EC-Council Certified Ethical Hacker

Cheat Sheet Exercises

How to Use the Cheat Sheets

Students often report that the most difficult thing about the CEH exam is the terms, tools, numbers, log files, packet dumps and example scripts. None of these items can be understood without the concepts that give them meaning, but once the concepts are clear, it is still necessary to be exposed to the raw data until they are second nature.

Cheatsheets are exercises that can be used to assist with memorization and refresh before the time of the exam. *They are not comrehensive reference guides.* They are designed to provide only enough data to trigger the memory or assess what needs to be better understood.

Having a list of everything at your fingertips is helpful on the job but is almost useless as a study tool. You must interract with the data in order to convert it to information and own it.

Since the exam is not open book, the goal is in fact to get to a point where you no longer need the cheat sheets at all.

Each cheat sheet is a concept object. These are examples to get you started and provide enough information to establish a grasp of the object at hand. Print them out, and hand copy each one in your own writting to another sheet of paper. Arrange the material in your own way, and add notes to them as you study.

Practice this at least three times. On the third try you may find you can copy the entire thing without looking at the original. Then you have mastered it, and will have problems recalling important data druing the real exam.

In summary, to get the most out of these study aids, follow these simple tips:

1. Check back often for new versions
2. Print them out and copy them by hand to a blank piece of paper; three times.
3. Take additional notes, fill in any information that seems to be missing

Chapter Map for the Cheat Sheets

Contributed By:
Shravansofts2011@gmail.com

CEH Prerequisites

There are entry level security classes, but security is not an entry level subject. In order to be comfortable with the CEH training, pre-requisites are assumed and test items will involve topics that time might not permit covering during the live trainging. Prior to training, try to refresh your skill sin the following areas. The more time spent on this step the more comfortable the training experience will be.

Know the basics of Information security

Concepts such as "CIA (Confidentiality, Integrity, Availability)
Coverage would have come during CompTIA or CISSP training

Know the basics of networking

Physical layer, cabling, hardware devices
The function of switches, routers, firewalls
IP Addressing, Subnetting and CIDR notation

Know how to convert numbers

Decimal, Octal, Binary; in all directions and combinations

Know the basics of Cryptography

There is a module in the class on Crypto, but there may not be time to cover it in class.
Sufficient coverage would have come during CompTIA Security+ or CISSP

Know the OSI model

Application	7	Service protocols
Presentation	6	Data formats
Session	5	Authentication, Cryptographic agreements
Transport	4	Ports, logical service to service connections
Network	3	Network to network delivery
Data Link	2	Host to host links, contention
Physical	1	Media

Know how to use a Windows PC

Be familiar with the Windows Graphical User Interface
Find toolbar icons, manage folders and files, use network shares
The labs in this class are difficult and must move rapidly,
slowdowns for poor PC skills may result in just watching the demonstration at times, please be understanding of this and courteous to the other students.

Terms and Definitions

Read the following terms and makwe sure you know their meaning. Look up any that you are not comfortable with. On your own cheat sheet, jot down any additional terms you run across that struck you as new or odd.

Term	***Definition***
Hax0r	Hacker
Uberhacker	Good hacker
L33t Sp33k	Replacing characters to avoid filters
Full disclosure	Revealing vulnerabilities
Hacktivism	Hacking for a cause
Suicide Hacker	Hopes to be caught
Ethical Hacker	Hacks for defensive purposes
Penetration Test	Determine true security risks
Vulnerability Assessment	Basic idea of security levels
Vulnerabilty Researcher	Tracks down vulnerabilities
White hat	Hacks with permission
Grey hat	Believes in full disclosure
Black hat	Hacks without permission
White Box	A test everyone knows about
Grey Box	A test with a very specific goal but unspecific means
Black Box	A test no one knows is happening
Threat	Potential event
Vulnerability	Weakness
Exposure	Accessibility
Exploit	Act of attacking
TOE	Target of Evaluation
Rootkit	Hides processes that create backdoors
Botnet	Robot network that can be commanded remotely
Buffer Overflow	Hijack the execution steps of a program
Shrinkwrap Code	Reused code with vulnerabilities

Methodologies

This class tells a story, and understanding that story is far more important than memoriing these lists. Think about what actions are taken during each phase, and notice how they logically progress.

The phases of an attack

1. Reconnaissance	Information gathering, physical and social engineering, locate network range
2. Scanning - Enumerating	Live hosts, access points, accounts and policies, vulnerability assessment
3. Gaining Access	Breech systems, plant malicious code, backdoors
4. Maintaining Access	Rootkits, unpatched systems
5. Clearing Tracks	IDS evasion, log manipulation, decoy traffic

Information Gathering

1. Unearth initial information	What/ Who is the target?
2. Locate the network range	What is the attack surface?
3. Ascertain active machines	What hosts are alive?
4. Open ports / access points	How can they be accessed?
5. Detect operating systems	What platform are they?
6. Uncover services on ports	What software can be attacked?
7. Map the network	Tie it all together, document, and form a strategy.

Legal Issues

Be able to describe the importance of each of these items. The exam will not go into depth on this, just be prepared to identify the issues.

United States

Computer fraud and abuse act	Addresses hacking activities
18 U.S.C. 1029 Possession of Access Devices	
18 U.S.C. 1030 Fraud and Related Activity in Conncetion with Computers	

CAN-SPAM	Defines legal eMail marketing
SPY-Act	Protects vendors monitoring for licence enforcement
DMCA - Digital Milenium Copyright Act	Protects intellectual property
SOX - Sarbanes Oxley	Controls for corporate financial processes
GLBA - Gramm-Leech Bliley Act	Controls use of personal financial data
HIPPA - Health Imformation Portability and Protection Act	Privacy for medical records
FERPA - Family Educational Rights and Privacy Act	Protection for education records
FISMA - Federal Information Security Management Act	Government networks must have security standards

Europe

Computer misuse act of 1990	Addresses hacking activities
Human Rights Act of 1990	Ensures privacy rights

Domain Name Service

DNS is critical in the footprinting of a target network.   It can sometimes save the attacker a lot of time, or at least corroborate other information that has been gathered. DNS is also a target for several types of attack.

Fields in the SOA record: (Time in seconds)

1882919 7200 3600 14400 2400
Serial Refresh Retry Expiry TTL

Requesting a zone transfer

```
nslookup; ls -d example.dom
dig @ns1.example.dom AXFR
host -t AXFR example.dom ns1.example.dom
```

Using Whois

```
whois example.dom
```

Regional Internet Registrars

ARIN	(North America)
APNIC	(Asia Pacific Region)
LACNIC	(Southern and Central America and Caribbean)
RIPE NCC	(Europe, the Middle East and Central Asia)
AfriNIC	(Africa)

Attacks against DNS servers

Zone transfers	Information gathering shortcut
Zone poisoning	Breach the primary server and alter the zone file to corrupt the domain
Cache poisoning	Send false answers to cache servers until they store them
Reflection DoS	Send bogus requests into a chain of servers that do recursive queries

Google Hacking

An attacker will use Google to enumerate a target without ever touching it. The advanced search syntax is easy to use but can be quirky at times. It takes practice and experimentation.

