

```

1 #!/usr/bin/env python
2
3 # Suppress warnings about missing IPv6 route and tcpdump bin
4 import logging
5 logging.getLogger("scapy.loading").setLevel(logging.ERROR)
6 logging.getLogger("scapy.runtime").setLevel(logging.ERROR)
7
8 from scapy.all import *
9
10 # TCP flags
11 def decode_tcp_flag(f):
12     if ((f & 0x01) or (f & 0x04) or (f & 0x08) or (f & 0x20) or (f & 0x40) or (f & 0x80)):
13         return 0
14     elif ((f & 0x02) and (f & 0x10)):
15         return 2
16     elif (f & 0x02):
17         return 1
18     else:
19         return 0
20
21 # counter of total packets
22 total_packets = 0
23 total_bytes = 0
24
25 # read input pcap file
26 pcap = rdpcap(sys.argv[1])
27
28 # read sinkholes.txt
29 sinkholes = [line.rstrip('\n') for line in open("sinkholes.txt", "r")]
30
31 # arp table
32 arp_table = {}
33
34 # IIS unicodes
35 iis_unicodes = ['%255c', '%25%35%63', '%252f', '%35c', '%35%63', '%C1%1C', '%C1%9C', '%C0%AF', '%c1%1c', '%c0%af', '%c1%9c', '%c0%af', '%e0%80%af', '%f0%80%80%af', '%f8%80'
36
37 for pkt in pcap:
38
39     if pkt.haslayer(IP):
40         # Q2 Spoofed packets
41         if (not ((pkt[IP].src[0:3] == '10.') or (pkt[IP].dst[0:3] == '10.'))) :
42             print("[Spoofed IP address]: src:" + pkt[IP].src + ", dst:" + pkt[IP].dst)
43
44         # TCP packet
45         if pkt.haslayer(TCP):
46             # Q3 Unauthorized servers
47             tcp_flags = decode_tcp_flag(pkt[TCP].flags)
48             if ( not (pkt[IP].src[0:3] == '10.') and (pkt[IP].dst[0:3] == '10.') and (tcp_flags == 1))):
49                 print ("[Attempted server connection]: rem:" + pkt[IP].src + ", srv:" + pkt[IP].dst + ", port:" + str(pkt[TCP].dport))
50             if ( (pkt[IP].src[0:3] == '10.') and not (pkt[IP].dst[0:3] == '10.') and (tcp_flags == 2)):
51                 print ("[Accepted server connection]: rem:" + pkt[IP].dst + ", srv:" + pkt[IP].src + ", port:" + str(pkt[TCP].sport))
52
53             # Q6 IIS worms
54             #if( (pkt[TCP].dport == 80) and not(tcp_flags == 1)):
55             #    http_host = pkt[HTTPRequest].Host
56             #    for iis_unicode in iis_unicodes:
57             #        print ("[Unicode IIS exploit]: src:" + pkt[IP].src + ", dst:" + pkt[IP].dst)
58
59         # UDP packet
60         if pkt.haslayer(UDP):
61             # Q4 Sinkholes
62             if pkt.haslayer(DNSRR):
63                 if ((pkt[DNSRR].type == 1) and (pkt[DNSRR].rdata in sinkholes) ):
64                     print ("[Sinkhole lookup]: src:" + pkt[IP].dst + ", host:" + pkt[DNSRR].rrname[:-1] + ", ip:" + pkt[DNSRR].rdata)
65             # Q7 NTP
66             if ((pkt[UDP].dport == 123) and pkt.haslayer(Raw) and (ord(pkt[Raw].load[3]) == 42) ):
67                 print ("[NTP DDoS]: vic:" + pkt[IP].src + ", srv:" + pkt[IP].dst)
68
69         if pkt.haslayer(ARP):
70             # Q5 ARP
71             if (pkt[ARP].op == 2):
72                 psrc = pkt[ARP].psrc
73                 hwsrc = pkt[ARP].hwsrc
74                 if arp_table.has_key(psrc):
75                     if not (arp_table[psrc] == hwsrc) :
76                         print ("[Potential ARP spoofing]: ip:" + psrc + ", old:" + arp_table[psrc].upper() + ", new:" + hwsrc.upper())
77                 arp_table[psrc] = hwsrc
78
79
80
81 for p, (sec, usec, wirelen) in RawPcapReader(sys.argv[1]):
82     # Q1 Anomaly detection
83     total_packets += 1
84     total_bytes += wirelen
85 print("Analyzed " + str(total_packets) + " packets, size " + str(total_bytes))

```