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How to Check System Logs on Linux [Complete Usage Guide]

System Logs in a Linux system display a timeline of events for specific processes and parts of the system, making it easier for system administration activities such as troubleshooting, managing, and monitoring.



① Updated: March 16, 2019











Note that all the Linux distros including the popular ones namely Debian, Ubuntu, Arch Linux, Linux Mint, Fedora, and CentOS have log files and it is common to Linux.

What are System Logs

The **log files** in a Linux system display a timeline of events for specific processes and parts of the system. For example, there are log files for *dpkg*, which have the information of all the programs installed, updated, and removed from your system, since the day it has been running.

Where to find the System Logs

You can find the log files in /var/log directory.

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```
Terminal - pulkit@fosslinux: ~
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oulkit@fosslinux:~$ ls /var/log
                       kern.log.1
alternatives.log
alternatives.log.1
apport.log
apport.log.1
                        lastlog
                       lightdm
                       mintsystem.log
                       mintsystem.timestamps
                       ntpstats
                       openvpn
                        samba
                       speech-dispatcher
auth.log
                       syslog
auth.log.1
                       syslog.1
boot.log
bootstrap.log
btmp
btmp.1
                        tallylog
cups
                        timeshift
dpkg.log
                       ubuntu-system-adjustments-adjust-grub-title.log
dpkg.log.1
                       ubuntu-system-adjustments-start.log
                       ubuntu-system-adjustments-stop.log
faillog
                       wtmp
fontconfig.log
                       wtmp.1
gpu-manager.log
                       Xorg.0.log
                       Xorg.0.log.old
installer
                       Xorg.1.log
journal
                       Xorg.1.log.old
kern.log
oulkit@fosslinux:~$
```

System logs list

These files are stored as plain text and are easy to read. You can use any GUI or CLI based text editor to read these files

Why Logs exist

The system logs are time-based records of all significant changes occurring on your system. It means that they can be used to trace back any change that may have caused an adverse effect on your system. It also helps system administrators to keep track of the activities taking place on an employee's system.

Here are the details of some of the critical log files:

- dpkg.log It keeps a log of all the programs that are installed, or removed or even updated in a system that uses DPKG
 package management. These systems include Ubuntu and all its derivatives, Linux Mint, Debian and all distributions based
 on Debian.
- yum.log This is similar to the dpkg.log file and keeps a record of the changes made to all programs on the system. It is
 present in systems that use Yum package management.
- **kern.log** This log contains the system's kernel data. Here you can find the record of changes made to the kernel. That is really a lot of information, due to which you might even find many versions of this file.
- boot.log This log contains the services and processes that are running when you start up your system. If you have
 configured your system not to show a splash-screen graphic but the boot text on starting up, you might have seen a lot of
 text, that begins with [OK] or [Failed] when your system boots up. The boot log is shown from this file.
- Xorg.0.log This file contains the data of the X Server program. X Server is the service that is responsible for the existence of the graphical interface on your system. If you have any issues with the GUI, you can check this log to pinpoint any errors.





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- wtmp.log/last.log These files contain the log-in data of the system. These are used by programs like last to show the names of users last logged in to the system.
- btmp.log This shows the failed log-in attempts on the system.

Reading Log Files

Syntax

Here is a sample line of a log file:

```
Mar 15 06:39:46 fosslinux systemd[1]: Started Clean php session files.
```

The general syntax therefore is:

- Date
- · Exact time
- Hostname (computer's name)
- · Service/process name
- Message

Reading Logs using Terminal

Reading log files is simple and can be done with any basic text editor, but it is highly recommended to use Terminal commands and utilities to read these files. Some of the commands used are:

```
head <filname>
```

To read the first ten lines of the file.