Using Advanced Search

operator:keyword additional search terms

Advanced Operators

site	Confines keywords to search only within a domain
ext	File extension
loc	Maps location
intitle	Keywords in the title tag of the page
allintitle	Any of the keywords can be in the title
inurl	Keywords anywhere in the URL
allinurl	Any of the keywords can be in the URL
incache	Search Google cache only

Keyword combinations

passsword | passlist | username | user
login | logon
Administrator | Admin | Root
Prototype | Proto | Test | Example

Examples

site:intenseschool.com (ceh ecsa lpt)
intitle:index.of
allinurl:login logon
-ext:html -ext:htm -ext:asp -ext:aspx -ext:php

Nmap Scan Types

Nmap is the de-facto tool for footprinting networks. It is capable of finding live hosts, access points, fingerprinting operating systems, and verifying services. It also has important IDS evasion capabilities.

Discovery Scans

Option	Description
-sP	Ping
-sL	List Scan
-sO	Protocol
-sV	Verify
-sL	List scan

Normal Scans

			Windows		Linux	
Option	Desc	Flags	Open	Closed	Open	Closed
-sT	Connect	S	SA	RA	SA	RA
-sS	Stealth	S	SA	RA	SA	RA

Inverse Scans

			Windows Linux			
Option	Desc	Flags	Open	Closed	Open	Closed
-sN	Null	-	RA	RA	-	RA
-sX	Xmas	UPF	RA	RA	-	RA
-sF	Fin	F	RA	RA	-	RA
-sA	Ack	A	R	R	R	R
-sW	Window	A	R	R	R	R

Other Important Nmap Options

Option	Description
-A	Enable OS detection, Version detection, Script scanning and Traceroute
-n	Do not lookup DNS
-v	Verbose output
-T [0-5]	Timing - 5 is faster
-P0	Do not ping first

TCP Flags

This test will have scenarios that require you demonstrate an understanding of TCP behavior including Nmap scan types. Be sure to know each of these combinations well.

TCP Flags

0 0 URG ACK PSH RST SYN FIN

TCP Handshake (Open Port)

Direction	Binary	Hex	Flags	
A -> B	00000010	0x02	S	Seq = 1 Ack = 0
B -> A	00010010	0x12	A S	Ack = 2 Seq = 10
A -> B	00010000	0x10	A	Seq = 2 Ack = 11

TCP Handshake (Closed Port)

A -> B	00000010	0x02	S	Seq = 1 Ack = 0
B -> A	00010100	0x14	A R	Ack = 2 Seq = 0

NMap Stealth Scan (Open Port)

Direction	Binary	Hex	Flags
A -> B	00000010	0x02	S
B -> A	00010010	0x12	A S
A -> B	00000100	0x04	R

NMap Xmas Scan (Open Port)

Direction	Binary	Hex	Flags
A -> B	00101001	0x29	U P F

No response from Linux hosts, R A from Windows

NMap ACK Scan

Direction	Binary	Hex	Flags
A -> B	00010000	0x10	A
A -> B	00000100	0x04	R

Solaris will not respond on open ports

Ports and Protocols

These must be memorized! Also be prepared to convert them to hexadecimal representation in case they must be identified in a packet dump, log file, IDS rule, or a sniffer capture/display filter.

Protocols

1	ICMP
6	TCP
17	UDP
47	GRE
50	AH
51	ESP

Ports

20 - 21	FTP
22	SSH
23	Telnet
25	SMTP
42	WINS
53	DNS
80 - 81 -8080	HTTP
88	Kerberos
110	POP3
111	Portmapper (Linux)
119	NNTP
135	RPC-DCOM
137 - 138 - 139	SMB
143	IMAP
161 - 162	SNMP
389	LDAP
445	CIFS
1080	SOCKS5
3389	RDP
6667	IRC
14237	Palm Pilot Remote Sync

Trojan Horses

7777	Tini
12345	NetBus
27374	Back Orifice
31337	Sub7

Enumeration

Enumeration is the act of making a list of policies, user accounts, shares and other resources. This step happens just before vulnerability assessment and helps the attack put together the best strategy for gaining access.

Establishing a Null Session

```
net use \\[target ip]\IPC$ "" /user:""
```

Protecting Information Disclosure

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\LSA\RestrictAnonymous

"0" is the default for Windows 2000 and gives up everything
"1" is the default for Windows 2003 and gives up less
"2" is the most secure setting but makes a machine not very cooperative with others

Microsoft SIDs

S-1-5-21-<	>-500	Built-in Local administrator
S-1-5-21-<	>-501	Built-in Local guest
S-1-5-21-<	>-512	Built-in Domain administrator
S-1-5-21-<	>-1000	Anything above 1000 are users that have been created

Ports involved with enumerations attacks

111	Linux Portmapper Service
42	WINS
88	Kerberos
135	Windows RPC-DCOM
137	NetBIOS Name Service
138	NetBIOS Datagram Service
139	NetBIOS Sessions
161	SNMP Agent
162	SNMP Traps
389	LDAP
445	CIFS (Common Internet File System)

Misc.

"public" and "private"	default community SNMP strings
1.1.1.2.1.0.0.1.3.4.1.4	is an SNMP OID
ou=sales,cn=example...	is an LDAP (LDIF) name string
fingerd	the finger daemon was used in older UNIX systems

Password Cracking

This test will have scenarios that require you demonstrate an understanding of TCP behavior. Be sure to know each of these combinations well.

Types of password cracking techniques

Guessing	Is the most efficient, assuming information gathering before hand
Dictionary	Based on a predetermined list of words
Brute Force	Trying every possible combination of characters
Hybrid	A combination of all other attacks

LM Hashes

Every password is ultimately 14 characters long, split into two 7 character halved
Passwords that are less than 7 character are easily identified in the SAM file (hash ends in 404EE)

Rainbow Tables

"Time / Memory Trade off""	Less memory than a lookup, less computing than a brute force.
Salting	the hash is a way to combat rainbow tables.

Cracking Effort

Weak passwords	can be cracked in seconds
Strong passwords	might take the lifetime of several universes to crack
Rainbow Tables	Solve the "Time / Memory Trade Off"
DNA	Distributed Network Architecture

Popular Cracking Tools

John the Ripper	Command line tool that runs under both Windows and Linux
L0phtcrack	Commercial tool
0phtcrack	Open source tool that supports rainbow tables
Cain and Abel	Powerful multipurpose tool that than sniff and crack passwords af many types

Trojans and Malware

The official definition is: A legitimate application that has been modified with malicious code. A Trojan horse is a social engineering technique. It masquerades as a legitimate download and injects the victim's host with an access point, or a client that can connect outbound to a server waiting remotely. They don't necessarily exploit a vulnerability unless privilege escalation is necessary. They provide a command environment for whoever connects to them that includes: File browsers, keyloggers, web cam viewer, and many additional tools.

Terms

Wrapper or Binder	Application used to combine a malicious binary and a legitimate program
Rootkit	Can be installed via Trojan, used to hide processes that create backdoor access
HTTP Trojan	Reverses a connection outbound through an HTTP or SHTTP tunnel
Netcat	Not really a Trojan, but often used in Trojan code to setup the listening socket
Hoax	Many legit tools are rumored to be Trojans but might not be
Keylogger	Records the keystrokes on the install host and saves them in a log

Famous Trojans

Tini	Small 3Kb file, uses port 7777
Loki	Used ICMP as a tunneling protocol
Netbus	One of the first RATs (Remote Authentication Trojan)
Sub 7	Written in Delphi, expanded on what Netbus had demonstrated
Back Orifice	First modular malware, had the capabilities to be expanded on by outside authors
Beast	All in one Client / Server binary
MoSucker	Client could select the infection method for each binary
Nuclear RAT	Reverse connecting Trojan
Monkey Shell	Provides a powerful shell environment that can reverse connections and encrypt commands.

