

## Basic network commands

### ping

The ping command (named after the sound of an active sonar system) sends echo requests to the host specified on the command line, and lists the responses received.

\$ ping ipAddress or hostname

e.g

\$ ping www.vit.ac.in

- ping - sends an ICMP *ECHO\_REQUEST* packet to the specified host. If the host responds, an ICMP packet is received.
- One can “ping” an IP address to see if a machine is alive.
- It provides a very quick way to see if a machine is up and connected to the network.

### netstat

- It works with the LINUX Network Subsystem, it will tell you what the status of ports are ie. open, closed, waiting connections. It is used to display the TCP/IP network protocol statistics and information.

### tcpdump

This is a sniffer, a program that captures packets off a network interface and interprets them.

### hostname

Tells the user the host name of the computer they are logged into.

### traceroute

*traceroute* will show the route of a packet. It attempts to list the series of hosts through which your packets travel on their way to a given destination.

Command syntax:

**traceroute machine\_name\_or\_ip**

e.g traceroute [www.vit.ac.in](http://www.vit.ac.in)

Each host will be displayed, along with the response times at each host.

### finger

Retrieves information about the specified user.

e.g finger bit50001

**ifconfig** ( In Windows use ipconfig )

This command is used to configure network interfaces, or to display their current configuration.

### dig

The "domain information groper" tool. If you give a hostname as an argument to output information about that host, including it's IP address, hostname and various other information.

e.g dig vitlinux

## **telnet**

`telnet` allows you to log in to a computer, just as if you were sitting at the terminal. Once your username and password are verified, you are given a shell prompt. From here, you can do anything requiring a text console.

## **ftp**

To connect to an FTP server use

```
ftp ipaddress
```

## **netstat**

Displays contents of `/proc/net` files. It works with the LINUX Network Subsystem, it will tell you what the status of ports are ie. open, closed, waiting, masquerade connections. It will also display various other things. It has many different options.

## **tcpdump**

This is a sniffer, a program that captures packets off a network interface and interprets them for you. It understands all basic internet protocols, and can be used to save entire packets for later inspection.

## **ping**

The ping command (named after the sound of an active sonar system) sends echo requests to the host you specify on the command line, and lists the responses received their round trip time.

You simply use ping as:

```
ping ip_or_host_name
```

## **hostname**

Tells the user the host name of the computer they are logged into. Note: may be called *host*.

## **traceroute**

*traceroute* will show the route of a packet. It attempts to list the series of hosts through which your packets travel on their way to a given destination. Also have a look at *xtraceroute* (one of several graphical equivalents of this program).

Command syntax:

```
traceroute machine_name_or_ip
```

## **tracpath**

*tracpath* performs a very similar function to *traceroute* the main difference is that *tracpath* doesn't take complicated options.

Command syntax:

```
tracpath machine_name_or_ip
```

## **findsmb**

*findsmb* is used to list info about machines that respond to SMB name queries (for example windows based machines sharing their hard disk's).

Command syntax:

```
Find smb
```

This would find all machines possible, you may need to specify a particular subnet to query those machines only...

## **nmap**

“ network exploration tool and security scanner”. *nmap* is a very advanced network tool used to query machines (local or remote) as to whether they are up and what ports are open on these machines.

A simple usage example:

```
nmap machine_name
```

This would query your own machine as to what ports it keeps open. *nmap* is a very powerful tool, documentation is available on the [nmap site](#) as well as the information in the manual page.

## telnet

Someone once stated that telnet(1) was the coolest thing he had ever seen on computers. The ability to remotely log in and do stuff on another computer is what separates Unix and Unix-like operating systems from other operating systems.

telnet allows you to log in to a computer, just as if you were sitting at the terminal. Once your username and password are verified, you are given a shell prompt. From here, you can do anything requiring a text console. Compose email, read newsgroups, move files around, and so on. If you are running X and you telnet to another machine, you can run X programs on the remote computer and display them on yours.

To login to a remote machine, use this syntax:

```
% telnet <hostname>
```

If the host responds, you will receive a login prompt. Give it your username and password. That's it. You are now at a shell. To quit your telnet session, use either the exit command or the logout command.

telnet does not encrypt the information it sends. Everything is sent in plain text, even passwords. It is not advisable to use telnet over the Internet. Instead, consider the Secure Shell. It encrypts all traffic and is available for free.

## The other use of telnet

Now that we have convinced you not to use the telnet protocol anymore to log into a remote machine, we'll show you a couple of useful ways to use telnet.

You can also use the telnet command to connect to a host on a certain port.

```
% telnet <hostname> [port]
```

This can be quite handy when you quickly need to test a certain service, and you need full control over the commands, and you need to see what exactly is going on. You can interactively test or use an SMTP server, a POP3 server, an HTTP server, etc. this way.

In the next figure you'll see how you can telnet to a HTTP server on port 80, and get some basic information from it.

**Figure 13-1. Telnetting to a webserver**

```
% telnet store.slackware.com 80

Trying 69.50.233.153...

Connected to store.slackware.com.

Escape character is '^]'.

HEAD / HTTP/1.0

HTTP/1.1 200 OK

Date: Mon, 25 Apr 2005 20:47:01 GMT

Server: Apache/1.3.33 (Unix) mod_ssl/2.8.22 OpenSSL/0.9.7d

Last-Modified: Fri, 18 Apr 2003 10:58:54 GMT

ETag: "193424-c0-3e9fda6e"

Accept-Ranges: bytes

Content-Length: 192

Connection: close

Content-Type: text/html
```

Connection closed by foreign host.

