



[nixCraft](#) → [Howto](#) → [Linux](#) → Understanding /etc/passwd File Format For Linux and Unix

Understanding /etc/passwd File Format

Author: Vivek Gite

Last updated: December 5, 2022

[111 comments](#)

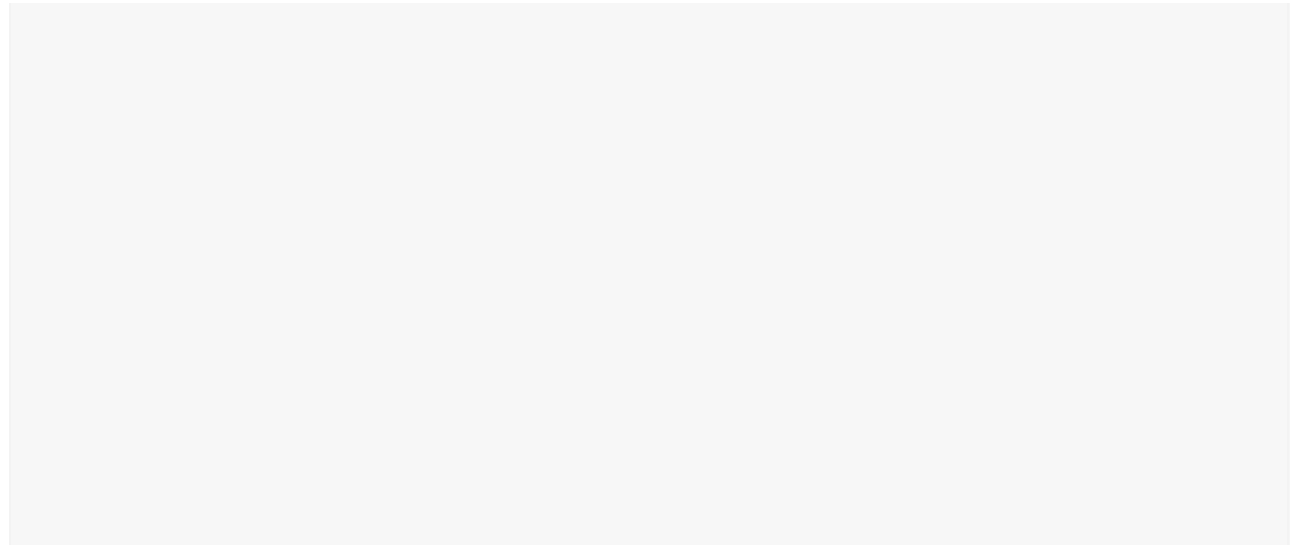
Can you explain **/etc/passwd** file format for Linux and Unix-like operating systems?



The `/etc/passwd` file stores essential information required during login. In other words, it stores user account information. The `/etc/passwd` is a plain text file. It contains a list of the system's accounts, giving for each account some useful information like user ID, group ID, home directory, shell, and more. The `/etc/passwd` file should have general read permission as many command utilities use it to map user IDs to user names. However, write access to the `/etc/passwd` must only limit for the superuser/root account.

Tutorial details	
Difficulty level	Easy
Root privileges	No
Requirements	Linux terminal
OS compatibility	BSD • Linux • Unix • WSL
Est. reading time	5 minutes

ADVERTISEMENT



Understanding /etc/passwd file fields

The /etc/passwd contains one entry per line for each user (user account) of the system.

All fields are separated by a colon (`:`) symbol. Total of seven fields as follows.

Generally, /etc/passwd file entry looks as follows:

```
oracle:x:1021:1020:Oracle user:/data/network/oracle:/bin/bash
```

1 2 3 4 5 6 7

(Fig.01: /etc/passwd file format – click to enlarge)

/etc/passwd file format

From the above image:

1. **Username**: It is used when user logs in. It should be between 1 and 32 characters in length.

