



LOG IN

SIGN UP

## Main menu

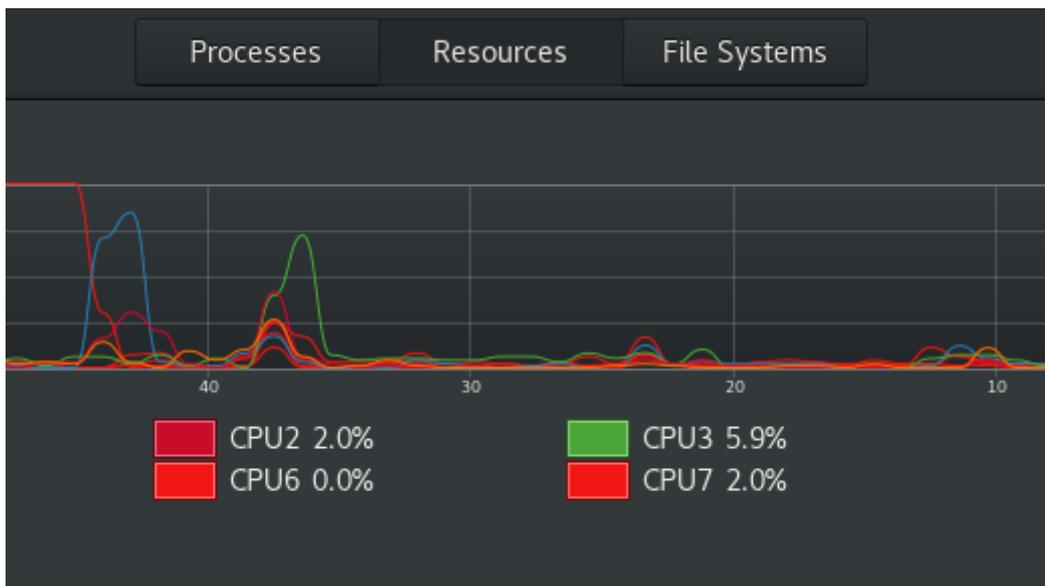
[Articles](#)   [Resources](#)   [Downloads](#)   [About](#)

[Open Organization](#)

# Monitor your Linux system in your terminal with procps-ng

How to find the process ID (PID) of a program. The most common Linux tools for this are provided by the procps-ng package, including the ps and pstree, pidof, and pgrep commands.

11 Aug 2021 | [Seth Kenlon \(Red Hat\) \(/users/seth\)](#) | 48 | [1 comment](#)



We use cookies on our websites to deliver our online services. Details about how we use cookies and how you may disable them are set out in our Privacy Statement. By using this website you agree to our use of cookies.



A process, in [POSIX \(https://opensource.com/article/19/7/what-posix-richard-stallman-explains\)](https://opensource.com/article/19/7/what-posix-richard-stallman-explains) terminology, is an ongoing event being managed by an operating system's kernel. A process is spawned when you launch an application, although there are many other processes running in the background of your computer, including programs to keep your system time accurate, to monitor for new filesystems, to index files, and so on.