%

### **1-)arp :**

When we need an Ethernet (MAC) address we can use arp(address resolution protocol).

In other words it shows the physical address of an host.

#### **Example:**

```
C:\Documents and Settings\sysadm>arp -a
```

```
Interface: 169.254.195.199 --- 0x2
```

Internet Address	Physical Address	Type
216.109.127.60	00-53-45-00-00-00	static

### **2-)nslookup:**

Displays information from Domain Name System (DNS) name servers.

#### **Example:**

```
C:\Documents and Settings\sysadm>nslookup itu.dk
```

```
Server: ns3.inet.tele.dk
```

```
Address: 193.162.153.164
```

```
Non-authoritative answer:
```

```
Name: itu.dk
```

Address: 130.226.133.2

**NOTE** :If you write the command as above it shows as default your pc's server name firstly.

C:\Documents and Settings\sysadm>nslookup mail.yahoo.com itu.dk

Server: superman.itu.dk

Address: 130.226.133.2

Non-authoritative answer:

Name: login.yahoo.akadns.net

Address: 216.109.127.60

Aliases: mail.yahoo.com, login.yahoo.com

NOTE:Remark that in the second example we do not see the default server name.

There are many nslookup with optional commands.To read them type nslookup and enter  
then type help and enter.

### **3-)finger:**

Displays the information about a user on the system.

#### **Example:**

**NOTE** :I could not find out the name of the server that we log on (windows) at the school.

Sysadmin does not know that either:o)

But as an example I tried it on the our unix server.

[hilmiolgun@ssh hilmiolgun]\$ finger

Login	Name	Tty	Idle	Login Time	Office	Office Phone
adel	Adel Abu-Sharkh	pts/1	7 Sep 10 00:11	(cpe.atm2-0-1091080.0x50a0bcb2.albnxx13.customer.tele.dk)		
adel	Adel Abu-Sharkh	pts/2	9 Sep 9 23:56	(cpe.atm2-0-1091080.0x50a0bcb2.albnxx13.customer.tele.dk)		
hilmiolgun	Hilmi Olgun	pts/9	Sep 10 00:20	(0x3ef3e2fe.albnxx8.adsl.tele.dk)		
hm	Hanne Munkholm	pts/6	1:56 Sep 8 21:27	(off180.palombia.dk)		
jcg	Jens Christian Godsk	pts/4	1d Sep 8 10:28	(toscana.itu.dk)		
kaj	Kenneth Ahn Jensen	pts/7	Sep 10 00:11	(cpe.atm2-0-54493.0x50a4ad32.boanxx12.customer.tele.dk)		
root	root	pts/8	1 Sep 10 00:12	(sysadm2.itu.dk)		
troels	Troels Arvin	pts/5	3:49 Sep 9 20:31	(62.79.119.132.adsl.vbr.worldonline.dk)		
webclaus	Claus Bech Rasmussen	pts/0	6 Sep 10 00:11	(port967.ds1-khk.adsl.cybercity.dk)		

**NOTE** :What I did is :I first check the online users,and get a list of them(above).

Then i just choosed one user to get information about him(below)

```
[hilmiolgun@ssh hilmiolgun]$ finger hm
```

Login: hm                      Name: Hanne Munkholm

Directory: /import/home/hm              Shell: /bin/bash

On since Mon Sep 8 21:27 (CEST) on pts/6 from off180.palombia.dk

1 hour 56 minutes idle

Last login Tue Sep 9 11:05 (CEST) on pts/12 from stud127.itu.dk

New mail received Mon Nov 11 23:01 2002 (CET)



Unread since Sat Oct 5 00:00 2002 (CEST)

Plan:

World Domination... fast.

[hilmiolgun@ssh hilmiolgun]\$

#### **4-)ping:**

Simply shows if the remote machine is available or not....

#### **Example:**

C:\Documents and Settings\sysadm>ping webmail.itu.dk

Pinging tarzan.itu.dk [130.226.133.3] with 32 bytes of data:

Reply from 130.226.133.3: bytes=32 time=29ms TTL=55

Reply from 130.226.133.3: bytes=32 time=30ms TTL=55

Reply from 130.226.133.3: bytes=32 time=30ms TTL=55

Reply from 130.226.133.3: bytes=32 time=30ms TTL=55

Ping statistics for 130.226.133.3:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 29ms, Maximum = 30ms, Average = 29ms

**NOTE :**Remark that the remote machine is replying.Otherwise the output will be "Request time out"  
which means the

remote machine is not working well.(Not answering)

### **5-)tracert:**

It simply shows the path between source and destination address.