Detecting Trojans

netstat / fport	Command line tools for viewing open ports and connections
tcpview	GUI tool for viewing open ports and connections
Process Viewer	GUI tool for showing open processes including child processes
Autoruns	Lists all programs that will run on start up and where they are called from
Hijack This	Displays a list of unusual registry entries and files on the drive
Spybot S&D	Originally volunteer supported scanning and detection tool

Virus Trivia

No one is expecting you the student to stay on top of the 40k or so known malware variants that have been discovered. But there are a few that are significant for demonstrating the capabilities of this method of attack. Think of the malware mentions in the course as examples of what thousands of others have copied or improved upon.

Phases of an outbreak

Infection -> Spreading -> Attack

Virus Lifecycle

Design - > Replication -> Launch -> Detection -> Incorporation -> Elimination

Types of Viruses

Boot Virus	Infects the boot sector of floppies or hard disks
Macro Virus	Written in Microsoft Office Macro language
Network Virus	Spreads via network shares
Stealth Virus	Hides in a file, copies itself out to deliver payload
Polymorphic Virus	Encrypts itself
Cavity Virus	Hides in the empty areas of executables
Tunneling Virus	Trace interceptor programs that monitor OS Kernel requests
Camouflage Virus	Disguise themselves as legit files
Multipartite Virus	Infects via multiple vectors
Metamorphic Virus	Rewrites itself

Famous Viruses

Elk Cloner	1st virus
Morris	1st worm
I Love You	VBScript worm, sent via email
Melissa	Macro virus
Klez	Mass mailer with its own SMTP engine
Slammer	Targets SQL server, total size of 376 bytes
MyDoom	Mass mailer, uses port 3127, attacks the hosts file
MonteCarlo	Memory resident, copies to the end on exe files

Sniffing

Social Engineering is the most powerful attack tool. It requires no equipment or technology, and often minimal expense. Only proper user education and awareness can prevent it and even then, errors in judgment can still be exploited.

Methods for defeating a switch

Admin the switch	If the password for the switch can be guessed, a port can be placed into monitor mode
MAC Spoofing	Set the MAC address of a NIC to the same value as another
MAC Flooding	Overwhelm the CAM table of the switch so it coverts to hub mode
ARP Poisoning	Inject incorrect information into the ARP caches of two or more endpoints.

Wireshark command line tools

tshark	Command line version of Wireshark
dumpcap	Captures traffic
capinfos	Reads a saved capture file and returns statistics about it
editcap	Edit and/or translate the format of capture files
mergecap	Merges multiple capture files into one
text2pcap	Generates a capture file from an ASCII hexdump of packets
tcpflow	Extracts data streams from dump files
tcptrace	Analyzes TCP conversations
tcpreplay	Can resend capture packets

TCPDump capture filters

Capture filters will be kept simple on the test. They look basically like English phrases. Analyze the examples below to get an idea.

```
host www.example.com and not (port 80 or port 25)
port not 53 and not arp
ip proto 1
(tcp[2:2] > 1500 and tcp[2:2] < 1550
```

Wireshark display filters

Display filters work basically like: `proto.field operator value`

Analyse the following examples:

```
tcp.flags == 0x29
ip.addr != 192.168.1.1
tcp.port eq 25 or icmp
ip.src==192.168.0.0/16 and ip.dst==192.168.0.0/16
http.request.uri matches "login.html"
```

MAC Addresses

Sniffing and defeating Ethernet switches requires an understanding of hardware addresses. Due to the risks involved with these local attacks, Intrusion Detection Systems are looking for too much ARP traffic or strange MAC addresses.

The MAC 48 Format

A Media Access Control address is 48 bits
The first 3 bytes of the MAC is a vendor code
The other three bytes are arbitrarily assigned

A broadcast MAC address is

FF:FF:FF:FF:FF:FF

Addresses can be assigned in two ways

BIA - Burned in Address
OUI - Organizationally Unique Identifier

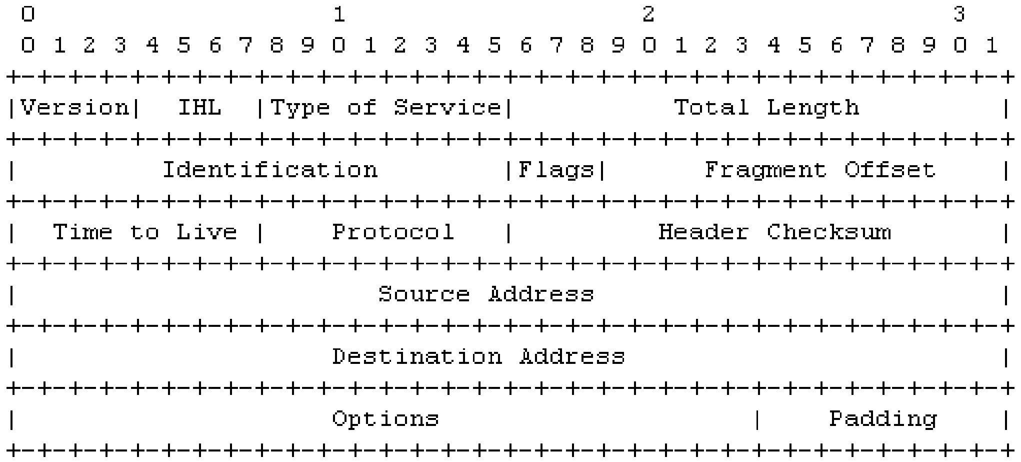
The two least significant bits of the first byte in the OUI address

nnnnnn0n = Universally administered address
nnnnnn1n = Administratively assigned
nnnnnnn0 = Unicast traffic
nnnnnnn1 = Multicast traffic

Internet Protocol

Internet protocol is responsible for packaging datagrams for delivery between networks. It is a "best effort" protocol with no error control or correction. For more information read RFC 791

Internet Protocol Header



```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|Version|  IHL  |Type of Service|          Total Length         |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|         Identification        |Flags|      Fragment Offset    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|  Time to Live |    Protocol   |         Header Checksum       |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                       Source Address                          |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                    Destination Address                        |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                    Options                    |    Padding    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

Example Internet Datagram Header

Checklist of items to concentrate on:

How IPIDs work

How the fragmentation works

How the TTL works

Protocol IDs

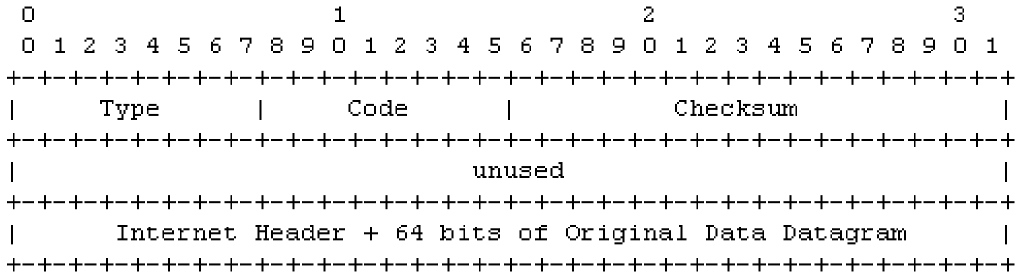
Basic IP addressing principles

DoS attacks relating to IP

Internet Control Message Protocol

ICMP is a transport protocol that creates message datagrams that can be exchanged by network hosts for troubleshooting, error reporting, and information. For more information read RFC 792
For a complete list of type and codes visit http://www.spirit.com/Resources/icmp.html

ICMP Header Example:



```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|     Type      |     Code      |          Checksum             |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                             unused                            |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|      Internet Header + 64 bits of Original Data Datagram      |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

Type	*Code*	*Description*
0	0	Echo Reply
3		Destination Unreachable
3	13	Administratively Prohibited
8	0	Echo Request
5	0	Redirect
11	0	Time Exceeded
13	-	Timestamp Request

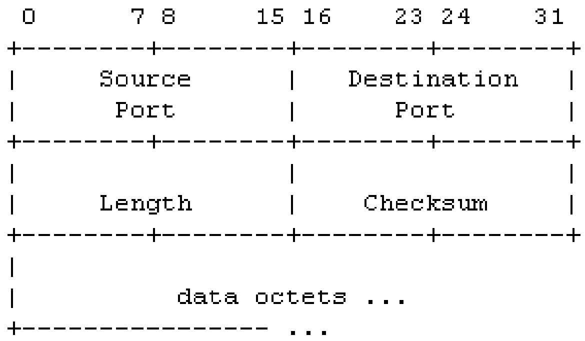
Don't forget!!

