



Vidyavardhini's College of Engineering & Technology

Department of Computer Engineering

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| Experiment No.1 |
| Analyzing Linux based computer systems using a. top, b. ps, c. kill, d. cat /proc/cpuinfo, e. vmstat |
| Date of Performance: 11/01/2024 |
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Aim: To analyze Linux based computer systems using following commands: **a.** top , **b.** ps , **c.** kill, **d.** cat /proc/cpuinfo **e.** vmstat

Objective: To understand linux commands

Theory:

The following commands are used for:

a. top: The 'top' command is used to display real-time system statistics, such as CPU usage, memory usage, running processes, etc. It displays the most CPU-intensive tasks at the top of the list, which helps in identifying and troubleshooting performance issues. The 'top' command can also be used to kill processes that are causing problems.

b. ps: The 'ps' command displays a list of currently running processes on the system. It can be used to find out the process ID (PID), the amount of memory and CPU usage, and the user who initiated the process. The 'ps' command can also be used to terminate a process using the 'kill' command.

c. kill: The 'kill' command is used to terminate a running process. It sends a signal to the process to stop execution. The signal can be specified using different options, such as '-9' to forcefully terminate the process or '-15' to ask the process to terminate gracefully.

d. cat /proc/cpuinfo: The 'cat /proc/cpuinfo' command displays information about the CPU installed on the system, such as the model name, clock speed, cache size, etc. This information can be useful in determining the capabilities of the system and whether it meets the requirements for running certain applications.

e. vmstat: The 'vmstat' command is used to display information about the virtual memory system of the system. It provides information on the amount of free memory, the number of processes waiting for I/O, the amount of swap space used, etc. This information can be used to diagnose performance issues related to memory and disk usage.

These commands can be used to gather information about the CPU, memory usage, running processes, and system performance. With these commands, system administrators can troubleshoot performance issues and optimize system resources for better efficiency. Familiarity with these commands is essential for anyone who manages Linux systems.

Output:

Top:



