NDG Linux Unhatched - NDG Linux Unhatched

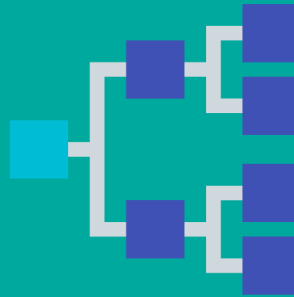**N** content.netdevgroup.com/contents/unhatched/400

Get Started
Listing Files

Listing Files

The `ls` command is used to list the contents of a directory. You've already seen it used a few times before in examples, but this page will help ensure you are comfortable with its use.

```
ls [OPTIONS] [FILE]
```

By default, when the `ls` command is used with no options or arguments, it will list the files in the current directory:

```
sysadmin@localhost:~$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  Templates  Videos
```

To learn the details about a file, such as the type of file, the permissions, ownerships or the timestamp, perform a long listing using the `-l` option to the `ls` command. Below, a listing of the `/var/log` directory is used as an example, since it provides a variety of output:

```
sysadmin@localhost:~$ ls -l /var/log/
total 844
-rw-r--r-- 1 root    root   18047 Dec 20  2017 alternatives.log
drwxr-x--- 2 root    adm     4096 Dec 20  2017 apache2
drwxr-xr-x 1 root    root    4096 Dec 20  2017 apt
-rw-r----- 1 syslog  adm     1346 Oct  2 22:17 auth.log
-rw-r--r-- 1 root    root   47816 Dec  7  2017 bootstrap.log
-rw-rw---- 1 root    utmp       0 Dec  7  2017 btmp
-rw-r----- 1 syslog  adm      547 Oct  2 22:17 cron.log
-rw-r----- 1 root    adm    85083 Dec 20  2017 dmesg
-rw-r--r-- 1 root    root  325238 Dec 20  2017 dpkg.log
-rw-r--r-- 1 root    root   32064 Dec 20  2017 faillog
drwxr-xr-x 2 root    root    4096 Dec  7  2017 fsck
-rw-r----- 1 syslog  adm      106 Oct  2 19:57 kern.log
-rw-rw-r-- 1 root    utmp  292584 Oct  2 19:57 lastlog
-rw-r----- 1 syslog  adm    19573 Oct  2 22:57 syslog
drwxr-xr-x 2 root    root    4096 Apr 11  2014 upstart
-rw-rw-r-- 1 root    utmp     384 Oct  2 19:57 wtmp
```

Each line corresponds to a file contained within the directory. The information can be broken down into fields separated by spaces. The fields are as follows:

File Type

```
-rw-r--r-- 1 root    root   18047 Dec 20  2017 alternatives.log

drwxr-x--- 2 root    adm     4096 Dec 20  2017 apache2
```

The first field actually contains ten characters, where the first character indicates the type of file and the next nine specify permissions. The file types are:

Symbol	File Type	Description
d	directory	A file used to store other files.
-	regular file	Includes readable files, images files, binary files, and compressed files.
l	symbolic link	Points to another file.
s	socket	Allows for communication between processes.
p	pipe	Allows for communication between processes.
b	block file	Used to communicate with hardware.
c	character file	Used to communicate with hardware.

The first file `alternatives.log` is a regular file `-`, while the second file `apache2` is a directory `d`.

Permissions

```
drwxr-xr-x 2 root    root    4096 Apr 11  2014 upstart
```

Permissions indicate how certain users can access a file. Keep reading to learn more about permissions.

Hard Link Count

```
-rw-r----- 1 syslog adm     1346 Oct  2 22:17 auth.log
```

This number indicates how many hard links point to this file. Hard links are beyond the scope of this module, but are covered in the NDG Linux Essentials course.

User Owner

```
-rw-r----- 1 syslog adm      106 Oct  2 19:57 kern.log
```

User `syslog` owns this file. Every time a file is created, the ownership is automatically assigned to the user who created it.

Group Owner

```
-rw-rw-r-- 1 root    utmp 292584 Oct  2 19:57 lastlog
```

Indicates which group owns this file

File Size

```
-rw-r----- 1 syslog adm   19573 Oct  2 22:57 syslog
```

Directories and larger files may be shown in kilobytes since displaying their size in bytes would present a very large number. Therefore, in the case of a directory, it might actually be a multiple of the block size used for the file system. Block size is the size of a series of data stored in the filesystem.

Timestamp

```
drwxr-xr-x 2 root    root    4096 Dec  7  2017 fsck
```

This indicates the time that the file's contents were last modified.

Filename

```
-rw-r--r-- 1 root    root   47816 Dec  7  2017 bootstrap.log
```

The final field contains the name of the file or directory.

Consider This

In the case of symbolic links, a file that points to another file, the link name will be displayed along with an arrow and the pathname of the original file.

```
lrwxrwxrwx. 1 root root 22 Nov 6 2012 /etc/grub.conf -> ../boot/grub/grub.conf
```

Symbolic links are beyond the scope of this module, but are covered in the NDG Linux Essentials course.

