

Diagnostic tools

ps - report a snapshot of the current processes

-a see all process on the system

-e every process

-f full output format

```
eureka@ubuntu:~$ ps -aef
```

UID	PID	PPID	C	STIME	TTY	TIME	CMD
root	1	0	0	15:10	?	00:00:03	/sbin/init
root	2	0	0	15:10	?	00:00:00	[kthreadd]
root	3	2	0	15:10	?	00:00:00	[ksoftirqd/0]
root	4	2	0	15:10	?	00:00:01	[kworker/0:0]
root	5	2	0	15:10	?	00:00:01	[kworker/u:0]

-j print session id and process group id

-H show process hierarchy

```
eureka@ubuntu:~$ ps -ejH
```

2736	1499	1499	?	00:00:15	gnome-terminal
2744	1499	1499	?	00:00:00	gnome-pty-helpe
2745	2745	2745	pts/0	00:00:00	bash
4948	4948	2745	pts/0	00:00:00	ps

pidof - find process id

```
eureka@ubuntu:~/test/a_dir$ pidof bash
```

2626

pgrep - look up or signal processes based on name and other attributes

```
eureka@ubuntu:~/test/a_dir$ pgrep bash
```

2626
4483

-l list name of process and process id

```
eureka@ubuntu:~/test/a_dir$ pgrep -l bash
```

2626 bash
4483 bash

uname - print system information

-a print all information

```
eureka@ubuntu:~$ uname -a
Linux ubuntu 3.2.0-36-generic-pae #57-Ubuntu SMP Tue Jan 8 22:01:06
UTC 2013 i686 athlon i386 GNU/Linux
```

getconf - Query system configuration variables

-a Displays all configuration variables for the current system and their values.

```
eureka@ubuntu:~$ getconf -a
LINK_MAX 65000
_POSIX_LINK_MAX 65000
MAX_CANON 255
_POSIX_MAX_CANON 255
MAX_INPUT 255
_POSIX_MAX_INPUT 255
```

dstat tool for generating full system resource statistics. and allows plugins like MySQL

```
eureka@ubuntu:~$ dstat
You did not select any stats, using -cdngy by default.
----total-cpu-usage---- -dsk/total- -net/total- ---paging-- ---system--
usr sys idl wai hiq siq| read writ| recv send| in out| int csw
  9  12  79  0  0  0| 383k 46k|  0   0|  0   0| 199 542
 40  10  50  0  0  0|  0   0|  0   0|  0   0| 305 517
```

See what's eating all the memory

```
eureka@ubuntu:~$ dstat -g -l -m -s --top-mem
---paging-- ---load-avg--- -----memory-usage----- ----swap--- --most-expensive-
in out| 1m 5m 15m| used buff cach free| used free| memory process
  0   0| 0.28 0.17 0.33| 270M 66.0M 319M 1358M|  0 1998M| compiz 62.0M
  0   0| 0.28 0.17 0.33| 268M 66.0M 319M 1360M|  0 1998M| compiz 62.0M
  0   0| 0.28 0.17 0.33| 268M 66.0M 319M 1360M|  0 1998M| compiz 62.0M
  0   0| 0.28 0.17 0.33| 268M 66.0M 319M 1360M|  0 1998M| compiz 62.0M
  0   0| 0.26 0.17 0.33| 268M 66.0M 319M 1360M|  0 1998M| compiz 62.0M
```

lsf – list open files

-p excludes or selects the listing of files for the processes whose optional process Identification (PID) numbers are in the comma-separated set

```
eureka@ubuntu:~/test$ lsof -p 1693
COMMAND      PID    USER   FD   TYPE    DEVICE  SIZE/OFF      NODE NAME
gnome-ses 1693 eureka   cwd    DIR      8,1      4096 1177845
/home/eureka
gnome-ses 1693 eureka  rtd    DIR      8,1      4096      2 /
gnome-ses 1693 eureka  txt    REG      8,1    241268 1833580
/usr/bin/gnome-session
```

dmesg - 'display message' - prints message buffer of the kernel. Can be found here: /var/log/dmesg

view system memory

```
eureka@ubuntu:~/test$ dmesg | grep memory
[    0.000000] initial memory mapped : 0 - 02000000
[    0.000000] Base memory trampoline at [c009b000] 9b000 size 16384
[    0.000000] init_memory_mapping: 0000000000000000-0000000037bfe000
[    0.000000] PM: Registered nosave memory: 0000000000009f000 -
000000000000a0000
[    0.000000] PM: Registered nosave memory: 000000000000a0000 -
000000000000ca000
```

htop- overview of running processes

- s for system call trace
- L for library call trace (ltrace)
- I for lsof

CPU[||||| 9.6%]