#### **Example:**

C:\Documents and Settings\sysadm>tracert webmail.itu.dk

Tracing route to tarzan.itu.dk [130.226.133.3]

over a maximum of 30 hops:

```
1  *      *      *      Request timed out.

2  29 ms   19 ms   29 ms   ge-0-2-1-2.1000M.albnxu1.ip.tele.dk [195.249.1.2 9]

3  29 ms   29 ms   19 ms   pos1-0.622M.lynxg1.ip.tele.dk [195.249.2.46]

4  29 ms   19 ms   29 ms   herman.fsknet.lyngby.forskningsnettet.dk [192.38 .7.1]

5  29 ms   29 ms   19 ms   130.225.244.214

6  29 ms   29 ms   29 ms   1.ku.forskningsnettet.dk [130.225.245.90]

7  29 ms   29 ms   29 ms   rk.itu.forskningsnettet.dk [130.226.249.30]

8  29 ms   29 ms   29 ms   130.225.245.86

9  29 ms   29 ms   29 ms   tarzan.itu.dk [130.226.133.3]
```

Trace complete.

## **6-)ftp:**

For file transferring..(File transfer protocol)

**Example:**Lets you dont have an ftp software and you want to get a file from your school harddisk.

So to do that:

C:\Documents and Settings\sysadm>ftp

ftp> open

To ftp.itu.dk

Connected to ssh.itu.dk.

220 ProFTPD 1.2.8rc2 Server (ProFTPD Default Installation) [ssh.it-c.dk]

**NOTE:**What am I doing is simply:typing them one-by-one(after each typing remember to enter)

ftp,open,ftp.itu.dk

User (ssh.itu.dk:(none)): hilmiolgun

331 Password required for hilmiolgun.

Password:

230 User hilmiolgun logged in.

**NOTE:**The server will require username and password..

**ftp> help**

Commands may be abbreviated. Commands are:

!            delete        literal        prompt        send

?	debug	ls	put	status
append	dir	mdelete	pwd	trace
ascii	disconnect	mdir	quit	type
bell	get	mget	quote	user
binary	glob	mkdir	recv	verbose
bye	hash	mls	remotehelp	
cd	help	mput	rename	
close	lcd	open	rmdir	

ftp> help dir

dir        List contents of remote directory

**NOTE:** If it is your first time to those commands just type help and get the commands.If you dont know how to use

them type help commandname..

ftp> dir

200 PORT command successful

150 Opening ASCII mode data connection for file list

drwx-----	4	hilmiolgun	hilmiolgun	155 Jul 1 14:02 Desktop
drwx-----	2	hilmiolgun	hilmiolgun	4096 May 30 10:21 Mail
drwxr-xr-x	5	hilmiolgun	hilmiolgun	90 Sep 2 02:59 MobilePositionSDK
drwx-----	7	hilmiolgun	hilmiolgun	4096 Aug 8 2002 NTnetscape
drwxr--r--	13	hilmiolgun	hilmiolgun	4096 Sep 4 01:56 New Folder
-rw-rw-r--	1	hilmiolgun	hilmiolgun	74 Sep 9 12:56 TTI409B

```

drwx----- 2 hilmiolgun hilmiolgun    6 Jan 21  2002 cgi-bin
-rw-rw-r-- 1 hilmiolgun hilmiolgun    74 Sep  9 12:56 geu
-rw-rw-r-- 1 hilmiolgun hilmiolgun    74 Sep  9 12:56 hilmiolgun
drwxr-xr-x  6 hilmiolgun hilmiolgun  4096 Aug 14 15:59 image
drwxr-xr-x  3 hilmiolgun hilmiolgun  4096 Jul 29 16:03 jmf20-apidocs
drwxr-xr-x  4 hilmiolgun hilmiolgun  4096 Sep  9 14:10 NOTEsieee
drwx----- 2 hilmiolgun hilmiolgun    6 Feb 21  2002 nsmail
drwx----- 3 hilmiolgun hilmiolgun   103 Feb 21  2002 office52
drwx----- 2 hilmiolgun hilmiolgun    6 Jan 21  2002 private
drwxr--rwx  2 hilmiolgun hilmiolgun  4096 Aug 23 12:02 public_html
drwxr-xr-x  5 hilmiolgun hilmiolgun  4096 Sep  6 03:30 speech
-rw-rw-r-- 1 hilmiolgun hilmiolgun  2630 Sep  9 13:58 test.txt
-rw-rw-r-- 1 hilmiolgun hilmiolgun   148 Sep  9 14:03 testing.txt

```

226 Transfer complete.

ftp: 1318 bytes received in 0,24Seconds 5,49Kbytes/sec.

ftp> get testing.txt

200 PORT command successful

150 Opening ASCII mode data connection for testing.txt (148 bytes)

226 Transfer complete.

ftp: 161 bytes received in 0,02Seconds 8,05Kbytes/sec.

**NOTE** :After taking a look to the school harddisk ,I copied a file "testing.txt" to my local harddisk....

ftp> !dir

Volume in drive C has no label.

Volume Serial Number is 0868-D52D

Directory of C:\Documents and Settings\sysadm

10-09-2003	00:21	<DIR>	.
10-09-2003	00:21	<DIR>	..
31-08-2003	07:28	<DIR>	.java
25-04-2003	12:18	<DIR>	.javaws
23-04-2003	15:26	<DIR>	.jpi_cache
26-08-2003	04:59	<DIR>	.Nokia
07-09-2003	01:46	12.546	.plugin140_03.trace
07-09-2003	04:46	693	.plugin141_02.trace
07-09-2003	01:20	164	.saves-3824-IBMR31IMAGE
07-09-2003	01:20	<DIR>	Desktop
07-09-2003	08:05	<DIR>	Favorites
06-09-2003	05:29	80.140	love.wav
09-09-2003	23:45	<DIR>	mindterm
09-09-2003	11:02	<DIR>	My Documents
10-09-2003	00:21	2.903	plugin131_08.trace
25-04-2003	11:44	<DIR>	Start Menu
06-09-2003	21:21	<DIR>	studio5se_user

