

W12D4 - Pratica

Report sulla valutazione e delle vulnerabilità e remediation su Metasploitable

Introduzione

- **Obiettivo:** Utilizzare Nessus come strumento di scansione delle vulnerabilità sulla macchina Metasploitable
- **Strumenti Utilizzati:** Nessus, la sua documentazione delle vulnerabilità conosciute e materiale trovato su internet.
- **Target:** Metasploitable è una macchina virtuale progettata per essere vulnerabile ed utilizzata come "campo" di addestramento per chi inizia ad imparare la cybersecurity.

Scansione Iniziale e Analisi

Metodologia di Scansione

- La scansione viene fatta con Nessus, uno strumento di scansione delle vulnerabilità conosciute. Viene utilizzato in ambito lavorativo per individuare debolezze nei sistemi informatici e fare report, per poi eventualmente passare all'effettiva messa in sicurezza di essi per prevenire attacchi informatici.
- La scansione fatta è completa e su tutte le porte

Risultati Iniziali

- La scansione di base (la prima fatta sulla macchina prima di fare la remediation) mostra decine di vulnerabilità, le più urgenti (critical) sono 7.
- La scansione sta nella repository (`Scansione di base.pdf`).

192.168.50.101



Vulnerabilities

Total: 104

SEVERITY	CVSS V3.0	VPR SCORE	PLUGIN	NAME
CRITICAL	9.8	-	134862	Apache Tomcat AJP Connector Request Injection (Ghostcat)
CRITICAL	9.8	-	51988	Bind Shell Backdoor Detection
CRITICAL	9.8	-	20007	SSL Version 2 and 3 Protocol Detection
CRITICAL	10.0*	-	32314	Debian OpenSSH/OpenSSL Package Random Number Generator Weakness
CRITICAL	10.0*	-	32321	Debian OpenSSH/OpenSSL Package Random Number Generator Weakness (SSL check)
CRITICAL	10.0*	-	11356	NFS Exported Share Information Disclosure
CRITICAL	10.0*	-	61708	VNC Server 'password' Password

Remediation delle Vulnerabilità

Vulnerabilità Scelte

- Queste sono le vulnerabilità critiche che sono riuscito a risolvere:
 - **Apache Tomcat A JP Connector Request Injection (Ghostcat):**
 - A file read/inclusion vulnerability was found in AJP connector. A remote, unauthenticated attacker could exploit this vulnerability to read web application files from a vulnerable server. In instances where the vulnerable server allows file uploads, an attacker could upload malicious JavaServer Pages (JSP) code within a variety of file types and gain remote code execution (RCE).
 - **Bind Shell Backdoor Detection:**
 - A shell is listening on the remote port without any authentication being required. An attacker may use it by connecting to the remote port and sending commands directly.
 - **NFS Exported Share Information Disclosure:**
 - At least one of the NFS shares exported by the remote server could be mounted by the scanning host. An attacker may be able to leverage this to read (and possibly write) files on remote host.
 - **VNC Server 'password' Password:**
 - The VNC server running on the remote host is secured with a weak password. Nessus was able to login using VNC authentication and a password of 'password'. A remote, unauthenticated attacker could exploit this to take control of the system.

Azioni di Remediation

- Di seguito tutti i passaggi fatti per risolvere le vulnerabilità:

Apache Tomcat A JP Connector Request Injection (Ghostcat)

Ho disabilitato il connettore AJP che può essere utilizzato per sfruttare la vulnerabilità Ghostcat. Per farlo ho commentato la linea nel file server.xml che configura il connettore AJP:

```
nsfadmin@metasploitable:~$ cd /etc
nsfadmin@metasploitable:/etc$ cd tomcat5.5
nsfadmin@metasploitable:/etc/tomcat5.5$ ls
Catalina          context.xml       server-minimal.xml  tomcat-users.xml
catalina.policy   logging.properties  server.xml          web.xml
catalina.properties  policy.d         tomcat5.5
nsfadmin@metasploitable:/etc/tomcat5.5$ sudo nano server.xml_
```

```
GNU nano 2.0.7          File: server.xml          Modified

<!-- Define a SSL HTTP/1.1 Connector on port 8443 -->
<!--
<Connector port="8443" maxHttpHeaderSize="8192"
          maxThreads="150" minSpareThreads="25" maxSpareThreads="75"
          enableLookups="false" disableUploadTimeout="true"
          acceptCount="100" scheme="https" secure="true"
          clientAuth="false" sslProtocol="TLS" />
-->
<!--
Define an AJP 1.3 Connector on port 8009 -->
<Connector port="8009"
          enableLookups="false" redirectPort="8443" address="192.168.50.15"
-->
<!-- Define a Proxied HTTP/1.1 Connector on port 8082 -->
<!-- See proxy documentation for more information about using this. -->
<!--
<Connector port="8082"
          maxThreads="150" minSpareThreads="25" maxSpareThreads="75"
          enableLookups="false" acceptCount="100" connectionTimeout="20000"
-->

^G Get Help  ^O WriteOut  ^R Read File ^Y Prev Page ^K Cut Text  ^C Cur Pos
```

```
GNU nano 2.0.7      File: server.xml      Modified

<!-- Define a SSL HTTP/1.1 Connector on port 8443 -->
<!--
<Connector port="8443" maxHttpHeaderSize="8192"
    maxThreads="150" minSpareThreads="25" maxSpareThreads="75"
    enableLookups="false" disableUploadTimeout="true"
    acceptCount="100" scheme="https" secure="true"
    clientAuth="false" sslProtocol="TLS" />
-->
<!--
Define an AJP 1.3 Connector on port 8009 -->
<Connector port="8009"
    protocol="AJP/1.3" />

<!-- Define a Proxied HTTP/1.1 Connector on port 8082 -->
<!-- See proxy documentation for more information about using this. -->
<!--
<Connector port="8082"
    maxThreads="150" minSpareThreads="25" maxSpareThreads="75"
    enableLookups="false" acceptCount="100" connectionTimeout="20000"
```

