

### Information

pwd	print working directory
cat	print file [on screen]
<i>user head or tail instead of cat</i>	shows the first few lines at beginning or end
hostname	display hostname
-i [displays network address] -l [displays all local IPs]	
date	set/display date & time
whois	
uptime	display how long the system has been running
cal	displays calendar
uname -a	displays Linux system info
uname -r	displays kernel info
lsb_release -s	

### Manage Users

su -	switch to root user & move to that directory
adduser	add new user
usermod -aG sudo <i>username</i>	add user to sudo list
groups <i>username</i>	list groups a user belongs too
su mfsmith	switch to listed user mfsmith
passwd	change password for current user name
passwd mfsmith	change password for listed user
passwd -S sysadmin	displays the status of the users password
	[P] Unlocked
	[L] locked
	[NP] no password
adduser mfsmith -or- useradd mfsmith	Creates a new user
usermod mfsmith	modify username account

### Manage Users (cont)

deluser mfsmith -or- userdel	Deletes user
deluser mfsmith --remove-- all-files	Deletes the user and removes all files in directory
getent powerusers   less	print user groups
usermod -l newusername oldusername	change user name
sudo chfn mfsmith	edit basic info i.e. full name, room #, phone #

### Process Management

ps	displays users current processes
ps -ef	displays all processes
mpmap	displays memory usage
pstree	display in a tree
ps -ef   grep wa	display all info reference this process
ps kill 84679	kill process id 84679
ps killall java	kill all processes named java
top	show all running proicesses

### Disk/Hardware Mgmt

df -h	disk usage
ps	running processes

### System Monitoring

whoami	display user
uptime	system run time
cat /proc/cpuinfo	
free -h	display free memory}
lshw	print hardware configuration
last reboot	disaply date & time of last reboot
w	display currently logged in users



By Mary F. Smith (boogie)  
[cheatography.com/boogie/](https://cheatography.com/boogie/)

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### General Maintenance

Shutdown *[OPTIONS] TIME* | sudo shutdown =1 "System  
*[MESSAGE]* scheduled for restart"

Update & Upgrade the Debian OS

sudo apt-get update && sudo apt-get  
upgrade

### Package management | OS Maintenance

sudo apt-get | check for updates in current version  
update

apt-get updater && apt-get upgrade

apt-cache search | search for packages with the word "Docker" in  
docker the file name

apt-get install | install docker  
docker

apt-get remove | removes a package

apt-get purge | removes and deletes

### Misc Need Organizing

ssh mfsmith@srv-tower log into machine

scp mfsmith@srv-tower :srv-dc

scp<username.>@<host:[remote copies files from the host to the  
source] <local. destination

### Working with Processes

pstree | display a tree of processes

systemctl proces- | control the systemd init system & service  
sname manager

### SuperUser

su - | change to superuser & stay at root directory

sudo - | execute a command as root

- or -

sudo -u | execute a command as a particular user

### Installs - Frequently Used

vagrant@debian11:/ sudo apt-get install nano -y

### Basic Network Mgmt

iwconfig | wireless interface

ifconfig | ethernetinterface

# The loopback network interface

auto lo

iface lo inet loopback

# The primary network interface

-auto enp0s3

iface enp0s3 inet static

-address 192.168.1.97

-netmask 255.255.255.0

-gateway 192.168.1.1

-dns-domain example.com

-dns-nameservers 1.1.1.1

sudo systemctl restart networking

### Networking Command/Queries

ip a | display IP Address, routing, devices and tunnels

netstat | displays all active TCP connections, ports

-nutilp [displays tcp/udp ports & application running on port]

-e [includes ethernet stats] -o [includes PIDs] -p [displays protocols] -  
r [displays routing table]

ping | test communication with machines

ping -c 4 | limits the ping response to 4 replies

traceroute srv- print packet route  
dc

host | DNS lookup utility

hostname | show or set system name

iptables |utility for packet filtering and NAT

mtr | network diagnostic tool

telnet | access to the telnet tool

ufw | application to mange filters and firewalls

mtr | diagnostic tool

nbtstat | displays netbios over tcp

arp | displays caches apr table

pathping | disaplys info about network latency/loss between  
hops

tcpdump



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### Other Commands

;	[semi colon]	allows a user to stack/insert multiple command on one command line
&&	[double ampersand]	if the command on the left is successful then run the command on the right
	[double pipe]	based on the results of the first command, skip the second command