06-09-2003 05:32 18 test.txt

06-09-2003 05:20 70 testing

10-09-2003 00:37 161 testing.txt

26-08-2003 03:46 <DIR> WINDOWS

8 File(s) 96.695 bytes

13 Dir(s) 3.842.056.192 bytes free

ftp> send love.wav

200 PORT command successful

150 Opening ASCII mode data connection for love.wav

226 Transfer complete.

ftp: 80140 bytes sent in 3,97Seconds 20,21Kbytes/sec.

ftp> dir

200 PORT command successful

150 Opening ASCII mode data connection for file list

drwx----- 4 hilmiolgun hilmiolgun 155 Jul 1 14:02 Desktop

drwx----- 2 hilmiolgun hilmiolgun 4096 May 30 10:21 Mail

drwxr-xr-x 5 hilmiolgun hilmiolgun 90 Sep 2 02:59 MobilePositionSDK

drwx----- 7 hilmiolgun hilmiolgun 4096 Aug 8 2002 NTnetscape

drwxr--r-- 13 hilmiolgun hilmiolgun 4096 Sep 4 01:56 New Folder

-rw-rw-r-- 1 hilmiolgun hilmiolgun 74 Sep 9 12:56 TTI409B

drwx----- 2 hilmiolgun hilmiolgun 6 Jan 21 2002 cgi-bin

```

-rw-rw-r-- 1 hilmiolgun hilmiolgun 74 Sep 9 12:56 geu
-rw-rw-r-- 1 hilmiolgun hilmiolgun 74 Sep 9 12:56 hilmiolgun
drwxr-xr-x 6 hilmiolgun hilmiolgun 4096 Aug 14 15:59 image
drwxr-xr-x 3 hilmiolgun hilmiolgun 4096 Jul 29 16:03 jmf20-apidocs
-rw-rw-r-- 1 hilmiolgun hilmiolgun 80137 Sep 9 22:36 love.wav
drwxr-xr-x 4 hilmiolgun hilmiolgun 4096 Sep 9 14:10 NOTEsieee
drwx----- 2 hilmiolgun hilmiolgun 6 Feb 21 2002 nsmail
drwx----- 3 hilmiolgun hilmiolgun 103 Feb 21 2002 office52
drwx----- 2 hilmiolgun hilmiolgun 6 Jan 21 2002 private
drwxr--rwx 2 hilmiolgun hilmiolgun 4096 Aug 23 12:02 public_html
drwxr-xr-x 5 hilmiolgun hilmiolgun 4096 Sep 6 03:30 speech
-rw-rw-r-- 1 hilmiolgun hilmiolgun 2630 Sep 9 13:58 test.txt
-rw-rw-r-- 1 hilmiolgun hilmiolgun 148 Sep 9 14:03 testing.txt

```

226 Transfer complete.

ftp: 1387 bytes received in 0,07Seconds 19,81Kbytes/sec.

ftp>

**NOTE:**At the end first looking at the local working directory and sending a file "love.wav" to the school harddisk.

## 7-)net:

It has many options, which are for checking/starting/stopping nt services, users, messaging, configuration and so on...



Some of those options require administration privileges..

**Example:**

**NOTE:** To have an overview of commands options....

C:\Documents and Settings\sysadm>net

The syntax of this command is:

**NET COMMANDS**

NET [ ACCOUNTS | COMPUTER | CONFIG | CONTINUE | FILE | GROUP | HELP |

HELPMSG | LOCALGROUP | NAME | PAUSE | PRINT | SEND | SESSION |

SHARE | START | STATISTICS | STOP | TIME | USE | USER | VIEW ]

**NOTE:** And furthermore to get an overview of a specific option ...

C:\Documents and Settings\sysadm>net help print

The syntax of this command is:

NET PRINT

\\computername\sharename

[\\computername] job# [/HOLD | /RELEASE | /DELETE]

NET PRINT displays print jobs and shared queues.

For each queue, the display lists jobs, showing the size

and status of each job, and the status of the queue.

\\computername        Is the name of the computer sharing the printer

queue(s).

sharename            Is the name of the shared printer queue.

job#                Is the identification number assigned to a print

job. A computer with one or more printer queues

assigns each print job a unique number.

/HOLD                Prevents a job in a queue from printing.

The job stays in the printer queue, and other

jobs bypass it until it is released.

/RELEASE            Reactivates a job that is held.

/DELETE             Removes a job from a queue.

NET HELP command | MORE displays Help one screen at a time.

Finally in addition to above there are also those commands: **hostname ,lpq, lpr ,rsh ,tftp ,nbstat ,netstat.**

To get familiar with those commands simply type **commandname /?** at the command line.

**C:\>net**

The syntax of this command is:

NET [ ACCOUNTS | COMPUTER | CONFIG | CONTINUE | FILE | GROUP | HELP |

HELPMSG | LOCALGROUP | NAME | PAUSE | PRINT | SEND | SESSION |

SHARE | START | STATISTICS | STOP | TIME | USE | USER | VIEW ]

**C:\>net use**

New connections will not be remembered.