```
File Edit View Terminal Tabs Help

pulkit@fosslinux:/var/log$ head dpkg.log
2019-03-01 12:57:07 startup archives unpack
2019-03-01 12:57:10 install partitionmanager:amd64 <none> 3.3.1-2
2019-03-01 12:57:10 status half-installed partitionmanager:amd64 3.3.1-2
2019-03-01 12:57:10 status triggers-pending gnome-menus:amd64 3.13.3-1lubuntu1.1
2019-03-01 12:57:10 status triggers-pending desktop-file-utils:amd64 0.23+linuxm
int4
2019-03-01 12:57:11 status triggers-pending mime-support:all 3.60ubuntu1
2019-03-01 12:57:11 status triggers-pending man-db:amd64 2.8.3-2ubuntu0.1
2019-03-01 12:57:12 status unpacked partitionmanager:amd64 3.3.1-2
2019-03-01 12:57:12 status unpacked partitionmanager:amd64 3.3.1-2
pulkit@fosslinux:/var/log$

Possilinux
```

Using the head command on a log file

Distribution Ever Made



Linux is growing faster than ever. As per the latest report, there is a drop in the Windows 10 market share for the first time, and Linux's market share has improved to 2.87% this month. Most of the features in the list were rolled out in the Pop OS 20.04. Let's a detailed look into the new features, how to upgrade, and a ride through video.

Elementary OS 5.1.4 Review: Parental Control Finally Works?



Elementary OS 5.1 Hera has received a point release with a handful of new features and bug fixes, and we will be reviewing the significant changes in this article. For those new to elementary OS, this Ubuntu-based Linux distribution uses their inhouse built Pantheon desktop environment and AppCenter.



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```
tail <filename>
```

To read the last ten lines of the file.

```
File Edit View Terminal Tabs Help

pulkit@fosslinux:/var/log$ tail dpkg.log

2019-03-15 06:26:49 trigproc hicolor-icon-theme:all 0.17-2 <none>
2019-03-15 06:26:49 status half-configured hicolor-icon-theme:all 0.17-2

2019-03-15 06:26:49 status installed hicolor-icon-theme:all 0.17-2

2019-03-15 06:26:49 configure glogg:amd64 1.1.4-1 </r>
2019-03-15 06:26:49 status unpacked glogg:amd64 1.1.4-1

2019-03-15 06:26:50 status half-configured glogg:amd64 1.1.4-1

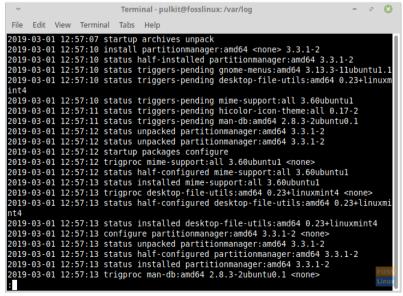
2019-03-15 06:26:50 trigproc libc-bin:amd64 2.27-3ubuntu1 <none>
2019-03-15 06:26:50 status half-configured libc-bin:amd64 2.27-3ubuntu1

2019-03-15 06:26:50 status installed libc-bin:amd64 2.27-3ubuntu1
```

Using the tail command on the log file

```
less <filename>
```

It is the most advanced utility. You can scroll up and down the file and even search for a word. It provides the most navigational options. You can guit it by pressing Q.



Using less command on a log file



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Finding a specific part

Finding a particular part of the file can be done in two ways. First, using the *less* command and next using the *grep* command. For the less command, open the file with:

```
less <filename>
```