2. **Password** : An x character indicates that encrypted password is stored in [/etc/shadow file](#). Please note that you need to use the passwd command to computes the hash of a password typed at the CLI or to store/update the hash of the password in /etc/shadow file.
3. **User ID (UID)** : Each user must be assigned a user ID (UID). UID 0 (zero) is reserved for root and UIDs 1-99 are reserved for other predefined accounts. Further UID 100-999 are reserved by system for administrative and system accounts/groups.
4. **Group ID (GID)** : The primary group ID (stored in /etc/group file)
5. **User ID Info (GECOS)** : The comment field. It allow you to add extra information about the users such as user's full name, phone number etc. This field use by finger command.
6. **Home directory** : The absolute path to the directory the user will be in when they log in. If this directory does not exists then users directory becomes /
7. **Command/shell** : The absolute path of a command or shell (/bin/bash). Typically, this is a shell. Please note that it does not have to be a shell. For example, sysadmin can use the nologin shell, which acts as a replacement shell for the user accounts. If shell set to `/sbin/nologin` and the user tries to log in to the Linux system directly, the /sbin/nologin shell closes the connection.

I hope you understood /etc/passwd file format to keep track of every registered user that has access to a system. Therefore, knowing the structure is essential for security reasons. Now, let us see some common examples of commands.

Task: [See Linux User List](#)

/etc/passwd is only used for local users. To see list of all users, simply use the [cat command](#) or [more/less command](#):

```
$ cat /etc/passwd
```

The following is an example of an /etc/passwd file from Linux system powered by Alpine Linux:

```
root:x:0:0:root:/root:/bin/ash
bin:x:1:1:bin:/bin:/sbin/nologin
daemon:x:2:2:daemon:/sbin:/sbin/nologin
adm:x:3:4:adm:/var/adm:/sbin/nologin
lp:x:4:7:lp:/var/spool/lpd:/sbin/nologin
sync:x:5:0:sync:/sbin:/bin/sync
shutdown:x:6:0:shutdown:/sbin:/sbin/shutdown
halt:x:7:0:halt:/sbin:/sbin/halt
mail:x:8:12:mail:/var/mail:/sbin/nologin
news:x:9:13:news:/usr/lib/news:/sbin/nologin
uucp:x:10:14:uucp:/var/spool/uucppublic:/sbin/nologin
operator:x:11:0:operator:/root:/sbin/nologin
man:x:13:15:man:/usr/man:/sbin/nologin
postmaster:x:14:12:postmaster:/var/mail:/sbin/nologin
cron:x:16:16:cron:/var/spool/cron:/sbin/nologin
ftp:x:21:21:./var/lib/ftp:/sbin/nologin
sshd:x:22:22:sshd:/dev/null:/sbin/nologin
at:x:25:25:at:/var/spool/cron/atjobs:/sbin/nologin
squid:x:31:31:Squid:/var/cache/squid:/sbin/nologin
xfs:x:33:33:X Font Server:/etc/X11/fs:/sbin/nologin
games:x:35:35:games:/usr/games:/sbin/nologin
cyrus:x:85:12:./usr/cyrus:/sbin/nologin
vpopmail:x:89:89:./var/vpopmail:/sbin/nologin
ntp:x:123:123:NTP:/var/empty:/sbin/nologin
smmsp:x:209:209:smmsp:/var/spool/mqueue:/sbin/nologin
guest:x:405:100:guest:/dev/null:/sbin/nologin
nobody:x:65534:65534:nobody:/:/sbin/nologin
nginx:x:100:101:nginx:/var/lib/nginx:/sbin/nologin
vnstat:x:101:102:vnstat:/var/lib/vnstat:/bin/false
redis:x:102:103:redis:/var/lib/redis:/bin/false
```

To search for a username called tom, use the [grep command](#):

```
$ grep tom /etc/passwd
```