### Directory Structure

/	root directory of operating system
/etc	host system config files
/var	storage for file which grow in size
/bin	user binary files i.e. cat, grep, etc.
/proc	system processes
/srv	system services
/mnt	permanent storage
/home	home directory for logged in user
/lib	shared library files and kernel modules
/usr	user utilities and apps
/dev	device files i.e. mouse, keyboard, harddrive, etc.
/sbin	system binary files
/opt	option software
/media	temp storage/flash drives

### Directory Colors

Blue   Directory	Yellow   Device
Green   Executable	Magenta   Graphic Image
Cyan   symbolic Link	Red   Archive File
	Red & Black   Broken link

**\*\*On many Linux distributions, directories may be displayed in blue, executable files may be displayed in green, and symbolic links may be displayed in cyan.**

Colored output is not the default behavior for the ls command, but rather the effect of the --color option. The ls seems to perform this coloring automatically because there is an alias for the ls command, so it runs with the --color option.\*\*

```
sysadmin@localhost:~$ type ls
ls is aliased to `ls --color=auto`
```

### Working with Directories

ls	list contents of current directory
ls -r	list files in subdirectories
ls -al	list files with directories, size, permissions etc.
ls -l	list files and permissions
	r [read] w[write] x [execute] -=[no permissions]
ls -a	list contents of current directory including hidden files
ls -lart	long, include hidden, ,
ls -d*/	list directories
cd ~	jump to users home
cd ..	jump to last directory
cd /	jump to root home directory
cd -	previous working directory
cd ../../	back up two levels

### Searching

locate [name of file]	searches system & locates that directory
find . -name [9414811_497-94.pdf]	search in current directory for file name
find /home -name *.jpg	search file type in listed directory
Using GREP	grep searches for patterns in files
grep -r	
command   grep	searches the output of a command

### Searching & Sorting

which i.e.	which command identifies the stored location of a command
which ls	
type -a	displays directory location of command
-t	sort by time
-r	sort by reverse order



### Searching & Sorting (cont)

#### Regular Expressions

.	Any one single character
[ ]	Any one specified character
[^ ]	Not the one specified character
*	Zero or more of the previous character
^	If first character in the pattern, then pattern must be at beginning of the line to match, otherwise just a literal ^
\$	If last character in the pattern, then pattern must be at the end of the line to match, otherwise just a literal \$

#### Extended Expressions

+	One or more of the previous pattern
?	The preceding pattern is optional
{ }	Specify minimum, maximum or exact matches of the previous pattern
	Alternation - a logical "or"
( )	Used to create groups

#### Anchor Characters

'search term'	single quotes "protects" the word
^	^ means the first place
search term	
'search term \$'	\$ means the last place
[ ]	[ ] match the blocked in character
.	
*	within a search, this character acts as a wildcard
?	in a search, this character indicates other letters/numbers
!	in a search, this character = does not

```
echo [D-P]*
echo [!D-P]*

echo ?????*s
echo D/rs
```

### Troubleshooting

Issue:	usermod command not found
Resolution:	use su - instead of su root
Issue:	wget command not found
Resolution:	sudo apt-get install wget
Issue:	cannot access repositories
Resolution:	manually add site via <b>nano /etc/apt/sources.list</b>

### Firewall

sudo apt-get install ufw	install firewall application
sudo ufw allow 'Nginx HTTP'	allow application to pass through firewall
sudo ufw status	check firewall status
sudo ufw disable	disable firewall
sudo ufw enable	enable firewall
sudo ufw allow 22	allow port number to pass
sudo ufw reset	reset firewall

### Redirection

Redirect the output of a command	add ">"
	i.e. cat food.txt > newfoodfile.txt
	use ">>" to overwrite a file

### Functions

Functions -  
are typically utilized in scripting  
are utilized to execute multiple commands

```
function_name ()
{
  commands
}
```

### Quotation Marks

There are [3] types of quotes	Section [5] Linus Essentials
" "   double quotes	tell the system to ignore special characters



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### Quotation Marks (cont)

' '   single quotes	the system does not consider it a variable
` `   backwards quotes	the system interprets the word in single quotes as an execution

each of these marks tells the system the text inside the quotes are to be handled differently



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