Linux Service Management

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https://github.com/swacademy/fss/tree/main/Linux

Service in Linux

- In Linux, Service refers to a program or a set of programs
- Run in the background and perform specific tasks that the system or other applications rely on.
- These services are often ***daemon***s.
- Daemons are processes that run continuously and manage system or netw ork activities.
- Can include things like :
  - Web servers
  - Database servers
  - File servers
  - Print services
  - Email services
  - System monitoring tools.

Service in Linux (Cont.)

- Services are typically managed through system initialization scripts or more modern service management systems like **`systemd`**.
- Allows for starting, stopping, and restarting services as needed.

```
ubuntu@ubuntu-desktop:~$ sudo systemctl start apache2
ubuntu@ubuntu-desktop:~$ sudo systemctl stop apache2
ubuntu@ubuntu-desktop:~$ sudo systemctl restart apache2
ubuntu@ubuntu-desktop:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
     Active: active (running) since Thu 2023-12-28 13:28:13 KST; 7s ago
       Docs: https://httpd.apache.org/docs/2.4/
    Process: 3877 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
   Main PID: 3881 (apache2)
      Tasks: 55 (limit: 4599)
     Memory: 4.8M
        CPU: 32ms
     CGroup: /system.slice/apache2.service
             ├─3881 /usr/sbin/apache2 -k start
             ├─3882 /usr/sbin/apache2 -k start
             └─3883 /usr/sbin/apache2 -k start

12월 28 13:28:13 ubuntu-desktop systemd[1]: Starting The Apache HTTP Server...
12월 28 13:28:13 ubuntu-desktop apachectl[3880]: AH00558: apache2: Could not reliably determine the server's fu
12월 28 13:28:13 ubuntu-desktop systemd[1]: Started The Apache HTTP Server.
lines 1-17/17 (END)
```

`systemctl` Command

- Is used for controlling the **`systemd`** system and service manager.
- Is responsible for initializing, managing, and tracking system services and daemons.
- Common uses of **`systemctl`** include ①starting and ②stopping services, ③enabling and ④disabling services to start at boot, checking the status of services, and ⑤reloading configuration files.
- Syntax
  - **`$ systemctl <command> <service>`**
  - Command : **`start`**, **`stop`**, **`restart`**, **`enable`**, **`disable`**, **`status`**, etc.
  - Service : The name of the service want to manage.

ubuntu

Service management with `systemctl`

- Service **`start`**
- Service **`stop`**
- Service **`status`**
- Service **`restart`**

```
ubuntu@ubuntu-desktop:~$ sudo systemctl status apache2
Unit apache2.service could not be found.
ubuntu@ubuntu-desktop:~$
```

```
ubuntu@ubuntu-desktop:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
     Active: active (running) since Thu 2023-12-28 13:26:10 KST; 33s ago
       Docs: https://httpd.apache.org/docs/2.4/
   Main PID: 3514 (apache2)
      Tasks: 55 (limit: 4599)
     Memory: 4.9M
        CPU: 77ms
     CGroup: /system.slice/apache2.service
             ├─3514 /usr/sbin/apache2 -k start
             ├─3515 /usr/sbin/apache2 -k start
             └─3516 /usr/sbin/apache2 -k start

12월 28 13:26:10 ubuntu-desktop systemd[1]: Starting The Apache HTTP Server...
12월 28 13:26:10 ubuntu-desktop apachectl[3513]: AH00558: apache2: Could not reliably determine the server's fully qualified dom
12월 28 13:26:10 ubuntu-desktop systemd[1]: Started The Apache HTTP Server.
lines 1-16/16 (END)
```