OR

```
$ grep -w '^tom' /etc/passwd
```

Sample outputs:

```
tom:x:1000:1000:Vivek Gite:/home/vivek:/bin/bash
```

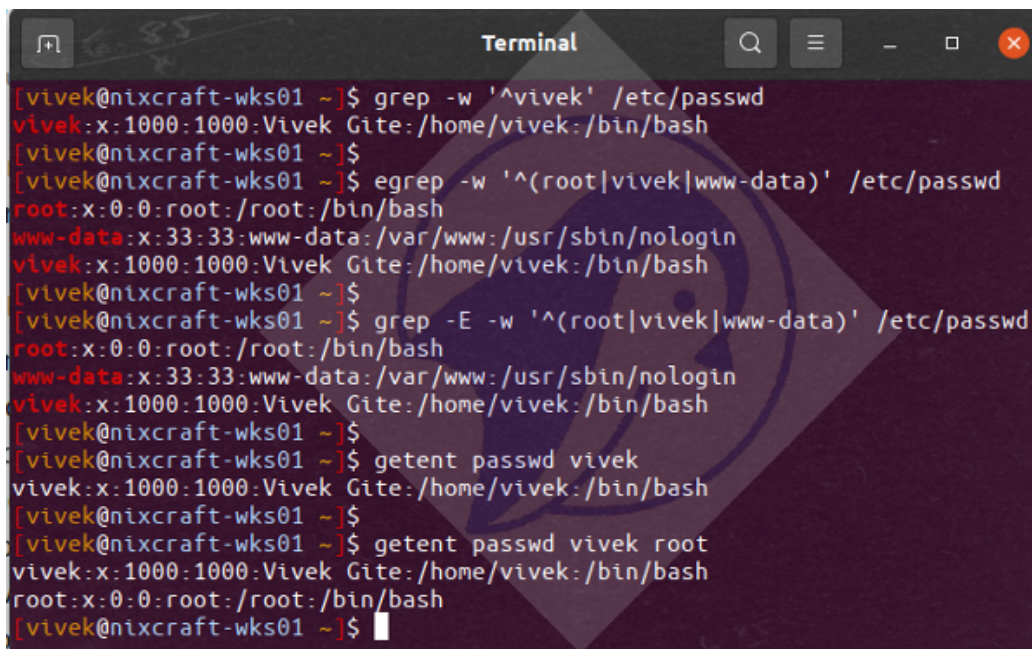
Using the /etc/passwd file

Want to find out multiple users? Try the [egrep command](#) as follows:

```
$ egrep -w '^(tom|jerry|fox)' /etc/passwd
## OR pass the '-E' ##
$ grep -E -w '^(root|vivek|www-data)' /etc/passwd
```

Of course, one can get entries from /etc/passwd using the getent command too. For example:

```
getent passwd
getent passwd {user1} {user2}
getent passwd vivek
getent passwd vivek root
```



```
[vivek@nixcraft-wks01 ~]$ grep -w '^vivek' /etc/passwd
vivek:x:1000:1000:Vivek Gite:/home/vivek:/bin/bash
[vivek@nixcraft-wks01 ~]$
[vivek@nixcraft-wks01 ~]$ egrep -w '^(root|vivek|www-data)' /etc/passwd
root:x:0:0:root:/root:/bin/bash
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
vivek:x:1000:1000:Vivek Gite:/home/vivek:/bin/bash
[vivek@nixcraft-wks01 ~]$
[vivek@nixcraft-wks01 ~]$ grep -E -w '^(root|vivek|www-data)' /etc/passwd
root:x:0:0:root:/root:/bin/bash
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
vivek:x:1000:1000:Vivek Gite:/home/vivek:/bin/bash
[vivek@nixcraft-wks01 ~]$
[vivek@nixcraft-wks01 ~]$ getent passwd vivek
vivek:x:1000:1000:Vivek Gite:/home/vivek:/bin/bash
[vivek@nixcraft-wks01 ~]$
[vivek@nixcraft-wks01 ~]$ getent passwd vivek root
vivek:x:1000:1000:Vivek Gite:/home/vivek:/bin/bash
root:x:0:0:root:/root:/bin/bash
[vivek@nixcraft-wks01 ~]$
```

The /etc/passwd file keeps track of every user that has access to a system, and we can query it using the getent or grep command.