Status	Local	Remote	Network
--------	-------	--------	---------

OK	F:	\\cse-sec\\fac	Microsoft Windows Network
----	----	----------------	---------------------------

**C:\>net user**

User accounts for \\CSE-DEPT-05

Administrator	Guest
---------------	-------

**C:\>net statistics**

Statistics are available for the following running services:

Server

Workstation

**Displays protocol statistics and current TCP/IP network connections.**

**NETSTAT [-a] [-e] [-n] [-s] [-p proto] [-r] [interval]**

**-a** Displays all connections and listening ports.

**-e** Displays Ethernet statistics. This may be combined with the  
**-s** option.

**-n** Displays addresses and port numbers in numerical form.

**-p proto** Shows connections for the protocol specified by proto; proto  
may be TCP or UDP. If used with the -s option to display

per-protocol statistics, proto may be TCP, UDP, or IP.

**-r** Displays the routing table.

**-s** Displays per-protocol statistics. By default, statistics are shown for TCP, UDP and IP; the **-p** option may be used to specify a subset of the default.

**interval** Redisplays selected statistics, pausing interval seconds between each display. Press CTRL+C to stop redisplaying statistics. If omitted, netstat will print the current configuration information once.

**C:\>net name**

Name

-----  
CSE-DEPT-05

**C:\>net session**

Computer	User name	Client Type	Opens	Idle time
----------	-----------	-------------	-------	-----------

-----  

\\ENGLISH-03		Windows NT 1381 0	00:10:47	
--------------	--	-------------------	----------	--

\\ENGLISHBDC		Windows NT 1381 0	00:02:01	
--------------	--	-------------------	----------	--

**C:\>net accounts**

Force user logoff how long after time expires?: Never

Minimum password age (days): 0

Maximum password age (days): 42

Minimum password length: 0

Length of password history maintained: None

Lockout threshold: Never

Lockout duration (minutes): 30

Lockout observation window (minutes): 30

Computer role: WORKSTATION

**C:\>net localgroup**

Aliases for \\CSE-DEPT-05

-----  
\*Administrators      \*Backup Operators      \*Guests

\*Power Users      \*Replicator      \*Users

**C:\>net config server**

Server Name            \\CSE-DEPT-05

Server Comment

Software version      Windows NT 4.0

Server is active on    NetBT\_DLKRTS1 (0050ba8b326b) NetBT\_DLKRTS1

(0050ba8b326b) NwlnkIpx (0050ba8b326b) NwlnkNb (0050ba8b326b) Nbf\_DLKRTS1 (0050ba8b326b)

Server hidden                      No

Maximum Logged On Users              10

Maximum open files per session      2048

Idle session time (min)              15

**C:\>net config workstation**

Computer name                      \\CSE-DEPT-05

User name                          Administrator

Workstation active on              NwlnkNb (0050BA8B326B) NetBT\_DLKRTS1 (0050BA8B326B) Nbf\_DLKRTS1 (0050BA8B326B)

Software version                  Windows NT 4.0

Workstation domain              WORKGROUP

Logon domain                      CSE-DEPT-05

COM Open Timeout (sec)              3600

COM Send Count (byte)              16

COM Send Timeout (msec)              250

**C:\>net share**

Share name	Resource	Remark
------------	----------	--------

---

D\$	D:\	Default share
IPC\$		Remote IPC
C\$	C:\	Default share
ADMIN\$	C:\WINNT	Remote Admin
E\$	E:\	Default share
abishek	E:\abishek	
akshu	E:\akshu	
HARSHINI	D:\ HARSHINI	
DHARSHINI	E:\ DHARSHINI	

**C:\>net stop messenger**

The Messenger service is stopping.

The Messenger service was stopped successfully.

**C:\>net start messenger**

The Messenger service is starting...

The Messenger service was started successfully.

### **Network Configuration commands**

#### **ifconfig**

This command is used to configure network interfaces, or to display their current configuration. In addition to activating and deactivating interfaces with the “up” and “down” settings, this command is necessary for setting an interface's address information if you don't have the *ifcfg* script.

Use *ifconfig* as either:

`ifconfig`

This will simply list all information on all network devices currently up.

`ifconfig eth0 down`

This will take eth0 (assuming the device exists) down, it won't be able to receive or send anything until you put the device back “up” again.

Clearly there are a lot more options for this tool, you will need to read the manual/info page to learn more about them.

## **ifup**

Use *ifup device-name* to bring an interface up by following a script (which will contain your default networking settings). Simply type *ifup* and you will get help on using the script.

For example typing:

`ifup eth0`

Will bring eth0 up if it is currently down.

## **ifdown**

Use *ifdown device-name* to bring an interface down using a script (which will contain your default network settings). Simply type *ifdown* and you will get help on using the script.

For example typing:

`ifdown eth0`

Will bring eth0 down if it is currently up.

## **ifcfg**

Use *ifcfg* to configure a particular interface. Simply type *ifcfg* to get help on using this script.

For example, to change eth0 from 192.168.0.1 to 192.168.0.2 you could do:

`ifcfg eth0 del 192.168.0.1`



```
ifcfg eth0 add 192.168.0.2
```

The first command takes eth0 down and removes that stored IP address and the second one brings it back up with the new address.

## **route**

The *route* command is the tool used to display or modify the routing table. To add a gateway as the default you would type:

```
route add default gw some_computer
```

# **INTERNET SPECIFIC COMMANDS**

## **host**

Performs a simple lookup of an internet address (using the Domain Name System, DNS).