Service management with `systemctl` (Cont.)

```
ubuntu@ubuntu-desktop:~$ sudo systemctl start apache2
ubuntu@ubuntu-desktop:~$ sudo systemctl stop apache2
ubuntu@ubuntu-desktop:~$ sudo systemctl restart apache2
ubuntu@ubuntu-desktop:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
     Active: active (running) since Thu 2023-12-28 13:28:13 KST; 7s ago
       Docs: https://httpd.apache.org/docs/2.4/
    Process: 3877 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
   Main PID: 3881 (apache2)
      Tasks: 55 (limit: 4599)
     Memory: 4.8M
        CPU: 32ms
     CGroup: /system.slice/apache2.service
             ├─3881 /usr/sbin/apache2 -k start
             ├─3882 /usr/sbin/apache2 -k start
             └─3883 /usr/sbin/apache2 -k start

12월 28 13:28:13 ubuntu-desktop systemd[1]: Starting The Apache HTTP Server...
12월 28 13:28:13 ubuntu-desktop apachectl[3880]: AH00558: apache2: Could not reliably determine the server's fu
12월 28 13:28:13 ubuntu-desktop systemd[1]: Started The Apache HTTP Server.
lines 1-17/17 (END)
```

Monitoring in Linux – System Performance Info.

Commands	Descriptions
`lscpu`	List CPU Information
`lshw`	List Hardware
`du`	Check file and directory sizes
`df`	Display disk size and free space
`fdisk`	List and modify partitions on your hard drive
`vmstat`	Show virtual memory usage
`free`	Show physical memory usage
`top`	Display system processes and resource usage
`uptime`	Displays how long the system has been up, number of users, and central processing unit (CPU) latency

ubuntu

Example

```
ubuntu@ubuntu-desktop:~$ lscpu
Architecture:                    x86_64
  CPU op-mode(s):                32-bit, 64-bit
  Address sizes:                 39 bits physical, 48 bits virtual
  Byte Order:                    Little Endian
CPU(s):                          2
  On-line CPU(s) list:           0,1
Vendor ID:                       GenuineIntel
  Model name:                    11th Gen Intel(R) Core(TM) i7-1165G7 @ 2.80GHz
```

```
ubuntu@ubuntu-desktop:~$ df
Filesystem     1K-blocks     Used Available Use% Mounted on
tmpfs             400144     1472    398672   1% /run
/dev/sda3       98195716 11102224  82077444  12% /
tmpfs            2000716        0   2000716   0% /dev/shm
tmpfs               5120        4      5116   1% /run/lock
/dev/sda2         451320   194068    257252  44% /boot
tmpfs             400140      120    400020   1% /run/user/1000
ubuntu@ubuntu-desktop:~$
```