And then to find a part, press '/' key and type the word that you need to search. Press enter and the word that you desired should highlight. To find the next word matching the same pattern, press the N key. To go to the previous matching case, press Shift + N. Again, to quit, press Q.

```
Terminal - pulkit@fosslinux: /var/log
                                                                                    - 0 🗵
 File Edit View Terminal Tabs Help
2019-02-20 19:13:17 install <mark>buttercup</mark>-desktop:amd64 <none> 1.15.0
2019-02-20 19:13:17 status half-installed <mark>buttercup</mark>-desktop:amd64 1.15.0
2019-02-20 19:13:17 status triggers-pending hicolor-icon-theme:all 0.17-2
2019-02-20 19:13:17 status triggers-pending gnome-menus:amd64 3.13.3-11ubuntu1.1
2019-02-20 19:13:17 status triggers-pending desktop-file-utils:amd64 0.23+linuxm
int4
2019-02-20 19:13:17 status triggers-pending mime-support:all 3.60ubuntul
2019-02-20 19:13:23 status unpacked buttercup-desktop:amd64 1.15.0
2019-02-20 19:13:23 status unpacked buttercup-desktop:amd64 1.15.0
2019-02-20 19:13:23 configure buttercup-desktop:amd64 1.15.0 1.15.0
2019-02-20 19:13:23 status unpacked buttercup-desktop:amd64 1.15.0
2019-02-20 19:13:23 status half-configured buttercup-desktop:amd64 1.15.0
2019-02-20 19:13:24 status installed buttercup-desktop:amd64 1.15.0
2019-02-20 19:13:24 trigproc hicolor-icon-theme:all 0.17-2 <none>
2019-02-20 19:13:24 status half-configured hicolor-icon-theme:all 0.17-2
2019-02-20 19:13:24 status installed hicolor-icon-theme:all 0.17-2
2019-02-20 19:13:24 trigproc gnome-menus:amd64 3.13.3-11ubuntu1.1 <none>
2019-02-20 19:13:24 status half-configured gnome-menus:amd64 3.13.3-11ubuntu1.1
2019-02-20 19:13:24 status installed gnome-menus:amd64 3.13.3-11ubuntu1.1
2019-02-20 19:13:24 trigproc desktop-file-utils:amd64 0.23+linuxmint4 <none>
2019-02-20 19:13:24 status half-configured desktop-file-utils:amd64 0.23+linuxmi
2019-02-20 19:13:24 status installed desktop-file-utils:amd64 0.23+linuxmint4
2019-02-20 19:13:24 trigproc mime-support:all 3.60ubuntu1 <none>
```

Using less command to find a specific part

To use the grep method, you also have to use the cat command. So to find a particular part, use this:

```
cat <filename> | grep <keyword>
```

```
Terminal - pulkit@fosslinux: /var/log
                                                                                                                                           - 0 🗵
  File Edit View Terminal Tabs Help
  pulkit@fosslinux:/var/log$ cat dpkg.log.1 | grep buttercup
2019-02-20 19:13:17 install buttercup-desktop:amd64 <none> 1.15.0 2019-02-20 19:13:17 status half-installed buttercup-desktop:amd64 1.15.0 2019-02-20 19:13:23 status unpacked buttercup-desktop:amd64 1.15.0
2019-02-20 19:13:23 status unpacked <mark>buttercup</mark>-desktop:amd64 1.15.0
2019-02-20 19:13:23 status unpacked <mark>buttercup</mark>-desktop:amd64 1.15.0
2019-02-20 19:13:23 configure buttercup-deskt
2019-02-20 19:13:23 status unpacked buttercup
                                                                           p-desktop:amd64 1.15.0 1.15.0
                                                                                       -desktop:amd64 1.15.0
2019-02-20 19:13:23 status half-configured buttercup-desktop:amd64 1.15.0
2019-02-20 19:13:24 status installed buttercup-desktop:amd64 1.15.0
2019-02-20 19:55:10 status installed buttercup-desktop:amd64 1.15.0
2019-02-20 19:55:10 remove buttercup-desktop:amd64 1.15.0 <none>
2019-02-20 19:55:10 status half-configured buttercup-desktop:amd64 1.15.0 2019-02-20 19:55:10 status half-installed buttercup-desktop:amd64 1.15.0 2019-02-20 19:55:11 status config-files buttercup-desktop:amd64 1.15.0 2019-02-20 19:55:11 status config-files buttercup-desktop:amd64 1.15.0 2019-02-20 19:55:11 status config-files buttercup-desktop:amd64 1.15.0
                                                                cup-desktop:amd64 1.15.0 <none>
 2019-02-20 19:55:12 purge butte
2019-02-20 19:55:12 status config-files buttercup-desktop:amd64 1.15.0
2019-02-20 19:55:12 status config-files buttercup-desktop:amd64 1.15.0 2019-02-20 19:55:13 status not-installed buttercup-desktop:amd64 <none>
2019-02-20 20:00:31 install buttercup-desktop:amd64 <none> 1.15.0
2019-02-20 20:00:31 status half-installed buttercup-desktop:amd64 1.15.0
2019-02-20 20:00:37 status unpacked buttercup-desktop:amd64 1 15 0
```

Finding a part using grep

GUI method

If you need to use a GUI program, you can use the **glogg**. It is an excellent program that efficiently displays logs. According to the website, it is a GUI combination of the *less* and *grep* commands.