Type 3 Code 13 means administratively prohibited

User Datagram Protocol

User Datagram Protocol is a simple fast transport protocol that is used for its low overhead in situations where error correction and flow control is not needed, such as short bursts of messages.   UDP is difficult to firewall off effectively because it is stateless. For more information read RFC 768

User Datagram Protocol



```
 0      7 8     15 16    23 24    31
+--------+--------+--------+--------+
|     Source      |   Destination   |
|      Port       |      Port       |
+--------+--------+--------+--------+
|                 |                 |
|     Length      |    Checksum     |
+--------+--------+--------+--------+
|
|          data octets ...
+---------------- ...
```

User Datagram Header Format

Checklist of items to concentrate on:

Port addresses and ranges

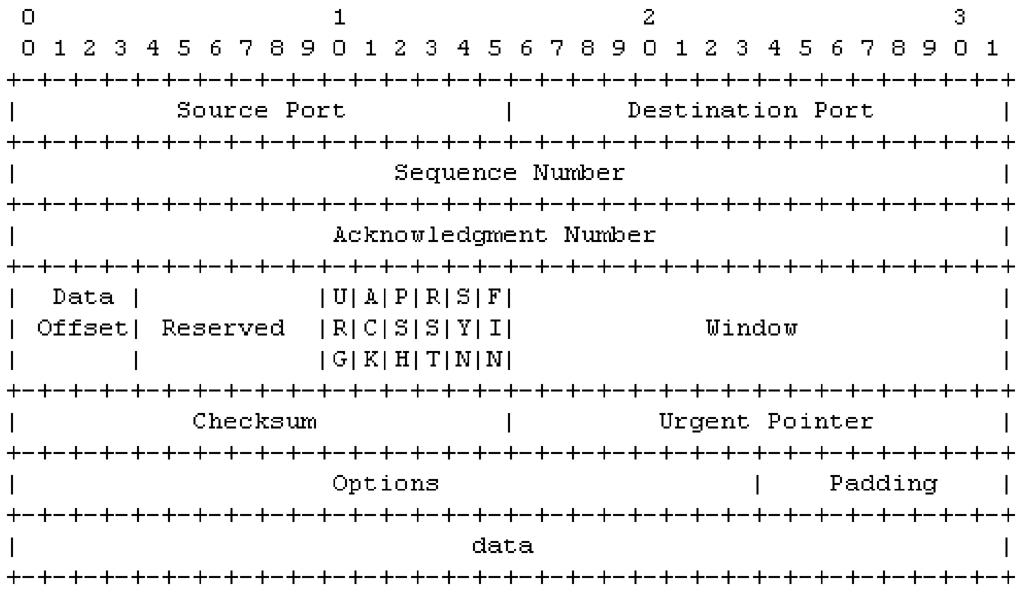
How ICMP and UDP assist each other

UDP based Denial of Service Attacks

Transmission Control Protocol

TCP provides guaranteed transport and flow control of layer 5-7 messages. Along with IP, ICMP, and UDP, a good solid understanding of this protocol is critical for understanding: Scanning, Firewalls, Intrusion Detection, and various types of DoS attacks. For more information read RFC 793

Transmission Control Protocol



```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|          Source Port          |       Destination Port        |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                        Sequence Number                        |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                    Acknowledgment Number                      |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|  Data |           |U|A|P|R|S|F|                               |
| Offset| Reserved  |R|C|S|S|Y|I|            Window             |
|       |           |G|K|H|T|N|N|                               |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|           Checksum            |         Urgent Pointer        |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                    Options                    |    Padding    |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                             data                              |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

TCP Header Format

Checklist of items to concentrate on:

Port addresses and ranges

Order of the six flags

How the handshake works

How the sequence numbers work

How session hijacking works

Denial of service attacks related to TCP

Social Engineering

Social Engineering is the most powerful attack tool. It requires no equipment or technology, and often minimal expense. Only proper user education and awareness can prevent it and even then, errors in judgment can still be exploited.

The principles of Social Engineering

Authority	An intimidating presence
Scarcity	Create the perception of loss or lack of access to a resource
Liking	Charm and charisma
Reciprocation	The victim believes they owe the attacker a favor
Consistency	Appealing the a victims true feelings and opinions
Social Validation	Compliments and praise

Types of Social Engineers

Insider Associates	Have limited authorized access, and escalate privileges from there.
Insider Affiliates	Are insiders by virtue of an affiliation, they spoof the identity of the insider.
Outsider Affiliates	Are non-trusted outsiders that use an access point that was left open.

DoS and DDoS

Denial of Services and Distributed Denial of Service attacks are embarrassing and inconvenient. They are extremely difficult to prevent from being attempted. The best defense is a well designed network that is hard to overwhelm.

DoS Methods

Buffer Overflows	Crashes applications or services
Smurf	Spoofed traffic sent to the broadcast address of a network
Fraggle	UDP version of the Smurf, usually bouncing Chargen traffic off Echo ports
Ping of Death	Packet larger than the 64k limit
Teardrop	Offset values modified to cause fragments to overlap during reassembly, results in short packet
Unnamed	Offset values modified to cause gaps between fragments, results in long packets
Syn Flood	SYN flags sent to open ports, no completion of the hansdshake
Land	Traffic sent to a victim spoofing itselft as the source, results in ACK storms
Winnuke	Sends TCP traffic with the URG flag set, causes CPU utilization to peak

Dos Tools

Jolt2	Floods with invalid traffic results in 100% CPU utilization
Land and La Tierra	Executes teardrop and land attacks
Targa	Provides a menu of several DoS attacks
Blast20	Also considered to be a web server load tester
Crazy Pinger	ICMP flooder
UDP Flood	UDP flooder written by Foundstone

DDos Attacks

Botnets - Command and Control Center communicates with "Handlers" which in term communicate with Zombies. The handlers and zombies are machines infected with malware. The C&CC is either a chatroom on IRC, or can even be a distributed system of infected machines.

DDoS Tools

Trinoo	One of the first to demonstrate "Master/slave" DDoS attacks
Tribal Flood Network	Could launch several DoS attacks from distributed positions at the same time
TFN2K	Bug fixes and updates to the original TFN
Stacheldraht	Means "Barbed Wire" in German
Agobot	A modular IRC bot, many derivatives have been created from this code
Nuclear Bot	Developed by "Nuclear Winter Crew" and written in Delphi, many features

Buffer Overflows

It isn't necessary to become a "C" programmer to pass the test, but several basic concepts and terms are critical in the understanding of BO scripts and the detection of BO attacks.

Terminology

Stack Memory place for short term processing
Heap Memory space for long term program execution
Push "Push" new instructions onto the stack
Pop "Pop" instructions off the stack when processed
EIP Execute Instruction Pointer, memory address of next instruction to be executed
NOOP A "do nothing" instruction that wastes a clock cycle
NOOP Sled Placed in a buffer overflow exploit to aid in running the payload

Dangerous Functions

The following functions are dangerous because they do not check the size of the destination buffers:

gets()
strcpy()
strcat()
printf()

The >> operator is also dangerous for the same reason

Canary bytes

String terminating characters:

LF	Line Feed
CR	Carriage Return
NULL	Null
EOF	End of File

A randomly chosen value can also be placed at the end of a stack and checked.

Recognizing a buffer overflow attempt

