

### Shell

#### Definition

Command line interpreter program that functions as the default interface when you connect to a server over a network

#### bash

Default shell on Ubuntu and OSX. "Bourne-again shell."

#### Terminal Prompt

`user>@host:path$`

`user` Logged in user name

`host` Machine name

`path` File system position

`$` Symbol (e.g. `$ bash`)

### Commands

#### About

`cmd -help` Full usage for `cmd`

`whatis cmd` One-line explanation of `cmd`

`man cmd` Manual for `cmd` if available

`info cmd` Info about `cmd`; use if `man` is unavailable

`str [2x tab]` List commands with `str` prefix

#### History

`history n` Show last `n` commands

`!!` Repeat last command

`!str` Repeat last command with `str` prefix

`up arrow` Scroll through history list

#### Directing Output

`cmd >> file` Append output of `cmd` to `file`

`cmd > file` Overwrite `file` with output of `cmd`

`cmd1 | cmd2 ...` Direct output of `cmd1` to `cmd2`

#### Example

```
$ echo "My new note" >> notes.txt
```

```
$ cat notes.txt
```

```
# My new note
```

### Manuals

`man cmd`

`-k key` search for keyword `key`

#### Navigate

`h` Help `q` Quit

`u` Up `d` Down

`g` Beginning `G` End

#### Search

`/pattern` Start `esc-u` Stop

`n` Next `N` Prev

### Directory Hierarchy

#### Absolute Path

Route to desired dir. Always starts w slash or tilde, e.g.

```
/home/john/myfile.txt
```

#### Relative Path

From working dir. Never starts w slash, e.g.

```
john/myfile.txt
```

#### Shortcuts

`..` Path of parent dir of current working dir

`.`

`~` Path of home dir, e.g.

```
$ echo ~
```

```
# user@host:/home/user/
```

`~user` Another user's home dir

`/` Root

#### Environmental Variables

`$OLDPWD`

`$PATH` Ordered, colon-delimited list of dirs in search when call is made from working dir

#### Parsing

Colon-delimited; use `tr` to replace, e.g.

```
$ echo $PATH | tr ":" "\n"
```



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### Directory Hierarchy (cont)

#### Home Directory

Home dir (e.g. /home/john) is never in path, but its subdirs may be if working dir is a subdir of home.

`$PYTHONPATH`

#### Useful Commands

<code>pwd</code>	Print working dir
<code>cd dir</code>	Move working dir to dir
<code>-</code>	To previous wd (i.e. <code>\$OLDPWD</code> )
<code>ls dir</code>	List dir contents
<code>-l</code>	Get a long list - permissions, links count,
<code>-F</code>	Indicate file type
<code>* exe</code>	
<code>/ dir</code>	
<code>-b</code>	Print special chars, including -   & ' ; ( ) < > space tab
<code>-a</code>	All including hidden files with . prefix
<code>-l</code>	All output in one column
<code>-R</code>	Recursive; include subdirs and contents
<code>-r</code>	Reverse sort order
<code>-t</code>	Sort by most recent modified
<code>-d</code>	Dirs only

`find dir opts` Search dir and its subdirs for file specified by opts expression, e.g.

```
$ find . -name 'chap*'
$ find . -mtime -2
$ find . -user john
```

### Account

#### Configuration

Update hidden programs run at login/shell start.

<code>.bashrc</code>	
<code>.bash_profile</code>	Run at bash login before .profile
<code>.profile</code>	Run at login by most UNIX shells

#### Example

Add lib to `$PYTHONPATH` in `~/ .bashrc` with

```
export PYTHONPATH=/home/john/module/lib$PYTHONPATH
```

#### Useful Commands

<code>ssh user@host</code>	connect to host as user
<code>whoami</code>	who you are logged in as
<code>passwd</code>	set password
<code>exit</code>	logout of session and close terminal

### Permissions

#### Useful Commands

`chmod`

#### Usage

```
$ chmod [ugoa][+|=][rwx], ..., [path]
```

#### Groups

User owner                      o Other/system

All

+ Add

- Remove

= Set Explicit

#### Mode



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### Permissions (cont)

**r**, 4 Read                      **x**, 1 Execute file

**w**, 2 Write                      **x**, 1 Access dir

### Octal

0 ---                              4 r--

--x                              5 r-x

2 -w-                              6 rw-

3 -wx                              7 rwx

### Examples

Both the following examples grant all permissions to the owner of bin and read + execute permissions to the owner's group and others.

```
$ chmod u=rwx,go=rx /home/john/bin
```

```
$ chmod 755 /home/john/bin
```



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