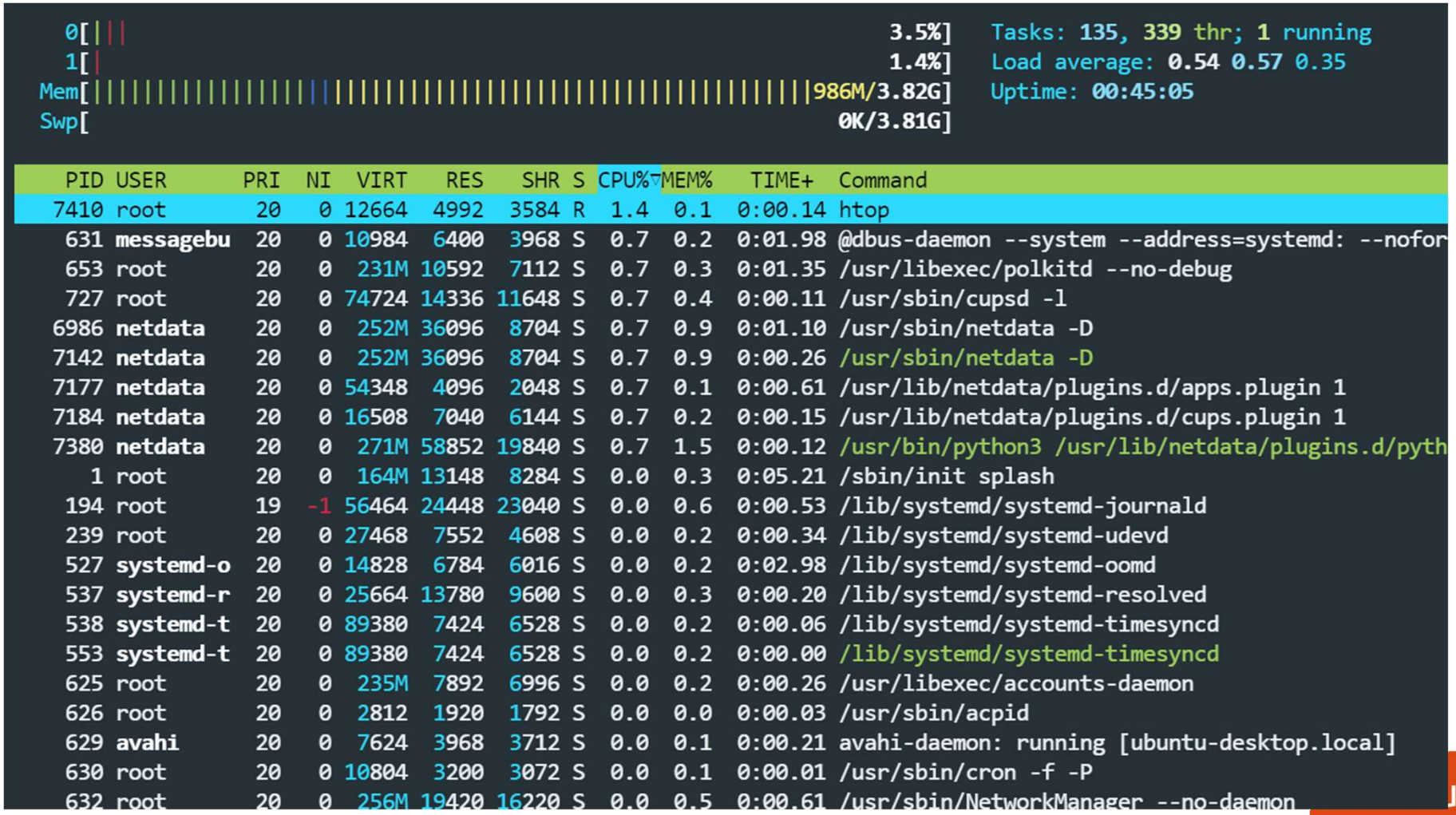
```
top - 13:11:58 up 5 min,  2 users,  load average: 0.26, 0.72, 0.42
Tasks: 188 total,   1 running, 187 sleeping,   0 stopped,   0 zombie
%Cpu(s):  0.0 us,  0.2 sy,  0.0 ni, 99.3 id,  0.2 wa,  0.0 hi,  0.3 si,  0.0 st
MiB Mem :   3907.6 total,   2028.1 free,    700.8 used,   1178.8 buff/cache
MiB Swap:   3905.0 total,   3905.0 free,      0.0 used.   2959.8 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
      9 root      20   0       0      0      0 I   0.3   0.0   0:01.26 kworker/u4:0-ext4-rsv-conversion
     47 root      20   0       0      0      0 I   0.3   0.0   0:00.75 kworker/1:1-mm_percpu_wq
     60 root       0 -20       0      0      0 I   0.3   0.0   0:00.43 kworker/0:1H-kblockd
   2814 ubuntu    20   0   14512   4352   3584 R   0.3   0.1   0:00.03 top
      1 root      20   0  166684  11740   8284 S   0.0   0.3   0:01.20 systemd
      2 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kthreadd
      3 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_gp
      4 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 rcu_par_gp
      5 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 slub_flushwq
      6 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 netns
      8 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker/0:0H-events_highpri
     10 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 mm_percpu_wq
     11 root      20   0       0      0      0 I   0.0   0.0   0:00.00 rcu_tasks_kthread
```

Monitoring in Linux – System Performance Info. (Cont.)

