </body>

</html>
```

Telnet to web server port 80:

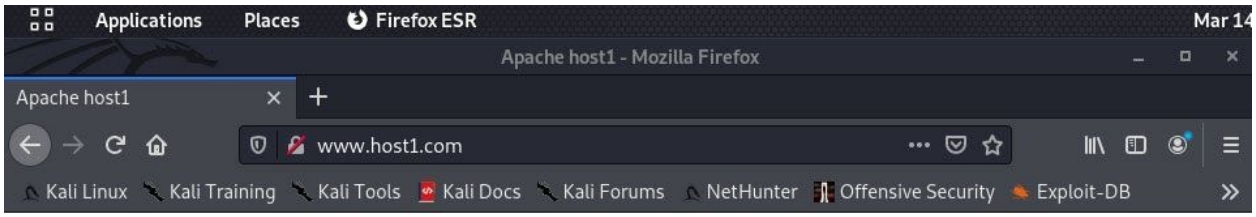
Write a simple http request to server as given below and press enter

GET / HTTP/1.1
HOST: www.host1.com

```
┌──(kali㉿kali)-[~]
└─$ telnet www.host1.com 80
Trying 127.0.0.1...
Connected to www.host1.com.
Escape character is '^]'.
GET / HTTP/1.1
HOST: www.host1.com

HTTP/1.1 200 OK
Date: Sun, 14 Mar 2021 18:53:47 GMT
Server: Apache/2.4.46 (Debian)
Last-Modified: Sun, 14 Mar 2021 17:10:52 GMT
ETag: "b3-5bd82372fb4d1"
Accept-Ranges: bytes
Content-Length: 179
Vary: Accept-Encoding
Content-Type: text/html

<!DOCTYPE html>
<html>
        <head>
                <title>
                        Apache host1
                </title>
        </head>
        <body>
                <h1>
                        HOST1 OPENED
                </h1>
                <p>
                        You have connected to host 1
                </p>
        </body>