---

## More Linux resources

- [Linux commands cheat sheet \(https://developers.redhat.com/cheat-sheets/linux-commands-cheat-sheet/?intcmp=7016000000h1jYAAQ&utm\\_source=intcallout&utm\\_campaign=linuxconter\)](https://developers.redhat.com/cheat-sheets/linux-commands-cheat-sheet/?intcmp=7016000000h1jYAAQ&utm_source=intcallout&utm_campaign=linuxconter)
- [Advanced Linux commands cheat sheet \(https://developers.redhat.com/cheat-sheets/advanced-linux-commands/?intcmp=7016000000h1jYAAQ&utm\\_source=intcallout&utm\\_campaign=linuxconter\)](https://developers.redhat.com/cheat-sheets/advanced-linux-commands/?intcmp=7016000000h1jYAAQ&utm_source=intcallout&utm_campaign=linuxconter)
- [Free online course: RHEL Technical Overview \(https://www.redhat.com/en/services/training/rh024-red-hat-linux-technical-overview?intcmp=7016000000h1jYAAQ&utm\\_source=intcallout&utm\\_campaign=linuxconter\)](https://www.redhat.com/en/services/training/rh024-red-hat-linux-technical-overview?intcmp=7016000000h1jYAAQ&utm_source=intcallout&utm_campaign=linuxconter)
- [Linux networking cheat sheet \(https://opensource.com/downloads/cheat-sheet-networking?intcmp=7016000000h1jYAAQ&utm\\_source=intcallout&utm\\_campaign=linuxconter\)](https://opensource.com/downloads/cheat-sheet-networking?intcmp=7016000000h1jYAAQ&utm_source=intcallout&utm_campaign=linuxconter)
- [SELinux cheat sheet \(https://opensource.com/downloads/cheat-sheet-selinux?intcmp=7016000000h1jYAAQ&utm\\_source=intcallout&utm\\_campaign=linuxconter\)](https://opensource.com/downloads/cheat-sheet-selinux?intcmp=7016000000h1jYAAQ&utm_source=intcallout&utm_campaign=linuxconter)
- [Linux common commands cheat sheet \(https://opensource.com/downloads/linux-common-commands-cheat-sheet?intcmp=7016000000h1jYAAQ&utm\\_source=intcallout&utm\\_campaign=linuxconter\)](https://opensource.com/downloads/linux-common-commands-cheat-sheet?intcmp=7016000000h1jYAAQ&utm_source=intcallout&utm_campaign=linuxconter)
- [What are Linux containers? \(https://opensource.com/resources/what-are-linux-containers?intcmp=7016000000h1jYAAQ&utm\\_source=intcallout&utm\\_campaign=linuxconter\)](https://opensource.com/resources/what-are-linux-containers?intcmp=7016000000h1jYAAQ&utm_source=intcallout&utm_campaign=linuxconter)
- [Our latest Linux articles \(https://opensource.com/tags/linux?intcmp=7016000000h1jYAAQ&utm\\_source=intcallout&utm\\_campaign=linuxconter\)](https://opensource.com/tags/linux?intcmp=7016000000h1jYAAQ&utm_source=intcallout&utm_campaign=linuxconter)

Most operating systems have a system activity monitor of some kind so you can know what processes are running at any given moment. Linux has a few favorites

We use cookies on our websites to deliver our online services. Details about how we use cookies and how you may disable them are set out in our Privacy Statement. By using this website you agree to our use of cookies.



your system in your terminal. Regardless of which you choose, it's a common task for those who take an active role in managing their computer is to examine a specific process.

In this article, I demonstrate how to find the process ID (PID) of a program. The most common tools for this are provided by the [procps-ng](https://gitlab.com/procps-ng) (<https://gitlab.com/procps-ng>) package, including the `ps` and `pstree`, `pidof`, and `pgrep` commands.

## Find the PID of a running program

Sometimes you want to get the process ID (PID) of a specific application you know you have running. The `pidof` and `pgrep` commands find processes by command name.

The `pidof` command returns the PIDs of a command, searching for the exact command by name:

```
$ pidof bash
1776 5736
```

The `pgrep` command allows for regular expressions (regex):

```
$ pgrep .sh
1605
1679
1688
1776
2333
5736
$ pgrep bash
5736
```

## Find a PID by file

You can find the PID of the process using a specific file with the `fuser` command.

## Get a process name by PID

If you have the PID *number* of a process but not the command that spawned it, you can do a "reverse lookup" with `ps`:

```
$ ps 3234
PID TTY      STAT   TIME COMMAND
5736 pts/1    Ss     0:00  emacs
```

## List all processes

The `ps` command lists processes. You can list every process on your system with the `-e` option:

```
$ ps -e | less
PID TTY      TIME CMD
  1 ?        00:00:03 systemd
  2 ?        00:00:00 kthreadd
  3 ?        00:00:00 rcu_gp
  4 ?        00:00:00 rcu_par_gp
  6 ?        00:00:00 kworker/0:0H-events_highpri
[...]
5648 ?        00:00:00 gnome-control-c
5656 ?        00:00:00 gnome-terminal-
5736 pts/1    00:00:00 bash
5791 pts/1    00:00:00 ps
5792 pts/1    00:00:00 less
(END)
```

## List just your processes

The output of `ps -e` can be overwhelming, so use `-u` to see the processes of just one user:

```
$ ps -U tux | less
PID TTY      TIME CMD
3545 ?        00:00:00 systemd
3548 ?        00:00:00 (sd-pam)
3566 ?        00:00:10 pulseaudio
```

We use cookies on our websites to deliver our online services. Details about how we use cookies and how you may disable them are set out in our [Privacy Statement](#). By using this website you agree to our use of cookies.



```

3592 tty2      00:00:00 gnome-session-b
3613 ?          00:00:00 gvfsd
3618 ?          00:00:00 gvfsd-fuse
3665 tty2      00:01:03 gnome-shell
[...]

