



# Basic Shell Usage

Linux Essentials



**TRAINING**  
CENTER



# Shell Types

	Bourne Shell (sh)	C Shell (csh)	Korn Shell (ksh)	Bourne-Again Shell (bash)
Path	/bin/sh /sbin/sh	/bin/csh	/bin/ksh	/bin/bash
Non-root	\$	%	\$	bash-x.xx\$
root user	#	#	#	bash-x.xx#
Features	<ul style="list-style-type: none"><li>• original UNIX shell</li><li>• compact and fast</li></ul>	<ul style="list-style-type: none"><li>• aliases and command history</li><li>• C-like expression syntax.</li></ul>	<ul style="list-style-type: none"><li>• sh-compatible</li><li>• has interactive features as C shell.</li><li>• C-like arrays, functions, string functions, etc.</li><li>• faster than csh</li></ul>	<ul style="list-style-type: none"><li>• sh-compatible</li><li>• command line editing</li><li>• unlimited size command history</li><li>• integer arithmetic in any base from 2 to 64</li></ul>

# Shell Config Files

System Wide	User Specific
/etc/profile /etc/bashrc	~/.bash_profile ~/.bash_login ~/.profile ~/.bashrc ~/.bash_logout ~/.inputrc

```
# enable color support of ls and also add handy aliases
if [ -x /usr/bin/dircolors ]; then
    test -r ~/.dircolors && eval "$(dircolors -b ~/.dircolors)" || eval "$(dircolors -b)"
    alias ls='ls --color=auto'
    #alias dir='dir --color=auto'
    #alias vdir='vdir --color=auto'

    alias grep='grep --color=auto'
    alias fgrep='fgrep --color=auto'
    alias egrep='egrep --color=auto'
fi

# colored GCC warnings and errors
export GCC_COLORS='error=01;31:warning=01;35:note=01;36:caret=01;32:locus=01:quote=01'

# some more ls aliases
alias ll='ls -alF'
alias la='ls -A'
alias l='ls -CF'
```

# Navigation

```
ubuntu@ip-172-31-32-20: /home
ubuntu@ip-172-31-32-20:/home$ pwd
/home
ubuntu@ip-172-31-32-20:/home$
```

*pwd* – shows current working directory

```
ubuntu@ip-172-31-32-20: /home
ubuntu@ip-172-31-32-20:/home$ ls
ftpuser  ubuntu
ubuntu@ip-172-31-32-20:/home$
```

*ls* – lists the files and directories

```
ubuntu@ip-172-31-32-20: /home/ftpuser
ubuntu@ip-172-31-32-20:/home$ cd ftpuser
ubuntu@ip-172-31-32-20:/home/ftpuser$
```

*cd* – changes working directory

## Looking closer into `ls`

```
ubuntu@ip-172-31-32-20:~$ ls -al
total 92
drwxr-xr-x 10 ubuntu ubuntu 4096 Jun  3 13:04 .
drwxr-xr-x  4 root    root   4096 May 11 14:42 ..
-rw----- 1 ubuntu ubuntu 17185 Jun 16 08:40 .bash_history
-rw-r--r-- 1 ubuntu ubuntu  220 Apr  4 2018 .bash_logout
-rw-r--r-- 1 ubuntu ubuntu 3968 Mar  3 19:29 .bashrc
drwx----- 2 ubuntu ubuntu 4096 Mar  3 19:18 .cache
drwx----- 3 ubuntu ubuntu 4096 Mar  3 19:32 .config
drwx----- 3 ubuntu ubuntu 4096 Mar  3 19:18 .gnupg
-rw----- 1 ubuntu ubuntu  66 Jun  1 22:34 .lessht
drwxrwxr-x 8 ubuntu ubuntu 4096 Mar  3 19:32 .nvm
-rw-r--r-- 1 ubuntu ubuntu 807 Apr  4 2018 .profile
drwx----- 2 ubuntu ubuntu 4096 Mar  3 18:47 .ssh
-rw-r--r-- 1 ubuntu ubuntu  0 Mar  3 19:21 .sudo_as_admin_successful
drwxr-xr-x 2 root    root   4096 Apr 22 09:22 .vim
-rw----- 1 ubuntu ubuntu 16051 Jun  3 13:04 .viminfo
-rw-rw-r-- 1 ubuntu ubuntu  0 Jun  1 23:32 TestFile3
drwxrwxr-x 2 ubuntu ubuntu 4096 Jun  1 23:35 testFiDir
drwxrwxr-x 2 ubuntu ubuntu 4096 Jun 16 07:57 testfidir2
-rw-rw-r-- 1 ubuntu ubuntu  0 Jun  1 23:23 testfile1
-rw-rw-r-- 1 ubuntu ubuntu  0 Jun  1 23:23 testfile2
ubuntu@ip-172-31-32-20:~$
```