You can install it using the command line. For Ubuntu (and derivatives), Linux Mint and other distributions that use APT management:

sudo apt-get install glogg

```
Terminal - pulkit@fosslinux: ~
                                                                             - ø 🗵
File Edit View Terminal Tabs Help
pulkit@fosslinux:~$ sudo apt-get install glogg
[sudo] password for pulkit:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
 libboost-program-options1.65.1
The following NEW packages will be installed:
glogg libboost-program-options1.65.1
0 upgraded, 2 newly installed, 0 to remove and 182 not upgraded.
Need to get 395 kB of archives.
After this operation, 1,526 kB of additional disk space will be used.
Do you want to continue? [Y/n]
Get:1 http://archive.ubuntu.com/ubuntu bionic/main amd64 libboost-program-option
s1.65.1 amd64 1.65.1+dfsq-0ubuntu5 [137 kB]
Get:2 http://archive.ubuntu.com/ubuntu bionic/universe amd64 glogg amd64 1.1.4-1
[258 kB]
Fetched 395 kB in 3s (126 kB/s)
Selecting previously unselected package libboost-program-options1.65.1:amd64.
(Reading database ... 305404 files and directories currently installed.)
Preparing to unpack .../libboost-program-options1.65.1 1.65.1+dfsg-0ubuntu5 amd6
4.deb ...
Unpacking libboost-program-options1.65.1:amd64 (1.65.1+dfsg-0ubuntu5) ...
Selecting previously unselected package glogg.
Preparing to unpack .../glogg_1.1.4-1_amd64.deb ...
Unpacking glogg (1.1.4-1) ...
Processing triggers for mime-support (3.60ubuntul) ...
Processing triggers for desktop-file-utils (0.23+linuxmint4) ...
Processing triggers for libc-bin (2.27-3ubuntu1) ...
Processing triggers for doc-base (0.10.8) ...
Processing 1 added doc-base file...
Registering documents with scrollkeeper...
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
Processing triggers for gnome-menus (3.13.3-11ubuntul.1) ...
Setting up libboost-program-options1.65.1:amd64 (1.65.1+dfsg-0ubuntu5) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Setting up glogg (1.1.4-1) ...
Processing triggers for libc-bin (2.27-3ubuntul) ...
 ulkit@fosslinux:~$
```

Installing glogg on Linux Mint

For Fedora and derivatives:

```
sudo yum install glogg
```

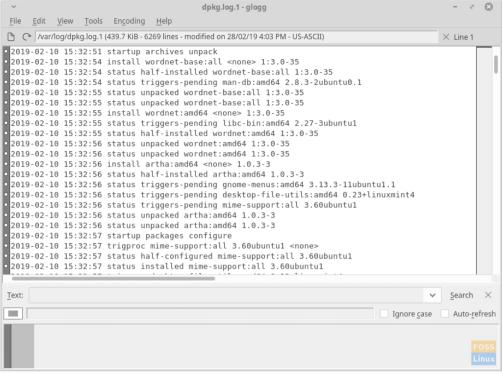
For Arch and derivatives:

```
sudo pacman -S glogg
```

You can find instructions or additional help here.