Simply type:

```
host ip_address
```

or

```
host domain_name
```

## **dig**

The "domain information groper" tool. More advanced than *host*... If you give a hostname as an argument to output information about that host, including its IP address, hostname and various other information.

For example, to look up information about "www.amazon.com" type:

```
dig www.amazon.com
```

To find the host name for a given IP address (ie a reverse lookup), use *dig* with the ``-x'` option.

```
dig -x 100.42.30.95
```

This will look up the address (which may or may not exist) and returns the address of the host, for example if that was the address of “http://slashdot.org” then it would return “http://slashdot.org”.

*dig* takes a huge number of options (at the point of being too many), refer to the manual page for more information.

## **whois**

(now BW whois) is used to look up the contact information from the “whois” databases, the servers are only likely to hold major sites. Note that contact information is likely to be hidden or restricted as it is often abused by crackers and others looking for a way to cause malicious damage to organisation's.

## **wget**

(GNU Web get) used to download files from the World Wide Web.

To archive a single web-site, use the `-m` or `--mirror` (mirror) option.

Use the `-nc` (no clobber) option to stop *wget* from overwriting a file if you already have it.

Use the `-c` or `--continue` option to continue a file that was unfinished by *wget* or another program.

Simple usage example:

```
wget url_for_file
```

This would simply get a file from a site.

*wget* can also retrieve multiple files using standard wildcards, the same as the type used in bash, like `*`, `[ ]`, `?`. Simply use *wget* as per normal but use single quotation marks ( `'` ) on the URL to prevent bash from expanding the wildcards. There are complications if you are retrieving from a http site (see below...).

Advanced usage example, (used from *wget* manual page):

```
wget --spider --force-html -i bookmarks.html
```

This will parse the file `bookmarks.html` and check that all the links exist.

Advanced usage: this is how you can download multiple files using http (using a wildcard...).

Notes: http doesn't support downloading using standard wildcards, ftp does so you may use wildcards with ftp and it will work fine. A work-around for this http limitation is shown below:

```
wget -r -l1 --no-parent -A.gif http://www.website.com[1]
```

This will download (recursively), to a depth of one, in other words in the current directory and not below that. This command will ignore references to the parent directory, and downloads anything that ends in “.gif”. If you wanted to download say, anything that ends with “.pdf” as well than add a *-A.pdf* before the website address. Simply change the website address and the type of file being downloaded to download something else. Note that doing *-A.gif* is the same as doing *-A “\*.gif”* (double quotes only, single quotes will not work).

*wget* has many more options refer to the examples section of the manual page, this tool is very well documented.

**Alternative website downloaders:** You may like to try alternatives like *httrack*. A full GUI website downloader written in python and available for GNU/Linux

## curl

*curl* is another remote downloader. This remote downloader is designed to work without user interaction and supports a variety of protocols, can upload/download and has a large number of tricks/work-arounds for various things. It can access dictionary servers (dict), ldap servers, ftp, http, gopher, see the manual page for full details.

To access the full manual (which is huge) for this command type:

```
curl -M
```

For general usage you can use it like *wget*. You can also login using a user name by using the *-u* option and typing your username and password like this:

```
curl -u username:password http://www.placetodownload/file
```

To upload using ftp you the *-T* option:

```
curl -T file_name ftp://ftp.uploadsite.com
```

To continue a file use the *-C* option:

```
curl -C - -o file http://www.site.com
```

### **View and modify network interfaces**

`ifconfig -a` Show information about all network interfaces

`ifconfig eth0` Show information only about the interface eth0

`ifconfig eth0 up` Bring up the interface eth0

`ifconfig eth0 down` Take down the interface eth0

### **Simple network diagnostic commands**

`ping hostname` Send ICMP echo requests to the host hostname

`traceroute hostname` Trace the network path to hostname

### **View open network connections**

**netstat** -a Show information about all open network connections

`netstat -a | grep LISTEN` Show information about all open network ports

## Set/view routing information

**netstat -r** View system routing tables

route View system routing tables

The command route can also be used to add or delete routes. Examples:

route add -host 192.168.3.4 gw 192.168.3.1 netmask 255.255.0.0

route del -host 192.168.3.4

## NETSTAT.exe TCP/IP Network Statistics

Displays protocol statistics and current TCP/IP network connections.

**NETSTAT [-a] [-e] [-n] [-s] [-p proto] [-r] [interval]**

**-a** Displays all connections and listening ports.

**-e** Displays Ethernet statistics. This may be combined with the **-s** option.

**-n** Displays addresses and port numbers in numerical form.

**-p proto** Shows connections for the protocol specified by proto; proto may be TCP or UDP.  
If used with the **-s** option to display per-protocol statistics, proto may be TCP, UDP, or IP.

**-r** Displays the routing table.

**-s** Displays per-protocol statistics. By default, statistics are shown for TCP, UDP and IP; the **-p** option may be used to specify a subset of the default.