```
Apr 5 02:02:09 [3432] : nops: 62.32.54.123:3211 -> 192.168.3.4:135
0x90/0x90/0x90/0x90/0x90/0x90/0x90/0x90/0x90/
```

HTTP and URLs

HTTP is the protocol for the World Wide Web. The client (web browser) sends request to the server (Apache, IIS) which is turn passes the request to an application. There are several attack types that are possible in this exchange since all of these components can have vulnerabilities.

HTTP Error Codes

200 Series	Everything is OK
400 Series	Could not provide requested resource (page not found, moved, authentication failure)
500 Series	Could not process request (script error, database connection error)

ASCII Characters

.	%2E
/	%2F
<	%3C
>	%3E

Uniform Resource Locators (URL)

Protocol   FQDN   Resource Path   Query String
http://www.example.com/folder/directory/page.asp?var=something&foo=some+other+thing

Representing IP Addresses

Dotted Quad	http://192.168.100.125
Hex Quad	http://0xC0.0xA8.0x64.0x7D
Decimal	http://3232261245

Converting Dotted Quad to Decimal (using above example)

192.168.100.125

Formula	(256^3 * 192) + (256^2 * 168) + (256^1 * 100) + (256^0 * 125)
Simplified	(16777216 * 192) + (65536 * 168) + (256 * 100) + 125
Simplified again	3221225472 + 11010048 + 25600 + 125 =
Answer	3232261245

Wireless Technology

Wireless is fast becoming the network technology of choice because it is cheap and easy. It is also a hubbed environment that can leak signals for miles. Configuring wireless technologies is an often misunderstood process, and often leaves many opportunities available for attack.

802.11

Spec	*Distance*	*Speed*	*Freq*
802.11a	30M	54Mbps	5Ghz
802.11b	100M	11Mbps	2.4Ghz
802.11g	100M	54Mbps	2.4Ghz
802.11n	125M	600Mbps	5Ghz

802.11i is a rewrite of WEP called WPA/TKIP

Wireless Security

WEP	Uses RC4 for the stream cipher with a 24b initialization vector Key sizes are 40b or 104b
WPA	Uses RC4 for the stream cipher but supports longer keys
WPA/TKIP	Changes the IV with each frame and includes key mixing
WPA2	Uses AES as the stream cipher and includes all the features of TKIP
OSA	Open Systems Authentication is a non-protected AP that broadcasts its SSID
PSK	Pre-Shared Key is protected by an encryption standard

Terms and Tools

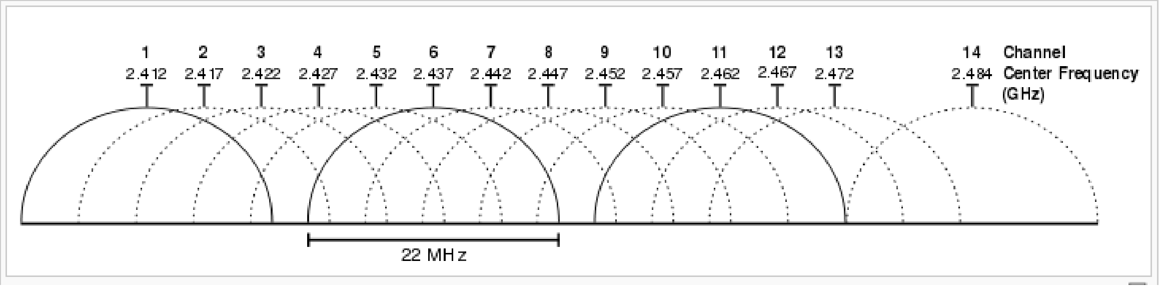
Wardriving	Driving around with portable equipment and locating wireless networks
Warchalking	Writing symbols on the sidewalk or buildings communicating found networks
Jamming	Producing white noise signals that overpower the Wifi networks
Netstumbler	Finds wireless networks, SSIDS, and channels
Ministumbler	for the pocket pc
Macstumbler	for the Macintosh
AirPcap	Hardware tools for wardriving, WEP cracking, and sniffing
Airopeek	Sniffer that specializes in wireless traffic
AircrackNG	WEP cracker
Airsnort	Another WEP cracker
CoWPAtty	WPA offline brute force cracker

Wireless Technology

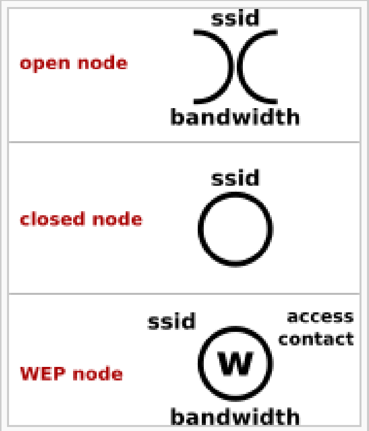
Wireless is fast becoming the network technology of choice because it is cheap and easy. It is also a hubbed environment that can leak signals for miles. Configuring wireless technologies is an often misunderstood process, and often leaves many opportunities available for attack.

WLAN Channels

Each channel increments by .005Mhz


1 2 3 4 5 6 7 8 9 10 11 12 13 14 Channel
2.412 2.417 2.422 2.427 2.432 2.437 2.442 2.447 2.452 2.457 2.462 2.467 2.472 2.484 Center Frequency (GHz)
22 MHz

Wardriving Symbols



Cryptography

Cryptography is assumed pre-requisite for this class. Its still a good idea to review some core terminology before the exam.

Terms and Definitions

Plaint Text	The data set before encryption
Cipher Text	The result of encryption
Cryptanalysis	Attempting to "break" and encryption algorithm
Cryptography	Obscuring the meaning of a message
Steganography	Hiding a message within another
Salt	Ensures different keys are created each time
Initialization Vector	Change the characteristics of the key each time it is reused

Types of Cryptography

Symmetric	Single key both encrypts and decrypts
Asymmetric	A pair of keys, public and private are mathematically associated One encrypts and the other decrypts, private key is always a secret
One-Way Hash	Cannot be reversed, only brute forced Used to represent data, sometimes called "Digital Fingerprint" or "Message Digest".

Symmetric Algorithms

DES	Block	56 bit key used in LM Hash password storage
3DES	Block	128 bit key used in NTLM
RC4	Stream	Used in WEP
AES	Stream	Used in WPA2

Asymmetric Algorithms

RSA	Asymmetric	Used in SSL/TLS
Elliptic Curve	Asymmetric	Used in TLS for portable devices

One-Way Hashes

MD5	One Way Hash	128b hash value, used for integrity checks
SHA-1	One Way Hash	160b hash value, stronger than MD5

Linux Operating System

While it is not necessary to be a Linux administrator or developer to pass this test, there is some assumed knowledge of a few basics, particularly pertaining to Security issues.

Linux File System

/	Root of the file system
/var	Variable data, log files are found here
/bin	Binaries, commands for users
/sbin	System Binaries, commands for administration
/root	Home directory for the root user
/home	Directory for all home folders for non-privileged users
/boot	Stores the Linux Kernel image and other boot files
/proc	Direct access to the Linux kernel
/dev	direct access to hardware storage devices
/mnt	place to mount devices on onto user mode file system

Identifying Users and Processes

INIT process ID	1
Root UID, GID	0
Accounts for services	1-999
All other users	Above 1000

MAC Times

Modify	Modify the contents of the file
Access	When the files was accessed last
Change	Metadata change

Use the "touch -mac filename" command to update all of them at the same time

Permissions

	User	Group	Others
R	400	040	004
W	200	020	002
X	100	010	001
SUID	4000		
SGID		2000	

Examples

User can RWX, Group can RW and Others can R	764
User can RW, Group can R and others can R	644
SUID bit set, User and group can RWX	4770
SUID and GUID bit set, all users can RWX	6777

Linux Commands

Practice the following commands and be able to recognize them in a shell script or log file. Always remember to "manpage" a command. Get used to reading about options and usage.

Command	Notable Options	Description
Using Linux (Basic Commands)		
man	/	Manual pages
ls	-l	Looksee into a directory
cd		Change directory
pwd		Print working directory
touch	-macr	Create a file or update its attributes
mv		Move a file
rm		Remove a file
mkdir		Make a directory
grep		String search utility
more		Paginate the output to the console
nano		Simple text editor
vi		Powerful text editor
gcc	-o	Compile from source code
Administration and Troubleshooting		
dd		Create an image file of a volume or device
file		Query a file for its type
netstat		List state of TCP/UDP ports
dig		DNS Zone transfer
host		Look up DNS records
lsof		List open files
ps	aux	View process list
rpcinfo		Enumerate portmapper
smbclient	-L	List or use SMB shares
md5sum		Calculate MD5 hash
Security tools that run best under Linux (add your own to this list !)		
mailsnarf, urlsnarf, filesnarf		
ettercap	-q -z	MiTM sniffer
nmap		Network mapper
hping	-c count -S	Packet crafter
snort		Network Intrusion Detection
iptables	-P -A -j --sport --dport -p	Kernel mode firewall
kismet		WiFi scanner and sniffer
nikto		Web vulnerability scanner
maltego		Information gathering
tcpdump	-i	Command line sniffer
firewalk	-u	Firewall enumerator
nc	-l -e -v	"Swiss army knife"

Firewalls and IPTables

The Linux firewall makes a good teaching example because once you understand it, all firewalls are easier. It is free, open source, and widely available.

Types of Firewalls

Packet filter	The simplest form of filtering, looks only at layer 3 and 4
Stateful Inspection	Understands directionality and established sockets
Circuit Level Gateway	Translates sequence numbers along with addresses and ports
Application Proxy	Deep packet inspection al the way into the payload

Attacking Firewalls

TCP Flag combinations	While some flag combinations are filtered, others may pass
Firewalking	Enumerating ACLs on a filter
ACK floods	Overwhelming an SPI firewall into thinking the traffic should pass
0th fragment	Host based firewalls only: The 0th fragment has TCP data, the others do not
ICMP redirection	Hijack local hosts to use the attackers host as a gateway, the traffic can be altered or observed
Tunneling and port redirection	Hiding data inside encapsulation

Setting up a network firewall

A host based firewall only protect the host, a network based firewall must also be a router. In Linux, the Kernel must be told to forward packets:

```
echo 1 > /proc/sys/net/ipv4/ip_forward
```

There are several default tables for a forwarding firewall to be aware of:

INPUT
OUTPUT
FORWARD
ACCEPT
NAT

IPTables Example: Defending against a Smurf attack

```
iptables -A FORWARD -p tcp -s 0/0 -d x.y.z.m/32 --destination-port 25 --syn -j ACCEPT
iptables -A FORWARD -p tcp -s 0/0 -d x.y.z.w/32 --destination-port 80 --syn -j ACCEPT
iptables -A FORWARD -p tcp -s 0/0 -d x.y.z.w/32 --destination-port 443 --syn -j ACCEPT
iptables -A FORWARD -p tcp -s 0/0 -d 0/0 --destination-port 22 --syn -j ACCEPT
```

IDS and Snort

Intrusion Detection Systems are a key technology for protecting a network. Attackers can also use them to look to look for very specific events on the network such as logins or other attackers. As a counterpart to firewalls, IDS is a great way to bring together the many of the concepts that been discussed in this course including; sniffing, scanning, and the four major protocols (IP, ICMP, TCP, UDP).

Types of IDS

Host Based	Active	Listens on the hosts
Network Based	Passive	Listens on the network

Detection Engines

Signature Analysis	Real time	Uses a rules based approach
Anomaly Analysis	Real time	Requires a baseline to compare with
Statistical Analysis	Not real time	Analysis of patterns and occurances

Evasion Techniques

Encryption	IDS cannot decrypt data to look at it
Fragmentation	IDS might be too busy peicving together traffic and start ignoring some
Decoy traffic	False positives can confuse investigators

Snort rules

Snort rules take on the following syntax:

```
action protocol address prot -> | <> address prot (option:value; option:value;)
```

Starting Snort

Display layer 2 and 7 to the console, use our own rules file and log here

```
snort -dve -c ./rules.local -l .
```

Examples of Snort rules

The simplest rule

```
alert tcp any any -> any any (msg:”Sample alert”; sid:1000000;)
```

Detecting a simple signature

```
alert tcp 192.168.1.6 any -> 192.168.1.5 139 \
(msg: “Possible SMBDie Attempt"; content:”|5c 50 49 50 45|”; sid:1000000;)
```

Dynamic rules (May be phased out in favor of a new method called "tagging")

```
activate tcp any any -> any 21 (content:"Login"; activates:1; sid:1000000;)
dynamic tcp any any -> any 21 (activated_by: 1; count:100;)
```

Command Line Tools

The key to becoming comfortable with command line tools is to practice saying in plain language what a command is trying to instruct the computerto do. Its hard to memorize switches and far easier to understand what a tool does. As you study and find more examples, add them to this list.

NMap

```
nmap -sT -T5  -n -p 1-100 192.168.1.1
```

Use nmap to run a connect scan at a fast rate without DNS resolution to ports 1-100 at host 192.168.1.1

Netcat

```
nc -v -z -w 2 192.168.1.1
```

Use netcat, show on the console a scan that sends packets every 2 seconds to host 192.168.1.1

tcpdump

```
tcpdump -i eth0 -v -X ip proto 1
```

Use tcpdump to listen on interface eth0 andsdisplay layer 2 and 7 for ICMP traffic

snort

```
snort -vde -c my.rules -l .
```

Use snort and show on the console layer 2 and 7 data using configuration file my.rules and log in this directory.

hping

```
hping3 -I eth0 -c 10 -a 2.2.2.2 -t 100 192.168.3.6
```

Use hping3 on eth0 and send 10 packets spoofing 2.2.2.2 and a TTL of 100 to host 192.168.3.6

iptables

```
iptables –A FORWARD –j ACCEPT –p tcp --dport 80
```

Use iptables and append the forward table with a rule that will jump to the accept table when tcp traffic that has a destination port of 80 is noticed.

Syntax Recognition

The CEH exam rewuires that you can recognize what an attack looks like from a log file. The following are examples that can be used to help explain the principles of each type of attack:

Directory Traversal