Sorting

By default the output of the `ls` command is sorted alphabetically by filename. It can sort by other methods as well.

Follow Along

The options in examples below will be combined with the `-l` option so the relevant details of the files are displayed. Notice fields corresponding to the search option.

The `-t` option will sort the files by timestamp:

```
sysadmin@localhost:~$ ls -lt /var/log
total 844
-rw-r----- 1 syslog adm   19573 Oct  2 22:57 syslog
-rw-r----- 1 syslog adm    1346 Oct  2 22:17 auth.log
-rw-r----- 1 syslog adm     547 Oct  2 22:17 cron.log
-rw-rw-r-- 1 root   utmp 292584 Oct  2 19:57 lastlog
-rw-rw-r-- 1 root   utmp    384 Oct  2 19:57 wtmp
-rw-r----- 1 syslog adm     106 Oct  2 19:57 kern.log
-rw-r--r-- 1 root   root  18047 Dec 20  2017 alternatives.log
-rw-r--r-- 1 root   root  32064 Dec 20  2017 faillog
-rw-r----- 1 root   adm   85083 Dec 20  2017 dmesg
-rw-r--r-- 1 root   root 325238 Dec 20  2017 dpkg.log
drwxr-x--- 2 root   adm    4096 Dec 20  2017 apache2
drwxr-xr-x 1 root   root   4096 Dec 20  2017 apt
-rw-r--r-- 1 root   root  47816 Dec  7  2017 bootstrap.log
drwxr-xr-x 2 root   root   4096 Dec  7  2017 fsck
-rw-rw---- 1 root   utmp      0 Dec  7  2017 btmp
drwxr-xr-x 2 root   root   4096 Apr 11  2014 upstart
```

The -S option will sort the files by file size:

```
sysadmin@localhost:~$ ls -l -S /var/log
total 844
-rw-r--r-- 1 root   root 325238 Dec 20  2017 dpkg.log
-rw-rw-r-- 1 root   utmp 292584 Oct  2 19:57 lastlog
-rw-r----- 1 root   adm   85083 Dec 20  2017 dmesg
-rw-r--r-- 1 root   root  47816 Dec  7  2017 bootstrap.log
-rw-r--r-- 1 root   root  32064 Dec 20  2017 faillog
-rw-r----- 1 syslog adm   19573 Oct  2 22:57 syslog
-rw-r--r-- 1 root   root  18047 Dec 20  2017 alternatives.log
drwxr-x--- 2 root   adm    4096 Dec 20  2017 apache2
drwxr-xr-x 1 root   root   4096 Dec 20  2017 apt
drwxr-xr-x 2 root   root   4096 Dec  7  2017 fsck
drwxr-xr-x 2 root   root   4096 Apr 11  2014 upstart
-rw-r----- 1 syslog adm    1346 Oct  2 22:17 auth.log
-rw-r----- 1 syslog adm     547 Oct  2 22:17 cron.log
-rw-rw-r-- 1 root   utmp    384 Oct  2 19:57 wtmp
-rw-r----- 1 syslog adm     106 Oct  2 19:57 kern.log
-rw-rw---- 1 root   utmp      0 Dec  7  2017 btmp
```

The -r option will reverse the order of any type of sort. Notice the difference when it is added to the previous example:

```
sysadmin@localhost:~$ ls -lSr /var/log
total 844
-rw-rw---- 1 root    utmp        0 Dec  7  2017 btmp
-rw-r----- 1 syslog adm       106 Oct  2 19:57 kern.log
-rw-rw-r-- 1 root    utmp      384 Oct  2 19:57 wtmp
-rw-r----- 1 syslog adm       654 Oct  2 23:17 cron.log
-rw-r----- 1 syslog adm      1669 Oct  2 23:17 auth.log
drwxr-xr-x 2 root    root     4096 Apr 11  2014 upstart
drwxr-xr-x 2 root    root     4096 Dec  7  2017 fsck
drwxr-xr-x 1 root    root     4096 Dec 20  2017 apt
drwxr-x--- 2 root    adm      4096 Dec 20  2017 apache2
-rw-r--r-- 1 root    root    18047 Dec 20  2017 alternatives.log
-rw-r----- 1 syslog adm     19680 Oct  2 23:17 syslog
-rw-r--r-- 1 root    root    32064 Dec 20  2017 faillog
-rw-r--r-- 1 root    root    47816 Dec  7  2017 bootstrap.log
-rw-r----- 1 root    adm     85083 Dec 20  2017 dmesg
-rw-rw-r-- 1 root    utmp  292584 Oct  2 19:57 lastlog
-rw-r--r-- 1 root    root  325238 Dec 20  2017 dpkg.log
```

The numbers in file size field switch from descending to ascending.

Used alone the -r option with list the files in reverse alphabetical order:

```
sysadmin@localhost:~$ ls -r /var/log
wtmp      lastlog   faillog   cron.log      auth.log  alternatives.log
upstart   kern.log  dpkg.log  btmp          apt
syslog    fsck      dmesg     bootstrap.log apache2
```