Commands	Descriptions
`htop`	Similar to top but with an improved user interface.
`iotop`	Monitors disk I/O usage.
`iftop`	Observes data flow through network interfaces.
`nmon`	Monitors various system resources like CPU, memory, disk I/O, and network simultaneously.
`glances`	Provides an overview of various system metrics.
`netdata`	A real-time system and application monitoring tool for performance and health monitoring.

Example (Cont.)

- htop



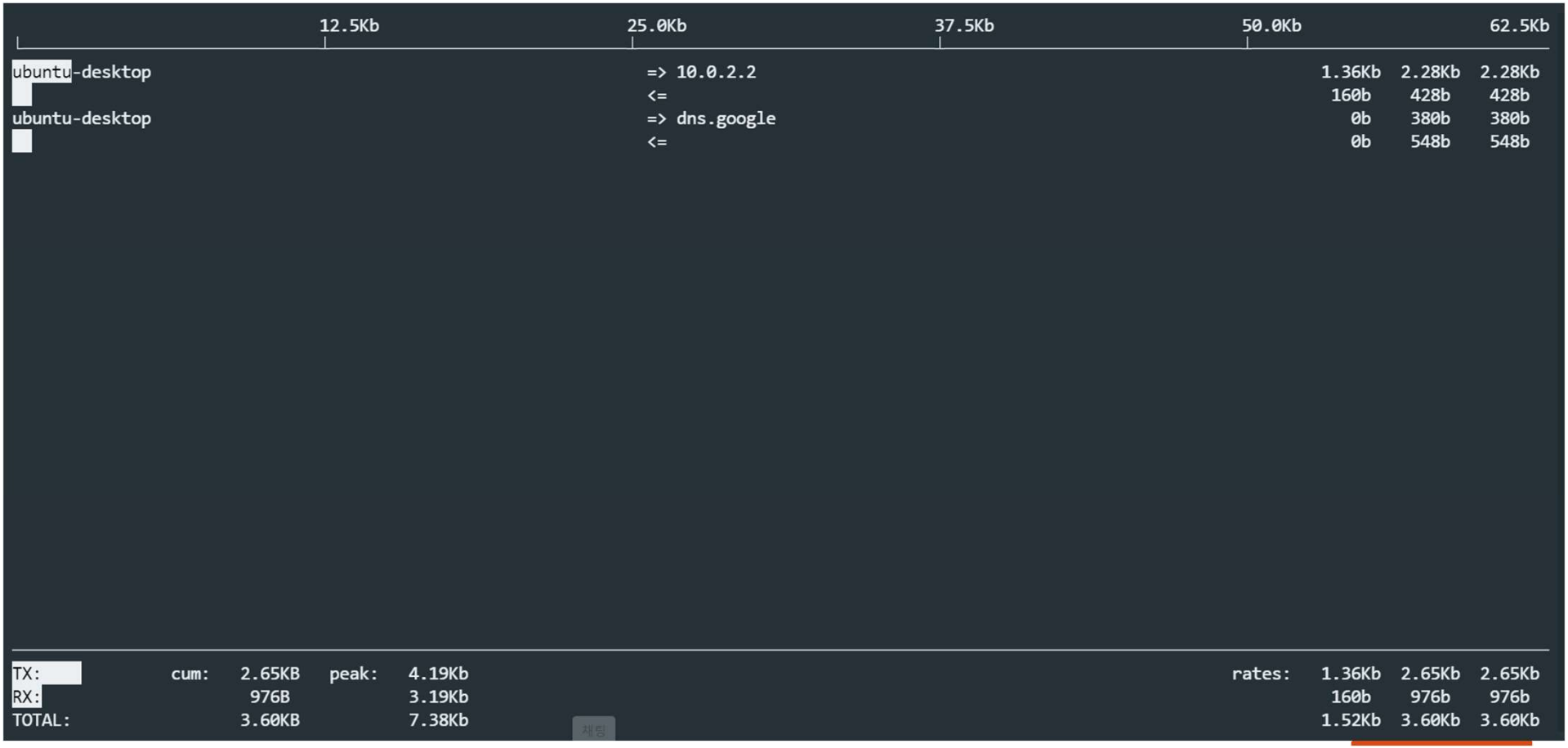
Example (Cont.)