Bind Shell Backdoor Detection

Dopo aver individuato il processo della backdoor l'ho eliminato e sono risalito allo script che avvia la backdoor rimuovendola definitivamente:

```
Metasploitable [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Last login: Fri Jul 26 14:24:43 EDT 2024 on tty1
Linux metasploitable 2.6.24-16-server #1 SMP Thu Apr 10 13:58:00 UTC 2008 i686

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To access official Ubuntu documentation, please visit:
http://help.ubuntu.com/
No mail.
msfadmin@metasploitable:~$ sudo su -
[sudo] password for msfadmin:
Sorry, try again.
[sudo] password for msfadmin:
root@metasploitable:~# sudo netstat -tulnp | grep :1524
tcp        0      0 0.0.0.0:1524        0.0.0.0:*          LISTEN
4478/xinetd
root@metasploitable:~# ls -l /proc/4478/exe
lrwxrwxrwx 1 root root 0 2024-07-27 10:14 /proc/4478/exe -> /usr/sbin/xinetd
root@metasploitable:~# kill 4478
root@metasploitable:~# rm -r -f /usr/sbin/xinetd
root@metasploitable:~#
```

NFS Exported Share Information Disclosure

Modifico i file /etc/hosts.allow e /etc/hosts.deny per controllare l'accesso ai servizi NFS:

```
File  Machine  View  Input  Devices  Help
GNU nano 2.0.7      File: /etc/hosts.allow      Modified

# /etc/hosts.allow: list of hosts that are allowed to access the system.
#                   See the manual pages hosts_access(5) and hosts_options(5).
#
# Example:         ALL: LOCAL @some_netgroup
#                  ALL: .foobar.edu EXCEPT terminalserver.foobar.edu
#
# If you're going to protect the portmapper use the name "portmap" for the
# daemon name. Remember that you can only use the keyword "ALL" and IP
# addresses (NOT host or domain names) for the portmapper, as well as for
# rpc.mountd (the NFS mount daemon). See portmap(8) and rpc.mountd(8)
# for further information.
#
portmap: 192.168.50.102

# /etc/hosts.deny: list of hosts that are _not_ allowed to access the system.
#                   See the manual pages hosts_access(5) and hosts_options(5).
#
# Example:         ALL: some.host.name, .some.domain
#                  ALL EXCEPT in.fingerd: other.host.name, .other.domain
#
# If you're going to protect the portmapper use the name "portmap" for the
# daemon name. Remember that you can only use the keyword "ALL" and IP
# addresses (NOT host or domain names) for the portmapper, as well as for
# rpc.mountd (the NFS mount daemon). See portmap(8) and rpc.mountd(8)
# for further information.
#
# The PARANOID wildcard matches any host whose name does not match its
# address.

# You may wish to enable this to ensure any programs that don't
# validate looked up hostnames still leave understandable logs. In past
# versions of Debian this has been the default.
# ALL: PARANOID
```

VNC Server 'password' Password

Ho cambiato la password in una più sicura:

```
root@metasploitable:~# vncpasswd
Using password file /root/.vnc/passwd
Password:
Verify:
Would you like to enter a view-only password (y/n)? y
Password:
Verify:
root@metasploitable:~# _
```

Scansione Post-Remediation

ecco come appare la lista delle vulnerabilità critiche dopo aver eseguito l'azione di remediation:

192.168.50.101



Vulnerabilities

Total: 85

SEVERITY	CVSS V3.0	VPR SCORE	PLUGIN	NAME
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CRITICAL	10.0*	5.1	32314	Debian OpenSSH/OpenSSL Package Random Number Generator Weakness
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Risultati Post-Remediation

la riduzione delle vulnerabilità ha ridotto superficie di attacco e migliorato la sicurezza della macchina.
Nella repository è allegata la scansione finale (`Scansione finale.pdf`).

Conclusione

Dopo aver rimediato ad alcune delle vulnerabilità più critiche, bisogna continuare con le altre residue e mantenere costantemente la macchina.

Nel caso di una macchina reale, conviene sempre aggiornarla e fare scansioni periodiche.