See /etc/passwd file permission

The permission on the /etc/passwd file should be read only to users (`-rw-r--r--` OR `0644`) and the owner must be root:

```
$ ls -l /etc/passwd
```

Sample outputs:

```
-rw-r--r-- 1 root root 2659 Sep 17 01:46 /etc/passwd
```

Use the stat command to see details about the file:

```
$ stat /etc/passwd
```

Outputs:

```
File: /etc/passwd
Size: 3445      Blocks: 8      IO Block: 4096   regular file
Device: fd02h/64770d  Inode: 25954390   Links: 1
Access: (0644/-rw-r--r--)  Uid: (  0/   root)   Gid: (  0/   root)
Access: 2021-05-24 01:34:01.794296901 +0530
Modify: 2021-05-08 00:33:40.430038177 +0530
Change: 2021-05-08 00:33:40.434038185 +0530
Birth: -
```

Reading /etc/passwd file

You can read /etc/passwd file using the [while loop](#) and [IFS separator](#) as follows:

```
#!/bin/bash
# seven fields from /etc/passwd stored in $f1,f2...,f7
#
while IFS=: read -r f1 f2 f3 f4 f5 f6 f7
do
    echo "User $f1 use $f7 shell and stores files in $f6 directory."
done < /etc/passwd
```

```

vivek@nixcraft-wks01:~$ ls -l /etc/passwd
-rw-r--r-- 1 root root 3103 Nov 23 22:10 /etc/passwd
vivek@nixcraft-wks01:~$ while IFS=: read -r f1 f2 f3 f4 f5 f6 f7
> do
>   echo "User $f1 use $f7 shell and stores files in $f6 directory."
> done < /etc/passwd
User root use /bin/bash shell and stores files in /root directory.
User daemon use /usr/sbin/nologin shell and stores files in /usr/sbin directory.
User bin use /usr/sbin/nologin shell and stores files in /bin directory.
User sys use /usr/sbin/nologin shell and stores files in /dev directory.
User sync use /bin/sync shell and stores files in /bin directory.
User games use /usr/sbin/nologin shell and stores files in /usr/games directory.
User man use /usr/sbin/nologin shell and stores files in /var/cache/man directory.
User lp use /usr/sbin/nologin shell and stores files in /var/spool/lpd directory.
User mail use /usr/sbin/nologin shell and stores files in /var/mail directory.
User news use /usr/sbin/nologin shell and stores files in /var/spool/news directory.
User uucp use /usr/sbin/nologin shell and stores files in /var/spool/uucp directory.
User proxy use /usr/sbin/nologin shell and stores files in /bin directory.
User www-data use /usr/sbin/nologin shell and stores files in /var/www directory.
User backup use /usr/sbin/nologin shell and stores files in /var/backups directory.
User list use /usr/sbin/nologin shell and stores files in /var/list directory.
User irc use /usr/sbin/nologin shell and stores files in /var/run/ircd directory.
User gnats use /usr/sbin/nologin shell and stores files in /var/lib/gnats directory.
User nobody use /usr/sbin/nologin shell and stores files in /nonexistent directory.
User systemd-timesync use /usr/sbin/nologin shell and stores files in /run/systemd directory.
User systemd-network use /usr/sbin/nologin shell and stores files in /run/systemd directory.
User systemd-resolve use /usr/sbin/nologin shell and stores files in /run/systemd directory.
User messagebus use /usr/sbin/nologin shell and stores files in /nonexistent directory.
User syslog use /usr/sbin/nologin shell and stores files in /home/syslog directory.

```

Your password hashes is in the /etc/shadow file

So far, so good, right? But, where are my encrypted passwords? Good question. Your encrypted password hashes are in the [/etc/shadow](#) file. There was no significant problem with this general read permission in the good old days. Everybody could read the encrypted passwords, but the hardware was [too slow to crack a well-chosen password](#), and the basic assumption used to be that of a friendly user community. Therefore, we use [/etc/shadow](#) files on Linux and other Unix-like operating systems for security reasons.

