

INTRODUCTION TO LINUX

(in an HPC context)

Version 20.09 | HPC.NRW Competence Network

PROCESSES

HPC.NRW Competence Network

INTRODUCTION TO LINUX

- Process: running instance of a program
 - System
 - User
 - User (manually launched)
- Like Windows
 - Equivalent to Task Manager: `top`
 - Short overview: `ps tree`
- Each process has an owner
 - Process can/can't do what owner can/can't do
- Each process has an ID number (PID)

OUTPUT AND NAVIGATION IN TOP

Total resource use

Command name

```
top - 11:23:45 up 50 days, 51 min, 9 users, load average: 3.12, 7.60, 8.63
Tasks: 335 total, 4 running, 331 sleeping, 0 stopped, 0 zombie
%Cpu(s): 22.3 us, 0.9 sy, 0.0 ni, 76.6 id, 0.0 wa, 0.0 hi, 0.3 si, 0.0 st
KiB Mem : 14854156+total, 85480256 free, 2977128 used, 60084180 buff/cache
KiB Swap: 12582908 total, 11918224 free, 664684 used. 14356795+avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
31352	zx657379	20	0	4508	792	588	R	100.0	0.0	21915.30	cl
6552	gk687	20	0	423588	287224	7180	R	99.7	0.2	0:04.69	cc1plus
14160	gk687	20	0	175052	3124	1328	R	66.4	0.0	9:48.26	sshd
2355	gk339	20	0	9052548	1.116g	206716	S	7.6	0.8	10:06.16	MATLAB
14162	gk687	20	0	67812	2876	2108	S	6.0	0.0	0:42.50	sftp-server
2193	gk339	20	0	175956	3552	1272	S	3.3	0.0	1:27.24	sshd
6444	root	20	0	0	0	0	S	0.3	0.0	0:02.80	kworker/3:1
10801	root	20	0	0	0	0	S	0.3	0.0	0:02.30	kworker/5:0
1	root	20	0	191612	2964	1556	S	0.0	0.0	11:44.62	systemd
2	root	20	0	0	0	0	S	0.0	0.0	0:02.66	kthreadd

Process ID

Owner

Resource use

Runtime

– Single-letter commands to navigate `top`

`u` : filter processes from a specific user

`k` : kill a specific process

`h` : show help

`f` : toggle displayed columns

`x` : highlight current sort column

`<>` : select column to sort for

`R` : Reverse sorting

`q` : quit top

- If you enter command, it runs in the shell
- Enter `<command> &` to start it in background
 - Good if command launches window, console still usable
- Send foreground command to background by Ctrl-Z (pauses it) and typing `bg`
- Bring to foreground with `fg <Job-ID>`
 - Caution: job ID is different from process ID!
 - Can be displayed with `jobs`