# Working with directories

```
ubuntu@ip-172-31-32-20: ~  
ubuntu@ip-172-31-32-20:~$ mkdir demo_dir  
ubuntu@ip-172-31-32-20:~$ ls -l  
total 4  
drwxrwxr-x 2 ubuntu ubuntu 4096 Jun  1 23:06 demo_dir  
ubuntu@ip-172-31-32-20:~$
```

***mkdir <dir\_name>*** – creates new directory

```
ubuntu@ip-172-31-32-20: ~  
ubuntu@ip-172-31-32-20:~$ rmdir demo_dir  
ubuntu@ip-172-31-32-20:~$ ls -l  
total 0  
ubuntu@ip-172-31-32-20:~$
```

***rmdir <dir\_name>*** – deletes empty directory  
***rm -r <dir\_name>*** – removes non-empty directories

# Working with files

```
ubuntu@ip-172-31-32-20: ~  
ubuntu@ip-172-31-32-20:~$ touch testfile1  
ubuntu@ip-172-31-32-20:~$ ls -l  
total 0  
-rw-rw-r-- 1 ubuntu ubuntu 0 Jun  1 23:23 testfile1  
ubuntu@ip-172-31-32-20:~$
```

***touch <file\_name>*** – if file doesn't exist, creates empty file; else modifies its timestamp

```
ubuntu@ip-172-31-32-20: ~  
ubuntu@ip-172-31-32-20:~$ ls -l  
total 0  
-rw-rw-r-- 1 ubuntu ubuntu 0 Jun  1 23:23 testfile1  
-rw-rw-r-- 1 ubuntu ubuntu 0 Jun  1 23:26 testfile2  
ubuntu@ip-172-31-32-20:~$ touch -r testfile1 testfile2  
ubuntu@ip-172-31-32-20:~$ ls -l  
total 0  
-rw-rw-r-- 1 ubuntu ubuntu 0 Jun  1 23:23 testfile1  
-rw-rw-r-- 1 ubuntu ubuntu 0 Jun  1 23:23 testfile2  
ubuntu@ip-172-31-32-20:~$
```

***touch -r <reference\_file> <file\_name>*** – allows to specify a reference file and use its timestamps instead of the current time

# Creating and viewing files

```
ubuntu@ip-172-31-32-20:~$ cat > myfile.txt
This is an example how to create files using cat command.
Try it yourself :)
ubuntu@ip-172-31-32-20:~$
```

```
ubuntu@ip-172-31-32-20:~$ cat >> myfile.txt
and this text will be appended
ubuntu@ip-172-31-32-20:~$
```

```
ubuntu@ip-172-31-32-20:~$ cat myfile.txt
This is an example how to create files using cat command.
Try it yourself :)
and this text will be appended
ubuntu@ip-172-31-32-20:~$
```

***cat > file\_name*** – redirects input from console to a file; if file exists context will be overwritten.

***cat >> file\_name*** – redirects input from console to a file; if file exists context will be appended.

***cat file\_name*** – shows contents of a file



# Searching files

```
ubuntu@ip-172-31-32-20: ~  
ubuntu@ip-172-31-32-20:~$ find /home/ubuntu -name "*estfi*"   
/home/ubuntu/testfile2  
/home/ubuntu/testfile1  
/home/ubuntu/testfidir2  
ubuntu@ip-172-31-32-20:~$
```

