Global Information Assurance Certification Paper

Intrusion Detection In-Depth

GCIA Practical Assignment for

SANS Parliament Square, London

June 20 – 23, 2001

Version 2.9

Philipp STADLER

Title: bypassing masquerading firewalls

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Assignment 1 – Network Detects

1. Trojan port scan

data:

```
2001-03-18-20:41:30  tcp  152.30.98.87:3908   ->   130.216.8.24:27374 S
2001-03-18-20:41:30  tcp  152.30.98.87:3909   ->   130.216.8.24:12345 S
2001-03-18-20:41:30  tcp  152.30 .98.87:3910  ->   130.216.8.24:139   S
2001-03-18-20:56:14  tcp  152.30.98.87:4560   ->   130.216.72.231:27374 S
2001-03-18-20:56:14  tcp  152.30.98.87:4561   ->   130.216.72.231:12345 S
2001-03-18-20:56:14  tcp  152.30.98.87:4562   ->   130.216.72.231:139   S
2001-03-18-21:57:40  tcp  152.30.98.87:4864   ->   130.216.108.39:27374 S
2001-03-18-21:57:40  tcp  152.30.98.87:4874   ->   130.216.108.39:12345 S
2001-03-18-21:57:40  tcp  152.30.98.87:4878   ->   130.216.108.39:139   S
2001-03-18-23:16:54  tcp  152.30.98.87:4911   -> 130.216.207.219:27374 S
```

1.1 Source of trace

GIAC: http://www.sans.org/y2k/031901.htm

1.2 Detect was generated by

Probably this output is generated by the portscan module of the SNORT Intrusion Detection System. (referenced to the SANS course book 3.3/3.4).

1.3 Probability the source address was spoofed

In this case the purpose of this network scan in to gather information about the destination systems (if the spec ified ports 139, 12345 and 27374 are listening). The sender of these packets is waiting for the response and so the source address is probably not spoofed. The only possibility that this address is spoofed is the „Kevin Mitnick" – way. (Spoof the source ad dress of a silent Windows host)

1.4 Description of attack

The source is searching for some Trojan horses or file shares on the victim systems. Because of the time gaps between the scans the attacker will likely scan the whole 130.216.x.x class B network. Also the increasing source ports (and the gaps between the scans) point to a whole class B scan.

The domain name of the source 152.30.98.87 is: rn098087.wcu.edu

The WHOIS query for the source domain name results:
Registrant: Western Carolina University (WCU-DOM)
        B-10 Forsyth Bldg.
        Cullowhee, NC 28723
        US

Domain Name: WCU.EDU

Administrative Contact, Technical Contact, Billing Contact:
        Swartzentruber, Scott (SS30838) scotts@WCU.EDU
        Western Carolina University / Computer Center
        Forsyth Bldg, Room B -10
        Cullowhee, NC 28723
        828.227.7282 (FAX) 828.227.7700

Record last updated on 07 -Aug-2000.
Record created on 26 -Jan-1990.
Database last updated on 4 -Sep-2001 22:17:00 EDT.

Domain servers in listed order:
        COWEE.WCU.EDU 152.30.2.120
        NS.GA.UNC.EDU 152.4.20.3
        NCNOC.NCREN.NET 192.101.21.1

1.5 Attack mechanism

This is a network scan to three different ports. The source address is from the IP address space of
Western Carolina University.
There are two Trojan horses related to the first port (27374), the most popular one is the
SubSeven Trojan, the other one is BadBlood. The second port (12345) is related to NetBus and
some more Trojans. The third port (139) is known as the „NETBIOS session service", this port is
used on Windows Systems for file sharing.
The attacker tried to begin the three -way handshake to the shown ports to search at the victims, if
one of these Trojan horses is installed.

The NetBus Trojan is similar to the Back Orifice, this tool is promoted as a remote
administration tool. You can fully control the remote host by this tool. The SubSe ven is also a
„remote administration tool", it can do everything that NetBus can do. (citation of reference 1)
This includes:
        File controls
        Upload / Download
        Move, Copy, Rename, Delete
        Erase hard drives and other disks
        Execute programs
        Monitoring
        Can see your screen as you see it
        Log any/all keypresses (even hidden passwords)
        Open/close/move windows
        Move mouse
        Network control
        Can see all open connections to and from your computer
        Can close connections
        Can 'bounce' or relay from their system to   yours, so wherever they connect, it seems as if
        you are doing it. This is how they prevent getting caught breaking into other computer
        systems and you can get in trouble!

1.6 Correlations

This particular scan was detected by . This pattern has never been seen before in a scan, but the SYN -Scan used for this attack is a common way to look for listening ports. A known tool for this scan is NMAP. If the attacker used NMAP he wrote a command like this:
nmap –sS –p 27374,12345,139 < -P0>
The „–P0" option is for suppressing the ping before scanning. The port scan is only a part of a whole scan process and so it's possible that the ping packets are not seen in the IDS.

1.7 Evidence of active targeting

We don't know the whole attack because only a part of it is shown in the IDS logs. If the shown IDS log would include all traces of this attack, a direct attack to a limited number of target systems could be assumed. But the publisher of the IDS log posted onl y a part of the data, so this scan is probably a general scan and not targeted to particular hosts. This is most likely not an active targeting attack.

1.8 Severity

GIAC's approach to determining severity is to apply the following formula:
(Criticality + Lethality) – (System + Net Countermeasures) = Severity
Each metric is assigned on a five -point scale (1 as the lowest and 5 as the highest).

Criticality -We don't know the real criticality of the systems and so I will set it to 3.
Lethality – This are Tr ojan horses with remote administration features, so if this Trojan is installed on the victim the attacker can do „everything", therefore the Lethality is 5.
System Countermeasure - The system countermeasure is 5, because none of the systems are infected to this Trojans (or won't answer to the scanned ports). The problem of this attack is the unknown network infrastructure and we don't know if the attack is blocked by a firewall or the ports are closed.
Network Countermeasure -..will be 4 because none of the attacks are successful (we don't know if this packets are blocked by firewall or the system isn't infected)

(Criticality + Lethality) – (System Countermeasure + Network Countermeasure) = **Severity**
(3 + 5) – (5 + 4) = **-1**

1.9 Defence recommendation

One possibility is to create input filters on a firewall or a packet filtering device to block all known Trojan ports. The much better possibility is surely to block all incoming traffic except the used and needed ports and also the established connections.
Another way to defend against such problems is to do regular scanning of the own network for the Trojan ports. Also integrity checkers should be installed on the systems to recognize chances in the systems.
An IDS or a logging facility is already installed because without this we wouldn't get the detect.

1.10 Multiple choice test question

Which are the interesting values in the following packets?

```
2001-03-18-20:41:30  tcp  152.30.98.87:3908   ->   130.216.8.24:27374    S
2001-03-18-20:41:30  tcp  152.30.98.87:3909   ->   130.216.8.24:12345    S
2001-03-18-20:41:30  tcp  152.30.98.87:3910   ->   130.216.8.24:139      S
2001-03-18-20:56:14  tcp  152.30.98.87:4560   ->   130.216.72.231:27374  S
2001-03-18-20:56:14  tcp  152.30.98.87:4561   ->   130.216.72.231:12345  S
2001-03-18-20:56:14  tcp  152.30.98.87:4562   ->   130.216.72.231:139    S
2001-03-18-21:57:40  tcp  152.30.98.87:4864   ->   130.216.108.39:27374  S
2001-03-18-21:57:40  tcp  152.30.98.87:4874   ->   130.216.108.39:12345  S
2001-03-18-21:57:40  tcp  152.30.98.87:4878   ->   130.216.108.39:139    S
```

a. same source IP address in all packets
b. the source ports
c. the destination ports
d. the timestamps

Answer: c. the destination port – because there are some Trojans associated to this ports.

2. telnet probe

data:
```
Feb  6 03:12:28 takahe snort[58999]: IDS127  - TELNET -
 Login Incorrect: 130.216.3.40:23   -> 210.55.97.124:4210
Feb  6 03:16:54 takahe snort[58999]: IDS376  - FINGER-root:
 210.55.97.124:4618 -> 130.216.7.15:79
Feb  6 03:17:30 takahe snort[58999]: IDS127  - TELNET -
 Login Incorrect: 130.216.7.15:23  -> 210.55.97.124:1503
Feb  6 03:18:31 takahe snort[58999]: IDS127  - TELNET -
 Login Incorrect: 130.216.7.15:23  -> 210.55.97.124:27 54
Feb  6 03:19:41 takahe snort[58999]: IDS378  - FINGER-Probe0:
 210.55.97.124:1287 -> 130.216.7.15:79
Feb  6 03:19:58 takahe snort[58999]: IDS378  - FINGER-Probe0:
 210.55.97.124:1447 -> 130.216.7.15:79
Feb  6 03:21:08 takahe snort[58999]: IDS127  - TELNET -
 Login Incorrect: 130.216.7.15:23  -> 210.55.97.124:3299
Feb  6 03:26:30 takahe snort[58999]: IDS304  - TELNET -
```

SGI telnetd format bug: 210.55.97.124:2407 -> 130.216.21.44:23
Feb 6 03:26:32 takahe snort[58999]: IDS304 - TELNET -
  SGI telnetd format bug: 210.55.97.124:2453 -> 130.216.21.44:23
Feb 6 03:26:40 takahe snort[58999]: IDS304 - TELNET -
  SGI telnetd format bug: 210.55.97.124:2674 -> 130.216.21.44:23
Feb 6 03:26:42 takahe snort[58999]: IDS304 - TELNET -
  SGI telnetd format bug: 210.55.97. 124:2684 -> 130.216.21.44:23
Feb 6 03:26:44 takahe snort[58999]: IDS304 - TELNET -
  SGI telnetd format bug: 210.55.97.124:2706 -> 130.216.21.44:23

2.1 Source of Trace

GIAC: http://www.sans.org/y2k/020701.htm

2.2 Detect was generated by

The detect was generated by various of SNORT Intrusion Detection systems with the rules
turned on for finger probes and denied telnet login attempts. A lot of data is missing because the
IDS don't sniff all systems, but the one, who detect this scan, wrote that he saw a lot of telnet
and finger attempts from this address to his network in the network traffic logs.

The following SNORT rules are written for Snort 1.8 and because of not knowing the exact
version which are u sed by the detect it's possible that the rules can differ in some options.

The **finger-probe** alerts are triggered by:
  alert tcp $EXTERNAL any -> $INTERNAL 79 (msg:" IDS378 - FINGER-Probe0";flags: A+;
  content:"0";reference:arachnids,378; classtype:attempted -recon; sid:325; rev:1;)
  alert tcp $EXTERNAL any -> $INTERNAL 79 (msg:" IDS376 - FINGER-root";flags: A+;
  content:"root";reference:arachnids,376; classtype:attempted -recon; sid:323; rev:1;)
The **telnet login attempts** are triggered by this rule:
  alert tcp $INTERNAL 23 -> $EXTERNAL any (msg:"IDS127 - TELNET login incorrect";
  content:"Login incorrect"; flags: A+; reference:arachnids,127; classtype:bad -unknown; sid:718;
  rev:1;)
The last five log entries (**telnet format bug**) are generated by the following SNORT rul e:
  alert TCP $EXTERNAL any -> $INTERNAL 23 (msg: "IDS304 - telnet_SGI telnetd format
  bug"; flags: A+; content: "_RLD"; classtype: system -attempt; reference: arachnids,304;)

2.3 Probability the source address was spoofed

It isn't probable that the source address is spoofed because the attacker wanted to get additional
information from the scanned systems. If a stateful inspection firewall is used and the target
systems are not vulnerable to sequence number prediction attacks I'm pretty certain that the
source address of this attack isn't spoofed. (normally telnet service isn't running on windows
systems, and those are the only known ones today which are vulnerable to sequence number
prediction attacks)

2.4 Description of attack

The telnet log entries on th e IDS are certainly responses to incorrect telnet access attempts, the finger log entries are stimulus to get finger information from the scanned systems. In this summary of data (merging different IDS log files and different alert types) it is very easy t o find the stimuli and the responses.

The attacker scanned the network and probably tried default logins on the telnet server, he also tried to get additional information with using the finger service. On the last section of the scan we can see that he als o attempted to exploit the telnet service with a format bug. (reference 4) This is a bug where unexpected characters can cause unwanted (unwanted by the administrators) errors like crashing the system.

The scan took about three hours (as the publisher wrot e).

2.5 Attack mechanism

The attacker completed the three -way handshake to a lot of destination addresses to port 23 (telnet) and port 79 (finger). On both connections he tried to get information or access to the system. With the SGI format bug weakness h e attempted to break in the system, this bug only can exploit IRIX systems. (reference 4)

Attackers Address: 210.55.97.124
Domain Name: ip124 -97.quik.co.nz

A WHOIS search for the source address reveals the following result:

```
inetnum              210.55.96.0  - 210.55.99.255
netname              QUIKINT-NZ
descr                Quik Internet (NZ) Ltd
descr                PO Box 7515
descr                Auckland
country              NZ
admin-c              BJ10-AP, inverse
tech-c               WEB193-ORG, inverse
rev-srv              ns.quik.co.nz
rev-srv              ns.quik.com
notify               nic@netgate.net.nz , inverse
changed              don@nertgate.net.nz 19991217
source               APNIC
```

2.6 Correlations

This particular scan was detected by Security@auckland . This attack pattern has never been seen before in this manner, but all parts of it are known and this scan is only a sum of three different recognitions. The telnet login attempts can be tested manually by starting a telnet client to all servers, this can also be easily auto mated.

2.7 Evidence of active targeting

There is no evidence of active targeting because this is a global network scan (the publisher wrote that there are a lot of such attempts in his network trace log) and no single host is specified.

2.8 Severity

GIAC's approach to determining severity is to apply the following formula:
(Criticality + Lethality) – (System + Net Countermeasures) = Severity
Each metric is assigned on a five -point scale (1 as the lowest and 5 as the highest).

Criticality –because of checking a lot of system also very critical systems can be scanned. (=4)
Lethality – If the systems are secured with a good passwords and if no IRIX system is in the
scanned address space the Lethality of this attack will be 2.
System Countermeasure - The system countermeasure will be 4 because the login attempts failed
but we don't know if one of the systems return finger information back to
the attacker.
Network Countermeasure -..will be 1 because none of the telnet packets are blocked and we don't
know how the finger packets will be handled by the firewall (if there is
one)

(Criticality + Lethality) – (System Countermeasure + Network Countermeasure) = **Severity**
(　　4　　+　　2　　) – (　　　　4　　　　　+　　　　1　　　　　) = **1**

2.9 Defensive recommendation

Because telnet is an unencrypted remote administration tool (username and password are
transmitted in cleartext) I strongly recommend that telnet shouldn't be used any more. The better
way to get a remote shell is SSH (secure shell) because you get an encrypted channel to the
server and it's much harder to get the username and password combination by sniffing the SSH
packets. Also the finger service should be turned off on all systems. If all this is done, the
security of the system s increases by a high amount.

2.10 Multiple choice test question

What type of attack are normally associated with finger and telnet service?
   a. buffer overflows
   b. Denial of Service attacks
   c. Backdoor attacks
   d. Additional reconnaissance

Answer: d. Additional reco nnaissance – because with both finger and telnet you get information
about the victim

3. DNS scan

data:

Jan 14 18:52:53 [firewall.ip.address] %PIX -6-106015: Deny TCP (no connection)
  from 12.3.146.212/53 to dmz.ip.addr.2/53 flags FIN SYN on interface   outside
Jan 14 18:52:53 [firewall.ip.address] %PIX -7-106011: Deny inbound (No xlate)
  tcp src outside:12.3.146.212/53 dst outside:cidr.net.addr.101/53
Jan 14 18:52:53 [firewall.ip.address] %PIX -7-106011: Deny inbound (No xlate)
  tcp src outside:12.3.14 6.212/53 dst outside:cidr.net.addr.102/53
Jan 14 18:52:53 [firewall.ip.address] %PIX -7-106011: Deny inbound (No xlate)
  tcp src outside:12.3.146.212/53 dst outside:cidr.net.addr.104/53
Jan 14 18:52:53 [firewall.ip.address] %PIX -7-106011: Deny inbound (N o xlate)
  tcp src outside:12.3.146.212/53 dst outside:cidr.net.addr.105/53
Jan 14 18:52:53 [firewall.ip.address] %PIX -6-106015: Deny TCP (no connection)
  from 12.3.146.212/53 to 192.149.115.2/53 flags FIN SYN on interface outside

3.1 Source of Trace

GIAC: http://www.sans.org/y2k/011901.htm

3.2 Detect was generated by

This detect was generated by the logging system of a Cisco PIX firewall. The log format is self
explaining. The lines with „%PIX -6-106015" are connection attempts from the outside to a
demilitarised zone, the „%PIX -7-106011" lines are probes from outside to the inside network.

3.3 Probability the source address was spoofed

It's improbable that the source address is spoofed because the at tacker is waiting for a reply.
Without getting the reply he wouldn't get the information about a listening port and a poorly
maintained firewall, and this is most likely what he want to know. (Excluding the rare case
where an attacker is located between th e spoofed Source and the victim host – there it is possible
to obtain the response by sniffing the passing answer packets)

3.4 Description of attack

It's not likely that the detected packets are responses, because it's not probable that 6 systems
attempt to connect to the same DNS server and get the reply in the same second, so these are
almost certain stimulus packets.

This attack is a scan for an open TCP -port 53 which is associated with the domain name service.
A lot of know bugs are possible to this port (mostly buffer overflows). The attacker used port 53
as the source port, because at poorly maintained firewalls there are inbound connections allowed
if the source port is 53. This is normally used for the reply packets of outbound TCP -connections
from a domain name server. (also possible from clients, which expect a big DNS reply). So if all
packets are permitted from source port 53 at the firewall, this could make this attack possible.
The attacker set the SYN and the FIN bit, and so you can be sure   that this is a crafted packet.

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One time again the attacker hoped that he scanned through a poorly maintained firewall. Because some poor firewalls (or old ones) only block inbound connections with only the SYN bit set, and if other bits are set, the packet will be passed. The problem is that normal systems will reply to a SYN/FIN packet with a SYN/ACK packet. And so it is possible that a connection can be established from outside without permission.

One problem of BIND is, that with the change from version 4 to 8, the code has undergone a major redesign. This also introduces the possibility for new unknown bugs. With version 9 we can hope dough that the code stabilizes again. Version 4 should under no circumstances be used since it contains known vulnerabil ities and is no longer maintained.

3.5 Attack mechanism

The attacker (source address: 12.3.146.212) tried to connect to different official NAT addresses of the PIX firewall to the port 53 (well -known port for the domain name service). The attacker used the source port 53 for this scan. Also some connection attempts to the demilitarised zone were detected from the same attacker and ports. All attempts were in the same second. The PIX firewall blocked the inbound connections (outside -> inside) because of h aving no translation entry for this address. The connections to the DMZ were blocked because of the access-list, which deny these packets. The packets to the DMZ had the SYN and the FIN bit set and because of that I expect that also the packets to the NAT address space are packets with SYN and FIN bit set.

A „WHOIS" at ARIN (American Registry for Internet Numbers) at the source address results the following:

Syracuse Supply (NETBLK-SYRACUSES-146-208)
  294 Ainsley Dr
  Syracuse,, NY 13205
  US
  Netname: SYRACUSES -146-208
  Netblock: 12.3.146.208 - 12.3.146.223
  Coordinator:
    Franz, Pat (PF21-ARIN) [No mailbox]
    315-476-9981
  Record last updated on 28 -Apr-1998.
  Database last updated on 5 -Sep-2001 23:16:33 EDT.

3.6 Correlations

The attack was detecte d by Curt Wilson. This is a known SYN/FIN scan to the domain name service. There are a lot of tools which can generate this pattern (SYN/FIN flag set, source port 53). One of the tools are hping and you can generate the scan with hping (version 2) for exam ple by: hping2 –s 53 –p 53 –S –F target.host

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3.7 Evidence of active targeting

My opinion of this scan is that there is no evidence of active targeting in this network scan, because the attacker scanned a lot of (or all) addresses of the victim location. Also the attacker doesn't know that there is no running domain name system on port 53 at this address space.

3.8 Severity

GIAC's approach to determining severity is to apply the following formula:
(Criticality + Lethality) – (System + Net Countermeasures) = Severity
Each metric is assigned on a five -point scale (1 as the lowest and 5 as the highest).

Criticality –DNS is a critical (in this case internal) service, without DNS normally most of the services can't be used, but it's not a core service like DH CP/BOOTP, therefore it will be 4.
Lethality – There are some DNS vulnerability known, but if a DNS server is well maintained most of the vulnerabilities will be fixed. Because of the frequency of published exploits the lethality will be 3.
System Countermeasure- The system countermeasure cannot be valued because we don't know if the system have installed services on port 53 because the firewall blocked the packets. So the system countermeasure is 3.
Network Countermeasure -..will be 5 because none of the scan packets will pass the firewall.

(Criticality + Lethality) – (System Countermeasure + Network Countermeasure) = **Severity**
(4   +   3   ) – (3   +   5   ) = **-1**

3.9 Defensive recommendation

No system can be reached from the outside to the port 53 of the addresses because they are blocked by the PIX firewall. This is a very good defence method for this scan. The only recommendation is, that if one of these systems is a DNS server, it should be well mai ntained. Otherwise a firewall that forwards packets with source port 53 ("pretending to be from a DNS server") opens the possibility to gain access to the system.