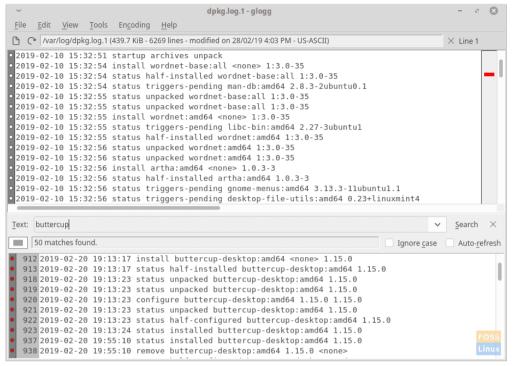
Usage

The usage of glogg is simple. Just launch the application from your application launcher, and click on the 'Open File' icon located on the left of the address bar after the reload button. Navigate to the log file that you want to open (probably in the /var/log directory), and open it.



Displaying logs using glogg

You can use the box present below the displayed content of the file to search for specific parts. The results should be displayed in a box below.



Finding logs on glogg

Log Rotation

The system log files are rotated where new versions get created periodically. It is easy to tell if a log is rotated by looking at the original file name. Like *dpkg.log.1* is an older version of *dpkg.log*. The information about the rotation of the log files is contained in the *logrotate* file and the *logrotate.d* directory. You can access them using:

```
cd /etc/logrotate.d/
ls
```

You will see the files containing log-rotation data of all services. To view the contents, enter:

```
cat <filename>
```

```
File Edit View Terminal Tabs Help

pulkit@fosslinux:~$ cd /etc/logrotate.d/
pulkit@fosslinux:/etc/logrotate.d$ ls
alternatives apt cups-daemon lightdm ppp speech-dispatcher
apport aptitude dpkg pm-utils rsyslog ufw
pulkit@fosslinux:/etc/logrotate.d$ cat dpkg
/var/log/dpkg.log {
    monthly
    rotate 12
    compress
    delaycompress
    missingok
    notifempty
    create 644 root root
}
pulkit@fosslinux:/etc/logrotate.d$ 

Fossitions

Fossitions

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Fossitions
```

Log-rotation sample file

You can even edit them if you want.

rsyslog

rsyslog is the service that is responsible for creating log files. You can find its configuration files at /etc/rsyslog.conf and in the /etc/rsyslog.d/ directory. You can make changes to the syntax of the system log entries using these files.

```
Terminal - pulkit@fosslinux: ~
                                                                        - ø 🔞
File Edit View Terminal Tabs Help
 oulkit@fosslinux:~$ cat /etc/rsyslog.conf
  /etc/rsyslog.conf Configuration file for rsyslog.
                       For more information see
                        /usr/share/doc/rsyslog-doc/html/rsyslog conf.html
  Default logging rules can be found in /etc/rsyslog.d/50-default.conf
#### MODULES ####
###################
module(load="imuxsock") # provides support for local system logging
#module(load="immark")  # provides --MARK-- message capability
# provides UDP syslog reception
#module(load="imudp")
#input(type="imudp" port="514")
# provides TCP syslog reception
#module(load="imtcp")
#input(type="imtcp" port="514")
# provides kernel logging support and enable non-kernel klog messages
module(load="imklog" permitnonkernelfacility="on")
##################################
#### GLOBAL DIRECTIVES ####
##################################
```

Log files configuration

Conclusion

System logs are a way for the system administrators and users to keep track of the changes going on in the system. They also help in finding errors and issues in the system and help maintain precise and efficient records. They are easy to read and manage, and very useful.

Let us know about any questions or your thought on logs in the comments. Cheers!

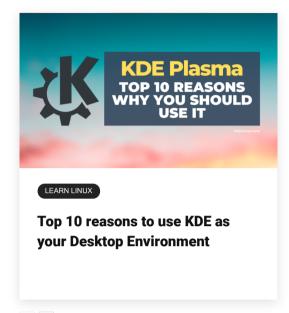




Pulkit Chandak

Pulkit Chandak is a Linux enthusiast and has been using and experimenting with open source software and hardware too since a long time. He is a huge admirer of open source software and wants to ventilate it to all around him. He is interested in reviewing and writing tutorials on Linux and its many distributions. He believes that freedom in software leads to freedom of the mind from the chains of limits.

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