- `iotop`

```
Total DISK READ:         0.00 B/s | Total DISK WRITE:        10.74 K/s
Current DISK READ:       0.00 B/s | Current DISK WRITE:      17.91 K/s
    TID  PRIO  USER     DISK READ  DISK WRITE  SWAPIN      IO>    COMMAND
    154 be/3 root        0.00 B/s   10.74 K/s  ?unavailable?  [jbd2/sda3-8]
      1 be/4 root        0.00 B/s    0.00 B/s  ?unavailable?  init splash
      2 be/4 root        0.00 B/s    0.00 B/s  ?unavailable?  [kthreadd]
      3 be/0 root        0.00 B/s    0.00 B/s  ?unavailable?  [rcu_gp]
      4 be/0 root        0.00 B/s    0.00 B/s  ?unavailable?  [rcu_par_gp]
      5 be/0 root        0.00 B/s    0.00 B/s  ?unavailable?  [slub_flushwq]
      6 be/0 root        0.00 B/s    0.00 B/s  ?unavailable?  [netns]
      8 be/0 root        0.00 B/s    0.00 B/s  ?unavailable?  [kworker/0:0H-events_highpri]
     10 be/0 root        0.00 B/s    0.00 B/s  ?unavailable?  [mm_percpu_wq]
     11 be/4 root        0.00 B/s    0.00 B/s  ?unavailable?  [rcu_tasks_kthread]
     12 be/4 root        0.00 B/s    0.00 B/s  ?unavailable?  [rcu_tasks_rude_kthread]
     13 be/4 root        0.00 B/s    0.00 B/s  ?unavailable?  [rcu_tasks_trace_kthread]
     14 be/4 root        0.00 B/s    0.00 B/s  ?unavailable?  [ksoftirqd/0]
     15 be/4 root        0.00 B/s    0.00 B/s  ?unavailable?  [rcu_preempt]
     16 rt/4 root        0.00 B/s    0.00 B/s  ?unavailable?  [migration/0]
     17 rt/4 root        0.00 B/s    0.00 B/s  ?unavailable?  [idle_inject/0]
     19 be/4 root        0.00 B/s    0.00 B/s  ?unavailable?  [cpuhp/0]
     20 be/4 root        0.00 B/s    0.00 B/s  ?unavailable?  [cpuhp/1]
     21 rt/4 root        0.00 B/s    0.00 B/s  ?unavailable?  [idle_inject/1]
     22 rt/4 root        0.00 B/s    0.00 B/s  ?unavailable?  [migration/1]
```