Mem[||||| 320/2012MB]

Swp[0/1997MB]

Tasks: 110, 230 thr; 1 running

Load average: 0.42 0.21 0.21

Uptime: 01:05:11

PID	USER	PRI	NI	VIRT	RES	SHR	S	CPU%	MEM%	TIME+	Command
4065	eureka	20	0	5456	1792	1272	R	5.0	0.1	0:01.30	htop
1108	root	20	0	100M	37592	8796	S	3.0	1.8	3:58.71	/usr/bin/X :0 -auth
1019	mongodb	20	0	90228	12852	4588	S	1.0	0.6	1:14.57	/usr/bin/mongod --c
4068	eureka	20	0	21236	11808	4456	S	0.0	0.6	0:00.38	python /usr/lib/ubu
2092	eureka	20	0	232M	65132	32196	S	0.0	3.2	0:46.03	compiz
1791	mongodb	20	0	90228	12852	4588	S	0.0	0.6	0:24.92	/usr/bin/mongod --c
3310	eureka	20	0	88708	15124	10804	S	0.0	0.7	0:19.66	gnome-terminal
2197	eureka	20	0	80076	15876	13060	S	0.0	0.8	0:30.32	/usr/lib/vmware-to
562	avahi	20	0	3852	1676	1384	S	0.0	0.1	0:09.01	avahi-daemon: runn

Ping

-t Specify the IP time to live for unicast and multicast packets

```
eureka@ubuntu:~$ ping google.com -t 16
PING google.com (74.125.225.65) 56(84) bytes of data.
64 bytes from ord08s07-in-f1.1e100.net (74.125.225.65): icmp_req=1
ttl=54 time=11.4 ms
```

netstat -network statistics. Displays network connections (both incoming and outgoing), routing tables, and a number of network interface (network interface controller or software-defined network interface) and network protocol statistics.

-n show numeric address

-r display kernel routing table

```
eureka@ubuntu:~$ netstat -rn
Kernel IP routing table
Destination      Gateway          Genmask          Flags     MSS Window
  irtt Iface
0.0.0.0          10.1.10.1       0.0.0.0          UG        0 0
0 eth0
10.1.10.0        0.0.0.0         255.255.255.0    U         0 0
0 eth0
169.254.0.0      0.0.0.0         255.255.0.0      U         0 0
0 eth0
```

touch - change file timestamps and creates new empty files

-a change only the access time

-m change only the modification time

-t use [[CC]YY]MMDDhhmm[.ss] instead of current time

```
eureka@ubuntu:~$ touch new_test.csv
eureka@ubuntu:~$ ls -l
-rw-rw-r-- 1 eureka eureka 0 Jul 1 23:43 new_test.csv
eureka@ubuntu:~$ touch -a -m -t 202012281205.09 test_file
eureka@ubuntu:~$ ls -l
-rw-rw-r-- 1 eureka eureka 72 Dec 28 2020 test_file
```

watch – execute a program and show output. Useful for viewing changes over time. ctrl+c to exit

-d highlight differences

-n seconds

```
eureka@ubuntu:~$ watch -d -n 5 "ps -e|grep watch"
```

Every 5.0s: ps -e|grep watch

```
  7 ?      00:00:00 watchdog/0
5539 pts/0  00:00:00 watch
5553 pts/0  00:00:00 watch
```

du - estimate file space usage

-h human readable

```
eureka@ubuntu:~/test$ du -h --max-depth=1
4.0K  ./a_dir
8.0K  ./another_dir
16K   .
```

-s summarize

-m block size

```
eureka@ubuntu:~$ du -sm *
11   Desktop
1    Documents
434  Downloads
465  epd
1    examples.desktop
1    learn_pandas
1    Music
1    Pictures
1    Public
33   redis-2.6.2
1    redis-2.6.2.tar.gz
1    sites
1    Templates
1    test
1    test_file
1    Videos
1    workspace
```

free – estimate memory usage

eureka@ubuntu:~\$ free					
	total	used	free	shared	buffers
cached					
Mem:	2061060	529288	1531772	0	60756
225804					
-/+ buffers/cache:		242728	1818332		
Swap:	2045948	0	2045948		