```
http://www.example.com/scripts/../../../../winnt/system32/cmd.exe?c+dir+c:
```

XSS (Cross Site Scripting)

```
http://www.example.com/pages/form.asp?foo=%3Cscript%3Ealert("Hacked")%3C/script%3El
ang=
```

SQL Injection

```
http://www.example.com/pages/form.asp?foo=blah'+or+1+=+1+--
http://www.example.com/pages/form.asp?foo=%27%3B+insert+into+usertable+("something"
)%3B+--lang=
blah' or 1 = 1 --
```

Nimda Virus

```
http://www.example.com/MSADC/../../../../winnt/system32/cmd.exe?c+dir+c:
```

Code Red

```
GET/default.ida?NNNNNNNNNNN%u9090%u688%u8b00%u0000%u00=a HTTP/1.0
```

SNMP OID

```
1.1.1.0.2.3.1.2.4.1.5.3.0.1
```

Buffer overflow attempt

```
Apr 5 02:02:09 [3432] : nops: 62.32.54.123:3211 -> 192.168.3.4:135
0x90/0x90/0x90/0x90/0x90/0x90/0x90/0x90/0x90/
```

Zone Transfer

```
Apr 5 02:02:09 [3432] : AXFR: 143.32.4.129:4865 -> 192.168.3.4:53
```

Enumerate email accounts

```
Apr 5 02:02:09 [3432] : VRFY: 78.34.65.45:5674 -> 192.168.3.4:25
```

Snort Signature Rule

```
Alert tcp any any -> any any (msg:"Test Rule"; sid:1000000;)
```

IPTables Rule