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```
taher@Taher: /mnt/c/Users/hp
top - 12:12:47 up 1 min, 1 user, load average: 0.13, 0.08, 0.03
Tasks: 35 total, 1 running, 34 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0.0 us, 0.0 sy, 0.0 ni,100.0 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
KiB Mem : 3747832 total, 2447392 free, 409208 used, 891232 buff/cache
KiB Swap: 1048576 total, 1048576 free, 0 used. 3163812 avail Mem
```

| PID | USER | PR | NI | VIRT | RES | SHR | S | %CPU | %MEM | TIME+ | COMMAND |
|------|----------|----|----|--------|-------|-------|---|------|------|---------|-----------------|
| 1 | root | 20 | 0 | 225096 | 8924 | 6728 | S | 0.0 | 0.2 | 0:00.74 | systemd |
| 2 | root | 20 | 0 | 2280 | 1304 | 1188 | S | 0.0 | 0.0 | 0:00.02 | init-systemd(Ub |
| 7 | root | 20 | 0 | 2280 | 4 | 0 | S | 0.0 | 0.0 | 0:00.00 | init |
| 67 | root | 19 | -1 | 86528 | 12220 | 11632 | S | 0.0 | 0.3 | 0:00.13 | systemd-journal |
| 73 | root | 20 | 0 | 42996 | 4524 | 3144 | S | 0.0 | 0.1 | 0:00.18 | systemd-udev |
| 87 | systemd+ | 20 | 0 | 71732 | 5120 | 4612 | S | 0.0 | 0.1 | 0:00.05 | systemd-network |
| 126 | root | 20 | 0 | 288000 | 6832 | 5968 | S | 0.0 | 0.2 | 0:00.05 | accounts-daemon |
| 170 | syslog | 20 | 0 | 263052 | 4160 | 3648 | S | 0.0 | 0.1 | 0:00.04 | rsyslogd |
| 200 | message+ | 20 | 0 | 50068 | 4136 | 3668 | S | 0.0 | 0.1 | 0:00.06 | dbus-daemon |
| 234 | daemon | 20 | 0 | 28340 | 2368 | 2160 | S | 0.0 | 0.1 | 0:00.00 | atd |
| 235 | root | 20 | 0 | 31756 | 3216 | 2920 | S | 0.0 | 0.1 | 0:00.00 | cron |
| 238 | root | 20 | 0 | 70452 | 5864 | 5244 | S | 0.0 | 0.2 | 0:00.05 | systemd-logind |
| 239 | root | 20 | 0 | 171260 | 17608 | 9456 | S | 0.0 | 0.5 | 0:00.20 | networkd-dispat |
| 254 | root | 20 | 0 | 288888 | 6652 | 5860 | S | 0.0 | 0.2 | 0:00.02 | polkitd |
| 291 | systemd+ | 20 | 0 | 70500 | 5096 | 4632 | S | 0.0 | 0.1 | 0:00.07 | systemd-resolve |
| 301 | root | 20 | 0 | 187696 | 20272 | 12336 | S | 0.0 | 0.5 | 0:00.15 | unattended-upgr |
| 327 | root | 20 | 0 | 72308 | 5744 | 5016 | S | 0.0 | 0.2 | 0:00.00 | sshd |
| 332 | root | 20 | 0 | 16424 | 2484 | 2332 | S | 0.0 | 0.1 | 0:00.00 | agetty |
| 344 | redis | 20 | 0 | 51676 | 9068 | 2684 | S | 0.0 | 0.2 | 0:00.09 | redis-server |
| 346 | root | 20 | 0 | 14900 | 1976 | 1844 | S | 0.0 | 0.1 | 0:00.00 | agetty |
| 359 | postgres | 20 | 0 | 320552 | 26968 | 24960 | S | 0.0 | 0.7 | 0:00.04 | postgres |
| 431 | postgres | 20 | 0 | 320552 | 4188 | 2184 | S | 0.0 | 0.1 | 0:00.00 | postgres |
| 432 | postgres | 20 | 0 | 320552 | 4188 | 2184 | S | 0.0 | 0.1 | 0:00.03 | postgres |
| 433 | postgres | 20 | 0 | 320552 | 9068 | 7044 | S | 0.0 | 0.2 | 0:00.00 | postgres |
| 434 | postgres | 20 | 0 | 320968 | 6772 | 4524 | S | 0.0 | 0.2 | 0:00.00 | postgres |
| 435 | postgres | 20 | 0 | 175468 | 3516 | 1512 | S | 0.0 | 0.1 | 0:00.00 | postgres |
| 436 | postgres | 20 | 0 | 320860 | 5052 | 2908 | S | 0.0 | 0.1 | 0:00.00 | postgres |
| 1100 | root | 20 | 0 | 2296 | 116 | 0 | S | 0.0 | 0.0 | 0:00.00 | SessionLeader |
| 1101 | root | 20 | 0 | 2296 | 124 | 0 | S | 0.0 | 0.0 | 0:00.00 | Relay(1106) |
| 1106 | taher | 20 | 0 | 23004 | 5040 | 3468 | S | 0.0 | 0.1 | 0:00.05 | bash |
| 1108 | root | 20 | 0 | 78640 | 3660 | 3108 | S | 0.0 | 0.1 | 0:00.00 | login |
| 1254 | taher | 20 | 0 | 76656 | 7764 | 6684 | S | 0.0 | 0.2 | 0:00.02 | systemd |
| 1255 | taher | 20 | 0 | 259076 | 2412 | 64 | S | 0.0 | 0.1 | 0:00.00 | (sd-pam) |
| 1266 | taher | 20 | 0 | 22948 | 4864 | 3376 | S | 0.0 | 0.1 | 0:00.03 | bash |
| 1384 | taher | 20 | 0 | 42116 | 3744 | 3224 | R | 0.0 | 0.1 | 0:00.02 | top |



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PS:

```
taher@Taher:/mnt/c/Users/hp$ ps
  PID TTY          TIME CMD
 1106 pts/0    00:00:00 bash
 1391 pts/0    00:00:00 ps
```

Kill:

```
taher@Taher:/mnt/c/Users/hp$ sudo kill 359
[sudo] password for taher:
taher@Taher:/mnt/c/Users/hp$
```



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Cat /proc/cpuinfo:

```
taher@Taher: /mnt/c/Users/hp
sr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtscp lm constant_tsc rep_good nopl tsc_reliable nons
top_tsc cpuid extd_apicid pni pclmulqdq ssse3 fma cx16 sse4_1 sse4_2 movbe popcnt aes xsave avx f16c rdr
and hypervisor lahf_lm cmp_legacy svm cr8_legacy abm sse4a misalignsse 3dnowprefetch osvw topoext perfct
r_core ssbd ibrs ibpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 rdseed adx smap clflushopt clwb sha_ni
xsaveopt xsavec xgetbv1 clzero xsaveerptr arat npt nrrip_save tsc_scale vmcb_clean flushbyasid decodeassi
sts pausefilter pfthreshold v_vmsave_vmload umip rdpid
bugs : sysret_ss_attrs null_seg spectre_v1 spectre_v2 spec_store_bypass retbleed smt_rsb srso
bogomips : 5988.75
TLB size : 3072 4K pages
clflush size : 64
cache_alignment : 64
address sizes : 48 bits physical, 48 bits virtual
power management:

processor : 11
vendor_id : AuthenticAMD
cpu family : 23
model : 96
model name : AMD Ryzen 5 4600H with Radeon Graphics
stepping : 1
microcode : 0xffffffff
cpu MHz : 2994.377
cache size : 512 KB
physical id : 0
siblings : 12
core id : 5
cpu cores : 6
apicid : 11
initial apicid : 11
fpu : yes
fpu_exception : yes
cpuid level : 13
wp : yes
flags : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov pat pse36 clflush mmx fx
sr sse sse2 ht syscall nx mmxext fxsr_opt pdpe1gb rdtscp lm constant_tsc rep_good nopl tsc_reliable nons
top_tsc cpuid extd_apicid pni pclmulqdq ssse3 fma cx16 sse4_1 sse4_2 movbe popcnt aes xsave avx f16c rdr
and hypervisor lahf_lm cmp_legacy svm cr8_legacy abm sse4a misalignsse 3dnowprefetch osvw topoext perfct
r_core ssbd ibrs ibpb stibp vmmcall fsgsbase bmi1 avx2 smep bmi2 rdseed adx smap clflushopt clwb sha_ni
xsaveopt xsavec xgetbv1 clzero xsaveerptr arat npt nrrip_save tsc_scale vmcb_clean flushbyasid decodeassi
sts pausefilter pfthreshold v_vmsave_vmload umip rdpid
bugs : sysret_ss_attrs null_seg spectre_v1 spectre_v2 spec_store_bypass retbleed smt_rsb srso
bogomips : 5988.75
TLB size : 3072 4K pages
clflush size : 64
cache_alignment : 64
address sizes : 48 bits physical, 48 bits virtual
power management:

taher@Taher: /mnt/c/Users/hp$
```

CSDL8022: High Performance Computing Lab



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vmstat:

```
taher@Taher:/mnt/c/Users/hp$ vmstat
procs -----memory----- ---swap-- -----io----- -system-- -----cpu-----
r  b   swpd   free   buff  cache   si   so    bi    bo    in   cs  us  sy  id  wa  st
0  0       0 2438636 224788 655488    0    0   137   60   17   52  0  0 99  0  0
```

Conclusion: In conclusion, the examination of Linux-based computer systems through commands such as 'top', 'ps', 'kill', 'cat /proc/cpuinfo', and 'vmstat' offers a comprehensive insight into system performance and resource utilization. These commands empower users to monitor processes, manage system resources efficiently, and troubleshoot issues effectively. By leveraging these tools, administrators can ensure optimal system functionality, enhance performance, and maintain stability in Linux environments.