</html>
Connection closed by foreign host.
```

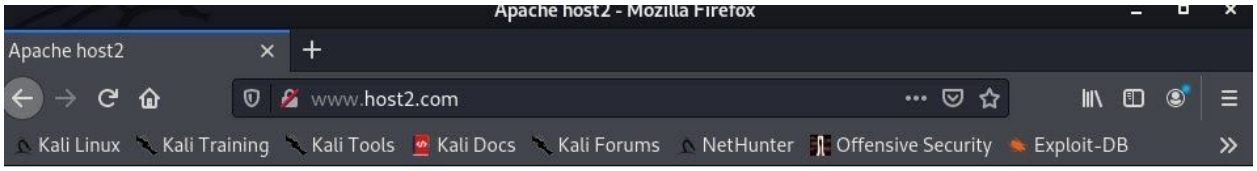
Server response

Connecting to web server through browser:



HOST1 OPENED

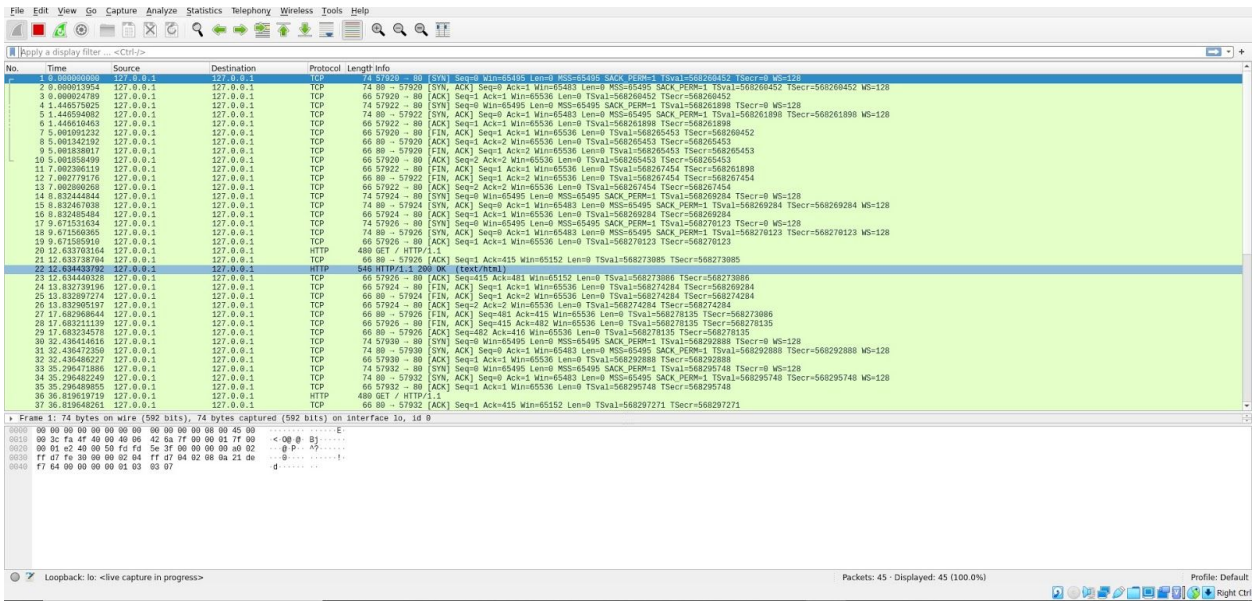
You have connected to host 1



HOST2 OPENED

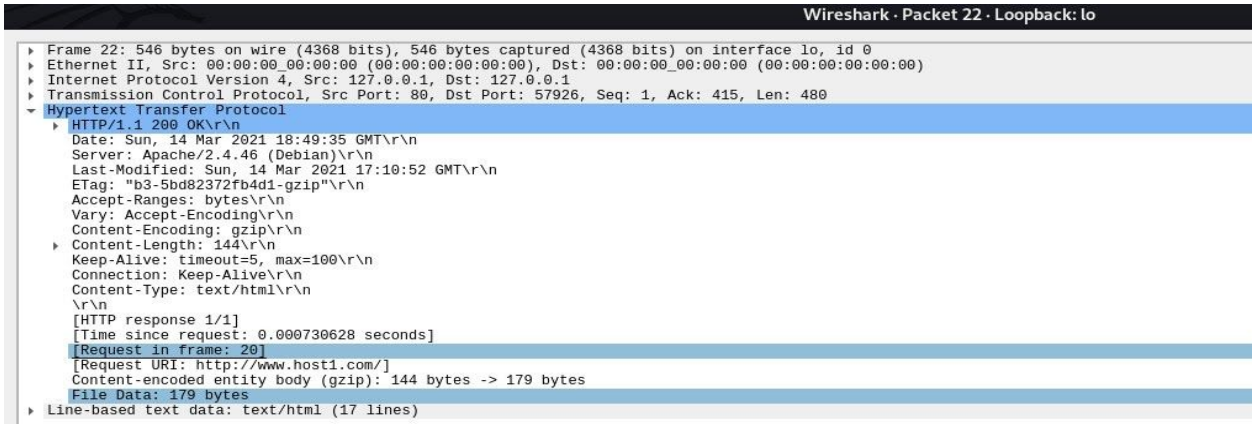
You have connected to host 2

Wireshark Capture:

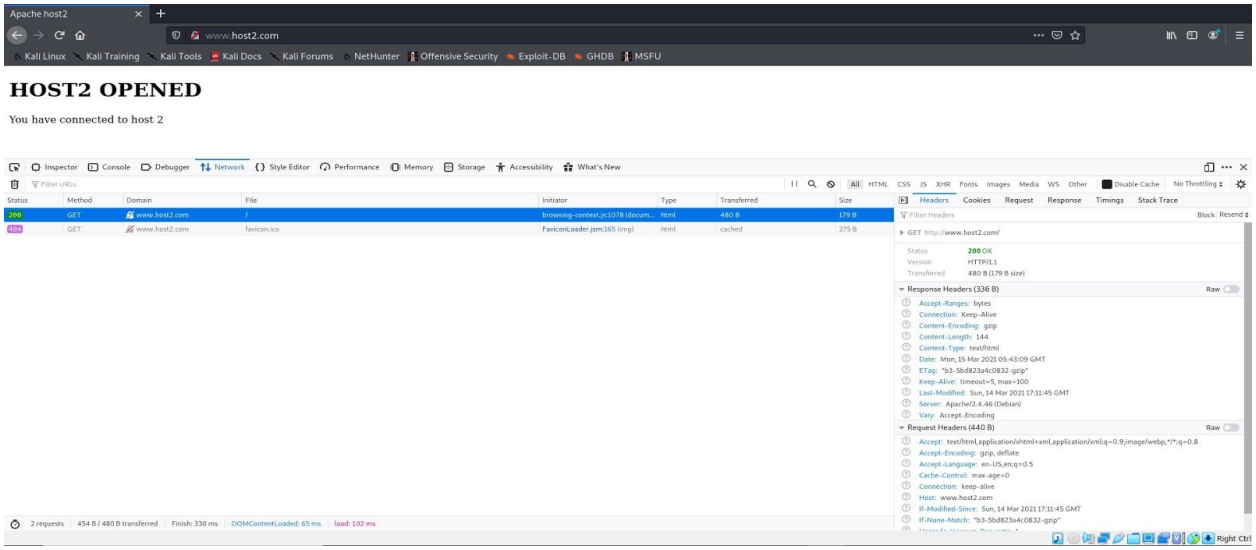


Wireshark capture on loopback interface

http request message



http response message



http header file

Task2: Very Simple Web Server (VSWS)

Modify the server program to send a http response to clients with a response body as Welcome to Networks Lab!

Welcome to Networks Lab!

Connecting to web server on port 8080

```
┌──(kali㉿kali)-[~]
└─$ gcc tcp_server_VSWS.c

┌──(kali㉿kali)-[~]
└─$ ./a.out
New Client connected

Http request message received

GET / HTTP/1.1
Host: localhost:8080
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:78.0) Gecko/20100101 Firefox/78.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: keep-alive
Upgrade-Insecure-Requests: 1


Http response sent

Connection closed
```

Server code execution