SSH connections

`ssh [username]@[remotehost]`

Network Terminology

headless node/server Machine not intended to be used by local user, often without monitor or input peripherals.

hostname Human-intelligible machine name.

local host Computer you are using.

remote host Computer that you are connecting to.

IP address Numerical network address of machine.

port Subdivision of network interface based on purpose.

X11 Program that renders GUIs on Linux.

keypair Complementary private/public encryption keys.

X11 Forwarding

Windows PuTTY + Xming / XWin32 / Cygwin/X / VcXsrv

Mac `ssh -X` + XQuartz

Linux `ssh -X`

Shell terminology

shell Program that provides command line interface.

command line interface (CLI) Non-graphical, textual prompt for operating computer.

bash Shell that is default on most contemporary Linux distributions.

alias Command that abbreviates another command or function.

.bashrc File that holds configuration for bash.

environment variable Variable with scope of the current shell session.

argument/switch option supplied to program to modify its behaviour.

Getting help

man [program] Access a manpage.

[program] --help Print available arguments and description of program.

apropos [query] Search manpage database for `[query]`

Special directories

/ Root of filesystem.

. Current working directory.

.. Parent of working directory.

~ Your home directory.

- Previous directory.

Navigating filesystem

cd [path] Change directory to `[path]`

ls List directory contents.

pwd Print working directory.

tree Print tree of directory hierarchy under working directory.

Keyboard shortcuts

`ctrl`+`u` Erases the command line prompt.

`ctrl`+`w` Deletes everything before the caret.

`ctrl`+`p` Deletes everything after the caret.

`ctrl`+`r` Search command history.

`ctrl`+`c` Kill (keyboard interrupt) a running task and return to prompt.

`ctrl`+`z` Suspend a running task and return to prompt.

`↑`, `↓` Move backwards and forwards in command history.

`ctrl`+`←`, `ctrl`+`→` Move backwards and forwards in line in delimited increments.

`→` Complete a command or path where possible.

Common switches (not universal)

-h/--help Print short help digest.

-a Prints all output.

-r Applies command recursively over directory hierarchy.

-f Forces a command to be executed where it would otherwise stop.

-v Turns on verbose output.

Types of users

Limited User Do not have complete access privileges. Cannot modify system files.

Superuser God-mode. With great power comes great responsibility.

Filesystem operations

touch [path] Create empty file or update timestamp if file already exists.

mv [source_path] [destination_path] Move file from `[source_path]` to `[destination_path]`.

cp [source_path] [destination_path] Copy file from `[source_path]` to `[destination_path]`.

rm [file_path] Delete `[file_path]`. `rm -rf` to delete populated directories.

rmdir Deletes a directory if empty.

Getting info

whoami Prints your username.

hostname Prints host name of machine.

ps Print processes created by current shell.

tophtop Live task manager.

w List currently logged in users and statistics about them.

host [ip-addr] Do DNS query on `ip-addr` to get hostname.

users Print all logged in users.

cat /etc/passwd Print all human and virtual users.

ifconfig Get network interface data.

Permissions

chmod

chmod changes the access mode of files.

chmod examples:

```
chmod u+rwx,g+rx-w,o-rwx [filename]
chmod 750 [filename]
```

chmod bitmask

Value	Read	Write	Execute
0			
1			Yes
2		Yes	
3		Yes	Yes
4	Yes		
5	Yes		Yes
6	Yes	Yes	
7	Yes	Yes	Yes

chown

chown changes ownership of a file.

chown example:

```
chown janedoe [filename]
```

chgrp

chgrp changes ownership of a file.

chgrp example:

```
chgrp innercircle [filename]
```

Reading files

cat [file] Print file to stdout.

tac [file] cat but in reverse.

echo Print stdin to stdout.

head [file]/tail [file] Print top or bottom of file.

grep [pattern] [file] Search file for [pattern] regex.

find [args] Find filename in directory hierarchy (read the manual).

less [file] Paginated text browser.

Writing and editing files

nano Simple text editor.

vim Hardcore modal text editor.

emacs Hardcore chorded text editor.

sed -i [expr] [file] Perform expression [expr] on [file] contents.

rename [expr] [file] Perform expression [expr] on [file] name.

IO redirection:

Redirect output and error streams to files:

```
./program.exe < [in] > [out] 2> [err]
```

Append output to file and discard error stream:

```
./program.exe < [in] >> [combined] 2> /dev/null
```

Append output and error streams to same file:

```
./program.exe < [in] >> [combined] 2>&1
```

Backgrounding and detaching jobs

[program] & Start program and send to background.

ctrl + z Suspend foreground job.

bg %[jobid] Resume suspended [jobid] in background.

fg %[jobid] Bring [jobid] to foreground.

jobs Get list of jobids.

ts [command] Append [command] to task spool.

disown [jobid] Detach job from shell.

Job management

nice -n [niceness] [command] Set command niceness between -20 and 19.

timeout [timelimit] [command] Automatically kill job after [timeout] period.

tail -f [filename] Watch file as it is being written to.

kill [PID] Kill process with [PID].

kill -9 [PID] *Really* kill process with [PID].

pkill [process] Kill process by executable name.

Moving data

scp example

```
scp -r user@remotehost:~/file ~/
```

rsync example

```
rsync -vuza user@remotehost:~/file ~/
```

Info

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