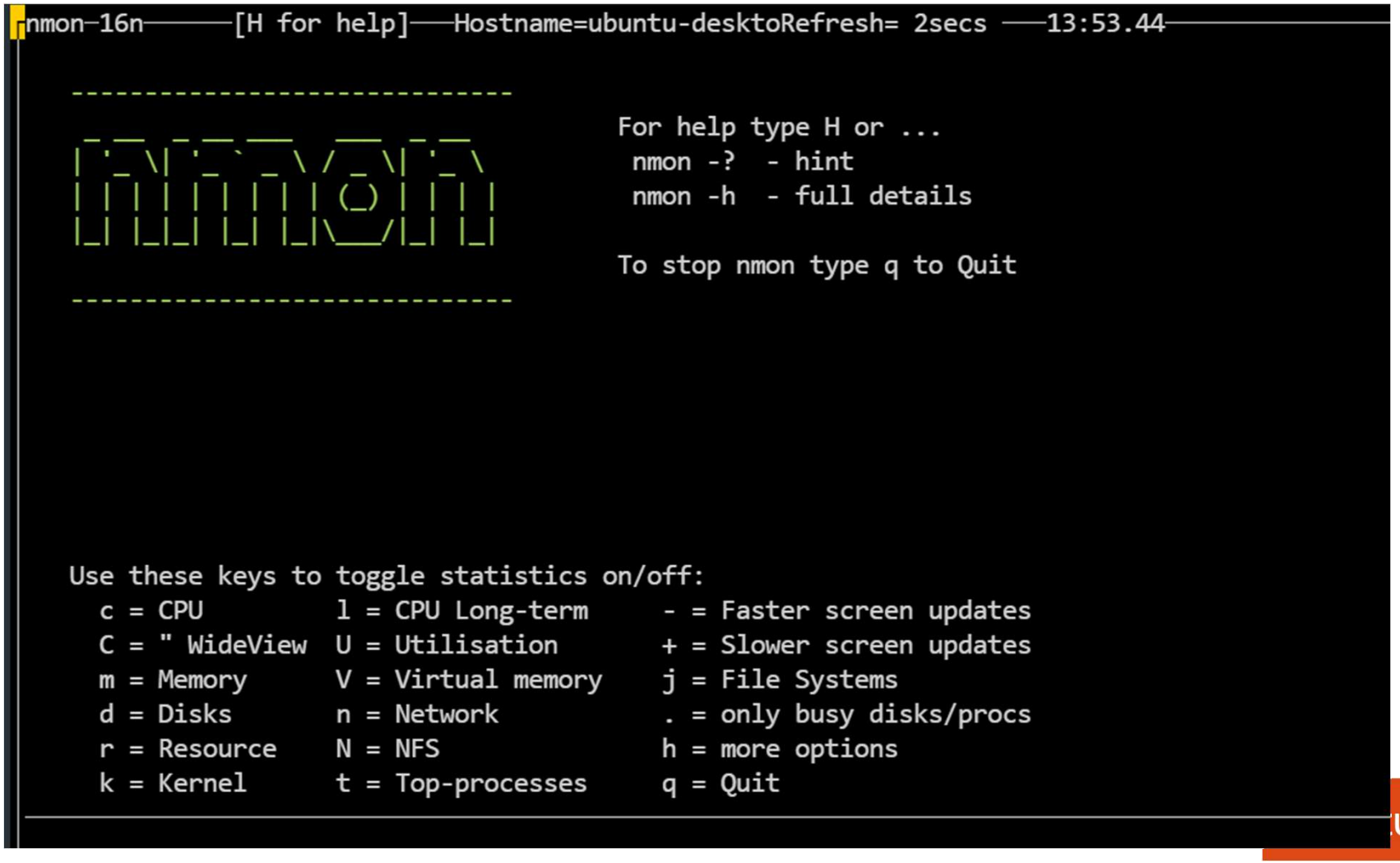
Example (Cont.)