How do I know am I using shadow files for passwords on my machine?

Almost all modern Linux and UNIX-like operating systems use shadow password suites. If your /etc/passwd file has asterisks () instead of encrypted (more like hash) passwords, then it is safe to assume that the [encrypted passwords hashes are in /etc/shadow](#) file. Please note that this file is only readable by the superuser only. Verify file permissions using the ls command or stat command:

```
ls -l /etc/shadow
stat /etc/shadow
```

Common commands that uses /etc/passwd files

Here is a list of commands that manipulate /etc/passwd file. Hence read the man pages using the [man command](#) or [help command](#):

- passwd command
- su command
- sulogin command
- getent command
- login command
- pwck command

- pwunconv command
- chpasswd command
- [chsh command](#)
- chfn command
- useradd command
- userdel command

Conclusion

The /etc/passwd file stores all user names and accounts on the Linux or Unix-like system. In other words, user account information is in the /etc/passwd file. Hence, you can confirm and read the documentation by reading the following man pages with the help of the [man command](#):

```
$ man 5 passwd
```

This entry is **1** of **3** in the **Linux / UNIX System's Accounts Files Tutorial** series. Keep reading the rest of the series:

1. Understanding **/etc/passwd** File Format
2. [/etc/shadow file format](#)
3. [Linux and Unix /etc/group file](#)

About the author: Vivek Gite is the founder of nixCraft, the oldest running blog about Linux and open source. He wrote more than 7k+ posts and helped numerous readers to master IT topics. Join the nixCraft community via [RSS Feed](#), [Email Newsletter](#) or follow on [Twitter](#).

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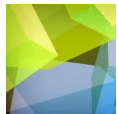


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Category	List of Unix and Linux commands
Ansible	Check version • Fedora • FreeBSD • Linux • Ubuntu 18.04 • Ubuntu • macOS
Backup Management	Debian/Ubuntu • FreeBSD • RHEL
Database Server	Backup MySQL server • MariaDB Galera cluster • MariaDB TLS/SSL • MariaDB replication • MySQL Server • MySQL remote access
Download managers	wget
Driver Management	Linux Nvidia driver • Ismod
Documentation	help • mandb • man • pinfo
Disk Management	df • dub • ncdu • pydf
File Management	cat • cp • less • mkdir • more • tree
Firewall	Alpine Awall • CentOS 8 • OpenSUSE • RHEL 8 • Ubuntu 16.04 • Ubuntu 18.04 • Ubuntu 20.04 • Ubuntu 24.04
KVM Virtualization	CentOS/RHEL 7 • CentOS/RHEL 8 • Debian 9/10/11 • Ubuntu 20.04
Linux Desktop apps	Chrome • Chromium • GIMP • Skype • Spotify • VLC 3
Modern utilities	bat • exa
Network Management	Monitoring tools • Network services • RHEL static IP • Restart network interface • nmcli

Category	List of Unix and Linux commands
Network Utilities	NetHogs • dig • host • ip • nmap • ping
OpenVPN	CentOS 7 • CentOS 8 • Debian 10 • Debian 11 • Debian 8/9 • Ubuntu 18.04 • Ubuntu 20.04
Power Management	upower
Package Manager	apk • apt-get • apt • yum
Processes Management	bg • chroot • cron • disown • fg • glances • gtop • iotop • jobs • killall • kill • pidof • pstree • pwdx • time • vtop
Searching	ag • egrep • grep • whereis • which
Shell builtins	compgen • echo • printf
System Management	reboot • shutdown
Terminal/ssh	sshpass • tty
Text processing	cut • rev
Text Editor	6 Text editors • Save and exit vim
User Environment	exit • who
User Information	groups • id • lastcomm • last • lid/libuser-lid • logname • members • users • whoami • w
User Management	/etc/group • /etc/passwd • /etc/shadow • chsh
Web Server	Apache • Let's Encrypt certificate • Lighttpd • Nginx Security • Nginx

Category	List of Unix and Linux commands
WireGuard	Alpine • Amazon Linux • CentOS 8 • Debian 10 • Firewall • Ubuntu 20.04 •
VPN	qrencode

111 comments... [add one](#) ↓

Ruwan.gawarammana

Feb 19, 2007 @ 6:47

What are the differences between system calls and Library functions?

