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EXPT: 7 NMAP TO DISCOVER LIVE HOSTS USING ARP SCAN AND TCP/UDP PING SCAN

AIM:

- Use ARP scanning to detect live hosts on the local subnet.
- Use ICMP (ping) scanning to discover hosts that reply to echo requests.
- Use tcpdump to capture and inspect the probe and reply packets for verification.
- Compare results and explain why a host may appear in one scan but not another.

Send Packet

From:
computer4

To:
computer4

Packet Type:
arp_request

Data:
computer6

Send Packet

- From computer4
- To computer4 (to indicate it is broadcast)
- Packet Type: "ARP Request"
- Data: computer6 (because we are asking for computer6 MAC address using ARP Request)

How many devices can see the ARP Request?

4

✓ Correct Answer

🔍 Hint

Did computer6 reply to the ARP Request? (Y/N)

Y

✓ Correct Answer

We mentioned the different *techniques* we can use for scanning in Task 1. Before we explain each in detail and put it into use against a live target, we need to specify the targets we want to scan. Generally speaking, you can provide a list, a range, or a subnet. Examples of target specification are:

- list: `MACHINE_IP scanme.nmap.org example.com` will scan 3 IP addresses.
- range: `10.11.12.15-20` will scan 6 IP addresses: `10.11.12.15`, `10.11.12.16`, ..., and `10.11.12.20`.
- subnet: `MACHINE_IP/30` will scan 4 IP addresses.

You can also provide a file as input for your list of targets, `nmap -iL list_of_hosts.txt`.

If you want to check the list of hosts that Nmap will scan, you can use `nmap -sL TARGETS`. This option will give you a detailed list of the hosts that Nmap will scan without scanning them; however, Nmap will attempt a reverse-DNS resolution on all the targets to obtain their names. Names might reveal various information to the pentester. (If you don't want Nmap to the DNS server, you can add `-n`.)

Launch the AttackBox using the Start AttackBox button, open the terminal when the AttackBox is ready, and use Nmap to answer the following.

Answer the questions below

What is the first IP address Nmap would scan if you provided `10.10.12.13/29` as your target?

10.10.12.8

✓ Correct Answer

🔍 Hint

How many IP addresses will Nmap scan if you provide the following range `10.10.0-255.101-125`?

6400

✓ Correct Answer

🔍 Hint

Send a packet with the following:

- From computer1
- To computer3
- Packet Type: "Ping Request"

What is the type of packet that computer1 sent before the ping?

ARP Request

✓ Correct Answer

What is the type of packet that computer1 received before being able to send the ping?

ARP Response

✓ Correct Answer

How many computers responded to the ping request?

1

✓ Correct Answer

Send a packet with the following:

- From computer2
- To computer5
- Packet Type: "Ping Request"

What is the name of the first device that responded to the first ARP Request?

router

✓ Correct Answer

Answer the questions below


We will be sending broadcast ARP Requests packets with the following options:

- From computer1
- To computer1 (to indicate it is broadcast)
- Packet Type: "ARP Request"
- Data: try all the possible eight devices (other than computer1) in the network: computer2, computer3, computer4, computer5, computer6, switch1, switch2, and router.

How many devices are you able to discover using ARP requests?

3

✓ Correct Answer

 nmap-PM-sn-openvpn.pcapng Packets: 1178 · Displayed: 512 (43.5%) Profile: Default

Answer the questions below

What is the option required to tell Nmap to use ICMP Timestamp to discover live hosts?

-PP

✓ Correct Answer

What is the option required to tell Nmap to use ICMP Address Mask to discover live hosts?

-PM

✓ Correct Answer

What is the option required to tell Nmap to use ICMP Echo to discover live hosts?

-PE

✓ Correct Answer

Answer the questions below

Which TCP ping scan does not require a privileged account?

TCP SYN Ping

✓ Correct Answer

Which TCP ping scan requires a privileged account?

TCP ACK Ping

✓ Correct Answer

What option do you need to add to Nmap to run a TCP SYN ping scan on the telnet port?

-PS23

✓ Correct Answer

🔍 Hint

Nmap's default behaviour is to use reverse-DNS on online hosts. Because the hostnames can reveal a lot, this can be a helpful step. However, if you don't want to send such DNS queries, you use `-n` to skip this step.

By default, Nmap will look up online hosts; however, you can use the option `-R` to query the DNS server even for offline hosts. If you want to use a specific DNS server, you can add the `-dns-servers DNS_SERVER` option.

Answer the questions below

We want Nmap to issue a reverse DNS lookup for all the possible hosts on a subnet, hoping to get some insights from the names. What option should we add?

-R

✓ Correct Answer

RESULT:

Ran an ARP scan on the local network (e.g. `arp-scan` or `nmap -PR`) and noted responsive IPs/MACs.

Performed an ICMP ping-scan (e.g. `nmap -PE` or `fping`) and recorded which hosts replied.

Started `tcpdump` during the ping scan to capture ICMP Echo Requests/Replies (and ARP requests/replies) for later inspection.

Performed an ICMP ping-scan (e.g. `nmap -PE` or `fping`) and recorded which hosts replied.