3.10 Multiple choice test question

Why does the attacker of this packet use source port 53 ?
Jan 14 18:52:53 [firewall.ip.address] %PIX -6-106015: Deny TCP (no connection)
 from 12.3.146.212/53 to dmz.ip.addr.2/53 flags FIN SYN on interface outside

a. to crash the destination host
b. to bypass the firewall
c. to hide the scan (stealth scan)
d. makes no sense for this scan

Answer: b. to bypass the firewall

4. Phorum attack

data:
a. SNORT alerts

[2001-07-28 14:24:38] 195.3.96.70:22215 -> target.host:80 [arachNIDS/205] WEB -MISC
Phorum admin access
[2001-07-28 14:24:38] 195.3.96.70:22215 -> target.host:8 0 [arachNIDS/205] WEB -MISC
Phorum admin access
[2001-07-28 14:24:38] 195.3.96.70:4524 -> target.host:80 [arachNIDS/205] WEB -MISC
Phorum admin access
[2001-07-28 14:24:38] 195.3.96.70:4524 -> target.host:80 [arachNIDS/205] WEB -MISC
Phorum admin acces s
[2001-07-28 14:24:30] 195.3.96.70:13483 -> target.host:80 [arachNIDS/205] WEB -MISC
Phorum admin access
[2001-07-28 14:24:30] 195.3.96.70:13483 -> target.host:80 [arachNIDS/205] WEB -MISC
Phorum admin access

b. packet #1

Generated by ACID v0.9.6b12 on Sat September 08, 2001 12:39:24

#(2 - 39651) [2001-07-28 14:24:38] [arachNIDS/205] WEB -MISC Phorum admin access
IPv4: 195.3.96.70 -> target.host
   hlen=5 TOS=16 dlen=621 I D=0 flags=0 offset=0 TTL=255 chksum=2806
TCP: port=22215 -> dport: 80 flags=***AP*** seq=3372272455
   ack=3372272455 off=5 res=0 win=32120 urp=0 chksum=18306
Payload: length = 581

```
000 : 47 45 54 20 2F 61 64 6D 69 6E 2E 70 68 70 33 3F    GET /admin.php3?
010 : 6F 70 3D 61 64 6D 69 6E 4D 61 69 6E 20 48 54 54    op=adminMain HTT
020 : 50 2F 31 2E 30 0D 0A 41 63 63 65 70 74 3A 20 69    P/1.0..Accept: i
030 : 6D 61 67 65 2F 67 69 66 2C 20 69 6D 61 67 65 2F    mage/gif, image/
040 : 78 2D 78 62 69 74 6D 61 70 2C 20 69 6D 61 67 65    x -xbitmap, image
050 : 2F 6A 70 65 67 2C 20 69 6D 61 67 65 2F 70 6A 70    /jpeg, image/pjp
060 : 65 67 2C 20 61 70 70 6C 69 63 61 74 69 6F 6E 2F    eg, application/
070 : 76 6E 64 2E 6D 73 2D 65 78 63 65 6C 2C 20 61 70    vnd.ms -excel, ap
080 : 70 6C 69 63 61 74 69 6F 6E 2F 6D 73 77 6F 72 64    plication/msword
090 : 2C 20 61 70 70 6C 69 63 61 74 69 6F 6E 2F 76 6E    , application/vn
0a0 : 64 2E 6D 73 2D 70 6F 77 65 72 70 6F 69 6E 74 2C    d.ms-powerpoint,
0b0 : 20 2A 2F 2A 0D 0A 52 65 66 65 72 65 72 3A 20 68    */*..Referer: h
0c0 : 74 74 70 3A 2F 2F 6F 72 67 61 67 75 69 64 65 2E    ttp://orgaguide.
0d0 : 6C 61 6E 70 61 72 74 79 2E 61 74 2F 61 64 6D 69    lanparty.at/admi
0e0 : 6E 2E 70 68 70 33 0D 0A 41 63 63 65 70 74 2D 4C    n.php3..Acc ept-L
0f0 : 61 6E 67 75 61 67 65 3A 20 64 65 2D 61 74 0D 0A    anguage: de -at..
100 : 41 63 63 65 70 74 2D 45 6E 63 6F 64 69 6E 67 3A    Accept -Encoding:
110 : 20 67 7A 69 70 2C 20 64 65 66 6C 61 74 65 0D 0A    gzip, deflate..
120 : 55 73 65 72 2D 41 67 65 6E 74 3A 20 4D 6F 7A 69    User -Agent: Mozi
130 : 6C 6C 61 2F 34 2E 30 20 28 63 6F 6D 70 61 74 69    lla/4.0 (compati
140 : 62 6C 65 3B 20 4D 53 49 45 20 35 2E 30 3B 20 57    ble; MSIE 5.0; W
```

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```
150 : 69 6E 64 6F 77 73 20 39 38 3B 20 44 69 67 45 78       indows 98; DigEx
160 : 74 29 0D 0A 48 6F 73 74 3A 20 6F 72 67 61 67 75    t)..Host: orgagu
170 : 69  64 65 2E 6C 61 6E 70 61 72 74 79 2E 61 74 0D    ide.lanparty.at.
180 : 0A 43 6F 6F 6B 69 65 3A 20 61 64 6D 69 6E 3D 5A    .Cookie: admin=Z
190 : 6D 56 77 63 44 70 6B 64 57 31 74 65 51 25 33 44    mVwcDpkdW1teQ%3D
1a0 : 25 33 44 3B 20 75 73 65 72 3D 4D 6A 70 6D 5A 58    %3D; user=MjpmZX
1b0 : 42 77 4F 6E 70 71 56 45 78 4A 4E 46 4E 55 64 30    BwOnpqVExJNFNUd0
1c0 : 64 69 4D 47 38 36 4E 54 70 6D 62 47 46 30 4F 6A    diMG86NTpmbGF0Oj
1d0 : 45 36 4D 44 6F 77 4F 6A 45 36 52 47 56 6D 59 58    E6MDowOjE6RGVmYX
1e0 : 56 73 64 44 6F 30 4D 44 6B 32 0D 0A 43 61 63 68    VsdDo0MDk2..Cach
1f0 : 65 2D 43 6F 6E 74 72 6F 6C 3A 20 6D 61 78 2D 73    e-Control: max -s
200 : 74 61 6C 65 3D 30 0D 0A 58 2D 46 6 F 72 77 61 72    tale=0..X-Forwar
210 : 64 65 64 2D 46 6F 72 3A 20 36 32 2E 34 36 2E 34    ded-For: 62.46.4
220 : 30 2E 38 32 0D 0A 56 69 61 3A 20 31 2E 30 20 77    0.82..Via: 1.0 w
230 : 69 65 6E 31 70 72 6F 78 79 2E 61 6F 6E 2E 61 74    ien1proxy.aon.at
240 : 20 0D 0A 0D 0A                                      ....
```

4.1 Source of Trace

This scan was detected at our external IDS in our company.

4.2 Detect was generated by

The detect was generated by the intrusion detection system SNORT and the following rule triggered the log entries:

alert tcp $EXTERNAL_NET any -> $HTTP_SERVERS 80 (msg:"WEB -MISC Phorum admin access"; flags: A+; uricontent:"/admin.php3"; nocase; reference:arachnids,205; classtype:attempted -recon; sid:1134; rev:1;)

explanation:
      This is a default SNORT rule, only the IP addresses were changed.

$EXTERNAL_NET	any, except our internal networks
$HTTP_SERVERS	external Web-Servers (accessible from the Internet)
flags: A+	match ACK-flag
uricontent:"/admin.php3"	match if the „/admin.php3" pattern is in the URI content
nocase	pattern matching is case insensitive
reference:arachnids,205	there is a reference for this vulnerability (http://www.whitehats.com/info/ids205)
classtype: attempte d-recon	type of packet is an additional reconnaissance
sid: 1134	SNORT rule ID is 1134
rev:1	rule revision is 1

4.3 Probability the source address was spoofed

It's not probable that the source IP is spoofed because the three -way handshake was succ essfully done (packets with ACK/PUSH flag set).Next the attacker wanted to get additional information whether the admin.php3 script exists, so he needed the reply from the server to get this information.

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4.4 Description of attack

This attack is a known attack against a Web-Server with the Phorum tool installed. This exploit is reported on arachNIDS (reference 5). Phorum is a web based discussion software. The attacker tried to find the admin.php3 script that is used for administrative tasks of the Phorum tool. Though a vulnerability in version 3.0.7 and early (www.whitehats.com) exists, that the attacker can change the administrative password without any rights on the system. After this he can read all files on the system that the user running the http server has access to. With the ".." parent directory trick it's also possible that the intruder can read for example the /etc/passwd file. This tool only works on UNIX systems with the Phorum tool installed.

To exploit the server it must be a UNIX Web-Server (i.e. apache) with PHP3-support and the tool Phorum installed. The attacker must establish a connection to the server, after that he can request the URL:
http://target.host/admin.php3?step=4&option=pass&confirm=testpwd&newPassword=testpwd

Target.host	the attacked system
Admin.php3	script for administrative tasks
?	separator of file and options
&	separator of different options
option=pass	to set password
newPassword=testpwd	set new admin password to "testpwd"
confirm=testpwd	confirm setting of password "testpwd"

After setting the password to his favourite password he can change a lot of administrative settings. (i.e. shutdown the Phorum tool, set a redirect URL, …)
One interesting part of the scan is the jumping source port because normally the source port increases by one for each new connection. There are two possibilities how this could be evoked. One possibility is that the attacker's system has a bad and non-standard TCP/IP stack implementation, which chooses the source ports randomly. The other and more plausible possibility is that the attacker's scanning tool used random source ports for the attempts.

4.5 Attack mechanism

The attacker (195.3.96.70) attempts to start the admin.php3 script at port 80 of the server (associated to the web service). Admin.php3 is a script for administrative tasks for the Phorum tool. He tried to connect 6 times and the source port is, instead of increasing as usual by one, jumping from 22215 to 4524 to 13483. Every source port is used for two connection attempts.

A WHOIS search in the RIPE database for the attackers IP results following:
inetnum: 195.3.86.72 - 195.3.97.255
netname: TA-HIGHWAY
descr: Telekom Austria Aktiengesellschaft
country: AT
admin-c: HMH25-RIPE
tech-c: AAH12-RIPE
tech-c: DAH12-RIPE
tech-c: HMH25-RIPE
status: ASSIGNED PA
mnt-by: AS8447-MNT

mnt-lower: <u>AS8447-MNT</u>
changed: hostmaster@aon.at 20000310
changed: hostmaster@aon.at 20010129
source: RIPE

This are a pool for Dial -In Users at the ISP Telekom Austria.

4.6 Correlations

The attack was detected by me on our external IDS. It was triggered by a SNORT rule explained above. This was a known exploit and was published by arachNIDS (reference 5)

4.7 Evidence of active targeting

Indeed we have evidence of active targeting, because this is not a scan for this vulnerability but an exact and single attempt to this server, which is a UNIX server running apache with php3 - support. The three-way handshake is completed, too. But th e tool Phorum isn't installed on this system, so the exploit wasn't successful.

4.8 Severity

GIAC's approach to determining severity is to apply the following formula:
(Criticality + Lethality) – (System + Net Countermeasures) = Severity
Each metric is a ssigned on a five-point scale (1 as the lowest and 5 as the highest).

Criticality –This is a stand-alone web-server only for one customer and so if this system crashed or is hacked only the web appearance of one customer is disturbed, so the criticality of this system is 2. (I would set the criticality to 1 only for test systems)

Lethality – If this exploit is successfully done, the attacker can shut down the Phorum service and after reading and cracking the /etc/passwd he have accounts of this machine. And so everything even a Denial of Service attack can be started, so the lethality will be 5.

System Countermeasure - The system countermeasure is 4 because this is a good maintained web server without running the Phorum tool (which is a prerequisite).

Network Countermeasure -..will be 3 because this attack can't be filtered on the packet filters in front of this network. But the attacker can only access the web -port (80/tcp) and can't access to a virtual terminal after cracking the passwd - file because the pac ket filter block all other connections but to port 80 and 443 (SHTTP).

(Criticality + Lethality) – (System Countermeasure + Network Countermeasure) = **Severity**
(2   +   5   ) – (4   +   3   ) =   **0**

4.9 Defense recommendation

First a possibility is that we install a content filtering device on the firewall to secure the network and increase the network countermeasure by 1 or 2 points. Also I recommended that if the Phorum tool will be installed, the newe st version (which fix this exploit) should be used.

4.10 Multiple choice test question

How can you stop a PHP3 script attack against a web server?

   a. With a packet filtering device
   b. With a content filtering device
   c. With a stateful inspection device
   d. With a NAT firewall

Answer: b. With a content filtering device – only a content filter can block this attack.

5. whisker attack

data:
a. SNORT alerts

[2001-08-07 15:23:26] 192.109.27.168:3131 -> target.host:80 [arachNIDS/296] WEB -MISC whisker splice attack
[2001-08-07 15:23:27] 192.109.27.168:3130 -> target.host:80 [arachNIDS/296] WEB -MISC whisker splice attack
[2001-08-07 15:25:02] 192.109.27.168:3139 -> target.host:80 [arachNIDS/296] WEB -MISC whisker splice attack
[2001-08-07 15:25:02] 192.109.27.168:3140 -> target.host:80 [arachNIDS/296] WEB -MISC whisker splice attack
[2001-08-07 15:25:44] 192.109.27.168:3138 -> target.host:80 [arachNIDS/296] WEB -MISC whisker splice attack
[2001-08-07 15:28:22] 192.109.27.168:3138 -> target.host:80 [arachNIDS/296] WE B-MISC whisker splice attack
[2001-08-07 15:31:00] 192.109.27.168:3138 -> target.host:80 [arachNIDS/296] WEB -MISC whisker splice attack

b. packet #1
Generated by ACID v0.9.6b12 on Sat September 08, 2001 12:33:35
-------------------------------------- --------------------------------------
#(3 - 237801) [2001-08-07 15:23:26] [arachNIDS/296] WEB -MISC whisker splice attack
IPv4: 192.109.27.168 -> target.host
    hlen=5 TOS=0 dlen=41 ID=597 flags=0 offset=0 TTL=21 chksum=36577
TCP: port=3131 -> dport: 80 flags=***A**** seq=17825973
    ack=1421780511 off=5 res=0 win=3072 urp=0 chksum=26124
Payload: length = 1
      000 : 20

5.1 Source of Trace

This logs were collected on our company's external network.

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5.2 Detect was generated by

The detect was generated by the SNORT Intrusion detection system and the entries was triggered by the following rule (this is a default SNORT rule):
alert tcp $EXTERNAL any -> $HTTP_SERVERS 80 (msg:"WEB -MISC whisker splice attack"; content: "|20|"; flags: A+; dsize: 1;reference:arachnids,296; classtype:attempted -recon; sid:1104; rev:1;)

5.3 Probability the source address was spoofed

The detected packet is a part of an established TCP connection. If a stateful inspection firewall is used and the target systems are not vulnerable to sequence number prediction attacks I'm pretty certain that the source address of this attack isn't spoofed.

5.4 Description of attack

Whisker is a known CGI scanner with special options to obfuscate Intrusion Detection System without packet reassembling. Because this feature is turned on on our IDS SNORT we detect this splicing attack. This stealthy attack based on small tcp packets that will be reassembled at the target host.
The attacker tried to hide his web CGI requests and this is a warning signal to the analyst. But we don't see any other traffic few days before and after this alert from the attacker's source address to our network (this information is from our 7 -day full network dump) and so I think someone was just experimenting with the whisker tool by using one of our web servers.

5.5 Attack mechanism

First the attacker established a TCP connection to port 80 (web service) that means that the three-way handshake was successfully done. The 'content: "|20|"' in the SNORT rule means that the content is a binary bytecode, so the binary content is: "0010 0000". The payload of the packet is 1 byte (dsize:1, that's a very unusual payload size), and so the packet was triggered by the IDS.

Source IP address: 192.109.27.168
Domain name: mpih-1-168.mpih-frankfurt.mpg.de

A WHOIS query on the RIPE home results:

inetnum: **192.109.27.0 - 192.109.27.255**

netname: MPIH -LAN

descr: Max -Planck-Institut fuer Hirnforschung

descr: Frankfurt/Main

country: DE

admin-c: WL21-RIPE

```
tech-c:        WL21-RIPE

rev-srv:       gwdu01 .GWDG.DE

rev-srv:       deneb.DFN.DE

rev-srv:       gwdu04.GWDG.DE

status:        ASSIGNED PI

mnt-by:        DFN-NTFY

changed:       cp@deins.Informatik.Uni -Dortmund.DE 19920902

changed:       rv@ Informatik.Uni -Dortmund.DE 19930920

source:        RIPE
```

The Max-Planck institute is a university like location and maybe there are a lot of students who try security tools like whisker.

5.6 Correlations

The attack was detected by me on our external IDS. It was triggered by a SNORT rule explained above. Whisker is a known CGI script scanner and can be downloaded from the wiretrip homepage (reference 7) to check your own web servers or Intrusion Detection Systems.

5.7 Evidence of active targeting

Indeed we have evidence of active targeting because this attack is only to one of our servers (and this is a web server). The attacker doesn't scan the network with the whisker tool he only tried to find out if one specific server has CGI troubles. Next the splici ng option is set to bypass Intrusion Detection Systems. These are all indications of active targeting.

5.8 Severity

GIAC's approach to determining severity is to apply the following formula:
(Criticality + Lethality) – (System + Net Countermeasures) = S everity
Each metric is assigned on a five -point scale (1 as the lowest and 5 as the highest).

Criticality –This is a stand-alone web -server only for one customer and so if this system crashed or is hacked only the web appearance of one customer is disturb ed, so the criticality of this system is 2. (I would set the criticality to 1 only for test systems)

Lethality – If this exploit is successfully done and the attacker can run some forbidden cgi scripts, it depends on the possibilities of the CGI script, s o my rating for lethality will be 3.

System Countermeasure - The system countermeasure is 3 because this is a medium maintained web server with CGI scripts running.

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Network Countermeasure -..will be 3 because this attack can't be filtered on the packet filte rs in front of this network. But the attacker can only access the web -port (80/tcp) and can't access to a virtual terminal after potentially getting a user/password combination because the packet filter block all other connections but to port 80 and 443 (S HTTP).

(Criticality + Lethality) – (System Countermeasure + Network Countermeasure) = **Severity**
(2 + 3) – (3 + 3) = **-1**

5.9 Defence recommendation

First a possibility is that we install a content filtering device on the firewall to secure the network and increase the network countermeasure by 1 or 2 points. Also the web server admin of this server should be informed that he should check his CGI scripts and search for possible changes on his system.

5.10 Multiple choice test question

What is whisker?

- a. a programming language
- b. a port scanner
- c. a CGI scanner
- d. a intrusion detection system

Assignment 2 - Describe the State of Intrusion Detection

Bypassing masquerading firewalls

1. Introduction

The first time I read about such a vulnerability to bypass a masquerading firewall was in April 2000. (www.securityfocus.om/bid/1078). The vulnerability was released at March 27, 2000 to securityfocus. On the website they use this vulnerability for obtainin g a tunnel from outside to the secured masqueraded network. But the real danger for my opinion doesn't get attention at this site. It's possible to start additional reconnassaince or to run attacks against some internal network services. The other thing of interest is, that a update to this bug was released on November 10, 2000. So it was still possible more than half a year later to obtain illegal access because of this vulnerability. My question is if it's still possible today to use this bug (in newer releases). In the next few pages I will describe how to use the masquerading vulnerability to get unallowed access to a secured network and I also will show some theoretical approaches to use UDP masquerading on "not vulnerable" systems for some dangerous p roblems. At the end I will give some methods and techniques to recognize and defend crafted packets for bypassing masquerading firewalls.

2. How masquerading works

There are a lot of masquerading description in the internet and I used about 10 to 15 sour ces for this topic and so this is a very short but technical description of masquerading Masquerading is a special case of Network Address Translation (NAT). Masquerading firewalls uses a mixture of NAT and PAT (port address translation) to handle packets. Masquerading is a feature of firewalls and layer three gateways to change the IP address of packets to and from a local address. The next table and picture will show two packets on the way through the firewall.

1 original packet from internal system (1. 1.1.1, port 1076) to the destination IP and port of the external system (5.5.5.6, port 23)

2 masquerading process (described below)

3 packet changed Source IP to outside firewall IP address (5.5.5.5) and a generic port (65111)

4 reply packet to the IP a ddress and port of the firewall (5.5.5.5, 65111) leaves external system

5 demasquerading process (described below)

6 demasqueraded packet: destination IP address and port changed to the internal system's IP address and original port (1.1.1.1, port 1076)

IP: 1.1.1.1   IP: 5.5.5.5   IP: 5.5.5.6

| Internal system | | Masq. Firewall | | Internet | | external system |

1
| SRC-IP, -port | DST-IP, -port |
| 1.1.1.1, 1076 | 5.5.5.6, 23 |

2
| masq. process |

3
| SRC-IP, -port | DST-IP, -port |
| 5.5.5.5, 65111 | 5.5.5.6, 23 |

4
| DST-IP, -port | SRC-IP, -port |
| 5.5.5.5, 65111 | 5.5.5.6, 23 |

5
| demasq. process |

6
| DST-IP, -port | SRC-IP, -port |
| 5.5.5.5, 65111 | 5.5.5.6, 23 |

◄ ,► ………   direction of packet flow
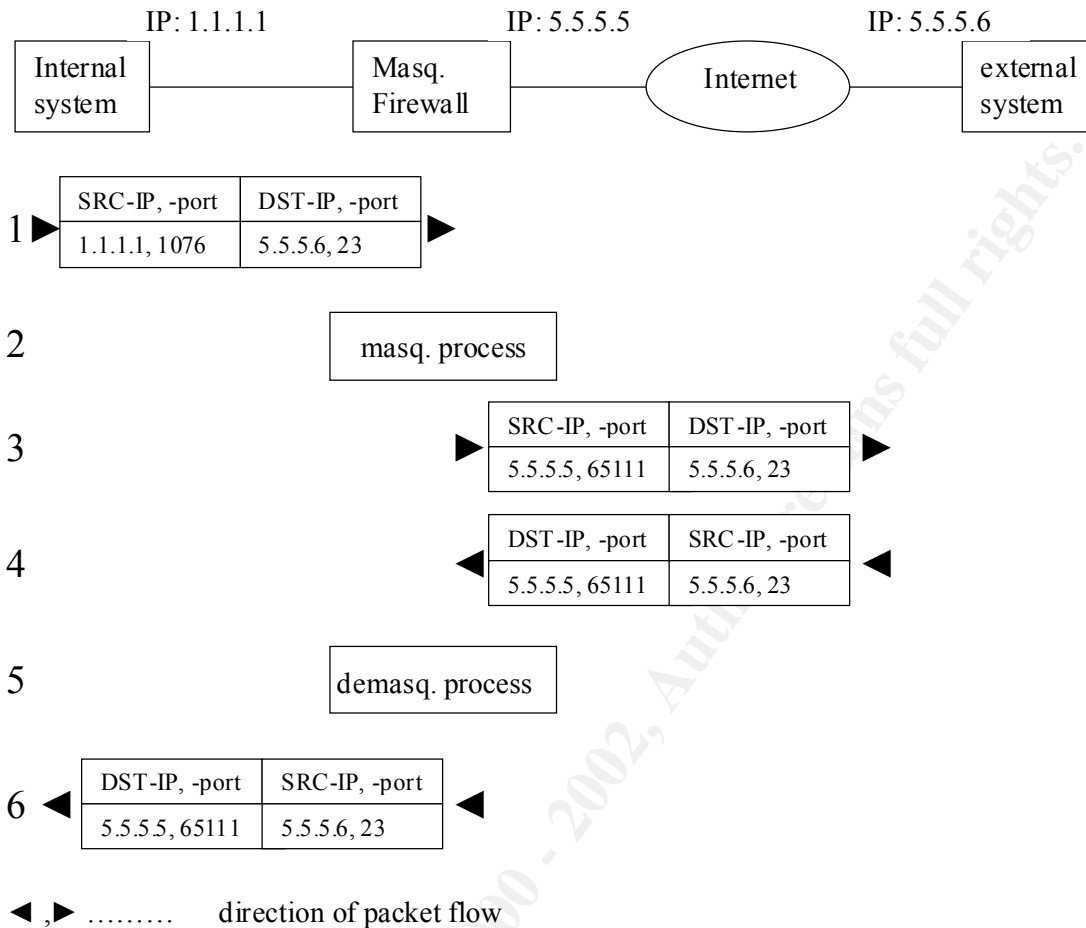
This show the principals of masquerading, now we look closer to the masquerading engine (step 2 and 5).

masquerading process:
When a packet comes to the firewall form the internal network it will first go through the input and forwarding rule of the firewall. Then the packet is changed in the masquerading process. In this process the source address of the IP packet is changed to the IP address of the outside interface of the firewall (or the interface, where the packets goes out, i.e. this could also be a demilitarized zone). Also the source port in the UDP or TCP field is changed to a gener ic port from 61000 to 65096 (per default). This port range is reserved in the Linux kernel or masquerading. But this can easily be changed by editing "linux -version/include/net/ip_masq.h". That means that a default Linux masquerading implementation can han dle a maximum of 4096 concurrent connections. After these changes of source IP address and port, Linux will create an entry in the masquerading table for this connection.