- `iftop`



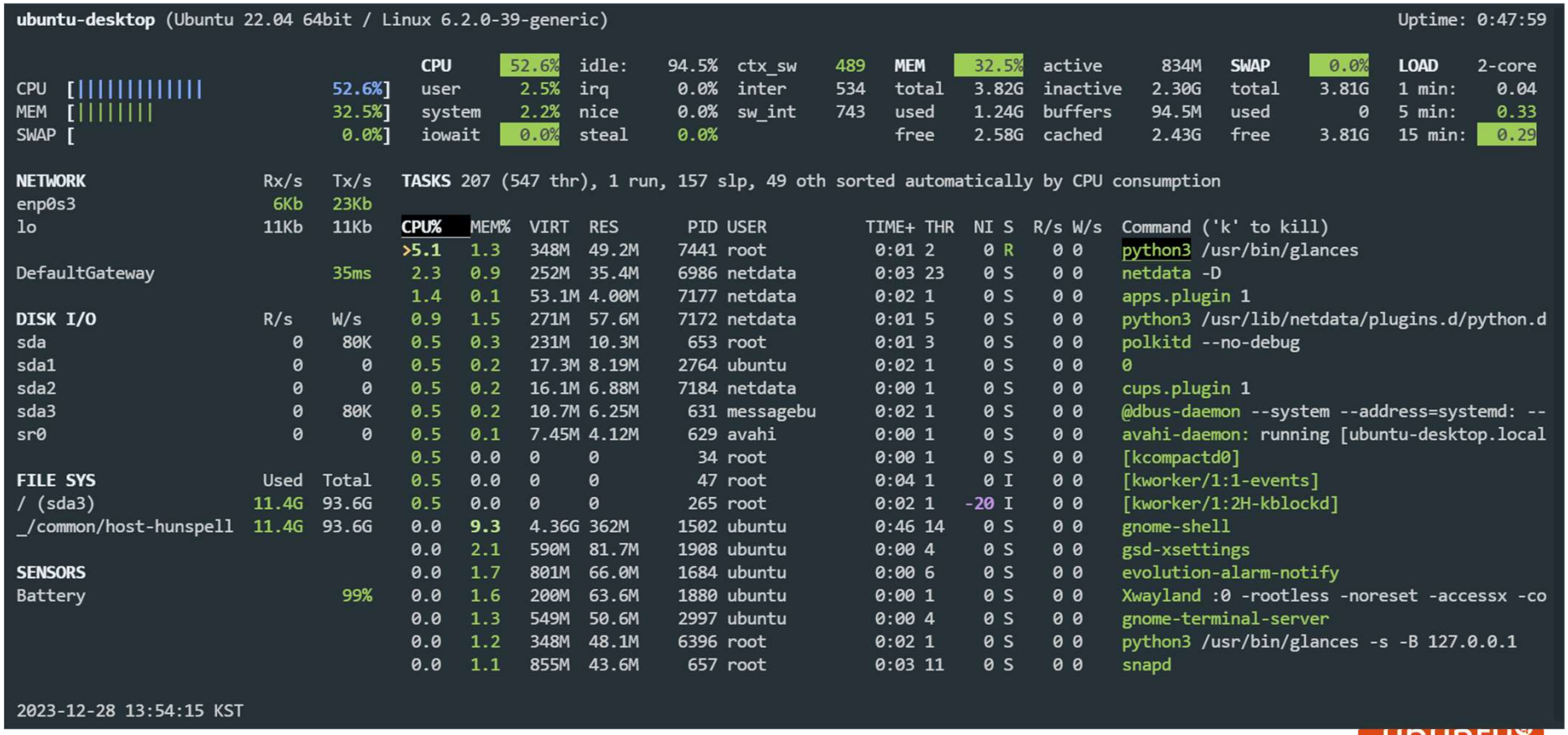
Example (Cont.)

- nmon



Example (Cont.)

- `glances`



Example (Cont.)

- netdata

```
ubuntu@ubuntu-desktop:/$ sudo wget -O /etc/netdata/netdata.conf http://localhost:19999/netdata.conf
--2023-12-28 14:02:25--  http://localhost:19999/netdata.conf
Resolving localhost (localhost)... 127.0.0.1
Connecting to localhost (localhost)|127.0.0.1|:19999... connected.
HTTP request sent, awaiting response... 200 OK
Length: 329897 (322K) [text/plain]
Saving to: ‘/etc/netdata/netdata.conf’

/etc/netdata/netdata.conf             100%[=======================================================================================>] 322.17K  --.-KB/s    in 0.001s

2023-12-28 14:02:25 (235 MB/s) - ‘/etc/netdata/netdata.conf’ saved [329897/329897]

ubuntu@ubuntu-desktop:/$ cat /etc/netdata/netdata.conf
# netdata configuration
#
# You can download the latest version of this file, using:
#
#  wget -O /etc/netdata/netdata.conf http://localhost:19999/netdata.conf
# or
#  curl -o /etc/netdata/netdata.conf http://localhost:19999/netdata.conf
#
# You can uncomment and change any of the options below.
# The value shown in the commented settings, is the default value.
#

# global netdata configuration
```

Lab. 서비스 관리