**interval** Redisplays selected statistics, pausing interval seconds between each display. Press

**CTRL+C to stop redisplaying statistics. If omitted, netstat will print the current configuration information once.**

---

**C:\WINDOWS>netstat -a**

Active Connections

Proto	Local Address	Foreign Address	State
TCP	My_Comp:ftp	localhost:0	LISTENING
TCP	My_Comp:80	localhost:0	LISTENING

Or with the "-an" parameters:

**C:\WINDOWS>netstat -an**

Active Connections

Proto	Local Address	Foreign Address	State
TCP	0.0.0.0:21	0.0.0.0:0	LISTENING
TCP	0.0.0.0:80	0.0.0.0:0	LISTENING

By simply opening a browser connection to both the HTTP (port 80) and FTP (port 21) servers (while still offline!), I saw the following:

**C:\WINDOWS>netstat -a**

Active Connections

Proto	Local Address	Foreign Address	State
TCP	My_Comp:ftp	localhost:0	LISTENING
TCP	My_Comp:80	localhost:0	LISTENING
TCP	My_Comp:1104	localhost:0	LISTENING
TCP	My_Comp:ftp	localhost:1104	ESTABLISHED
TCP	My_Comp:1102	localhost:0	LISTENING
TCP	My_Comp:1103	localhost:0	LISTENING
TCP	My_Comp:80	localhost:1111	TIME_WAIT
TCP	My_Comp:1104	localhost:ftp	ESTABLISHED
TCP	My_Comp:1107	localhost:0	LISTENING
TCP	My_Comp:1112	localhost:80	TIME_WAIT
UDP	My_Comp:1102	*:*	

```
UDP    My_Comp:1103      *.*
UDP    My_Comp:1107      *.*
```

This may be a bit confusing to some people, but remember I'm running BOTH the servers and clients on the same machine in these examples. A little later (using both 'a' and 'n') I got this:

```
C:\WINDOWS>netstat -an
```

Active Connections

Proto	Local Address	Foreign Address	State
TCP	0.0.0.0:21	0.0.0.0:0	LISTENING
TCP	0.0.0.0:80	0.0.0.0:0	LISTENING
TCP	0.0.0.0:1104	0.0.0.0:0	LISTENING
TCP	127.0.0.1:21	127.0.0.1:1104	FIN_WAIT_2
TCP	127.0.0.1:1102	0.0.0.0:0	LISTENING
TCP	127.0.0.1:1103	0.0.0.0:0	LISTENING
TCP	127.0.0.1:1104	127.0.0.1:21	CLOSE_WAIT
TCP	127.0.0.1:1107	0.0.0.0:0	LISTENING
UDP	127.0.0.1:1102	*.*	
UDP	127.0.0.1:1103	*.*	
UDP	127.0.0.1:1107	*.*	

After turning off my server, I ended up with this for a while:

```
C:\WINDOWS>netstat -an
```

Active Connections

Proto	Local Address	Foreign Address	State
TCP	127.0.0.1:80	127.0.0.1:1150	TIME_WAIT
TCP	127.0.0.1:80	127.0.0.1:1151	TIME_WAIT

---

**PING.exe**

**Usage:** ping [-t] [-a] [-n count] [-l size] [-f] [-i TTL] [-v TOS]  
          [-r count] [-s count] [[-j host-list] | [-k host-list]]

**[-w timeout] destination-list**

**Options:**

- t**            **Ping the specified host until interrupted.**
  - a**            **Resolve addresses to hostnames.**
  - n count**     **Number of echo requests to send.**
  - l size**      **Send buffer size.**
  - f**            **Set "Don't Fragment" flag in packet.**
  - i TTL**       **Time To Live.**
  - v TOS**       **Type Of Service.**
  - r count**      **Record route for count hops.**
  - s count**      **Timestamp for count hops.**
  - j host-list**   **Loose source route along host-list.**
  - k host-list**   **Strict source route along host-list.**
  - w timeout**    **Timeout in milliseconds to wait for each reply.**
- 

There's one special IP number everyone should know about:

**127.0.0.1 - localhost** (or loopback).

This is used to connect ( through a browser, for example) to a Web server on your own computer. (127 being reserved for this purpose.) You can use this IP number **at all times**. It doesn't matter if you're connected to the Internet or not.

It's also called the **loopback** address because you can **ping** it and get *returns* even when you're *offline* (not connected to *any* network). If you don't get any valid replies, then there's a problem with the computer's Network settings. Here's a typical response to the 'ping' command:

Here's another recent example using the name of my computer which I have tied to the IP number 127.0.0.1 in my C:\WINDOWS\HOSTS file:

C:\WINDOWS>**ping My\_Comp**

Pinging My\_Comp [127.0.0.1] with 32 bytes of data:

Reply from 127.0.0.1: bytes=32 time=1ms TTL=128



Reply from 127.0.0.1: bytes=32 time=1ms TTL=128

Reply from 127.0.0.1: bytes=32 time<10ms TTL=128

Reply from 127.0.0.1: bytes=32 time=1ms TTL=128

Ping statistics for 127.0.0.1:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 0ms, Maximum = 1ms, Average = 0ms

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## TRACERT.exe      **Trace Route**

### Usage:

**tracert [-d] [-h maximum\_hops] [-j host-list] [-w timeout] target\_name**

### Options:

- d**              **Do not resolve addresses to hostnames.**
  - h maximum\_hops**    **Maximum number of hops to search for target.**
  - j host-list**        **Loose source route along host-list.**
  - w timeout**         **Wait timeout milliseconds for each reply.**
- 