```
----------------------------------------------------------
| internal IP, port   | masquer. port      |
----------------------------------------------------------
|    1.1.1.1, 1076    |      65111         |
|        ....         |         ....       |
```

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With Linux you can masquerade packets by inserting firewall rules in the following way: (in this example all TCP connection fro m the internal address 1.1.1.1 to the port 23, which means normally telnet service, will be masqueraded)

ipfwadm (2.0.x):   ipfwadm -A -M -p tcp -S 1.1.1.1 -D 0/0 23

ipfwadm	firewalling tool
-A	append new rule
-M	masquerade packet after accept ing
-p tcp	TCP is the specified protocol
-S 1.1.1.1	accepted source address of internal network
-D 0/0 23	destination address: any, destination port:23

ipchains (2.2.x):   ipchains -i forward -j MASQ -p tcp -s 1.1.1.1 -d 0/0 23

ipchains	firewalling tool
-i forward	insert rule in forward chain
-j MASQ	if rule matches jump to masquerading process
-p tcp	TCP is the specified protocol
-s 1.1.1.1	accepted source address of internal network
-d 0/0 23	destination address: any, destinat ion port:23

iptables (2.4.x):   iptables –A FORWARD –t nat –to-source *fw.out.ip* –p tcp –s 1.1.1.1 –d 0/0 –dport 23 –j SNAT

iptables	firewalling tool
-A FORWARD	append to forward chain
-t nat	rule for table: nat
--to-source fw.out.ip	translate to outside firewall IP (masquerading)
-p tcp	TCP is the specified protocol
-s 1.1.1.1	accepted source address of internal network
-d 0/0	destination address: any
-dport 23	destination port: 23
-j SNAT	if rule matches jump to Source N AT process (masquerading)

Normally you can change the time how long a masquerading entry will exist in the table. In ipfwadm and ipchains there are 3 parameters to modify:
How long a masquerading entry exists after ....
1. ... a TCP FIN packet was sent (normally a very low value)
2. ... "normal" packet was sent (idle timout, default 15 minutes)
3. ... UDP packet matches the specified entry

After reaching one of the timeout values, the entry in the masquerading table will b deleted.
After sending a new packet without a related masquerading entry, a new one will be created with a new random port (61000 -65096).

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demasquerading process:
The demasquerading process works by changing the destination IP address and port of the incoming packet.
After receiving a packet the demasquerading process will look into the masquerading table, if a masqueraded port matches the destination port in the incoming packet. After this the destination IP address and port is changed to the internal machines IP address and UDP or TCP port. Exactly this behaviour (not checking for the source IP and port of the incoming packet) will make the attack possible.

3. The original vulnerability

The original attack is used for establishing a tunnel through a masquerading firewall from outside (reference 8).
Citation of bugtraq:

> *A serious vulnerability exists in the IP Masquerading code present in, but not necessarily limited to, the 2.2.x Linux kernel. Due to poor checking of connections in the kernel code, an attacker can potentially rewrite the UDP masquerading entries, making it possible for UDP packets to be routed back to the internal machine.*
> *The IP masquerading code only uses destination ports to determine if a packet from the external network is to be forwarded to the internal network. It then sets the remote host and port in its tables to the source address and port of the incoming packet. The attacker needs to determine the local port on the masq gateway to be able to rewrite the table with their own address and port. As the range of ports used to masquerade connections is small, from 61000 to 65096 for both UDP and TCP, it becomes fairly easy for an external host to determine the ports in use.*

As it is written in the text above it's possible that these attack technique functions as well on other Linux kernels and other masquerading firewalls.

Now I will show the original trace of the example shown at securityfocus:

ipchains -L -M -n on the masq gateway BEFORE the probes
> UDP 03:39.21 192.168.1.100 10.0.0.25 1035 (63767) -> 53
[tcpdump from attacker's machine]
(we picked source port 12345 for our packets just so the trace would be easier to follow)
[snip -- this starts at port 61000]
10.0.0.1 > 10.10.187.13: icmp: 10.0.0.1 udp port 63762 unreachable [tos 0xd8] (ttl 245, id 13135)
10.10.187.13.12345 > 10.0.0.1.63763: udp 0 (DF) [tos 0x18] (ttl 254, id 23069)
10.0.0.1 > 10.10.187.13: icmp: 10.0.0.1 udp port 63763 unreachable [tos 0xd8] (ttl 245, id 13136)
10.10.187.13.12345 > 10.0.0.1.63764: udp 0 (DF) [tos 0x18] (ttl 254, id 23070)
10.0.0.1 > 10.10.187.13: icmp: 10.0.0.1 udp port 63764 unreachable [tos 0xd8] (ttl 245, id 13137)
10.10.187.13.12345 > 10.0.0.1.63765: udp 0 (DF) [tos 0x18] (ttl 254, id 23071)
10.0.0.1 > 10.10.187.13: icmp: 10.0.0.1 udp port 63765 unreachable [tos 0xd8] (ttl 245, id 13138)

Explanation of trace:
First the output of "ipchains –L –M –n shows the masquerading entries and there is a entry for the internal IP addre ss of 192.168.1.100 and source port of 1035, the masqueraded source port (after passing the firewall and getting the firewall IP address) is 63767. The destination host is 10.10.187.13 with the destination port of 12345. The attacker scans the UDP ports o f the firewall from 61000 to 65096. For each port checked he gets a UDP port unreachable message. All of them are from the firewall, except the one for port 63767 which is originated by the masqueraded host. Normally the UDP port unreachable packet's IP ID   increases by one every time and the TTL (time to live) is normally set to 245, that means the firewall is 10 hops away. But the UDP port unreachable message for port 63767 is different, it has a completely different IP ID and a TTL of 244 (11 hops away), so we know that this packet couldn't be sent by the firewall but by the internal server 192.168.1.100.
After we have seen a packet like this, we look once again in the masquerading table with "ipchains –L –M –n". We will see that the destination host were changed to the attackers IP address 10.10.187.13 without a stimulus packet from the internal network. Now a channel from this attacking system to the internal system 192.168.1.100 to port 1035 exists.

4. Requirements

To be able to use the exploit as des cribed, a Linux firewall with one of the following
distributions and/or kernels is needed:

> Debian Linux 2.2pre potato
> Debian Linux 2.2
> Debian Linux 2.1
> Linux kernel 2.2.14
>> +Caldera eServer 2.3.1
>> +Caldera eDesktop 2.4
> Linux kernel 2.2.12
> Linux kernel 2.2.10
>> +Caldera OpenLinux 2.3
> RedHat Linux 6.2 i386
> RedHat Linux 6.1 sparc
> RedHat Linux 6.1 i386
> RedHat Linux 6.1 alpha
> RedHat Linux 6.0 sparc
> RedHat Linux 6.0 i386
> RedHat Linux 6.0 alpha

The next thing which is required is a masquerading entry for the internal target. But in case of a
server as the target of attack (DNS, NTP, ...) this requirement is easily fulfilled, and in most
cases servers are the attackers primary targets. This vulnerability is tested with UDP
masquerading entries. I think it is also possible to bypass the TCP masquerading process, but this
would be much more difficult to demonstrate or exploit.
Next I also think that some other (not so popular) firewalls can be vulnerable in case of a similar
behaviour.

5. Modification of attack to worst case scenario

To create a tunnel it's imaginable that the attacker send a Trojan horse to one of the internal
clients (i.e. per E -mail). This Trojan may send packets to a popular external server with a well -
known service from the victim with a high source port (grater than 1024 and the "listening" port
of the Trojan horse, normal behaviour of IP stack). Because this is a normal and common
connection, neither the firewall nor an Intrusion Detection system will detect this connection as a
forbidden one. Now the attacker is able to connect to the victim by using the described
vulnerability of obfuscating the masquerading process. So a connection from the Internet to the
internal and "secured" network is possible and nobody wo uld realize it because it seems that this
is a normal UDP connection.

The bigger problem and more dangerous thing are internal UDP servers which a source port
lower than 1024. For example a lot of domain name systems will connect via UDP from source
port 53 to destination port 53. So the masquerading table is filled with the following entry:
"*internal.server, 53, 63201*" where "*internal.server*" is the internal system, "*53*" is the source
port of the internal server" and "*63201*" is the masqueraded source port on the firewall. If this
server starts a request to an external DNS server (i.e. the Root Servers) it will create such an

entry in the masquerading table. After that an attacker can send DNS packets to the UDP port 63201 on the firewall's outside interfac e. This packet will be forwarded from the firewall to the internal.server on the destination port of 53. So it is possible that an outside attacker can resolve internal domain names. Also exploits could be started to the domain name server. Nowadays most of domain name servers use a high port for it's source port of requests, so this attack isn't possible to these servers (there is still a option to set source port to 53), but I'm sure that there are a lot of old implementations for DNS servers.

This is the same trace as shown in the original attack but the ports and addresses changed. We used a RedHat Linux system with kernel 2.2.14. The scan was generated by NMAP with a normal UDP scan: *nmap –sU –p 61000-65096 –P0 fw_out*

-sU	UDP scan
-p 61000-65096	scanned port range
-P0	don't ping destination host
fw_out	outside firewall interface

Fwall:~# ipchains -ML   # on our masquerading firewall before
                                                                             nmap scan was started
UDP 04:54.48 internal_DNS   external_DNS   53 (64180)   -> 53

[tcpdump from attacker's machine]
fw_out > attacker : icmp: fw_out udp port 61176 unreachable [tos 0xc0] (ttl 253, id 9364)
attacker.1073 > fw_out.61177: udp 0 (DF) [tos 0x18] (ttl 254, id 7096)
fw_out > attacker: icmp: fw_out udp port 61177 unreachable [to s 0xc0] (ttl 253, id 9365)
attacker. 1073 > fw_out.61178: udp 0 (DF) [tos 0x18] (ttl 254, id 7099)
fw_out > attacker: icmp: fw_out udp port 61178 unreachable [tos 0xc0] (ttl 253, id 9366)
attacker. 1073 > fw_out.61179: udp 0 (DF) [tos 0x18] (ttl 254, id 7 101)
fw_out > attacker: icmp: fw_out udp port 61179 unreachable [tos 0xc0] (ttl 253, id 9368)
attacker. 1073 > fw_out. **61180***: udp 0 (DF) [tos 0x18] (ttl 254, id 7102)*
attacker. 1073 > fw_out.61181: udp 0 (DF) [tos 0x18] (ttl 254, id 7105)
fw_out > attacker : icmp: fw_out udp port 61181 unreachable [tos 0xc0] (ttl 253, id 9372)
attacker. 1073 > fw_out.61182: udp 0 (DF) [tos 0x18] (ttl 254, id 7116)
fw_out > attacker: icmp: fw_out udp port 61182 unreachable [tos 0xc0] (ttl 253, id 9373)
attacker. 1073 > fw_out .61183: udp 0 (DF) [tos 0x18] (ttl 254, id 7119)
fw_out > attacker: icmp: fw_out udp port 61183 unreachable [tos 0xc0] (ttl 253, id 9375)

Fwall:~# ipchains -ML   # on our masquerading firewall after port
                                                                             scan
UDP 04:52.55 internal_DNS   atta cker   53 (64180) -> 53

Internal_DNS	this is our internal name server
External_DNS	this is our external name server
Attacker	attacking system outside the firewall
Fw_out	outside firewall interface

First we see the normal UDP masquerading entr y for the outgoing DNS request. Then I started the nmap UDP scan to the masquerading port range to the outside firewall IP. For all ports

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except 61180 I get UDP port unreachable messages, that means that this port could be open (and indeed it is).

Another affected service is NTP (network time protocol) that is associated with the well -known UDP port 123. Most of NTP servers also use source port=destination port, that means that a connection from a NTP server are done from the local source port 123/UDP. So the "bypass masquerading firewall" vulnerability can also be targeted to NTP servers.

6. Detection and Defence

A good choice to reduce the possibility of an attack is to change the masquerading ports (61000 to 65096) to another range. Also you can check for port probes on the masquerading ports. If you change the range you can look at the default and the new port range, because in my mind an attacker will first test the original ports. In most cases after getting no response for the original probe he will stop checking to these vulnerability if he isn't really sure, that the system is a masquerading firewall. The exploit is only published for Linux firewalls but I recommend that all existing firewalls should be checked for the masquerading vulnerability, b ecause in my opinion this is one of the most dangerous bugs for masquerading firewalls if the system is vulnerable, because every experienced hacker could exploit this and then have access to internal systems. Another good defence is that you never use sou rce ports of known services (lower than 1024 and all special high port services). On Linux systems the value for source ports can be set in the at /proc/sys/net/ipv4/ip_local_port_range. In this file there are two values separated by a tab, the first value indicates the low end of the source port range, the other value indicates the high end of the source port range. This range can only be set for TCP and UDP simultaneously. So this values should be set to a range where no running service have it's default port. Another good defence possibility is that a stateful inspection firewall is being installed because the firewall can check if before a incoming UDP packet is received a outgoing one was passed.

That's a very good example how important egress filterin g (outgoing filters) can be. If you don't create and maintain outgoing rules you won't be aware of such attacks, furthermore outgoing port unreachable messages should be blocked because than the attacker don't know if a port is in listening state or closed

I've written a Snort rule for the bypassing firewall vulnerability for DNS, this rule should check if a incoming UDP DNS packet is a DNS request or a response. A request from outside to our internal nameserver should never occur.
alert udp !$INTERNAL any -> $INTERNAL 53 (msg:"DNS bypassing firewall attempt"; content: "|0*|"; regex; offset: 2; depth: 1; reference:cve,CVE -2000-0289; reference:bugtraq,1078; classtype: successful-recon-largescale; rev:1;)

7. Conclusion

This is an older exploit (about one y ear old) , although I think it works on a lot of systems today, because I'm sure that many systems are still running Linux kernel 2.2.14 or lower. As noticed above there are a high possibility that also other systems are exploitable and so this one of few vulnerabilities that an attacker can send packets to the internal systems "directly" (not via other hacked systems in for example a demilitarised zone. After showing a lot of defence techniques it should be possible to stop bypassing the masquerading firew all.

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<u>Assignment 3 – "Analyze This" Scenario</u>

GIAC Enterprises has provided us with one week of SNORT data from their network. The data was analysed using various tools and scripts. (Main tool was SnortSnarf from www.silicondefense.com). Some data are missing because of various troubles (full disk, power outages, etc. The resulting data and analysis are presented below:

1. Introduction

The data provided for this analysis was from alert logs generated by the Sno rt intrusion detection system. The analyses based on the file from July 23 rd ot July 29th because in this week I've a lot of security incidents myself, so I decided to look what other networks „say" about this week.

Number of analysed Alerts: 1582163

Number of analysed Network Scans: 463444

Number of analysed Out of Spec packets: 1076, all are TCP packets
(data from July 27th are missing)

Statistical analysis was used on these alerts, scans and OoS packets to identify:
    Most scans by source host
    Most scans by destination host
    Most scans by destination port   .... done with scan log files and sometimes compared
        with data from alert and OOS logs.

    Most crafted packets by source host   .... done with OOS (Out of Spec) logs

    All other analyses are based on resu lts of the above analyses (if a more exact research is necessary) or on the snort_stat.pl output of Appendix A.

I always show as much results as needed for research, my default value are the top 10 counts.

2. Portscan statistics

portscans

	07-23-2001	07-24-2001	07-25-2001	07-26-2001	07-27-2001	07-28-2001	07-29-2001
portscans	6868	6968	7270	5957	6068	4890	3524
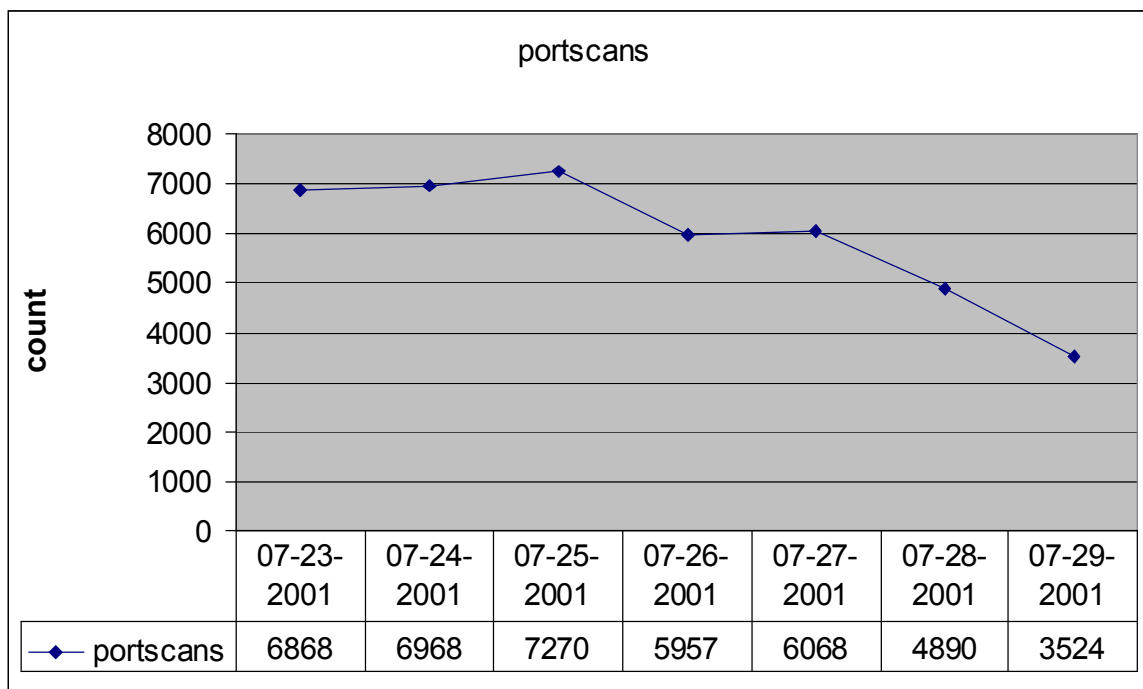
In the graph above there are no special statistic anomalies detected. This is only the sum of all portscans, detailed analyses for portscans will be done later in this document.

3. statistical analysis on alert data

total events

	07-23-2001	07-24-2001	07-25-2001	07-26-2001	07-27-2001	07-28-2001	07-29-2001
total events	154705	160864	245927	184370	158938	102748	115642

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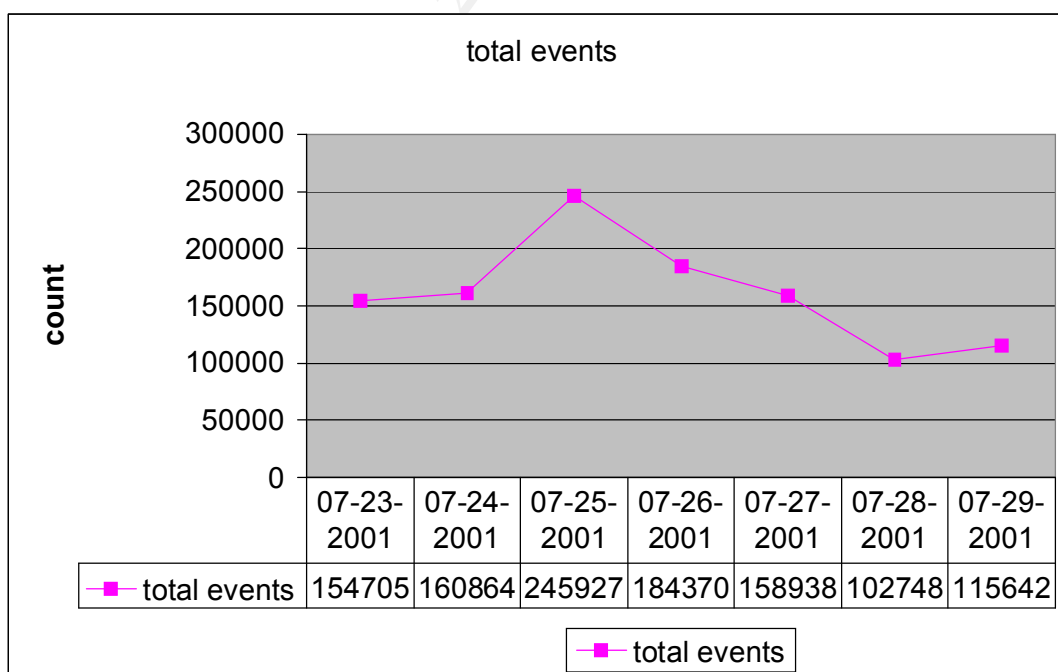
On July 25th, 2001 we have a increase of total events by about 60 percents, so this day should be analysed a little bit closer. So after analysing the snort_stat – data (appendix A) in depth I saw a huge amount of http_decode, the following tables presented this result:

distribution of attack methods on July 25th, 2001:

%	count	attack method
28.80	70820	spp_http_decode
12.05	29631	spp_http_decode
9.77	24039	Possible trojan server activity
7.75	19070	MISC traceroute
7.04	17309	ICMP Destination Unreachable (Communication Administratively Prohibited)
6.03	14839	WEB-MISC prefix-get //
3.90	9603	INFO MSN IM Chat data
3.83	9424	ICMP Echo Request Nmap or HPING2
3.21	7886	SMB Name Wildcard
3.18	7824	ICMP Echo Request L3retriever Ping

So the http_decode data are taken to Excel to see a trend for this alerts:

http_decode alerts

	07-23-2001	07-24-2001	07-25-2001	07-26-2001	07-27-2001	07-28-2001	07-29-2001
http_decode alerts	41764	41576	100451	60351	26958	5022	6773
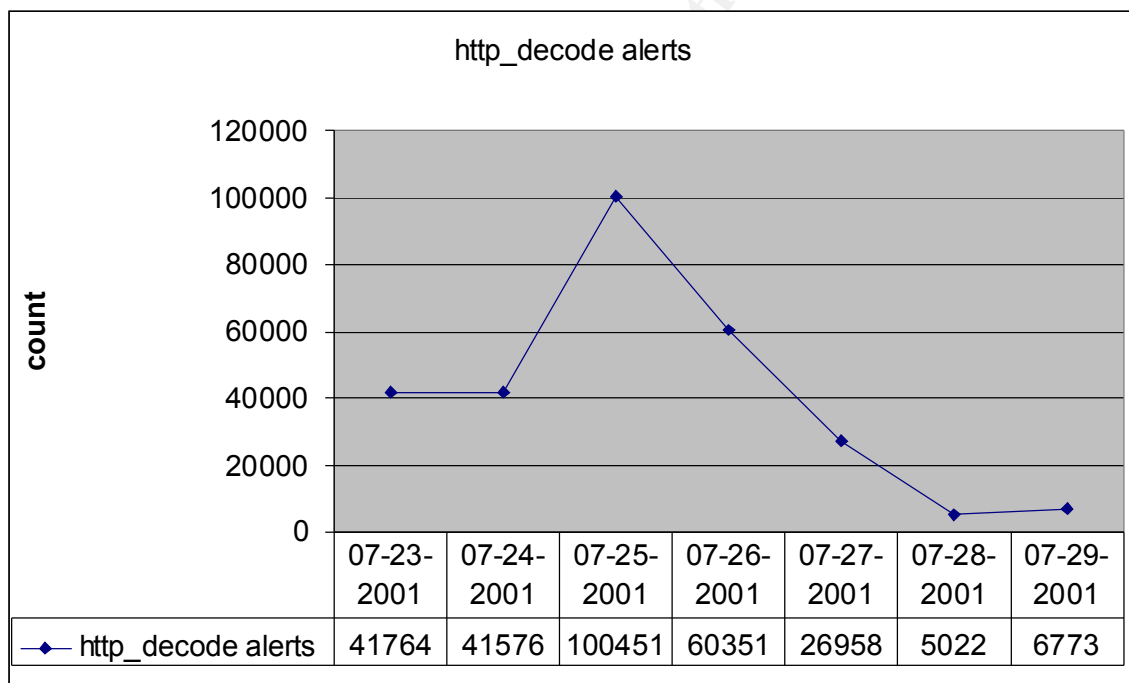
On July 25th, 2001 the amount of http_decode alerts increase by about 120 percent, so some resources were searched for similar activities on this date. (SANS home, incidents.org, securityfocus.com, caida.org, …). The possibility that the high increase of http alerts is attributed to the spread of the famous code red worm, a exact analysis of this worm can be found on the CAIDA homepage (reference 21). This is a worm spread by himself and are distributed based on a Microsoft Internet Information Server vulnerability.
The following table shows most occurred attacks by source and destination host to see which servers are probable infected.

# of attacks	from	to	method

==			======
24163	**10.10.75.150**	216.241.219.14	spp_http_decode: CGI Null Byte attack detected
10484	**10.10.157.108**	207.200.89.193	spp_http_decode: IIS Unicode attack detected
9177	10.10.162.228	204.152.190.70	ICMP Ech o Request Nmap or HPING2
7532	**10.10.157.108**	207.200.89.225	spp_http_decode: IIS Unicode attack detected
5664	**10.10.104.47**	207.200.86.66	spp_http_decode: IIS Unicode attack detected
5618	**10.10.85.74**	207.200.86.97	spp_http_decode: IIS Unicode attack detected
4426	**10.10.85.74**	207.200.86.66	spp_http_decode: IIS Unicode attack detected
4401	**10.10.104.47**	207.200.86.97	spp_http_decode: IIS Unicode attack detected
4291	10.10.16.5	10.10.162.228	ICMP Destination Unreachable (Communication Administratively Prohibited)
4236	216.150.152.145	10.10.5.44	SMB Name Wildcard

All http_decode entries in the top 10 table above are starte d from internal systems, this is an indication that internal servers are infected by CodeRed. It's strongly recommended that the highlighted systems are checked immediately. Also the Incidents Response Team should be alarmed because internal systems are m ost likely infected an this indicates an critical security vulnerability in the companies network.
The other statistical data from snort_stat.pl don't show gross anomalies and so only the top 5 alarms of this week are analysed a little bit more.

4. TOP 5 alerts

TOP 5 alerts

	07-23-2001	07-24-2001	07-25-2001	07-26-2001	07-27-2001	07-28-2001	07-29-2001
IIS Unicode	38972	32439	70820	59810	26664	4620	5672
traceroute	19280	18242	19070	17396	19699	19600	18947
sport 53 to <1024	19666	19259	18469	16064	29385	14071	13081
dest. Unreach.	18106	17089	17309	15642	17641	20461	22507
NMAP or HPING	9987	9644	9424	9928	10428	10100	9830
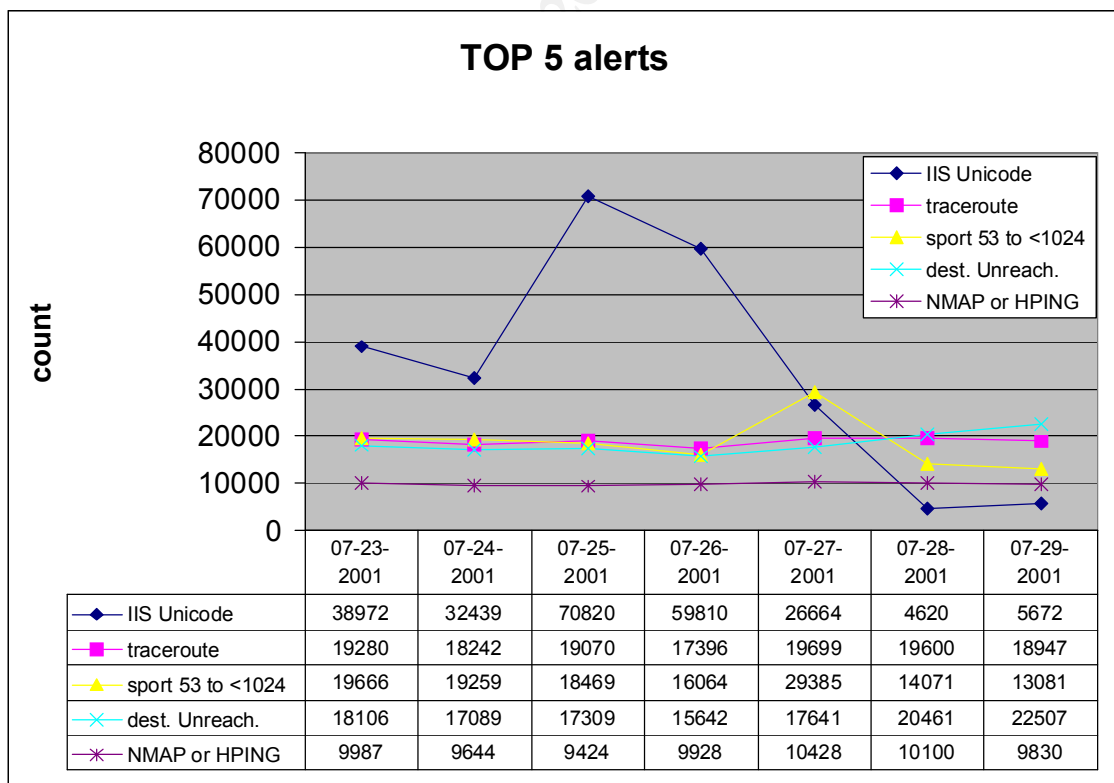
4.1 IIS Unicode attack detected

(reference 25)
There are some vulnerabilities in the Microsoft Internet Information Server based to craft the URL with UNICODE characters. Then resources which normally be inaccessi ble can be accessed. A lot of these exploits are fixed in the IIS code, nevertheless exploits being published ever and anon. Because of this the IIS servers should be checked for intrusions more than other services and be updated as soon as security patche s exists. Normally this is a noisy alert (which happens often) but in this analysis it occurs more often than the noise because of the Code Red worm in these days (shown above).

4.2 ICMP traceroute

Traceroute is a tool to show the route to the specified h ost, by sending packets with increasing Time-To-Live by one every packet sent (beginning by 1). The first gateway gets the packet, decrease Time-To-Live by one to zero then the gateway send back a TTL exceeded to the origin. The second packet will be repli ed by the second gateway, and so on ….
The UNIX traceroute implementation works by sending UDP packets to the destination, the Windows implementation uses ICMP packets, so this traceroute is most likely originated from a Windows system. Probability that th ese are false positives are minimal, because packets normally don't have a TTL of 1, but this traffic is normally not hostile traffic.
The source address can be easily spoofed, because ICMP is a connectionless protocol, but I challenge if source IP spoofin g makes sense in this case, the only reason could be to fill up the IDS logs to hide some attacks.

4.3 source port 53 to <1024

arachNIDS (reference 22)
This alert indicates that one is making a connection to a privileged port using the source port 53. Some years ago this was normal to DNS servers which start requests from port 53 to port 53, also nowadays server can be justified to use destination port 53. Today this is used to bypass packet filters, because some old packet filters let incoming UDP packets from port 53 pass because of having no connection state table. This traffic should be analysed more closer to see if this is a stimulus or a response. If it is a stimulus the IP address should be checked if the origin is an old DNS server or some attacker .
It's recommended that stateful inspection filters are installed to block such packets.
The source address can be easily spoofed, because this event was caused by a TCP packet, but the packet isn't thought to be a part of an existing connection. So exploi t packets can be sent to victims without getting the attacker's identity.

4.4 ICMP Destination Unreachable (Communication Administratively

Prohibited)

This is a ICMP message of type 3 (Destination Unreachable Message) and code 13 (prohibited communication). If a packet is sent to a destination and the destination doesn't prohibit this packet some systems send a ICMP message back to the originator. The problem of this message is that the destination host send back information of prohibited services and coul d be used for backward host scan (look for denied services). Normally this messages should be blocked by the egress filters (outgoing filters) to stop sending information back to the origin.

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4.5 ICMP Echo Request Nmap or HPING2

arachnids (reference 23)

Normally ICMP echo requests are used for mapping networks to get additional information of destination networks. Many implementations of the PING program (which uses ICMP echo requests and replies) create unique echo -request packets so these particular aler ts were associated with the pattern of the HPING2 or NMAP ping. These are two tools to scan networks by permitting to set a lot of protocol parameters by command line options. But the special pattern of the packet can be easily self -maded by network progra mmers and so these packets could also originated by some unknown tools.

The source address can be easily spoofed, because ICMP is a connectionless protocol, but I challenge if source IP spoofing makes sense in this case, the only reason could be to fill up   the IDS logs to hide some attacks.

5. Most scans by source host

The following table shows the count of scans per source host, this is to detect possible attackers who constantly scan your systems. (used script: scan.sourcehost.pl)

Count	source host
171812	10.10.160.114
40999	205.188.233.153
35962	205.188.233.185
27210	205.188.246.121
24343	209.11.66.3
16697	10.10.217.114
15871	205.150.237.250
14311	205.188.244.121
12170	205.188.244.249
11540	10.10.70.242
10917	213.51.204.55
10669	210.15.29.17

The top source host is an internal system, it is recommended to check this system immediately, because either their is a busy employee who scan different networks or   the system had been compromised and is now used as a "anonymizer" (attacker scan from a source host other then his own). After I saw this I decide to write a script to check the destination addresses of the scans from 10.10.160.114.

5.1 more exact analyses to scanning source host 10.10.160.114

Now I want to get more information of network scans from the internal system 10.10.160.114.
First I want to show which hosts are the most targeted system.
(used script: scans.dadr.sourcehost.pl)

Count	destination scanned by 10.10.160.114
14058	206.206.48.64
10821	66.66.130.148
10221	166.84.159.101
8959	66.92.70.235
6754	24.30.5.24
6731	24.43.12.34
4836	24.19.234.22
4161	64.108.11.238
2482	64.91.29.66
2340	63.62.0.96
2296	24.23.61.159
2238	24.22.167.43
2004	24.101.53.229

Because there is no decisive indicator in the analyse above another analyse is started to check a ll
destination ports scanned by 10.10.160.114.

Count	destination ports scanned by 10.10.160.114
124637	27005
8945	27500
1594	27243
1513	1027
976	1051

Top 5 destination ports are enough because we can yet see what the problem is. Most of the
connections go to port 27005 which looks like a Trojan horse. The problem is that there are no
known Trojan associated with this port (also port 27500 and 27243 are not known,   reference 1)
so it is possible that this is a new Trojan **. Now I strongly recommended that the system should
be checked in depth.** If a integrity checker is installed the logs on this checker should be
scanned carefully. The Incidents Response Team should be   alarmed to handle this case. The
team should consist in at least one security expert and one system administrator for
10.10.160.114.

Commentary after complete analyse: As shown some section below this is probably only a
online game (Half-Life), for more details jump to section 4.2! Before alarming the Incident
Response Team read defence recommendation.

6. Most scans by destination host

The following table shows the count of scans per destination host, this is to detect possible victim systems which are constantly scanned.
Used script: scans.targethost.pl

Count	destination host
14058	206.206.48.64
10821	66.66.130.148
10221	166.84.159.101
9940	10.10.110.33
9458	10.10.109.62
8959	66.92.70.235
8374	10.10.178.222
8285	10.10.110.169
7503	10.10.145.166
7418	10.10.178.188

There are no statistical anomalies detected by this analyses.

7. Most scans by destination port

The following table shows the count o f scans per destination port, the usage of this analyse is for detecting increased scanning of a special service/Trojan.
Used script: scans.targetport.pl

Count	destionation port
134843	6970
124647	27005
30412	21
29903	23
29795	53
10169	6699
8950	27500
7684	13139
7132	1214
6535	4665

As seen above there are two destinati on ports were many more scans occurred than by the other ones. About half of the scans are targeted to these two ports, that is an indication to analyse this in depth. First I want to check associations with the two ports.

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7.1 more exact analyses to scanned destination port 6970

The port 6970 is a high port which is associated to the GateCrasher Trojan horse. This is a Trojan based on Windows systems and is spread by a Macro in a "Microsoft Word97 documents". (Macro started as soon as the victim opens the document) A more specific description of this Trojan is given by the "Privacy Software Corporation" (reference 15).

To download the GateCrasher software for security researches go to reference 16 (handle with care). Then you can check your network security devices and your IDS to handle this detect and block GateCrasher attempts.

Now we should look which systems are scanned by this Trojan, so I want to create a table how often one target host are scanned on this port.
Used script: scans.targethost.target port6970.pl

Count	destination hosts scanned on port 6970
9940	10.10.110.33
9455	10.10.109.62
8327	10.10.178.222
8244	10.10.110.169
7501	10.10.145.166
7416	10.10.178.188
7389	10.10.180.76
7307	10.10.108.15
7253	10.10.130.132
6534	10.10.108.13

There could be some reasons, one is that a lot of systems are infected by this Trojan and so no statistical anomalies are detected. The other possibility is a new invasion of this Trojan horse so we should look closer to the source hosts scanning to port 6970.
After getting the result (with the script scans.sourcehost.targettport6970.pl) we can realize that all source hosts are from external systems (look at the list below), and most of scans come from one /16-range (exactly 3 class C networks). So this is indeed an indication of deeper research.

Count	source hosts scanning destination port 6970
40571	205.188.233.153
35952	205.188.233.185
26321	205.188.246.121
14167	205.188.244.121
12042	205.188.244.249
5789	205.188.233.121
1	213.67.144.6

The WHOIS query at ARIN (American Registry for Internet Numbers) results:
America Online, Inc (NETBLK-AOL-DTC)
   22080 Pacific Blvd
   Sterling, VA 20166
   US

   Netname: AOL -DTC
   Netblock: 205.188.0.0 - 205.188.255.255

Coordinator:
  America Online, Inc. (AOL-NOC-ARIN) domains@AOL.NET
  703-265-4670

Domain System inverse mapping provided by:

DNS-01.NS.AOL.COM   152.163.159.232
DNS-02.NS.AOL.COM   205.188.157.232

Record last updated on 27 -Apr-1998.
Database last updated on 7 -Sep-2001 23:28:25 EDT.

All scans are launched from IP addresses in the AOL address space. This could be some dial   -in
users who tried to spread the GateCrasher Trojan or it is possible that some American Online
systems are infected with this Trojan.

Correlation:
GateCrasher attempts are also logged on March 11 [th], 2000 (reference 17). Another alert was
published by Arrigo Triulzi on May 28 [th], 2000 (reference 18), but he identified the attempt as a
false positive because of a NAT firewall. Neither on whitehats.com nor on inc   idents.org I found
more correlations to GateCrasher attempts (I also searched our own SNORT logs).

Defence recommendation:
Citation of reference 15 – Privacy Software Corporation Security Advisory:
The GateCrasher server will install its program in the re gistry under the
HKEY_LOCAL_MACHINE \SOFTWARE \Microsoft \Windows \CurrentVersion \Run key with a
string value of „Explore" with data pointing to the file which was installed, which will usually
be Explore.exe.
It is necessary to remove the registry subkey fir st. It will not be possible to remove the program
file while the server is running and you may also be prevented from shutting down the computer.
A reboot will be required in order to restart the machine without the GateCrasher" server being
reloaded at wh ich time the file pointed to in the registry can be removed without further risk.
As a result, care should be taken to back up your registry first as well as your programs and files
in the event that removal of the registry entry results in damage to your   system. Use of Privacy
Software Corporation's BOClean 3.01 program will safeguard against this possibility by
removing the program and its registry entries automatically without risk of damage, or the nee   d
to disconnect the infected machine or reboot.

Next the SNORT ruleset should be updated because of non -alarming this in the alert logs, so a
rule for possible GateCrasher Trojan access (filter on destination port 6969 and 6970) should be
installed.

7.2 more exact analyses to scanned destination 27005

As shown above the count of scanned port 27005 are 124647, this is many more than other scanned ports, I realized this again in section 2.1, and so I do some additional analysis to that port. The only kn own program associated to this port is Half Life (Game) and so I decided to check which internal users use this.
We need two tables, one for the scanned target hosts and one for the scanning source hosts.

Used script: scans.sourcehost.dport27005.pl

Count	source hosts scanning destination port 27005
124637	10.10.160.114
6	10.10.160.169
3	10.10.98.195
1	10.10.97.242

Used script: scans.targethost.dport27005.pl

Count	destination hosts scanned o n port 27005
14017	206.206.48.64
10808	66.66.130.148
10133	166.84.159.101
6750	24.30.5.24
6661	24.43.12.34
4830	24.19.234.22
4157	64.108.11.238
2481	64.91.29.66
2339	63.62.0.96
2239	24.23.61.159

After doing the correlations to this port there was no other reference to this port than the one from Lars Hansen (reference 19), so it's recommended to check the internal systems if anyone is playing Ha lf-Life from the internal network. Also incidents.org associate this port (27005) to Half-Life. (reference 20)

Defense Recommendation:
If Half -Life can be found on the four source hosts, only a deinstallation of this game (to decrease the amount of networ k traffic) is recommended, if Half -Life isn't detected on the systems, it is strongly recommended that the Incident Response Team is called, because it's possible that this is a new trojan. Then new analyses based on port 27005 must be started.

Correlatio n:
The scan to port 27005 correlates to the previous analyses for host 10.10.160.114. The Global Incidents Analyses Center has a lot of analysed detects to port 27005 on their pages:

    03/22/2000 Handler on Duty : Jeff Stutzman
    03/18/2000 Handler on Duty: J eff Stutzman
    05/28/2000 by Andy Johnston

On February 26th, 2001 Lars Hansen wrote that port 27005 is a default port for Half -Life (Game), so before starting new and deeper analyses the systems should be checked for this game.

8. TOP 5 crafted packet origins

Used script: **oos.sourcehost.pl**

Count	source host
231	199.183.24.194
185	141.157.88.27
91	198.186.202.147
51	62.41.32.27
49	193.231.15.194

8.1 "199.183.24.194"

domain name: vger.kernel.org
WHOIS query:

      Red Hat Software (NET-REDHAT)
        P.O. Box 4325
        Chapel Hill, NC 27515
        US
        Netname: REDHAT
        Netblock: 199.183.24.0 - 199.183.24.255
        Coordinator:
          Taylor, Stacy (ST452-ARIN) abuse@icgcom.com
          408-579-5000
        Record last updated on 01-Mar-2001.
        Database last updated on 7-Sep-2001 23:28:25 EDT.

Correlations:

      Another website could be found which logs Out of Specs data for this IP address, the data
was from the SnortSnarf alert page of nothing-on.tv, they log data from this source on
July 26th and 27th, 2001 – exactly in the same timeframe of our logs (data of July 27 [th] are
missing in Out of Spec logs). It's possible that the server on kernel.org was being
compromised these days . We should inform the admin of this server on kernel.org
(normally a trustable organization) to check the systems for signs of compromise.

8.2 "141.157.88.27"

domain name: pool-141-157-88-27.balt.east.verizon.net
WHOIS query:

      Bell Atlantic (NETBLK-BELL-ATLANTIC)
        1880 Campus Commons Drive
        Reston, VA 20191
        US
        Netname: BELL -ATLANTIC
        Netblock: 141.149.0.0 - 141.158.255.255
        Maintainer: BAIS
        Coordinator:
          Verizon Global Networks Inc.   (ZV20-ARIN) noc@gnilink.net
          (703) 295-4583
        Domain System inverse mapping provided by:
        NSDC.BA -DSG.NET   199.45.45.14
        GTEPH.BA -DSG.NET   141.151.0.68
        Record last updated on 19 -Jul-2001.
        Database last updated on 7 -Sep-2001 23:28:25 EDT.

No correlations for this IP address was found.

8.3 "198.186.202.147"

domain name: panoramix.v alinux.com
WHOIS query:
      Dandelion Digital (NETBLK -DANDELION -C)
        930 Tahoe Blvd. #802 -546
        Incline Village, NV 89451
        US
        Netna me: NETBLK -DANDELION -C
        Netblock: 198.186.200.0 - 198.186.203.255
        Coordinator:
         Zubkoff, Leonard N. (LNZ-ARIN) lnz@DANDELION.COM
         775.832.1068
        Domain System inverse mapping provided by:
        NS1.VALINUX.COM   198.186.202.135
        NS2.VALINUX.COM   198.186.202.136
        Record last updated on 18 -Jul-2001.
        Database last updated on 7 -Sep-2001 23:28:25 EDT.

No correlations for this IP address was found .

8.4 "62.41.32.27"

domain name: proxy.sharif.ac.ir
WHOIS query:

    ine tnum: **62.41.32.0 - 62.41.32.255**

    netname: CYBERROUTE

    descr: Cyberroute ASP

    country: NL

    admin-c: AP8093 -RIPE

    tech-c: AP8093 -RIPE

    status: ASSIGNED PA

    notify: pols@cyberroute.com

    mnt-by: RIPE-NCC-NONE -MNT

    changed: beri@EU.net 20000612

    source: RIPE

    route :   **62.41.0.0/16**

    descr: KPNQwest

origin: AS286

mnt-by: AS286-MNT

changed: beri@EU.net 20000529

source: RIPE

No correlations for this IP address was found.

8.5 "193.231.15.194"

domain name: hal.cs.tuiasi.ro
WHOIS query:

inetnum: 193.231.15.0 - 193.231.15.255

netname: UTI-NET

descr: "Gh. A sachi" Technical University of Iasi - ROMANIA

country: RO

admin-c: BC4-RIPE

tech-c: FA27-RIPE

tech-c: CC28-RIPE

status: ASSIGNED PA

notify: domain-admin@rnc.ro

mnt-by: AS3233-MNT

changed: irina@u1.ici.ro 19960405

changed: estaicut@rnc.ro 19981123

changed: cristih@rnc.ro 20010215

source: RIPE

route: 193.231.0.0/19

descr: Romanian Education Network

origin: AS2614

mnt-by: PUB-MNT

changed: george@roedu.net 20000923

source: RIPE

No correlations for this IP address was found.

9. Analysis process:

The analyses was done on a 800MHz CPU with 256MB RAM and 512 MB Swap space, the hard drive has about 55GB of free space.
First I downloaded the sources from www.research.umbc.edu/~andy (resource given by SANS). This include alerts, scans and OOS files.

9.1 general process

After I changed the pattern "MY.NET" to "10.10" because of readability to SnortSnarf. I do this with the following script:

```
#!/bin/bash
for file in `ls ./*`
do
cat $file | sed 's/MY.NET/10.10/g' >./$file.vers1
done
```

(modified script from practical assignment of Paul Asadoorian)

This was verified by: *grep „MY.NET" *.vers1* and there was no output, so there is no „MY.NET" in the log file s any more.

Next I combined the files into one

ls –l *.vers1 | awk ‚{print „cat „$9 „ >> merged.alerts"}' | sh
(The above code was present in many previous practicals.)

Then I sorted it by date and time

cat merged.alerts |sort > sorted.merged.alerts

after this I deleted the header lines with VI and do all previous tasks with the scan log files.

I tried to start SnortSnarf for the merged file, but my system ran out of memory and the process was killed. Then I tried SnortSnarf with the single day logs, but the system ran out of memory again. So I wrote some scripts to get the desired tables for port scans (modification of a self - written DENY-Log-Analyser).

After a lot of tries with different log analysers I used **snort_stat.pl** to generated analyses bas ed on daily logs and correlate the data by hand. This perl -script could be downloaded from the SNORT website. (reference 27)

cat ./alert.0107**.B.gz.vers1 |./snort_stat.pl > alerts -0107**.stat

"**" was substituted by date

Then all relevant data are bein g cut out, only the top 10 of every statistical overview were saved. (data in appendix A). Then I took some data to Excel to look for some trends respectively some anomalies. All Excel -created data are described in the related chapters.

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9.2 Scripts for network scan logs

Most scans by source host
Scriptname: **scan.sourcehost.pl**
Activation: ./scans.sourcehost.pl |sort –r –k1 > result.scan.sourcehost
(the sort command is used to sort the count downward)