```

That produces 200 fewer (give or take a hundred, depending on the system you're running it on) processes to sort through.

You can view the same output in a different format with the `pstree` command:

```

$ pstree -U tux -u --show-pids
[...]
├─gvfsd-metadata(3921)─┬─{gvfsd-metadata}(3923)
│                       └─{gvfsd-metadata}(3924)
├─ibus-portal(3836)─┬─{ibus-portal}(3840)
│                   └─{ibus-portal}(3842)
├─obexd(5214)
├─pulseaudio(3566)─┬─{pulseaudio}(3640)
│                  └─{pulseaudio}(3649)
│                  └─{pulseaudio}(5258)
├─tracker-store(4150)─┬─{tracker-store}(4153)
│                    └─{tracker-store}(4154)
│                    └─{tracker-store}(4157)
│                    └─{tracker-store}(4178)
└─xdg-permission-(3847)─┬─{xdg-permission-}(3848)
                       └─{xdg-permission-}(3850)

```

## List just your processes with context

You can see extra context for all of the processes you own with the `-u` option.

```

$ ps -U tux -u
USER  PID  %CPU  %MEM    VSZ   RSS TTY  STAT  START   TIME  COMMAND
tux   3545  0.0   0.0   89656   9708 ?    Ss    13:59   0:00 /usr/lib/systemd/systemd
tux   3548  0.0   0.0  171416   5288 ?    S     13:59   0:00 (sd-pam)
tux   3566  0.9   0.1  1722212 17352 ?    S<sL  13:59   0:29 /usr/bin/pulseaudio [...]
tux   3570  0.0   0.0   664736   8036 ?    SLl   13:59   0:00 /usr/bin/gnome-keyring-d
[...]
tux   5736  0.0   0.0   235628   6036 pts/1  Ss    14:18   0:00 bash
tux   6227  0.0   0.4  2816872  74512 tty2  Sl+   14:30   0:00 /opt/firefox/firefox-bin

```



## Troubleshoot with PIDs

If you're having trouble with a specific application, or you're just curious about what else on your system an application uses, you can see a memory map of the running process with `pmap`:

```
$ pmap 1776
5736:  bash
000055f9060ec000  1056K r-x--  bash
000055f9063f3000    16K r----  bash
000055f906400000   40K rw---  [ anon ]
00007faf0fa67000  9040K r--s-  passwd
00007faf1033b000   40K r-x--  libnss_sss.so.2
00007faf10345000  2044K ----- libnss_sss.so.2
00007faf10545000    4K rw---  libnss_sss.so.2
00007faf10546000 212692K r----  locale-archive
00007faf1d4fb000  1776K r-x--  libc-2.28.so
00007faf1d6b7000  2044K ----- libc-2.28.so
00007faf1d8ba000    8K rw---  libc-2.28.so
[...]
```

## Process IDs

The **procps-ng** package has all the commands you need to investigate and monitor what your system is using at any moment. Whether you're just curious about how all the disparate parts of a Linux system fit together, or whether you're investigating an error, or you're looking to optimize how your computer is performing, learning these commands gives you a significant advantage for understanding your OS.



[\(/article/18/5/how-kill-process-stop-program-linux\)](https://opensource.com/article/18/5/how-kill-process-stop-program-linux)

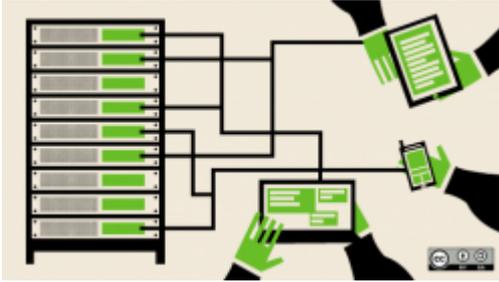
**How to kill a process or stop a program in Linux** [\(/article/18/5/how-](https://opensource.com/article/18/5/how-kill-process-stop-program-linux)

We use cookies on our websites to deliver our online services. Details about how we use cookies and how you may disable them are set out in our Privacy Statement. By using this website you agree to our use of cookies.



Here are several options for terminating a program in Linux using the command line or a graphical interface.

[Sachin Patil \(Red Hat\) \(/users/psachin\)](#).



[\(/article/20/11/cockpit-server-management\)](#)

## How I use Cockpit for my home's Linux server management

[\(/article/20/11/cockpit-server-management\)](#)

Anyone—from home users to large-network admins—can access enterprise-grade server management with Cockpit.