Here's an example which traces the route from some ISP in Los Angeles to the main server at UCLA in California ( note how two computers relatively close to each other may be routed way round about! ):

C:\WINDOWS>**tracert [www.ucla.edu](http://www.ucla.edu)**

Tracing route to [www.ucla.edu](http://www.ucla.edu) [169.232.33.129]

over a maximum of 30 hops:

```
  1  141 ms  132 ms  140 ms  wla-ca-pm6.icg.net [165.236.29.85]
  2  134 ms  131 ms  139 ms  whv-ca-gw1.icg.net [165.236.29.65]
  3  157 ms  132 ms  143 ms  f3-1-0.lai-ca-gw1.icg.net [165.236.24.89]
  4  194 ms  193 ms  188 ms  a0-0-0-1.dai-tx-gw1.icg.net [163.179.235.61]
```

5	300 ms	211 ms	214 ms	a1-1-0-1.ati-ga-gw1.icg.net [163.179.235.186]
6	236 ms	237 ms	247 ms	a5-0-0-1.was-dc-gw1.icg.net [163.179.235.129]
7	258 ms	236 ms	244 ms	163.179.243.205
8	231 ms	233 ms	230 ms	wdc-brdr-03.inet.qwest.net [205.171.4.153]
9	240 ms	230 ms	236 ms	wdc-core-03.inet.qwest.net [205.171.24.69]
10	262 ms	264 ms	263 ms	hou-core-01.inet.qwest.net [205.171.5.187]
11	281 ms	263 ms	259 ms	hou-core-03.inet.qwest.net [205.171.23.9]
12	272 ms	229 ms	222 ms	lax-core-02.inet.qwest.net [205.171.5.163]
13	230 ms	217 ms	230 ms	lax-edge-07.inet.qwest.net [205.171.19.58]
14	228 ms	219 ms	220 ms	63-145-160-42.cust.qwest.net [63.145.160.42]
15	218 ms	222 ms	218 ms	ISI-7507--ISI.POS.calren2.net [198.32.248.21]
16	232 ms	222 ms	214 ms	UCLA--ISI.POS.calren2.net [198.32.248.30]
17	234 ms	226 ms	226 ms	cbn5-gsr.calren2.ucla.edu [169.232.1.18]
18	245 ms	227 ms	235 ms	www.ucla.edu [169.232.33.129]

Trace complete.

## Net Bios Stats

NBTSTAT.exe

**Displays protocol statistics and current TCP/IP connections using NBT (NetBIOS over TCP/IP).**

**NBTSTAT [-a RemoteName] [-A IP address] [-c] [-n] [-r] [-R] [-s] [S] [interval]**

**-a (adapter status) Lists the remote machine's name table given its name.**

**-A (Adapter status) Lists the remote machine's name table given its IP address.**

**-c (cache) Lists the remote name cache including the IP addresses.**

**-n (names) Lists local NetBIOS names.**

**-r (resolved) Lists names resolved by broadcast and via WINS**

**-R (Reload) Purges and reloads the remote cache name table**

**-S (Sessions)    Lists sessions table with the destination IP addresses.**

**-s (sessions)    Lists sessions table converting destination IP addresses to host names via the hosts file.**

**RemoteName   Remote host machine name.**

**IP address   Dotted decimal representation of the IP address.**

**interval    Redisplays selected statistics, pausing interval seconds between each display. Press Ctrl+C to stop redisplaying statistics.**

---

## **ROUTE.exe**

**Manipulates network routing tables.**

**ROUTE [-f] [command [destination] [MASK netmask] [gateway]]**

**-f            Clears the routing tables of all gateway entries. If this is used in conjunction with one of the commands, the tables are cleared prior to running the command.**

**command    Specifies one of four commands**

**PRINT    Prints a route**

**ADD      Adds a route**

**DELETE   Deletes a route**

**CHANGE   Modifies an existing route**

**destination Specifies the host to send command.**

**MASK      If the MASK keyword is present, the next parameter is interpreted as the netmask parameter.**

**netmask    If provided, specifies a sub-net mask value to be associated with this route entry. If not specified, it defaults to 255.255.255.255.**

**gateway    Specifies gateway.**

All symbolic names used for destination or gateway are looked up in the network and host name database files NETWORKS and HOSTS, respectively.

If the command is print or delete, wildcards may be used for the destination and gateway, or the gateway argument may be omitted.

---

## **ARP.exe    Address Resolution Protocol**

**ARP -s inet\_addr eth\_addr [if\_addr]**

**ARP -d inet\_addr [if\_addr]**

**ARP -a [inet\_addr] [-N if\_addr]**

**-a**        Displays current ARP entries by interrogating the current protocol data. If inet\_addr is specified, the IP and Physical addresses for only the specified computer are displayed. If more than one network interface uses ARP, entries for each ARP table are displayed.

**-g**                (Same as -a)

**inet\_addr**   Specifies an internet address.

**-N if\_addr**   Displays the ARP entries for the network interface specified by if\_addr.

**-d**        Deletes the host specified by inet\_addr.

**-s**        Adds the host and associates the Internet address inet\_addr with the Physical address eth\_addr. The Physical address is given as 6 hexadecimal bytes separated by hyphens. The entry is permanent.

**eth\_addr**   Specifies a physical address.

**if\_addr**    If present, this specifies the Internet address of the interface whose address translation table should be modified. If not present, the first applicable interface will be used.