```perl
#!/usr/bin/perl –w

use strict;
use FileHandle;
my $inplog="scans/sorted.merged.scans";                    #input file
my ($sadr);                                                 #declaration of some variables
my $sum;
my (%user,@usert,@keys,$key);
# Jul 23 23:44:34 10.10.160.114:777   -> 172.172.124.105:3046 UDP   #sample scan log line
open(LOGREAD,"$inplog") or die "open   nicht ok";
while (<LOGREAD>) {
     ($sadr) = /.* \:\d\d\s(.+?)\:.+?\s->\s.+?\:.+?\s.+?\s.*/i;  #regular expression to filter out diff.   Sources
     $user{"$sadr"}+=1;
}
foreach $key (sort(keys %user)) {
$_=$key;
($sadr)=/(.+)/;
printf "%10s % -16s\n",$user{$key},$sadr;
$sum=$sum+$user{$key};
}
printf $sum;
close LOGREAD;
exit;
```

This script is a little bit long for this use, because this is a modified script of a DENY -Log
analyser, which is a little bit more complex, but so it can easy be modified f or my other analyses.

Additional research scripts for 10.10.160.114:

Script name: **scans.dadr.sourcehost.pl**
Activation: ./scans.dadr.sourcehost.pl |sort –r –k1 |less

```perl
#!/usr/bin/perl –w

use strict;
use FileHandle;
my $inplog="scans/sorted.merged.scans";
#my $inplog="test";
my ($dadr);
my $sum;
my (%user,@usert,@keys,$key);
# Jul 23 23:44:34 10.10.160.114:777   -> 172.172.124.105:3046 UDP

open(LOGREAD,"$inplog") or die "open nicht ok";
while (<LOGREAD>) {
   if (/.* \:\d\d\s10\.10\.160\114\:.+?\s->\s.+?\:.+?\s.+?\s.*/i) {
     ($dadr) = /.* \:\d\d\s.+?\:.+?\s->\s(.+?)\:.+?\s.+?\s.*/i;
     $user{"$dadr"}+=1;
   }
}
```

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```perl
}
foreach $key (sort(keys %user)) {
$_=$key;
($dadr)=/(.+)/;
printf "%10s % -16s\n",$user{$key},$dadr;
$sum=$sum+$user{$key};
}
printf $sum;
close LOGREAD;
exit;
```

script name: **scans.dport.sourcehost.pl**
activation: ./scans.dport.sourcehost.pl |sort –r –k1 |less

```perl
#!/usr/bin/perl –w

use strict;
use FileHandle;
my $inplog="scans/sorted.merged.scans";
#my $inplog="test";
my ($dport);
my $sum;
my (%user,@usert,@keys,$key);
# Jul 23 23:44:34 10.10.160.114:777   -> 172.172.124.105:3046 UDP

open(LOGREAD,"$inplog") or die "open nicht ok";
while (<LOGREAD>) {
   if (/.*\:\d\d\s10\.10\.160\114\:.+?\s->\s.+?\:.+?\s.+?\s.*/i) {
      ($dport) = /.* \:\d\d\s.+?\:.+?\s->\s.+?\⊗.+?)\s.+?\s.*/i;
      $user{"$dport"}+=1;
   }
}
foreach $key (sort(keys %user)) {
$_=$key;
($dport)=/(.+)/;
printf "%10s % -16s\n",$user{$key},$dport;
$sum=$sum+$user{$key};
}
printf $sum;
close LOGREAD;
exit;
```

script name: **scans.targethost.pl**
activation: ./scans.targethost.pl |sort –r –k1 |less

```perl
#!/usr/bin/perl –w

use strict;
use FileHandle;
my $inplog="scans/sorted.merged.scans";
#my $inplog="test";
my ($dadr);
my $sum;
my (%user,@usert,@keys,$key);
# Jul 23 23:44:34 10.10.160. 114:777 -> 172.172.124.105:3046 UDP

open(LOGREAD,"$inplog") or die "open nicht ok";
while (<LOGREAD>) {
```

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```perl
     ($dadr) = /.* \:\d\d\s.+?\:.+?\s->\s(.+?)\:.+?\s.+?\s.*/i;
     $user{"$dadr"}+=1;
}
foreach $key (sort(keys %user)) {
$_=$key;
($dadr)=/(.+)/;
printf "%10s % -16s\n",$user{$key},$dadr;
$sum=$sum+$user{$key};
}
printf $sum;
close LOGREAD;
exit;
```

script name: **scans.targetport.pl**
activation: ./scans.targetport.pl |sort –r –k1 |less

```perl
#!/usr/bin/perl –w

use strict;
use FileHandle;
my $inplog="s cans/sorted.merged.scans";
#my $inplog="test";
my ($dport);
my $sum;
my (%user,@usert,@keys,$key);
# Jul 23 23:44:34 10.10.160.114:777   -> 172.172.124.105:3046 UDP

open(LOGREAD,"$inplog") or die "open nicht ok";
while (<LOGREAD>) {
     ($dport) = /.* \:\d\d\s.+?\:.+?\s->\s.+?\⊗.+?)\s.+?\s.*/i;
     $user{"$dport"}+=1;
}
foreach $key (sort(keys %user)) {
$_=$key;
($dport)=/(.+)/;
printf "%10s % -16s\n",$user{$key},$dport;
$sum=$sum+$user{$key};
}
printf $sum;
close LOGREAD;
exit;
```

script name: **scans.targethost.dport6970.pl**
Activation: ./scans.targethost.dport6970.pl |sort –r –k1 |less

```perl
#!/usr/bin/perl –w

use strict;
use FileHandle;
my $inplog="scans/sorted.merged.scans";
#my $inplog="test";
my ($dadr);
my $sum;
my (%user,@usert,@keys,$key);
# Jul 23 2 3:44:34 10.10.160.114:777   -> 172.172.124.105:3046 UDP

open(LOGREAD,"$inplog") or die "open nicht ok";
while (<LOGREAD>) {
```

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```perl
  if (/.* \:\d\d\s.+?\:.+?\s->\s.+?\:6970\s.+?\s.*/i) {
     ($dadr) = /.* \:\d\d\s.+?\:.+?\s->\s(.+?)\:6970\s.+?\s.*/i;
     $user{"$dadr"}+=1;
  }
}
foreach $key (sort(keys %user)) {
$_=$key;
($dadr)=/(.+)/;
printf "%10s % -16s\n",$user{$key},$dadr;
$sum=$sum+$user{$key};
}
printf $sum;
close LOGREAD;
exit;
```

script name: **scans.sourcehost.dport6970.pl**
activation: ./scans.sourcehos t.dport6970.pl |sort –r –k1 |less

```perl
#!/usr/bin/perl  -w

use strict;
use FileHandle;
my $inplog="scans/sorted.merged.scans";
#my $inplog="test";
my ($sadr);
my $sum;
my (%user,@usert,@keys,$key);
# Jul 23 23:44:34 10.10.160.114:777   -> 172.172.124.105:3046 UDP

open(LOGREAD,"$inplog") or die "open nicht ok";
while (<LOGREAD>) {
  if (/.* \:\d\d\s.+?\:.+?\s->\s.+?\:6970\s.+?\s.*/i) {
     ($sadr) = /.* \:\d\d\s(.+?)\:.+?\s->\s.+?\:6970\s.+?\s.*/i;
     $user{"$sadr"}+=1;
  }
}
foreach $key (sort(keys %user )) {
$_=$key;
($sadr)=/(.+)/;
printf "%10s % -16s\n",$user{$key},$sadr;
$sum=$sum+$user{$key};
}
printf $sum;
close LOGREAD;
exit;
```

The scripts **scans.targethost.dport27005.pl** and **scans.sourcehost.dport27005.pl** are similar to
the two scripts for port 69 70 above, only the destination port are changed in the regular
expression.

script name: **oos.sourcehost.pl**
activation: ./scans.sourcehost.pl |sort –r –k1 |less

```perl
#!/usr/bin/perl  -w

use strict;
use FileHandle;
my $inplog="oos/merged.oos";
```

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```perl
my ($sadr);
my (%us er,@usert,@keys,$key);
# 07/23 -10:01:07.985411 198.186.202.147:40726   -> 10.10.70.113:113

open(LOGREAD,"$inplog") or die "open nicht ok";
while (<LOGREAD>) {
   if (/.* \s.+?\:.+?\s->\s.+?\:.+?/i) {
      ($sadr) = /.* \s(.+?)\:.+?\s->\s.+?\:.+?/i;
      $user{"$sadr"}+=1;
   }
}
foreach $key (sort(keys %user)) {
#print $key, "=", $user{$key}, " \n";
$_=$key;
($sadr)=/(.+)/;
printf "%10s % -16s\n",$user{$key},$sadr;
}
close LOGREAD;
exit;
```

Appendix A – Consolidated data from snort_stat.pl output

1. July 23rd, 2001

Subject: snort daily report

The log begins from: 07 23 00:00:06
The log ends   at: 07 23 23:50:23
Total events: 154705
Signatures recorded: 128
Source IP recorded: 7992
Destination IP recorded: 2070
Portscan recorded: 6868

The number of attacks from same host to same
destination using same method

```
=========================================================================
 # of
attacks from          to            method
========================================================================= ==
 9273  10.10.162.228   204.152.190.70   ICMP Echo Request Nmap or HPING2
 4301  10.10.16.5      10.10.162.228    ICMP Destination Unreachable (Communication
                                        Administratively Prohibited)
 3508  216.158.21.42   10.10.137.7      ICMP Destination Unreachable (Communication
                                        Administratively Prohibited)
 2427  10.10.14.1      10.10.162.228    ICMP Destination Unreachable (Communication
                                        Administratively Prohibited)
 2310  10.10.153.196   211.111.214.125  spp_http_decode: IIS Unicode attack detected
 2297  10.10.14.1      10.10.5.4        ICMP Destination Unreachable (Communication
                                        Administratively Prohibited)
 2292  198.32.224.31   10.10.140.9      ICMP Destination Unreachable (Host Unre achable)
 2060  216.158.21.226  10.10.137.7      ICMP Destination Unreachable (Communication
                                        Administratively Prohibited)
 2030  10.10.97.209    64.12.151.216    spp_http_decode: IIS Unicode attack detected
 1850  10.10.85.74     207.200.86.66    spp_http_decode: IIS Unicode attack detected
```

Percentage and number of attacks from a host to a
destination

```
===========================================================
    # of
%  attacks from          to
===========================================================
5.99  9273   10.10.162.228   204.152.190.70
2.78  4301   10.10.16.5      10.10.162.228
```

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2.27	3508	216.158.21.42	10.10.137.7
1.57	2427	10.10.14.1	10.10.162.228
1.49	2310	10.10.153.196	211.111.214.125
1.48	2297	10.10.14.1	10.10.5.4
1.48	2292	198.32.224.31	10.10.140.9
1.33	2060	216.158.21.226	10.10.137.7
1.31	2030	1 0.10.97.209	64.12.151.216
1.20	1850	10.10.85.74	207.200.86.66

Percentage and number of attacks from one host to any
with same method

```
===============================================================
     # of
 %  attacks  fro m         method
===============================================================
```

%	# of attacks	from	method
5.99	9273	10.10.162.228	ICMP Echo Request Nmap or HPING2
3.84	5937	10.10.14.1	ICMP Destination Unreachable (Communication Administratively Pro hibited)
3.81	5901	10.10.16.5	ICMP Destination Unreachable (Communication Administratively Prohibited)
2.97	4592	10.10.97.209	spp_http_decode: IIS Unicode attack detected
2.27	3508	216.158.21.42	ICMP Destinatio n Unreachable (Communication Administratively Prohibited)
1.74	2686	10.10.71.19	spp_http_decode: IIS Unicode attack detected
1.73	2675	10.10.85.74	spp_http_decode: IIS Unicode attack detected
1.69	2620	10.10.153.196	spp_http_decode: IIS Unicode attack detected
1.48	2292	198.32.224.31	ICMP Destination Unreachable (Host Unreachable)
1.34	2066	10.10.153.203	spp_http_decode: IIS Unicode attack detected

The distribution of attack metho ds