```
iptables –A FORWARD –j ACCEPT –p udp ––dport 53
```

Capture Filter

```
host 192.168.1.1 and host 192.168.1.2 ip proto 1
```

Display Filter

```
ip.addr == 192.168.1.1 && tcp.flags == 0x29
```

Random Recall Exercise

Memorizing a list of tool names is difficult and not actually very beneficial.   A better approach is too strengthen your minds ability to "think" it has seen all of these things before and map them to an important concept.

The list below is made up of names of tools and malware code divided into groups of five. Sometimes they are related and other times have nothing in common at all. Glance at a group and jot down the first word or phrase that comes to mind and move on to the next group. So not try to explain every item; just one word or phrase an keep going. One term may remind you of something, but your subconscious will see the others as well. On each pass, try to recall something different.

DOS
Smurf
SYN flood
Fraggle
Buffer Overflow

Ping OF Death
Tear drop
The UNnamed Attack
Land
SMB Die

Chargen
CPU Hog
Dos Attack Tools
Jolt2
Bubonic

Land and LaTierra
Targa
Blast20
Nemesys
Panther2 (Nuke)

ICMP Packets Sender
Some Trouble
UDPFlod
FSMax
Trinoo

TFN (trible Flow Network)
Stacheldrach
TFN2K
Shaft
Mstream

Trinity
Knight
Kaiten
Worms
Slammer

Bots
Bot Nets

Agobot/Phatbot/Forbot.Xtrembot
SDBot/RBot/UrXBot
mIRC-based Bots-GT-Bots:

DSNX Bots
Q8 Bots
Kaiten
r1-based bots
nslookup

whois
Sam Spade
Smart Whois
NetScan
GTWhois

Xwhois
ARIN
LACNIC
APNIC
DNS Enumnerator

subdomain retrieval
Spiderfoot
Domain footprinting tool
SensePost Footprint
Footprinting toolset

Bile
Bile-Weigh
TLD
vet-IPRange
qtrace

vet-mx
jarf-rev
jarf-dnsbrute
Teleport Pro
Wikto

HTTrack Web Copier
Tifny
Google
Google Earth
ciseek.com

DMOZ
Internal URL guessing
Archive.org
Neotrace
VisualRoute Trace

Smart Whois
Email Tacker Pro
Website Watcher (change notification)
GEO Spider

GEOwhere (news search)

Email Spider
Necrosoft Advanced DIG
IANA (Internet Assigned Numbers Authority
3D Traceroute
Kartoo Search Engine

Touchgraph Visual Browser
VisualRoute Mail Tracker
ReadNotify.com (email tracking)
Web Ripper
Robots.txt

Email Spiders
Web Data Extractor
1st Email Address Spider
Power Email Collector Tool
HPing2

Firewalk
Nmap
Blaster Scan
Port Scan Plus
Strobe

IPSecScan
NetScan Tools Pro
WUPS - UDP Scanner
SuperScan
IPScanner

MegaPing
Global Netwrok Inventory
Net Tools Suite Pack
FloppyScan
PhoneSweep - War Dialing Tool

THC Scan
Sandtrap Tool
pof-Banner Grabbing Tool
Httprint Banner Grabbing Tool
Xprobe2

Ring V2
Netcraft URL site
IIS Lockdown Tool
Servermask
PageXchange

Bidiblah Automated Scanner
Qualys Web Based Scanner
SAINT
ISS Security Scanner
Nessus

GFI Languard
SATAN
Retina
Nikto
SAFEsuite Internet Scanner

IdentTCPScan
Cheops
Friendly Printer
Free Proxy Servers (page 352)
SocksChain

Proxy Workbench
Proxymanager Tool
Super Proxy Helper Tool
Happy Browser Tool
Multiproxy

Tor Proxy Chaining Software
Proxy Finder
Proxybag
Proxy Scanner Server
Cheron

Anonymizers
Primedious Anonymyzer
Anonymous Surfing Browzar
Torpark Browser
G-Zapper

SSL Proxy Tool
HTTP-Tunnel
HTTP Port
Despoof Tool
What It Is

Sentry PC
Enumeration
SNMP Enumeration Countermeasures
Windows 2000 DNS Zone transfer
Identifying Win2000 Accounts

Active Directory Enumeration
SNMP Enumertion
SNMPUtil
NetBios Null Sessions
NetBIOS Enumeration

DumpSec
NAT
IP Network Browser
User2SID
SID2User

Enum
UserInfo

GetAcct
NewSID
NetBrute

wmidump
ShareEnum
WinFingerprint Untility
snmpenum
winfo

w2k Active Directory Attack
IP-Tools
getacct
netview
superscan

enum
pstools
ps exe
ps file
psgetrid

pskill
psinfo
pslist
pslogged on
pspaaswd

psservice
solarwinds
snscan
getif
Network View

The Dude Sniffer
Ethereal
tcpdump
ARP Spoof
Ethercap

Macof
Etherflood
IRS
ARPWorks
Nemesis

arpspoof
dnsspoof
dsniff
filesnarf
mailsnarf

msgsnarf
sshmitm
tcpkill
tcpnice

urlsnarf

webspy
Webmitm
TCP Relay
EffeTech
Password Sniffer

MSN Sniffer
SmartSniff
Netwitness
Cain and Abel
Packet Crafter

SMAC
NetSetMan
RAW SNIFFING TOOLS:
Sniffit
Aldebaran

Hunt
NGSSniff
Ntop
pf
IPTraf

EtherApe
Snort
Windump/tcpdump
Etherpeek
Mac Changer

Iris
NetIntercept
WinDNSSpoof
Netfilter
Network Probe

MaaTec Network Analyzer
Antisniff
ArpWatch
PromiScan
AntiSniff

Prodetect
Apple II Virus 1981
Brain 1983
Virdem 1986
Lehigh Virus

IBM Christmas Worm
MacMag
Scores Virus
Internet Worm
AIDS Trojan

VX BBS
Little Black Book (AT&T Attack)
Tequila (first Polymorphic virus)
Michelangelo
DAME (Dark Avenger Mutation Engine)

VCL (Virus Creation Laboratory)
Boza (Windows 95)
Laroux (Excel Macro)
Staog (Excel Macro)
Strange Brew (Java based)

Back Orifice (first remote admin control)
Melissa (Word macro virus and worm)
Corner (ms project)
Tristate (multi-program macro)
Bubbleboy (opening email spread)

Love Letter (fast, shuts down email)
Timofonica (VBS on phones)
LIberty (for PDA's)
Pirus (PHP scripting)
Gnuman (masked in file sharing)

Winux virus (infects both Windows and Linux)
LogoLogic-A Worm (MIRC chat and email)
PeachyPDF (Adobe PDF worm)
Apple Script worm
Nimda

LFM-926 (against shockwave flash)
Donut (against .net)
Sharp A
Javascript Worm/SQLSpider (MS SQL)
Benjamin (P2P

Perrun Virus (Jpeg)
Scalper Worm (FreeBSD and Apache)
Sobig (SMTP
Slammer worm (MS SQL servers)
Lovegate (trojan and worm)

Fizzer (email and P2P)
Welchia
Trojan.Xombe
Randex
Bizex

Witty
MP3Concept
Sassar
Mac OS X
W64.Rugrat.3344

Symb/Cabir-A
JS/Scob-A

WCE/Duts-A
W32/Amus-A
WinCE/Brador-A

JPEG Weakness
SH/Renepo-a
Bofra/IFrame
Santy
MYDOOM

I Love you virus (VBS Script)
Virus Hoaxes
CT Cookie Spy
Dictionary Maker
LophtCrack (LC4)

Brutus
AuthForce
Cain&Abel
Munga Bunga
ReadCookies.html

WinSSLMiM
GammaProg
John the Ripper
Obiwan
Hydra

Webcracker
Passlist
Snadboy
RAR
Messenpass

Wireless WEP Key Password Spy
RockXP
PasswordSpectator
Instant Source
wget

Web Sleuth
Black Widow
Window Bomb
Burp
cURL

sitescope Tool
WSDigger
CookieDigger
SSLDigger
SiteDigger

dotDefender
Google Hacking Database (GHDB)
Acunetix Webscanner
Appscan

AccessDiver

Xsite Scripting
SQL Inject
CMD Inject
Cookies/Session Poisoning
Parameter/Form Tampering

Buffer Overflow
Doirectory Traversal/Forceful Browsing
Cryptographic Interception
Authentication Hijack
Log Tampering

Error Msg Intercept attack
Obfuscation Application
Platform Exploits
DMZ Protocol Attacks
Security Management Exploits

Web Services Attack
Zero Day Attacks
Networtk Access Attacks
TCP Fragmentation
Log Analyzer

CleanIISlog
Metasploit Framework
Immunity Canvas Professional
Core Impact
UpdateExpert

qfecheck
HFNetchk
cacls.exe
Whisker
N-Stealth HTTP Vul Scanner

WebInspect
Shadow Security Scanner
SecureIIS
Buffer Overflow
$DATA IIS vulnerability

ShowCode.ASP
IIS Directory Traversal
ISSxploit.exe
Msw3prt IPP Vulnerability
WebDav/ntdll.dll Vul

RPC DCOM
ASN exploits
ASP Trojan
URL Poisoning
SQL Injection

Authorization bypass
SQL injection using single quotes
execute OS command
Bad login and bad product list
Getting Output of SLQ Query.

Get Data from DB using ODBC Error message
AutoMagic SQL
Absinthe
SQLDict
sqlExec

SQLbf
SQLSmack
SQL2.exe
AppDetective
Database Scanner

SQLPoke
NGSSQuirreL
SWLPing v2.2
Walking
Wardriving

WarFlying
WarChalking
Blue jacking
GPS
Rogue AP

Fake AP
NetStumbler
MiniStumbler
AiroPeek
WEPCrack, AirSnort

KisMAC
Kismet
WepLab
Wellenreiter
Fatajack

Redfang 2.5
THC-WarDrive
PrismStumbler
MacStumbler
Mognet

WaveStumbler
StumbVerter
AP Scanner
SSID Sniff
Wavemon

Wireless Security Auditor
AirFraf

Wifi Finder
AirMagnet
NAI Wireless

Ethereal
VPNmonitorl
Aerosolve.65
VxSniffer
EtherPEG

DriftNeit
WinDump
Ssidsniff
NetChaser v1.0
WinPcap

AirPcap
BSD-Airtools
AirDefense Guard
WIDZ
Netbios Auditing Tool

Smbbr
SMBCrack Tool
Legion
L0phtCrack
PWdump

RainbowCrack
KerbCrack
NBTDeputy
NetBios Dos Attack
John the Ripper

ScoopLM
SMBRelay
SMBCapture
SMBProxy
SMBGrind

SMBDie
Syskey Utility
Active Password Changer
X.EXE
PsExec

Remoxec
Alchemy Remote Executor
SC-KEylog
SC-Keylog PRO
SpyTestor FTP Keylogger

IKS Software Invisible Keylogger
Ghost Keylogger
KeyGhost USB Keylogger
Perfect Keylogger

Stealth Email Redirector
Spyware
Spector Pro
RemoteSpy
eBlaster

Stealth Voice Recorder
Stealth Keylogger
Stealth Website Logger
Digi-Watcher Video Surveillance
Desktop Spy Screen Capture Program

Telephone Spy
Print Monitor Spy Tool
Wiretap Professional
FlexiSpy
PC Phonehome

Rootkits
Blacklight
Rootkit Revealer
AFX Rootkit 2005
Nuclear

Vanquish
Rootkit Countermeasures
Pathfinder
Rootkit Revealer
Back Orifice

Deep Throat
NetBus
Whack-a-mole
NetBus 2
Girl Friend

Sub Seven
WinTrinoo
Tini
icmd
netcat

Beast
MoSucker Trojan
Proxy Server Trojan
SARS Trojan
Wrappers

RemoteByMAil
HTTP RAT
Shttpd Trojan
Nuclear RAT
BadLucj Destructive Trojan

ICMP Tunneling

ScreenSaver Password Hack
Phatbot
Amitis
Senna Spy

QAZ
Cyber Spy
Subroot Telnet
RECUB
Loki

Sockets de Troie
MAsters Paradise
DEvil
Evil
Doly Trojan

Chargen
Stealth Spy Phaze
NetBIOS datagram
ICQ Trojan
MStream

The PRayer 1.0-2.0
Online KEyLogger
Portal of Doom
Senna Spy
Trojan Cow

netstat
fport
TCPview
CurrPorts Tool
Process Viewer

Device Drivers
Registry
Autoruns
Startup List
Tripwire (SIV)

SIV / SFV
MD5sum
ipchains
SARA
gcc

make
chroot
nessus
nmap
cheops

portsentry
iptables
netcat

snort
saint

tcpdump
ethereal
dsniff
hping
sniffit

nemesis
lsof
iptraf
lids
hunt

tcp wrappers
LKMs
chkrootkit
ntop
lsat

IDS
firewall
honeypot
ids techniques
SIV

sidestep
Tripwire
fragroute
firewall types
firewalk

banner grabbing
HTTP Tunnel
loki
specter
honeyd

KFSSensor