ARP Cache Poisoning with Scapy

Where are the VMs?

- **They’re on dh2020pc[0-5] under: “/virtual/csc427scapy/”**
- **The VMs are based on Tiny Core Linux, a very strange tiny Linux distro that stores everything in RAM**
- **TinyCore_Preinstalled.7z contains a suspended VMWare image that has Scapy, tcpdump, and Python already installed**
- **Beware: Rebooting this VM will remove all these preinstalled programs!**
- **TinyCore-8.2.1.iso contains the bootable iso, which can be used to create more bare VMs easily**

What are we doing?

- Open the preinstalled TinyCore VM, we will use this for the attacker
- Create a new VM using the TinyCore iso file, this will be the victim
- http://www.secdev.org/projects/scapy/demo.html
- We will be using ARP cache poisoning to route traffic through our attacker

What is ARP?

- **Address resolution protocol**

Hardware Type		Protocol Type
Hardware length	Protocol length	Operation Request 1, Reply 2
Sender hardware address (For example, 6 bytes for Ethernet)		
Sender protocol address (For example, 4 bytes for IP)		
Target hardware address (For example, 6 bytes for Ethernet) (It is not filled in a request)		
Target protocol address (For example, 4 bytes for IP)		

What does it do?

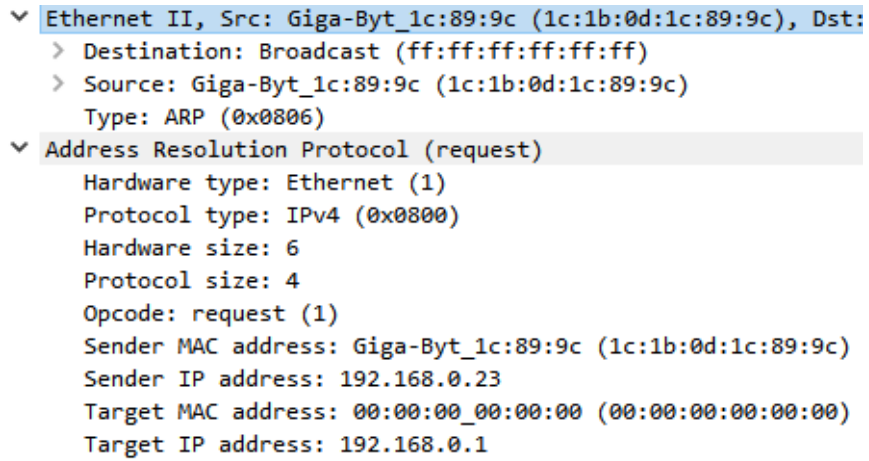
- **ARP Resolves IP addresses to link-layer MAC addresses**
- **Simple protocol, where one node broadcasts, asking what MAC address corresponds to the target IP address**
- **The response is targeted at the sender of the request, and they cache the response**

What is ARP Poisoning?

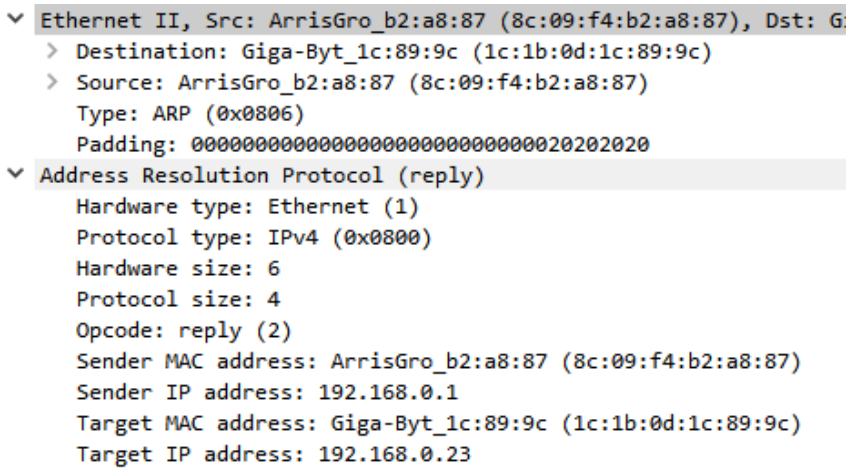
- We can spoof responses, and tell our victim that we own the gateway IP address
- We can tell the gateway that we own the victim IP address
- Then all traffic to and from our victim goes to us
- By “we own”, I mean “our mac address has this IP associated with it”

What does ARP look like?

- **“Who has 192.168.0.1?, tell 192.168.0.23”**



- **“192.168.0.1 is at 8C:09:F4:B2:A8:87”**



What do we do next?

- `poison_target = ARP(op='is-at', psrc=gateway_ip, pdst=target_ip, hwdst=target_mac)`
- `poison_gateway = ARP(op='is-at', psrc=target_ip, pdst=gateway_ip, hwdst=gateway_mac)`
- **Find out how to spoof a response to route traffic through your attacker VM**
- **Spam your two ARP poison packets to the gateway and the victim**

How do I know if it worked?

- **Check the arp table with the arp command**
- **Forward traffic through yourself:**

  # echo 1 > /proc/sys/net/ipv4/ip_forward
- **(Or dont! The VM won’t be able to connect outside the gateway)**
- **Do some cool things with iptables DNAT prerouting filters (I might be able to help)**

What to install?

- Go to apps, cloud, browse
- Search for python.tcz, hit “Go” in the bottom left
- Then install python-pip.tcz
- Then install tcpdump.tcz
- Then open a terminal and type:
- “sudo python -m pip install scapy”