```
=============================================
     # of
 %  attacks  method
=============================================
```

%	# of attacks	method
25.19	38972	spp_http_decode
12.71	19666	MISC source port 53 to <1024

	1247	134.93.19.12	-> 10.10.130.122
	160	195.161.192.249	-> 10.10.1.4
	72	63.108.210.10	-> 10.10.1.3
	50	209.182.195.135	-> 10.10.1.3
	49	130.113.45.26	-> 10.10.1.5
	48	130.113.45.26	-> 10.10.1.3
	46	207.25.71.78	-> 10.10.1.5
	41	63.236.72.138	-> 10.10.1.5
	41	130.113.45.26	-> 10.10.1.4
	39	207.25.71.78	-> 10.10.1.4

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```
12.46   19280    MISC traceroute
                 361  192.5.110.20     -> 10.10.140.9
                 361  130.191.18.80    -> 10.10.140.9
                 361  35.8.2.229       -> 10.10.140.9
                 356  128.182.61.50    -> 10.10.140.9
                 354  128.82.254.69    -> 10.10.140.9
                 354  128.114.129.62   -> 10.10.140.9
                 353  18.201.0.122     -> 10.10.140.9
                 353  206.220.240.230  -> 10.10.140.9
                 353  128.103.209.74   -> 10.10.140.9
                 352  198.202.74.41    -> 10.10.140.9

11.70   18106    ICMP Destination Unreachable (Communication Administratively Prohibited)
                 4301 10.10.16.5      -> 10.10.162.228
                 3508 216.158.21.42   -> 10.10.137.7
                 2427 10.10.14.1      -> 10.10.162.228
                 2297 10.10.14.1      -> 10.10.5.4
                 2060 216.158.21.226  -> 10.10.137.7
                 428  192.80.53.46    -> 10.10.140.9
                 308  10.10.16.5      -> 10.10.110.56
                 237  10.10.16.5      -> 10.10.140.196
                 227  10.10.14.1      -> 10.10.10.56
                 189  10.10.16.5      -> 10.10.97.35

10.09   15610    WEB -MISC prefix -get //
                 798  63.48.140.86    -> 10.10.253.114
                 495  208.11.51.239   -> 10.10.253.114
                 285  137.187.30.199  -> 10.10.253.114
                 268  134.192.172.168 -> 10.10.253.114
                 260  208.58.202.152  -> 10.10.253.114
                 211  12.42.37.200    -> 10.10.253.114
                 196  63.82.104.195   -> 10.10.253.114
                 194  140.90.233.216  -> 10.10.253.114
                 194  63.210.219.181  -> 10.10.253.114
                 185  172.159.14.190  -> 10.10.253.114

 6.46    9987    ICMP Echo Request Nmap or HPING2
                 9273 10.10.162.228   -> 204.152.190.70
                 61   10.10.98.159    -> 10.0.3.3
                 36   10.10.137.7     -> 207.245.122.125
                 35   10.10.153.171   -> 24.147.249.241
                 34   10.10.115.115   -> 141.151.19.217
                 34   10.10.115.115   -> 12.154.10.63
                 27   10.10.137.7     -> 216.158.50.240
                 24   10.10.185.35    -> 149.1.1.1
                 21   10.10.97.244    -> 172.160.206.40

 5.72    8846    INFO MSN IM Chat data
                 242  10.10.153.195   -> 64.4.13.138
                 177  64.4.13.192     -> 10.10.97.197
                 172  10.10.97.199    -> 64.4.13.137
```

```
                    149   10.10.97.241     -> 64.4.13.117
                    140   64.4.13.165      -> 10.10.97.180
                    137   10.10.98.164     -> 64.4.13.196
                    134   64.4.13.195      -> 10.10.98.242
                    121   10.10.15.185     -> 64.4.13.165
                    117   10.10.153.201    -> 64.4.13.123
                    109   10.10.218.230    -> 64.4.13.123


        2.06   3180    INFO - ICQ Access
                    84    10.10.97.187     -> 205.188.248.25
                    83    10.10.97.187     -> 64.12.184.121
                    72    10.10.97.159     -> 205.188.248.89
                    68    10.10.97.187     -> 205.188.140.249
                    61    10.10.98.129     -> 64.12.174.153
                    51    10.10.97.187     -> 205.188.248.89
                    50    10.10.98.129     -> 205.188.248.57
                    47    10.10.97.159     -> 205.188.140.249
                    47    10.10.97.187     -> 205.188.140 .185
                    44    10.10.98.129     -> 205.188.140.185


        1.94   2999    MISC Large UDP Packet
                    984   204.248.36.85    -> 10.10.115.74
                    782   211.35.66.166    -> 10.10.153.143
                    607   216.106.166.145  -> 10.10.115.74
                    380   216.106.166.14 7 -> 10.10.115.74
                    237   202.109.129.46   -> 10.10.111.188
                    7     128.2.121.218    -> 10.10.7.10
                    1     207.25.79.227    -> 10.10.178.155
                    1     207.25.79.227    -> 10.10.177.16


        1.87   2890    ICMP Destination Unreachable (Host Unre achable)
                    2292  198.32.224.31    -> 10.10.140.9
                    61    204.177.252.34   -> 10.10.70.161
                    43    63.146.1.33      -> 10.10.70.97
                    14    63.146.1.33      -> 10.10.70.42
                    12    213.65.232.247   -> 10.10.70.97
                    11    63.146.1.33      -> 10.10.135.3
                    9     205.171.4.10     -> 10.10.70.97
                    8     63.146.1.33      -> 10.10.70.72
```

Portscans performed to/from HOME_NET

```
===================================
 # of
attacks  from
===================================
 620    10.10.70.242
 564    10.10.217.114
 355    10.10.100.230
 167    10.10.253.24
 141    10.10.160.114
 106    10.10.150.220
  61    10.10.218.126
  54    10.10.111.157
  54    10.10.70.97
  52    10.10.53.220
```

2. July 24th, 2001

Subject: snort daily report

The log begins from: 07 24 00:00:06
The log ends   at: 07 24 23:51:54
Total events: 160864
Signatures recorded: 115
Source IP recorded: 7697
Destination IP recorded: 2184
Portscan recorded: 6968

The number of attacks from same host to same
destination using same method

```
==================================================================
 # of
attacks  from          to            method
================================================================ ====
 9042   10.10.162.228   204.152.190.70    ICMP Echo Request Nmap or HPING2
 5105   61.153.19.95    10.10.162.164     MISC Large UDP Packet
 4185   10.10.16.5      10.10.162.228     ICMP Destination Unreachable (Communication
                                          Administratively Prohibited)
 3273   10.10.130.127   216.241.219.28    spp_http_decode: CGI Null Byte attack detected
 3001   10.10.85.74     207.200.86.66     spp_http_decode: IIS Unicode attack detected
 2871   10.10.85.74     20 7.200.86.97    spp_http_decode: IIS Unicode attack detected
 2764   216.158.21.226  10.10.137.7       ICMP Destination Unreachable (Communication
                                          Administratively Prohibited)
 2508   216.158.21.42   10.10.137.7       ICMP Destination U  nreachable (Communication
                                          Administratively Prohibited)
 2332   10.10.14.1      10.10.162.228     ICMP Destination Unreachable (Communication
                                          Administratively Prohibited)
 2251   198.32.224.31   10.10.140.9       ICMP Destination Unreachab  le (Host Unreachable)
```

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Percentage and number of attacks from a host to a
destination

```
=========================================================
     # of
  %   attacks  from           to
================================== =====================
  5.62   9042   10.10.162.228    204.152.190.70
  3.17   5106   61.153.19.95     10.10.162.164
  2.60   4185   10.10.16.5       10.10.162.228
  2.03   3273   10.10.130.127    216.241.219.28
  1.87   3001   10.10.85.74      207.200.86.66
  1.83   2949   216.150.152.145  10.10.5.44
  1.78   2871   10.10.85.74      207.200.86.97
  1.72   2764   216.158.21.226   10.10.137.7
  1.56   2508   216.158.21.42    10.10.137.7
  1.45   2332   10.10.14.1       10.10.162.228
```

Percentage and number of attacks from one host to any
with same method

```
==============================================================
     # of
  %   attacks  from           method
==================== ========================================
  5.62   9042   10.10.162.228    ICMP Echo Request Nmap or HPING2
  3.66   5889   10.10.85.74      spp_http_decode: IIS Unicode attack detected
  3.55   5704   10.10.16.5       ICMP Destination Unreac hable (Communication
                                 Administratively Prohibited)
  3.37   5425   10.10.14.1       ICMP Destination Unreachable (Communication
                                 Administratively Prohibited)
  3.17   5105   61.153.19.95     MISC Large UDP Packet
  2.03   3273   10.10.130.127    spp_http_decode: CGI Null Byte attack detected
  1.72   2764   216.158.21.226   ICMP Destination Unreachable (Communication
                                 Administratively Prohibited)
  1.59   2552   10.10.157.108    spp_http_decode: IIS Unicode attack detected
  1.58   2545   216.150.152.145  ICMP Echo Request L3retriever Ping
  1.58   2534   216.150.152.145  SMB Name Wildcard
```

Percentage and number of attacks to one certain host

```
=================================================================
      # of
  %   attacks  to           method
=================================================================
11.32  18216   10.10.140.9       MISC traceroute
 9.26  14890   10.10.253.114     WEB -MISC prefix -get //
 5.62   9042   204.152.190.70    ICMP Echo Request Nmap or HPING2
 4.45   7166   10.10.1.3         MISC source port 53 to <1024
 4.05   6517   10.10.162.228     ICMP Destination Unreachable (Communication
                                 Administratively Prohibited)
 3.50   5625   10.10.1.5         MISC source port 53 to <1024
 3.35   5392   64.12.151.216     spp_http_decode: IIS Unicode attack detected
 3.28   5272   10.10.137.7       ICMP Destination Unreachable (Communication
                                 Administratively Prohibited)
 3.22   5178   216.241.219.28    spp_http_decode: CGI Null Byte attack detected
 3.17   5105   10.10.162.164     MISC Large UDP Packet
```

The distribution of attack methods

```
==========================================
      # of
  %   attacks  method
==========================================
20.17  32439    spp_http_decode
11.97  19259    MISC source port 53 to <1024
               1020  134.93.19.12    -> 10.10.130.122
                 56  208.48.26.15    -> 10.10.1.3
                 54  63.108.210.10   -> 10.10.1.3
                 54  207.25.71.78    -> 10.10.1.5
                 53  149.173.1.4     -> 10.10.1.5
                 46  169.207.0.9     -> 10.10.1.4
                 42  205.197.182.100 -> 10.10.1.5
                 37  216.32.74.10    -> 10.10.1.2
                 37  207.25.71.78    -> 10.10.1.4

11.34  18242    MISC traceroute
                392  129.137.254.5   -> 10.10.140.9
                353  128.103.209.74  -> 10.10.140.9
                347  129.119.224.250 -> 10.10.140.9
                343  128.195.186.5   -> 10.10.140.9
                343  129.89.70.20    -> 10.10.140.9
                342  129.116.218.196 -> 10.10.140.9
                341  128.118.58.5    -> 10.10.140.9
                341  199.249.169.82  -> 10.10.140.9
                340  131.215.48.15   -> 10.10.140.9
                339  130.191.18.80   -> 10.10.140.9

 9.27  14914    WEB -MISC prefix -get //
                479  199.196.144.13  -> 10.10.253.114
                321  209.218.232.100 -> 10.10.253.114
```

```
267   207.86.98.202    -> 10.10.253.114
232   169.253.4.1      -> 10.10.253.114
215   208.146.240.164  -> 10.10.253.114
212   24.249.229.91    -> 10.10.253.114
197   65.201.178.34    -> 10.10.253.114
197   198.139.249.94   -> 10.10.253.114
195   63.253.99.158    -> 10.10.253.114
194   63.44.135.162    -> 10.10.253.114
```

6.97   11206   INFO MSN IM Chat data
```
589   64.4.13.132      -> 10.10.218.186
220   10.10.98.204     -> 64.4.13.195
211   64.4.13.164      -> 10.10.218.230
187   10.10.98.204     -> 64.4.13.191
160   10.10.98.106     -> 64.4.13.126
151   64.4.13.123      -> 10.10.97.43
130   10.10.153.241    -> 64.4.13.126
122   10.10.97.78      -> 64.4.13.133
120   10.10.98.189     -> 64.4.13.168
112   10.10.98.109     -> 64.4.13.191
```

6.00   9644   ICMP Ec ho Request Nmap or HPING2
```
9042  10.10.162.228    -> 204.152.190.70
85    10.10.17.47      -> 65.229.226.249
70    10.10.98.154     -> 64.58.77.28
55    10.10.137.7      -> 207.245.122.125
53    10.10.98.235     -> 64.231.214.213
43    10.10.137.7      -> 216.158.50.240
32    10.10.98.235     -> 24.88.213.8
28    10.10.98.192     -> 65.15.57.92
27    10.10.98.235     -> 66.31.59.224
18    10.10.153.141    -> 24.21.224.230
```

5.68   9137   spp_http_decode

3.42   5500   MISC Large UDP Packet
```
5105  61.153.19.95     -> 10.10.162.164
316   209.132.218.11   -> 10.10.153.147
73    63.250.209.74    -> 10.10.178.141
5     208.48.88.11     -> 10.10.98.153
1     207.25.79.227    -> 10.10.97.219
```
1.96   3157   ICMP Destination Unreachable (Host Unreachable)
```
2251  198.32.224.31    -> 10.10.140.9
273   63.146.1.33      -> 10.10.70.11
57    142.169.13.225   -> 10.10.70.174
20    207.136.109.3    -> 10.10.70.11
18    195.249.6.93     -> 10.10.70.97
```
1.87   3007   INFO - ICQ Access
```
109   10.10.217.18     -> 205.188.248.89
97    10.10.217.18     -> 205.188.248.25
89    10.10.98.164     -> 64.12.184.89
```

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```
88    10.10.98.164    -> 205.188.248.25
87    10.10.98.122    -> 152.163.180.24
72    10.10.217.18    -> 205.188.248.57
52    10.10.98.225    -> 205.188.248.25
46    10.10.98.152    -> 64.12.174.153
46    10.10.97.184    -> 152.163.180.24
45    10.10.97.207    -> 64.12.184.57
```

Portscans performed to/from HOME_NET

```
==================================
 # of
 attacks  from
==================================
637    10.10.217.114
609    10.10.70.242
315    10.10.100.230
275    10.10.253.24
174    10.10.150.220
162    10.10.160.114
141    10.10.218.106
107    10.10.60.43
69     10.10.218.206
```

3. July 25th, 2001

Subject: snort daily report

The log begins from: 07 25 00:00:05
The log ends   at: 0 7 25 23:52:57
Total events: 245927
Signatures recorded: 111
Source IP recorded: 8602
Destination IP recorded: 7811
Portscan recorded: 7270

The number of attacks from same host to same
destination using same method

```
=========================================  ==========================
 # of
 attacks  from          to          method
=========================================  ==========================
24163    10.10.75.150    216.241.219.14    spp_http_decode: CGI Null Byte attack detecte  d
10484    10.10.157.108   207.200.89.193    spp_http_decode: IIS Unicode attack detected
 9177    10.10.162.228   204.152.190.70    ICMP Echo Request Nmap or HPING2
 7532    10.10.157.108   207.200.89.225    spp_http_decode: IIS U  nicode attack detected
 5664    10.10.104.47    207.200.86.66     spp_http_decode: IIS Unicode attack detected
 5618    10.10.85.74     207.200.86.97     spp_http_decode: IIS Unicode attack detected
```

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4426	10.10.85.74	207.200.86 .66	spp_http_decode: IIS Unicode attack detected
4401	10.10.104.47	207.200.86.97	spp_http_decode: IIS Unicode attack detected
4291	10.10.16.5	10.10.162.228	ICMP Destination Unreachable (Communication Administra tively Prohibited)
4236	216.150.152.145	10.10.5.44	SMB Name Wildcard

Percentage and number of attacks from a host to a
destination

```
===========================================================
     # of
 %   attacks from           to
===========================================================
 9.83  24163    10.10.75.150     216.241.219.14
 4.26  10484    10.10.157.108    207.200.89.193
 3.73  9177     10.10.162.228    204.152.190.70
 3.44  8448     216.150.152.145  10.10.5.44
 3.06  7532     10.10.157.108    207.200.89.225
 2.81  6906     216.150.152.145  10.10.5.45
 2.30  5664     10.10.104.47     207.200.86.66
 2.28  5618     10.10.85.74      207.200.86.97
 1.80  4426     10.10.85.74      207.200.86.66
 1.79  4401     10.10.104.47     207.200.86.97
```

Percentage and number of attacks from one host to any
with same method

```
============================================================
     # of
 %   attacks from         method
============================================================
 9.83  24163  10.10.75.150    spp_http_decode: CGI Null Byte attack detected
 8.80  21644  10.10.157.108    spp_http_decode: IIS Un icode attack detected
 4.09  10065  10.10.104.47    spp_http_decode: IIS Unicode attack detected
 4.08  10044  10.10.85.74     spp_http_decode: IIS Unicode attack detected
 3.73  9177   10.10.162.228   ICMP Echo Request Nmap or HP ING2
 3.13  7692   216.150.152.145   SMB Name Wildcard
 3.12  7662   216.150.152.145   ICMP Echo Request L3retriever Ping
 2.84  6995   10.10.16.5    ICMP Destination Unreachable (Communication
                              Administratively Prohibited)
 2.51  6165   10.10.14.1    ICMP Destination Unreachable (Communication
                              Administratively Prohibited)
 1.61  3961   10.10.15.71    spp_http_decode: IIS Unicode attack detected
```

Percentage and number of attacks to one certain host

```
=================================================================
     # of
 %   attacks to           method
=================================================================
 9.83  24163  216.241.219.14   spp_http_decode: CGI Null Byte attack d etected
```

7.73	19021	10.10.140.9	MISC traceroute
6.00	14747	10.10.253.114	WEB -MISC prefix -get //
5.11	12564	207.200.89.193	spp_http_decode: IIS Unicode attack detected
4.46	10970	207.200.86.66	spp_http_decode: IIS Unicode attack detected
4.35	10710	207.200.86.97	spp_http_decode: IIS Unicode attack detected
4.08	10032	207.200.89.225	spp_http_decode: IIS Unicode attack detected
3.73	9177	204.152.190.70	ICMP Ec ho Request Nmap or HPING2
2.71	6658	10.10.162.228	ICMP Destination Unreachable (Communication Administratively Prohibited)
2.59	6364	10.10.1.4	MISC source port 53 to <1024

The distribution of attack methods

=============== =============================

	# of	
%	attacks	method

===

28.80	70820	spp_http_decode
12.05	29631	spp_http_decode
9.77	24039	Possible trojan server activity

6	137.216.4.10	-> 10.10.4.3
6	64.229.69.60	-> 10.10.218.106
6	10.10.53.39	-> 64.231.133.240
5	10.10.217.70	-> 64.245.58.28
4	10.10.226.177	-> 24.226.114.182
4	24.141.140.131	-> 10.10.18.9
4	24.169.166.164	-> 10.10.153.72
4	24.36.83.12	-> 10.10.68.32
4	64.229.20.127	-> 10.10.204.78
4	10.10.226.245	-> 24.226.114.182

| 7.75 | 19070 | MISC traceroute |

362	131.247.254.97	-> 10.10.140.9
361	199.165.80.10	-> 10.10.140.9
359	128.182.61.50	-> 10.10.140.9
357	146.229.127.200	-> 10.10.140.9
356	137.145.206.101	-> 10.10.140.9
356	128.82.254.69	-> 10.10.140.9
356	129.79.20.239	-> 10.10.140.9
353	131.215.48.15	-> 10.10.140.9
352	216.79.60.26	-> 10.10.140.9
352	128.118.58.5	-> 10.10.140.9

| 7.04 | 17309 | ICMP Destination Unreachable (Communication Adminis tratively Prohibited) |

4291	10.10.16.5	-> 10.10.162.228
2367	10.10.14.1	-> 10.10.162.228
2225	10.10.14.1	-> 10.10.5.4
2186	216.158.21.226	-> 10.10.137.7
920	216.158.21.42	-> 10.10.137.7
513	192.80.53.46	-> 10.10.140.9
444	10.10.16.5	-> 10.10.111.131

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```
                        375   10.10.16.5      -> 10.10.98.145
                        303   10.10.16.5      -> 10.10.110.56
                        247   10.10.14.1      -> 10.10.98.160

            6.03   14839    WEB -MISC prefix -get //
                        354   66.44.15.104    -> 10.10.253.114
                        317   137.187.144.220 -> 10.10.253.114
                        292   207.144.254.249 -> 10.10.253.114
                        270   198.26.130.37   -> 10.10.253.114
                        238   128.8.23.129    -> 10.10.253.114
                        219   141.161.104.140 -> 10.10.253.114
                        208   198.50.63.15    -> 10.10.253.114
                        206   66.44.17.127    -> 10.10.253.114
                        199   208.210.197.2   -> 10.10.253.114
                        195   63.16.79.64     -> 10.10.253.114
            3.90   9603     INFO MSN IM Chat data
                        226   10.10.98.113    -> 64.4.13.133
                        177   10.10.98.128    -> 64.4.13.192
                        165   10.10.98.250    -> 64.4.13.117
                        152   10.10.98.202    -> 64.4.13.125
                        149   64.4.13.168     -> 10.10.219.10
                        146   64.4.13.194     -> 10.10.160.121
                        145   10.10.98.112    -> 64.4.13.138
                        129   64.4.13.165     -> 10.10.97.220
                        119   10.10.160.179   -> 64.4.13.164
                        113   64.4.13.113     -> 10.10.98.162

            3.83   9424     ICMP Echo Request Nmap or HPING2
                        9177  10.10.162.228   -> 204.152.190.70
                        60    10.10.97.209    -> 204.192.47.24
                        48    10.10.137.7     -> 207.245.122.125
                        21    10.10.137.7     -> 216.158.50.240
                        14    10.10.97.192    -> 64.65.45.117
                        8     10.10.99.53     -> 149.1.1.1
                        8     10.10.110.33    -> 149.1.1.1
                        7     10.10.150.220   -> 193.145.124.6
                        6     10.10.10.21     -> 149.1.1.1
                        5     10.10.99.225    -> 149.1.1.1
            3.21   7886     SMB Name Wildcard
                        4236  216.150.152.145 -> 10.10.5.44
                        3456  216.150.152.145 -> 10.10.5.45
                        12    130.13.103.236  -> 10.10.137.5
                        11    211.192.158.74  -> 10.10.132.1
                        10    216.158.50.7    -> 10.10.137.7

            3.18   7824     ICMP Echo Request L3retriever Ping
                        4212  216.150.152.145 -> 10.10.5.44
                        3450  216.150.152.145 -> 10.10.5.45
                        155   10.10.98.172    -> 64.14.116.72
                        4     10.10.137.7     -> 216.158.50.240
                        3     207.245.122.125 -> 10.10.137.7
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```

Portscans performed to/from HOME_NET

================================
 # of
attacks from
================================
 680   10.10.70.242
 326   10.10.100.230
 307   10.10.253.24
 286   10.10.217.114
 233   10.10.150.220
 135   10.10.160.114
 89   10.10.218.206
 75   10.10.253.53
 75   24.180.237.142
 51   10.10.98.147

4. July 26th, 2001

Subject: snort daily report

The log begins from: 07 26 00:00:06
The log ends   at: 07 26 23:51:35
Total events: 184370
Signatures recorded: 122
Source IP recorded: 70 42
Destination IP recorded: 3187
Portscan recorded: 5957

The number of attacks from same host to same
destination using same method

==
 # of
attacks from   to   method
==
 13131   216.166.219.72   10.10.160.114   High port 65535 udp   - possible Red Worm -
                                             traffic
 12136   10.10.157.108   207.200.89.225   spp_http_decode: IIS Unic ode attack detected
 9360   10.10.157.108   207.200.89.193   spp_http_decode: IIS Unicode attack detected
 8615   10.10.162.228   204.152.190.70   ICMP Echo Request Nmap or HPING2
 6096   10.10.157.108   64.12.151.216   spp_h ttp_decode: IIS Unicode attack detected
 4021   10.10.16.5   10.10.162.228   ICMP Destination Unreachable (Communication
                                             Administratively Prohibited)
 3217   10.10.85.74   207.200.86.97   spp_http_decode: IIS Unicode attack detec ted
 2860   10.10.71.19   64.12.151.216   spp_http_decode: IIS Unicode attack detected
 2549   10.10.85.74   207.200.86.66   spp_http_decode: IIS Unicode attack detected

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```
2526    216.158.21.42    10.10.137.7        ICMP Dest ination Unreachable (Communication
                                             Administratively Prohibited)
```