***find <dir> -name "expression"*** – searches for files and directories, case sensitive

```
ubuntu@ip-172-31-32-20: ~  
ubuntu@ip-172-31-32-20:~$ find /home/ubuntu -iname "*estfi*"   
/home/ubuntu/testFiDir  
/home/ubuntu/testfile2  
/home/ubuntu/testfile1  
/home/ubuntu/TestFile3  
/home/ubuntu/testfidir2  
ubuntu@ip-172-31-32-20:~$
```

***find <dir> -iname "expression"*** – searches for files and directories

```
ubuntu@ip-172-31-32-20: ~  
ubuntu@ip-172-31-32-20:~$ find /home/ubuntu -type d -name "*estfi*"   
/home/ubuntu/testfidir2  
ubuntu@ip-172-31-32-20:~$
```

***find <dir> -type <d/f> -name "expression"*** – searches for directory or file depending on specified type parameter

```
ubuntu@ip-172-31-32-20: ~  
ubuntu@ip-172-31-32-20:~$ find /home/ubuntu -type f -name "*estfi*"   
/home/ubuntu/testfile2  
/home/ubuntu/testfile1  
ubuntu@ip-172-31-32-20:~$
```

# Getting help in bash: man command

```
ubuntu@ip-172-31-32-20: ~  
CAT(1) User Commands  
NAME  
  cat - concatenate files and print on the standard output  
SYNOPSIS  
  cat [OPTION]... [FILE]...  
DESCRIPTION  
  Concatenate FILE(s) to standard output.  
  With no FILE, or when FILE is -, read standard input.  
  -A, --show-all  
      equivalent to -vET  
  -b, --number-nonblank  
      number nonempty output lines, overrides -n  
  -e      equivalent to -vE  
  -E, --show-ends  
      display $ at end of each line  
  -n, --number  
      number all output lines  
  -s, --squeeze-blank  
      suppress repeated empty output lines  
  -t      equivalent to -vT  
Manual page cat(1) line 1 (press h for help or q to quit)
```

**Man (section\_number) page** - used to display the user manual.

Available sections:

- 1 : User command (including shell commands)
- 2 : System calls
- 3 : Library calls
- 4 : Special files (usually found in /dev)
- 5 : File formats and
- 6 : Games
- 7 : Miscellaneous (including macro packages and conventions)
- 8 : System administration commands (usually only for root)
- 9 : Kernel routines

## Getting help in bash: other ways

```
ubuntu@ip-172-31-32-20: ~  
ubuntu@ip-172-31-32-20:~$ help  
GNU bash, version 4.4.20(1)-release (x86_64-pc-linux-gnu)  
These shell commands are defined internally. Type 'help' to see this list.  
Type 'help name' to find out more about the function 'name'.  
Use 'info bash' to find out more about the shell in general.  
Use 'man -k' or 'info' to find out more about commands not in this list.  
  
A star (*) next to a name means that the command is disabled.  
  
job_spec [&]  
(( expression ))  
. filename [arguments]  
:  
[ arg... ]  
[[ expression ]]  
alias [-p] [name[=value] ... ]  
bg [job_spec ...]  
bind [-lpsvPSVX] [-m keymap] [-f filename] [-q name] [-u name] [-r keyseq] [>  
break [n]  
builtin [shell-builtin [arg ...]]  
caller [expr]  
case WORD in [PATTERN [| PATTERN]...) COMMANDS ;;]... esac  
cd [-L|[-P [-e]] [-@]] [dir]  
command [-pVv] command [arg ...]  
compgen [-abdefgjkusv] [-o option] [-A action] [-G globpat] [-W wordlist] >  
complete [-abdefgjkusv] [-pr] [-DE] [-o option] [-A action] [-G globpat] [->  
compopt [-o|+o option] [-DE] [name ...]  
continue [n]
```

- `--help`(or just `-h`) after command name: `pwd --help`
- `man` command: `man pwd`
- `info` command: `info bash`
- `whatis` – your one-line help: `whatis ls`
- `apropos` – searches through man pages and lists all in which this command exists: `apropos pwd`
- `help` – lists all possible commands that are pre-installed in the system