[Alan Formy-Duval \(Correspondent\) \(/users/alanfdoss\)](#).



[\(/article/21/7/improve-linux-pc-performance\)](#)

## Open source tools and tips for improving your Linux PC's performance

Make changes to your software (and how you use it) to improve your Linux computer's performance.

[Howard Fosdick \(/users/howtech\)](#).

Topics : [Linux \(/tags/linux\)](#)



### About the author

**Seth Kenlon** - Seth Kenlon is a UNIX geek, free culture advocate, independent multimedia artist, and D&D nerd. He has worked in the [film](#) (<http://www.imdb.com/name/nm1244992>) and [computing](#)

We use cookies on our websites to deliver our online services. Details about how we use cookies and how you may disable them are set out in our [Privacy Statement](#). By using this website you agree to our use of cookies.



is one of the maintainers of the Slackware-based multimedia production project [Slackermedia](http://slackermedia.info) (<http://slackermedia.info>).

• [More about me \(/users/seth\)](/users/seth)

## Recommended reading



[Write a guessing game in ncurses on Linux](/article/21/8/guess-number-game-ncurses-linux?utm_campaign=intrel)  
([/article/21/8/guess-number-game-ncurses-linux?utm\\_campaign=intrel](/article/21/8/guess-number-game-ncurses-linux?utm_campaign=intrel))



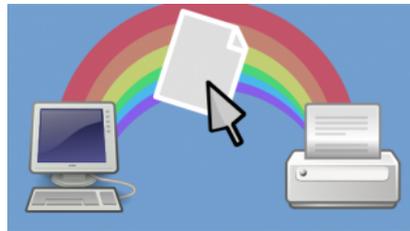
[Linux kernel modules we can't live without](/article/21/8/linux-kernel-module?utm_campaign=intrel)  
([/article/21/8/linux-kernel-module?utm\\_campaign=intrel](/article/21/8/linux-kernel-module?utm_campaign=intrel))



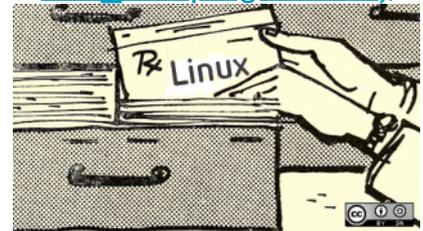
[30 things you didn't know about the Linux kernel](/article/21/8/linux-kernel?utm_campaign=intrel)  
([/article/21/8/linux-kernel?utm\\_campaign=intrel](/article/21/8/linux-kernel?utm_campaign=intrel))



[Access your iPhone on Linux with this open source tool](/article/21/8/libimobiledevice-iphone-linux?utm_campaign=intrel)  
([/article/21/8/libimobiledevice-iphone-linux?utm\\_campaign=intrel](/article/21/8/libimobiledevice-iphone-linux?utm_campaign=intrel))



[How to set up your printer on Linux](/article/21/8/add-printer-linux?utm_campaign=intrel)  
([/article/21/8/add-printer-linux?utm\\_campaign=intrel](/article/21/8/add-printer-linux?utm_campaign=intrel))



[Check file status on Linux with the stat command](/article/21/8/linux-stat-file-status?utm_campaign=intrel)  
([/article/21/8/linux-stat-file-status?utm\\_campaign=intrel](/article/21/8/linux-stat-file-status?utm_campaign=intrel))

1 Comment, [Register \(/user/register\)](/user/register) or [Log in \(/user/login?destination=node/67901%3Fsc\\_cid%3D7013a000002pe3mAAA\)](/user/login?destination=node/67901%3Fsc_cid%3D7013a000002pe3mAAA) to post a comment

We use cookies on our websites to deliver our online services. Details about how we use cookies and how you may disable them are set out in our [Privacy Statement](#). By using this website you agree to our use of cookies.





[Greg Pittman \(/users/greg-p\)](#) on 11 Aug 2021

Something I have used the PID for is to kill some process that's gone haywire.



[\(http://creativecommons.org/licenses/by-sa/4.0/\)](http://creativecommons.org/licenses/by-sa/4.0/)

## Subscribe to our weekly newsletter

Subscribe

[Privacy Statement](#)

Get the highlights in your inbox every week.

Find us:

[Privacy Policy](#) | [Terms of Use](#) | [Contact](#) | [Meet the Team](#) | [Visit opensource.org](#)

We use cookies on our websites to deliver our online services. Details about how we use cookies and how you may disable them are set out in our Privacy Statement. By using this website you agree to our use of cookies.