Percentage and number of attacks from a host to a
destination

```
=========================================================
      # of
  %   attacks   from            to
=========================================================
7.12   13131    216.166.219.72    10.10.160.114
6.58   12136    10.10.157.108     207.200.89.225
5.08   9360     10.10.157.108     207.200.89.193
4.67   8615     10.10.162.228     204.152.190.70
3.31   6096     10.10.157.108     64.12.151.216
2.68   4947     216.150.152.145   10.10.5.45
2.45   4518     216.150.152.145   10.10.5.44
2.18   4021     10.10.16.5        10.10.162.228
1.74   3217     10.1 0.85.74      207.200.86.97
1.55   2860     10.10.71.19       64.12.151.216
```

Percentage and number of attacks from one host to any
with same method

```
===============================================================
      # of
  %   attacks   from            method
===============================================================
15.11  27856    10.10.157.108      spp_http_decode: IIS Unicode attack detected
7.12   13131    216.166.219.72     High port 65535 udp  - possible Red Worm - traffic
4.67   8615     10.10.162.228      ICMP Echo Request Nmap or HPING2
3.13   5770     10.10.85.74        spp_http_decode: IIS Unicode attack detected
3.10   5720     10.10.16.5         ICMP Destination Unreachable (Communication
                                    Administratively Prohi bited)
2.89   5336     10.10.14.1         ICMP Destination Unreachable (Communication
                                    Administratively Prohibited)
2.59   4780     216.150.152.145    SMB Name Wildcard
2.54   4680     216.150.152.145    ICMP Echo Request L3retriever Ping
2.53   4668     10.10.71.19        spp_http_decode: IIS Unicode attack detected
1.43   2630     10.10.153.146      spp_http_decode: IIS Unicode attack detected
```

Percentage and number of attacks to one certain host

```
==============================  ============================
      # of
  %   attacks  to           method
==============================================================
9.41   17344   10.10.140.9      MISC traceroute
7.78   14350   207.200.89.225    s pp_http_decode: IIS Unicode attack detected
7.12   13131   10.10.160.114     High port 65535 udp  - possible Red Worm - traffic
5.87   10814   64.12.151.216    spp_http_decode: IIS Unicode attack detected
```

5.52	10174	207.200.89.193	spp _http_decode: IIS Unicode attack detected
5.06	9325	10.10.253.114	WEB -MISC prefix -get //
4.67	8615	204.152.190.70	ICMP Echo Request Nmap or HPING2
3.42	6299	10.10.162.228	ICMP Destination Unreachable (Communication Administratively Prohibited)
2.78	5134	10.10.1.3	MISC source port 53 to <1024
2.49	4595	10.10.1.5	MISC source port 53 to <1024

The distribution of attack methods

```
============================================
     # of
 %  attacks  method
============================================
32.44   59810    spp_http_decode
 9.44   17396    MISC traceroute
                336   128.252.120.3    -> 10.10.140.9
                334   129.137.254.5    -> 10.10.140.9
                330   128.114.129.62   -> 10.10.140.9
                327   170.140.127.97   -> 10.10.140.9
                327   128.249.1.199    -> 10.10.140.9
                327   146.229.127.200  -> 10.10.140.9
                325   137.145.206.116  -> 10.10.140.9
                325   129.237.15.1     -> 10.10.140.9
                324   18.201.0.122     -> 10.10.140.9
                322   137.78.21.22     -> 10.10.140.9

 8.48   15642    ICMP Destination Unreachable (Communication Administratively Prohibited)
                4021  10.10.16.5       -> 10.10.162.228
                2526  216.158.21.42    -> 10.10.137.7
                2278  10.10.14.1       -> 10.10.162.228
                2082  10.10.14.1       -> 10.10.5.4
                1486  216.158.21.226   -> 10.10.137.7
                366   192.80.53.46     -> 10.10.140.9
                264   10.10.16.5       -> 10.10.1 10.56
                189   10.10.16.5       -> 10.10.2 18.114
                166   10.10.16.5       -> 10.10.60.11
                158   10.10.16.5       -> 10.10.98.200

 7.16   13207    High port 65535 udp  - possible Red Worm - traffic
                13131  216.166.219.72  -> 10.10.160.114
                16     217.59.83.45    -> 10.10.163.54
                14     209.10.56.35    -> 10.10.177.22
                11     217.59.83.44    -> 10.10.163.54
                8      62.158.28.160   -> 10.10.70.242
                8      209.10.56.38    -> 10.10.177.22
                4      62.227.62.212   -> 10.10.70.242
                3      64.182.96.150   -> 10.10.160.169
                3      199.34.53.73    -> 10.10.183.12

 5.61   10334    INFO MSN IM Chat data
```

```
              196   64.4.13.191      -> 10.10.98.129
              184   10.10.97.21      -> 64.4.13.121
              157   10.10.160.179    -> 64.4.13.161
              152   64.4.13.121      -> 10.10.97.21
              150   64.4.13.135      -> 10.10.98.124
              144   10.10.98.183     -> 64.4.13.115
              142   10.10.160.179    -> 64.4.13.197
              122   10.10.97.169     -> 64.4.13.121
              121   10.10.98.22 6    -> 64.4.13.123
              110   10.10.98.124     -> 64.4.13.135

5.38   9928   ICMP Echo Request Nmap or HPING2
              8615  10.10.162.228    -> 204.152.190.70
              144   10.10.97.69      -> 10.0.3.3
              51    10.10.98.109     -> 206.251.6.192
              38    10.10.98.211     -> 24.182.118.68
              38    10.10.98.211     -> 24.222.133.138
              37    10.10.115.115    -> 66.41.33.78
              32    10.10.137.7      -> 216.158.50.240
              31    10.10.97.162     -> 24.116.72.121
              30    10.10.98.211     -> 66.56.140 .64
              28    10.10.137.7      -> 207.245.122.125

5.07   9347   WEB -MISC prefix -get //
              250   206.71.96.3      -> 10.10.253.114
              246   63.22.71.141     -> 10.10.253.114
              194   64.91.149.214    -> 10.10.253.114
              185   24.4.252.26      -> 10.10.253.114
              162   63.21.84.171     -> 10.10.253.114
              159   198.26.119.86    -> 10.10.253.114
              129   216.76.144.73    -> 10.10.253.114
              126   141.157.90.35    -> 10.10.253.114
              121   24.4.252.28      -> 10.10.253.114
              116   131.11 8.250.205 -> 10.10.253.114

2.69   4968   SMB Name Wildcard
              2490  216.150.152.145  -> 10.10.5.45
              2290  216.150.152.145  -> 10.10.5.44
              11    204.245.190.131  -> 10.10.132.10
              10    64.12.34.214     -> 10.10.137.7

2.55   4704   ICMP Echo Request L3retriever P ing
              2452  216.150.152.145  -> 10.10.5.45
              2228  216.150.152.145  -> 10.10.5.44
              11    207.245.122.245  -> 10.10.137.7
              4     10.10.137.7      -> 216.158.50.240
              3     10.10.97.157     -> 146.225.100.239
              2     216.158.50.245   -> 10.10.137.7
              2     216.158.50.240   -> 10.10.137.7
              2     10.10.98.201     -> 209.202.149.202
1.75   3218   Watchlist 000222 NET -NCFC
```

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```
          1048  159.226.125.129  -> 10.10.6.47
          571   159.226.39.4     -> 10.10.6.7
          357   159.226.125.129  -> 10.10.6.34
          342   159.226.5.83     -> 10.10.100.165
          289   159.226.39.4     -> 10.10.253.43
          207   159.226.8.67     -> 10.10.100.165
          175   159.226.39.4     -> 10.10.253.41
          124   159.226.158.174  -> 10.10.253.114
          98    159.226.39.4     -> 10.10.253.42
          4     159.226.5.222    -> 10.10.100.230
          3     159.226.6.2      -> 10.10.111.197
```

Portscans performed to/from HOME_NET

====================================

```
 # of
 attacks  from
```
====================================

```
 692   10.10.217.114
 531   10.10.70.242
 315   10.10.150.220
 312   10.10.100.230
 234   10.10.253.24
 96    10.10.6.45
 93    10.10.160.114
 78    141.157.88.27
 71    10.10.218.206
 51    10.10.253.53
```

5. July 27th, 2001

Subject: snort daily report

The log begins from: 07 27 00:00:08
The log ends   at: 07 27 23:52:24
Total events: 158938
Signatures recorded: 118
Source IP recorded: 7275
Destination IP recorded: 2139
Portscan recorded: 6068

The number of attacks from same host to same
destination using same method

==

```
 # of
 attacks  from          to           met hod
```
==

```
 9528   10.10.162.228   204.152.190.70    ICMP Echo Request Nmap or HPING2
```

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```
8733    204.178.125.65   10.10.163.111      BACKDOOR NetMetro Incoming Traffic
5556    10.10.157.108    207.200.89.193     spp_http_decode: IIS Unicode attack detected
4419    10.10.16.5       10.10.162.228      ICMP Destination Unreachable (Communication
                                            Administratively Prohibited)
3867    10.10.98.181     207.200.86.66      spp_http_decode: IIS Unicode attack detected
3804    10.10.157.108    207.200.89.225     spp_http_decode: IIS Unicode attack detected
3090    216.158.21.42    10.10.137.7        ICMP Destination Unreachable (Communication
                                            Administratively Prohibited)
2927    216.150.152.145  10.10.5.45         SMB Name Wildcard
2912    216.150.152.145  10.10.5.45         ICMP Echo Request L3retriever Ping
2732    216.158.21.226   10.10.137.7        ICMP Destination Unreachable (Communication
                                            Administratively Prohibited)
```

Percentage and number of attacks from a host to a
destination

```
========================================================
      # of
 %    attacks   from              to
============================= ===============================
5.99  9528      10.10.162.228    204.152.190.70
5.49  8733      204.178.125.65   10.10.163.111
3.67  5839      216.150.152.145  10.10.5.45
3.50  5556      10.10.157.108    207.200.89.193
2.78  4419      10.10.16.5       10.10.162.228
2.44  3874      216.150.152.145  10.10.5.44
2.43  3867      10.10.98.181     207.200.86.66
2.39  3804      10.10.157.108    207.200.89.225
1.94  3090      216.158.21.42    10.10.137.7
1.72  2732      216.158.21.226   10.10.137.7
```

Percentage and number of attacks from one host to any
with same method

```
================================================================
      # of
 %    attacks   from           method
============= ===================================================
6.55  10404    10.10.157.108    spp_http_decode: IIS Unicode attack detected
5.99  9528     10.10.162.228    ICMP Echo Request Nmap or HPING2
5.49  8733     204.178.125.65   BACKDOOR NetMetro Incoming Traffic
3.57  5670     10.10.14.1       ICMP Destination Unreachable (Communication
                                Administratively Prohibited)
3.52  5589     10.10.98.181     spp_http_decode: IIS Unicode attack detected
3.41  5420     10.10.16.5       ICMP Destination Unreachable (Communication
                                Administratively Prohibited)
3.07  4887     216.150.152.145  SMB Name Wildcard
3.04  4826     216.150.152.145  ICMP Echo Request L3retriever Ping
1.94  3090     216.158.21.42    ICMP Destination Unreachable (Communication
                                Administratively Prohibited)
```

1.72 2732 216.158.21.226   ICMP Destination Unreachable (Communication
                                   Administratively Prohibited)

Percentage and number of attacks to one certain host
======================== ======================================
     # of
  %   attacks to   method
==

12.38   19673   10.10.140.9   MISC traceroute
11.17   17752   10.10.1.3   MISC source port 53 to <1024
 6.19   9832   10.10.253.114   WEB -MISC prefix -get //
 5.99   9528   204.152.190.70   ICMP Echo Request Nmap or HPING2
 5.49   8733   10.10.163.111   BACKDOOR NetMetro Incoming Traffic
 4.39   6970   10.10.162.228   ICMP Destination Unreachable (Communication
                                   Administratively Prohibited)
 3.92   6223   207.200.89.193   spp_http_decode: IIS Unicode attack detected
 3.66   5822   10.10.137.7   ICMP Destination Unreachable (Communicatio n
                                   Administratively Prohibited)
 3.42   5430   10.10.1.5   MISC source port 53 to <1024
 2.92   4646   10.10.1.4   MISC source port 53 to <1024

The distribution of attack methods
==
     # of
  %   attacks method
==

18.49   29385   MISC source port 53 to <1024
             1699 206.132.75.247 -> 10.10.1.3
             1394 206.132.75.249 -> 10.10.1.3
             1249 134.93.19.12   -> 10.10.130. 122
              943 209.184.192.51 -> 10.10.1.3
              941 209.184.192.50 -> 10.10.1.3
              550 207.127.157.135 -> 10.10.1.3
              480 205.232.111.3   -> 10.10.1.3
              471 205.232.111.2   -> 10.10.1.3
              361 207.127.157.10 -> 10.10.1.3
              288 207.171.178.7   -> 10.10.1.3
16.78   26664   spp_http_decode
12.39   19699   MISC traceroute
              379 128.82.254.69   -> 10.10.140.9
              375 192.5.110.20   -> 10.10.140.9
              373 206.220.240.230 -> 10.10.140.9
              371 139.78.100.102 -> 10.10.140.9
              370 152.3.2.244   -> 10.10.140.9
              368 138.26.220.46   -> 10.10.140.9
              368 18.201.0.122   -> 10.10.140.9
              367 132.198.101.254 -> 10.10.140.9
              367 129.237.15.1   -> 10.10.140.9
              367 128.182.61.50   -> 10.10.140.9

6.56   10428   ICMP Echo Request Nmap or HPING2
              9528   10.10.162.228   -> 204.152.190.70
              461   10.10.156.125   -> 207.46.131.30
              69   10.10.97.224   -> 10.0.3.3
              62   10.10.137.7   -> 216.158.50.240
              39   10.10.98.134   -> 206.45.220.176
              19   10.10.99.53   -> 149.1.1.1
              18   10.10.97.222   -> 146.83.19.208
              18   10.10.98.134   -> 4.43.165.85
              16   10.10.97.205   -> 216.35.217.28
              10   10.10.110.33   -> 149.1.1.1

6.19   9835   WEB -MISC prefix -get //
              282   63.44.198.248   -> 10.10.253.114
              275   61.168.11.14   -> 10.10.253.114
              242   63.74.185.126   -> 10.10.253.114
              236   24.6.134.211   -> 10.10.253.114
              202   24.4.161.134   -> 10.10.253.114
              186   206.99.186.21   -> 10.10.253.114
              179   24.13.120.48   -> 10.10.253.114
              165   134.113.185.96 -> 10.10.253.114
              159   206.128.71.76   -> 10.10.253.114
              159   216.10.178.218 -> 10.10.253.114

5.49   8733   BACKDOOR NetMetro Incoming Traffic
              8733   204.178.125.65 -> 10.10.163.111
4.46   7083   INFO MSN IM Chat data
              246   10.10.98.221   -> 64.4.13.167
              204   10.10.139.10   -> 64.4.13.117
              182   64.4.13.135   -> 10.10.98.126
              177   64.4.13.167   -> 10.10.98.221
              173   64.4.13.161   -> 10.10.97.16
              170   10.10.97.178   -> 64.4.13.196
              161   64.4.13.137   -> 10.10.99.39
              140   64.4.13.165   -> 10.10.53.40
              98   10.10.97.199   -> 64.4.13.193
              97   64.4.13.197   -> 10.10.97.161

3.18   5054   SMB Name Wildcard
              2927   216.150.152.145 -> 10.10.5.45
              1960   216.150.152.145 -> 10.10.5.44
              6   130.13.91.62   -> 10.10.133.115
              6   130.13.149.59   -> 10.10.137.235
              6   65.2.38.115   -> 10.10.132.119
              6   211.220.82.215 -> 10.10.137.11
              6   211.236.46.105 -> 10.10.135.119
              6   130.13.163.2 44 -> 10.10.133.14
              5   130.13.148.165 -> 10.10.135.146
3.08   4900   ICMP Echo Request L3retriever Ping
              2912   216.150.152.145 -> 10.10.5.45
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```
                      1914  216.150.152.145  -> 10.10.5.44
                        52  216.158.50.245   -> 10.10.137.7
                         6  207.245.122.245  -> 10.10.137.7
                         4  10.10.137.7      -> 216.158.50.240
                         4  207.245.122.125  -> 10.10.137.7
                         4  216.158.50.240   -> 10.10.137.7
                         2  209.205.91.18    -> 10.10.60.16
                         2  209.205.91.18    -> 10.10.60.11
       2.12   3375      ICMP Destination Unreachable (Host Unreachable)
                      2338  198.32.224.31    -> 10.10.140.9
                        63  63.146.1.33      -> 10.10.70.11
                        63  131.118.255.17   -> 10.10.70.225
                        50  131.118.255.17   -> 10.10.140.9
                        24  209.165.57.5     -> 10.10.70.11
                        24  131.118.255.17   -> 10.10.70.161
                        21  193.152.5.161    -> 10.10.70.161
                        20  131.118.255.17   -> 10.10.137.7
                        18  213.65.232.247   -> 10.10.70.11
                        15  63.146.1.33      -> 10.10.135.3
```

Portscans performed to/from HOME_NET

===================================
 # of
attacks from
===================================
```
598    10.10.70.242
396    10.10.217.26
285    10.10.100.230
259    10.10.150.220
254    10.10.253.24
142    10.10.160.114
 88    10.10.186.17
 78    199.183.24.194
 77    10.10.111.89
 69    10.10.53.197
```

6. July 28th, 2001

Subject: snort daily report

The log begins from: 07 28 00:00:07
The log ends   at: 07 28 23:56:46
Total events: 102748
Signatures recorded: 109
Source IP recorded: 4847
Destination IP recorded: 1752
Portscan recorded: 4890

The number of attacks from same host to same
destination using same method

== =======================

# of attacks	from	to	method
9723	10.10.162.228	204.152.190.70	ICMP Echo Request Nmap or HPING2
4664	10.10.16.5	10.10.162.228	ICMP Destination Unreachable (Communication Administratively Prohibited)
3412	216.150.152.145	10.10.5.45	SMB Name Wildcard
3391	216.150.152.145	10.10.5.45	ICMP Echo Request L3retriever Ping
2782	216.158.21.42	10.10.137.7	ICMP Destination Unreachable (Communication Administratively Prohibited)
2702	10.10.14.1	10.10.162.228	ICMP Destination Unreachable (Communication Administratively Prohibited)
2611	10.10.14.1	10.10.5.4	ICMP Destination Unreachable (Communication Administratively Prohibited)
2527	216.158.21.226	10.10.137.7	ICMP Destination Unreachable (Communication Administratively Prohibited)
2443	198.32.224.31	10.10.140.9	ICMP Destination Unreachable (Host Unreachable)
2429	10.10.16.5	10.10.115.155	ICMP Destination Unreachable (Communication Administratively Prohibited)

Percentage and number of attacks from a h ost to a
destination

==

%	# of attacks	from	to
9.46	9723	10.10.162.228	204.152. 190.70
6.62	6803	216.150.152.145	10.10.5.45
4.64	4768	216.150.152.145	10.10.5.44
4.54	4664	10.10.16.5	10.10.162.228
2.71	2782	216.158.21.42	10.10.137.7
2.63	2702	10.10.14.1	10.10.162.228
2.54	2611	10.10.14.1	10.10.5.4
2.46	2527	216.158.21.226	10.10.137.7
2.38	2443	198.32.224.31	10.10.140.9
2.36	2429	10.10.16.5	10.10.115.155

Percentage and number of attacks from one host to any
with same method

==

%	# of attacks	from	method
9.46	9723	10.10.162.2 28	ICMP Echo Request Nmap or HPING2

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%	# of attacks	to	method
8.04	8261	10.10.16.5	ICMP Destination Unreachable (Communication Administratively Prohibited)
5.94	6108	10.10.14.1	ICMP Destination Unreachable (Communication Administratively Proh ibited)
5.63	5786	216.150.152.145	SMB Name Wildcard
5.63	5785	216.150.152.145	ICMP Echo Request L3retriever Ping
2.71	2782	216.158.21.42	ICMP Destination Unreachable (Communication Administratively Prohibited)
2.46	2527	216.158.21.226	ICMP Destination Unreachable (Communication Administratively Prohibited)
2.38	2443	198.32.224.31	ICMP Destination Unreachable (Host Unreachable)
1.54	1583	207.46.230.189	MISC Large UDP Packet
1.13	1163	134.93.19.12	MISC source port 53 to <1024

Percentage and number of attacks to one certain host

==

%	# of attacks	to	method
19.05	19573	10.10.140.9	MISC traceroute
9.46	9723	204.152.190.70	ICMP Echo Request Nmap or HPING2
7.17	7366	10.10.162.228	ICMP Destination Unreacha ble (Communication Administratively Prohibited)
5.17	5309	10.10.137.7	ICMP Destination Unreachable (Communication Administratively Prohibited)
4.38	4497	10.10.253.114	WEB -MISC prefix -get //
4.21	4328	10.10.1.5	MISC source port 53 to <1024
4.04	4151	10.10.1.4	MISC source port 53 to <1024
3.97	4074	10.10.1.3	MISC source port 53 to <1024
3.32	3412	10.10.5.45	SMB Name Wildcard
3.30	3391	10.10.5.45	ICMP Echo Request L3retriever Ping

The distribution of attack methods

===

%	# of attacks	method
19.91	20461	ICMP Destination Unrea chable (Communication Administratively Prohibited)
	4664	10.10.16.5 -> 10.10.162.228
	2782	216.158.21.42 -> 10.10.137.7
	2702	10.10.14.1 -> 10.10.162.228
	2611	10.10.14.1 -> 10.10.5.4
	2527	216.158.21.226 -> 10.10.137.7
	2429	10.10.16.5 -> 10.10.115.155
	475	192.80.53.46 -> 10.10.140.9
	355	10.10.16.5 -> 10.10.1 10.56
	297	10.10.16.5 -> 10.10.1 15.178
	129	151.159.97.254 -> 10.10.140.9

19.08   19600   MISC traceroute
                  380   205.166.205.222 -> 10.10.140.9
                  379   134.79.196.42   -> 10.10.140.9
                  378   128.103.209.74   -> 10.10.140.9
                  374   137.78.21.22   -> 10.10.140.9
                  373   128.182.61.50   -> 10.10.140.9
                  373   137.145.206.116 -> 10.10.140.9
                  373   35.8.2.229   -> 10.10.140.9
                  373   199.249.169.82   -> 10.10.140.9
                  371   130.191.18.80   -> 10.10.140.9
                  371   137.145.206.101 -> 10.10.140.9

13.69   14071   MISC source port 5 3 to <1024
                  1163   134.93.19.12   -> 10.10.130.122
                  453   204.34.211.86   -> 10.10.1.4
                  449   204.34.211.86   -> 10.10.1.5
                  175   204.34.211.86   -> 10.10.1.3
                  159   204.34.211.87   -> 10.10.1.5
                  155   204.34.211.81   -> 10.10.1.4
                  148   204.34.211.81   -> 10.10.1.5
                  144   204.34.211.82   -> 10.10.1.5
                  119   204.34.211.87   -> 10.10.1.4
                  107   204.34.211.82   -> 10.10.1.4

5.78   5934   SMB Name Wildcard
                  3412   216.150.152.145 -> 10.10.5.45
                  2374   216.150.152.145 -> 10.10.5.44
                  8   130.13.120.130   -> 10.10.135.127
                  8   62.163.146.66   -> 10.10.137.203
                  6   64.12.34.214   -> 10.10.137.7
                  6   169.254.187.207 -> 10.10.134.41
                  5   61.216.5.150   -> 10.10.135.227
                  5   203.134.61.111   -> 10.10.134.41
                  5   130.74.106.81   -> 10.10.134.197
                  4   61.217.73.71   -> 10.10.137.153

4.50   4620   spp_http_decode
4.38   4503   WEB -MISC prefix -get //
                  315   131.118.250.190 -> 10.10.253.114
                  279   199.196.144.12   -> 10.10.253.114
                  231   209.36.53.212   -> 10.10.253.114
                  152   64.20.3.194   -> 10.10.253.114
                  150   140.198.37.149   -> 10.10.253.114
                  141   12.78.125.143   -> 10.10.253.114
                  126   63.48.100.106   -> 10.10.253.114
                  113   64.198.132.69   -> 10.10.253.114
                  111   63.44.145.111   -> 10.10.253.114
                  108   61.169.127.73   -> 10.10.253.114
3.90   4011   INFO MSN IM Chat data
                  131   10.10.97.227   -> 64.4.13.191
                  116   64.4.13.166   -> 10.10.98.237

```
105   10.10.98.218    -> 64.4.13.124
104   64.4.13.122     -> 10.10.97.236
101   10.10.97.231    -> 64.4.13.139
 99   10.10.98.237    -> 64.4.13.166
 99   10.10.97.236    -> 64.4.13.122
 90   64.4.13.191     -> 10.10.97.227
 85   64.4.13.124     -> 10.10.98.218
 85   64.4.13.168     -> 10.10.97.217
```

```
3.61   3712   ICMP Destination Unreachable (Host Unreachable)
       2443   198.32.224.31   -> 10.10.140.9
        284   63.146.1.33     -> 10.10.140.9
         44   63.146.1.33     -> 10.10.70.11
         37   216.135.4.21    -> 10.10.70.174
         13   206.115.152.194 -> 10.10.70.161
          9   212.185.251.69  -> 10.10.70.11
          9   195.162.200.1   -> 10.10.70.11
          8   192.169.40.139  -> 10.10.70.11
          8   62.225.254.9    -> 10.10.70.11
          8   206.115.220.248 -> 10.10.70.11
1.71   1753   MISC Large UDP Packet
       1583   207.46.230.189  -> 10.10.182.13
        170   216.54.223.195  -> 10.10.153.159
1.24   1276   INFO - ICQ Access
         55   10.10.98.153    -> 205.188.248.89
         40   10.10.98.153    -> 64.12.174.185
         40   10.10.98.120    -> 205.188.248.25
         36   10.10.98.153    -> 205.188.248.25
         34   10.10.97.223    -> 205.188.248.89
         31   10.10.98.153    -> 64.12.174.153
         29   10.10.98.132    -> 205.188.248.57
         28   10.10.162.117   -> 205.188.248.57
         27   10.10.98.132    -> 205.188.248.89
         25   10.10.98.121    -> 205.188.248.25
```

Portscans performed to/from HOME_NET

```
==================================
 # of
attacks  from
==================================
595    10.10.217.26
531    10.10.70.242
521    10.10.150.220
215    10.10.160.114
207    10.10.100.230
156    10.10.253.24
 79    207.109.34.25
 67    10.10.98.164
 65    10.10.186.17
 59    10.10.98.159
```

7. July 29th, 2001

Subject: snort daily report

The log begins from: 07 29 00:00:02
The log ends   at: 07 29 23:53:13
Total events: 115642
Signatures recorded: 111
Source IP recorded: 5047
Destination IP recorded: 1733
Portscan recorded: 3524

The number of attacks from same host to same
destination using same method

```
==========================================================================
 # of
attacks  from           to            method
==========================================================================
  9316   10.10.162.228    204.152.190.70     ICMP Echo Re  quest Nmap or HPING2
  5958   10.10.16.5       10.10.115.155   ICMP Destination Unreachable (Communication
                                           Administratively Prohibited)
  4611   216.150.152.145  10.10.5.44        ICMP Echo Request L3retriever Ping
  4607   216.150.152. 145  10.10.5.44        SMB Name Wildcard
  4379   216.150.152.145  10.10.5.45        ICMP Echo Request L3retriever Ping
  4314   216.150.152.145  10.10.5.45        SMB Name Wildcard
  4304   10.10.16.5       10.10.162.228   ICMP D estination Unreachable (Communication
                                           Administratively Prohibited)
  2952   216.158.21.226   10.10.137.7       ICMP Destination Unreachable (Communication
                                           Administratively Prohibited)
  2420   10.10.14.1       10.10.162.228   ICMP Destinati  on Unreachable (Communication
                                           Administratively Prohibited)
  2313   198.32.224.31    10.10.140.9       ICMP Destination Unreachable (Host Unreachable)
```


Percentage and number of attacks from a host to a
destination

```
================================= ==========================
    # of
 %  attacks from          to
==========================================================================
8.06  9316     10.10.162.228    204.152.190.70
7.97  9218     216.150.152.145   10.10.5.4 4
7.52  8693     216.150.152.145   10.10.5.45
5.15  5958     10.10.16.5       10.10.115.155
3.72  4304     10.10.16.5       10.10.162.228
2.55  2952     216.158.21.226   10.10.137.7
2.09  2420     10.10.14.1       10.10.162.228
```

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```
2.00   2313   198.32.224.31    10.10.140.9
1.92   2217   10.10.14.1       10.10.5.4
1.48   1717   216.158.21.42    10.10.137.7
```

Percentage and number of attacks from one host to any
with same method

```
=====================================================
     # of
 %  attacks  from          method
=====================================================
10.31  11920  10.10.16.5       ICMP Destination Unreachable (Communication
                                   Administratively Prohibited)
8.06   9316   10.10.162.228    ICMP Echo Request Nmap or HPING2
7.77   8990   216.150.152.145  ICMP Echo Request L3retriever Ping
7.71   8921   216.150.152.145  SMB Name Wildcard
4.60   5318   10.10.14.1       ICMP Destination Unreachable (Communication
                                   Administratively Prohibited)
2.55   2952   216.158.21.226   ICMP Destination Unreachable (Communication
                                   Administratively Prohibited)
2.00   2313   198.32.224.31    ICMP Destination  Unreachable (Host Unreachable)
1.48   1717   216.158.21.42    ICMP Destination Unreachable (Communication
                                   Administratively Prohibited)
1.31   1516   205.188.160.165  MISC Large UDP Packet
0.85   979    134.93.19.12     MISC source  port 53 to <1024
```

Percentage and number of attacks to one certain host

```
=====================================================================
     # of
 %  attacks  to            method
=================================================================  ======
16.35  18905  10.10.140.9     MISC traceroute
 8.06  9316   204.152.190.70  ICMP Echo Request Nmap or HPING2
 5.81  6724   10.10.162.228   ICMP Destination Unreachable (Communication
                                   Administratively Prohibited)
 5.15  5958   10.10.115.155   ICMP Destination Unreachable (Communication
                                   Administratively Prohibited)
 4.61  5335   10.10.253.114   WEB -MISC prefix -get //
 4.04  4669   10.10.137.7     ICMP Destination Unreachable (Communication
                                   Administratively Prohibited)
 3.99  4611   10.10.5.44      ICMP Echo Request L3retriever Ping
 3.98  4607   10.10.5.44      SMB Name Wildcard
 3.79  4379   10.10.5.45      ICMP Echo Request L3retriever Ping
 3.74  4322   10.10.1.4       MISC source port 53 to <1024
```

The distribution of attack methods

```
=============================================
     # of
 %  attacks  method
=============================================
```

19.46 22507   ICMP Destination Unreachab le (Communication Administratively Prohibited)
    5958 10.10.16.5   -> 10.10.115.155
    4304 10.10.16.5   -> 10.10.162.228
    2952 216.158.21.226 -> 10.10.137.7
    2420 10.10.14.1   -> 10.10.162.228
    2217 10.10.14.1   -> 10.10.5.4
    1717 216.158.21.42 -> 10.10.137.7
    652 10.10.16.5   -> 10.10.115.178
    483 192.80.53.46 -> 10.10.140.9
    269 10.10.16.5   -> 10.10.110.56
    159 10.10.16.5   -> 10.10.98.158

16.38 18947   MI SC traceroute
    400 129.137.254.5 -> 10.10.140.9
    372 129.116.218.196 -> 10.10.140.9
    369 134.79.196.42 -> 10.10.140.9
    366 128.182.61.50 -> 10.10.140.9
    365 205.166.205.222 -> 10.10.140.9
    363 128.227.0.107 -> 10.10.140.9
    361 198.202.74.41 -> 10.10.140.9
    360 198.119.6.13 -> 10.10.140.9
    360 18.201.0.122 -> 10.10.140.9
    360 138.26.220.46 -> 10.10.140.9

11.31 13081   MISC source port 53 t o <1024
    979 134.93.19.12 -> 10.10.130.122
    485 204.34.211.86 -> 10.10.1.4
    356 204.34.211.86 -> 10.10.1.5
    157 204.34.211.81 -> 10.10.1.4
    149 204.34.211.82 -> 10.10.1.4
    137 204.34.211.87 -> 10.10.1.4
    116 204.34.211.81 -> 10.10.1.5
    107 204.34.211.82 -> 10.10.1.5
    103 204.34.211.87 -> 10.10.1.5
    87 204.34.211.86 -> 10.10.1.3

8.50 9830   ICMP Echo Request Nmap or HPING2
    9316 10.10.162.228 -> 204.152.190.70
    63 10.10.98.183 -> 10.0.3.3
    40 10.10.137.7 -> 216.158.50.240
    39 10.10.98.162 -> 24.12.12.182
    32 10.10.137.7 -> 207.245.122.125
    26 10.10.184.37 -> 65.42.135.63
    19 10.10.98.239 -> 66.21.168.61
    15 10.10.98.205 -> 206.251.6.192
    13 10.10.97.242 -> 206.251.6.192
    12 10.10.98.162 -> 172.155.124.227

7.87 9102   SMB Name Wildcard
    4607 216.150.152.145 -> 10.10.5.44
    4314 216.150.152.145 -> 10.10.5.45

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```
        12   144.132.19.157   -> 10.10.132.92
        11   203.198.242.31   -> 10.10.133.186
        10   165.247.240.201  -> 10.10.134.79
         7   130.67.134.135   -> 10.10.137.138
         7   63.70.217.146    -> 10.10.133.46
         6   12.44.129.42     -> 10.10.134.82
         6   130.13.149.59    -> 10.10.133.3
         6   192.115.218.254  -> 10.10.132.102

7.77  8990    ICMP Echo Request L3retriever Ping
      4611  216.150.152.145 -> 10.10.5.44
      4379  216.150.152.145 -> 10.10.5.45
6.55  7574    INFO MSN IM Chat data
       443   10.10.98.166     -> 64.4.13.122
       338   64.4.13.165      -> 10.10.98.158
       229   10.10.97.18      -> 64.4.13.194
       193   64.4.13.194      -> 10.10.97.18
       177   64.4.13.167      -> 10.10.98.143
       147   64.4.13.122      -> 10.10.98.166
       144   10.10.98.112     -> 64.4.13.169
       143   10.10.97.241     -> 64.4.13.116
       134   64.4.13.136      -> 10.10.97.52
       119   10.10.97.22 5    -> 64.4.13.118

4.90  5672    spp_http_decode
4.62  5344    WEB -MISC prefix -get //
       270   172.164.232.120 -> 10.10.253.114
       241   12.78.236.101    -> 10.10.253.114
       188   203.197.187.204 -> 10.10.253.114
       174   63.22.24.41      -> 10.10.253.114
       172   64.105.100.88    -> 10.10.253.114
       155   65.80.148.149    -> 10.10.253.114
       150   144.59.13.2      -> 10.10.253.114
       150   65.165.88.155    -> 10.10.253.114
       126   66.44.113.19     -> 10.10.253.114
       126   24.4.252.27      -> 10.10.253.114

3.54  4088    ICMP Destination Unreachable (Host Unreachable )
      2313  198.32.224.31    -> 10.10.140.9
       299   205.171.1.26     -> 10.10.70.174
        87   63.146.1.33      -> 10.10.70.11
        57   203.63.176.52    -> 10.10.70.161
        35   205.171.1.26     -> 10.10.70.11
        34   206.47.121.162   -> 10.10.70.11
        20   213.65.88.247    -> 10.10.70.11
        14   196.3.153.6      -> 10.10.70.11
        13   206.115.151.29   -> 10.10.70.11
        12   62.161.0.33      -> 10.10.70.11
```

Portscans performed to/from HOME_NET
==================================
 # of
attacks from
==================================
343   10.10.100.230
165   10.10.218.94
152   10.10.150.220
126   10.10.253.24
113   10.10.217.26
107   10.10.151.79
72   10.10.97.209
66   10.10.98.183
60   10.10.160.114
51   10.10.70.11

Appendix B – Out of Spec files

There are daily log files f or Out of Spec packets, these are packets which aren't created by specification, so this packets must be crafted. These files are for additional research to correlate data.

Sample Out of Spec data:
```
=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+= +=+=+=+=+
07/23-09:45:34.125077 194.138.17.98:2000  -> 10.10.60.14:80
TCP TTL:47 TOS:0x0 ID:57419  DF
21S***** Seq: 0x79FF149E   Ack: 0x0   Win: 0x16D0
TCP Options => MSS: 1460 SackOK TS: 2356437 0 EOL EOL EOL EOL
=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+= +=+=+=+=+=+=+=+=+=+=+
07/23-09:54:49.955667 198.186.202.147:40481  -> 10.10.70.113:113
TCP TTL:47 TOS:0x0 ID:38055  DF
21S***** Seq: 0x9EC7A5F0  Ack: 0x0   Win: 0x16D0
TCP Options => MSS: 1460 SackOK TS: 99692887 0 EOL EOL EOL EOL
=+=+=+=+=+=+=+=+=+=+=+= +=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+
07/23-09:54:59.430238 198.186.202.147:40494  -> 10.10.70.113:25
TCP TTL:47 TOS:0x0 ID:23766  DF
21S***** Seq: 0x9F7969DC  Ack: 0x0   Win: 0x16D0
TCP Options => MSS: 1460 SackOK TS: 99693834 0 EOL EOL EOL EOL
=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+
07/23-10:01:07.985411 198.186.202.147:40726  -> 10.10.70.113:113
TCP TTL:47 TOS:0x0 ID:45209  DF
[root@ids oos]# tail -n20 oos_Jul.23.2001.gz.vers1
20 00 4E 3B 00 00 02 04 05 B4 01 01            .N;........
=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+=+
```

Following anomalies can be detected are:

> SF – SYN FIN flags set
> Static IP ID
> Same TCP sequence number
> Same Source and Destination port

<u>Appendix C - References</u>

Assignment 1 – Network Detects

Detect 1:
Ref. 1: What port numbers do well -known Trojan horses use? – SANS Institute
  http://www.sans.org/newlook/resources/IDFAQ/oddports.ht m

Ref. 2: NetBus - Chris A. Hayden December 17, 2000
  http://www.sans.org/infosecFAQ/malicious/netbus.htm

Ref. 3: Subseven Trojan Summary - Kelly Kester December 19, 2000
  http://www.sans.org/infosecFAQ/malicious/subseven3.htm

Detect 2:
Ref. 4: arachNIDS – SGI TELNETD FORMAT BUG
  http://www.whitehats.com/cgi/arachNIDS/Show?_id=ids304

Detect 4:
Ref. 5: arachNIDS –HTTP-Phorum-Admin
  http://www.whitehats.com/cgi/arachNIDS/Show?_id=ids205

Detect 5:
Ref. 6: atachNIDS – HTTP Whisker splicing attack space
  http://www.whitehats.com/cgi/arachNIDS/Show?_id=ids296

Ref. 7: Wiretrip – Whisker CGI scanner
  http://www.wiretrip.net/rfp/p/doc.asp?id=21&iface=3

Assignment 2 – Describe the state of Intrusion Detection

Ref. 8: securityfocus.com – Multiple Linux Vendor 2.2.x Kernel IP Masquerading Vuln.
  http://www.securityfocus.com/vdb/bottom.html?vid=1078

Ref. 9: Release Notes for Linux kernel 2.2.15
  http://www.linux.org.uk/VERSION/relnotes.2215.html

Ref. 10: CVE-2000-0289
  http://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE -2000-0289

Ref. 11: TCP/IP Illustrated, Volume 1 – The Protocols by W. Richard Stevens
  (Addison Wesley, ISBN: 0 -201-63346-9)

Ref. 12: IPFWADM:Linux firewall facilities for kernel -level packet screening
  http://www.kulichki.com/moshkow/SECURITY/ipfwadm/paper.txt

Ref. 13 : Diplomarbeit – IP NETWORK ADRESS TRANSLATION, Michael Hasenstein, 1997
http://www.suse.de/~mha/linux -ip-nat/diplom/nat.html

Ref. 14 : Linux IP Masquerading HOWTO, Version 1.95c
http://www.e -infomax.com/ipmasq /howto/ipmasq -HOWTO-1.95c.html

Assignment 3 – „Analyse This" Scenario

Ref. 15 : Privacy Software Corporation Security Advisory
http://www.nsclean.com/psc -gc.html

Ref. 16 : anonymous Trojan download page (should be handled carefully!!)
http://www.multimania.com/cdcorg/trojans.html

Ref. 17 : Global Incident Analysis Center - Detects Analyzed 3/11/00
http://www.sans.org/y2k/031100.htm

Ref. 18 : Global Incident Analysis Center - Detects Analyzed 5/28/00
http://www.incidents.org/archives/y2k/052800 -1130.htm

Ref. 19 : Global Incident Analysis Center - Detects Analyzed 02/26/01
http://www.incidents.org/archives/y2k/022601 -1400.htm

Ref. 20 : What Are Some Of The Signs Of Internet Gaming by analyst Matt Scarborough
http://www.incidents.org/detect/gaming.php

Ref. 21 : CAIDA Analysis of Code Red
http://www.caida.org/analysis/security/code -red/

Ref. 22 : arachNIDS – traffic from source port 53 to <1024
http://www.whitehats.com/info/ids07

Ref. 23 : arachNIDS – HPING2 or NMAP echo request
http://www.whitehats.com/info/ids162

Ref. 24 : RFC 792
http://rfc.fh -koeln.de/rfc/html/rfc0792.html

Ref. 25 : Serious flaw in Microsoft IIS UNICODE translation
http://www.infowar.com/iwftp/xforce/advise68.shtml

Ref. 26 : SnortSnarf alert page of nothing -on.tv
http://www.nothing -on.tv/snarf/20010727/199/183/24/src199.183.24.194.html

Ref. 27 : snort_stat.pl download page
http://www.snort.org/downloads.html