[reply](#) [link](#)

marwen

Jun 2, 2011 @ 10:54

– system call is a call of a service to be done by the kernel, it's executed in the kernel address space.

– a library function call is done by “importing” (linking) the (library/function) code to the user's program, and it's executed in the user address space.

[reply](#) [link](#)

surya

Mar 12, 2007 @ 9:28

What is the need for /etc/shadow file, when there is /etc/passwd file?

Can the password be maintained in /etc/passwd file itself?

please tell me why Developers implemented two files /etc/passwd and /etc/shadow/

[reply](#) [link](#)

Vikas

Nov 1, 2010 @ 11:36

Actually the Passwd stored in the etc/shadow is the exact password which is encrypted and also the developer haven't implemented two files the /etc/passwd is the symbolik link to the /etc/shadow

[reply](#) [link](#)

Manoj

Apr 27, 2011 @ 7:32

the /etc/passwd file will contain the details for the user created (uid, gid, home dir, login shell etc), whereas the /etc/shadow file will contain information specific to the password set for the users.

[reply](#) [link](#)

DG12

Feb 20, 2015 @ 22:21

/etc/password is readable by all (useful for the 5th field: User ID Info).

Placing an encrypted password there would enable cracking.

/etc/shadow is not readable by anyone (other than the owner:root, or processes with SETUID root) . This prevents any attempts at password cracking.

[reply](#) [link](#)

DG12

Feb 20, 2015 @ 22:23

like Gabe said

[reply](#) [link](#)

Gabe

Mar 14, 2007 @ 20:30

surya – There may be other reasons, but one reason is that the /etc/shadow file is not readable by any user except root. Whereas the /etc/passwd has legitimate reasons to be read by other users. Even though the passwords can be encrypted directly in /etc/passwd, that is still less secure than have even the encrypted passwords hidden.

[reply](#) [link](#)

Bill

Oct 1, 2007 @ 2:17

I have been asked to create a new user on an HP-UX 7.05 machine circa 1990.

Editing the /etc/admin file in Motif to add my user account resulted in that user having denied access. the user name was as added as a user to /etc/groups. I used a new UID fot the user.

Any clues as to what i did wrong?

Thanks

[reply](#) [link](#)

Bill

Oct 1, 2007 @ 2:19

That was /etc/passwd

[reply](#) [link](#)

Praveen

Feb 26, 2008 @ 21:31

First let me tell tht i am newbie into the linux arena.

Please educate me how updated pwds of the users are been changed in /etc/shadow which has only read perminssions

Praveen Joy.

[reply](#) [link](#)

Manoj

Apr 27, 2011 @ 7:45

Good question.

A concept called SUID is used here.

“The SUID permission makes a script to run as the user who is the owner of the script, rather than the user who started it.”

The “passwd” command is present located under “/usr/bin”. Check the permissions for this file using.

```
ll /usr/bin/passwd
```

(Note that an extra ‘s’ is added to the rwx permissions)

For any further queries, mail to s.manoj89@gmail.com

[reply](#) [link](#)

Jenny Oscar

May 14, 2008 @ 1:45

What does it mean if the password (2nd field) leaves blank or shows as “*”? Thanks.

[reply](#) [link](#)

sunil Meher

Dec 9, 2011 @ 18:34

If the second field in /etc/passwd file is set with "*" then the password is disabled for the respective user

[reply](#) [link](#)

Eddel Gauten

Jan 21, 2017 @ 15:41

So what does it mean? Is the user account can still login?

[reply](#) [link](#)

Gerald F. McMullen

Jun 4, 2008 @ 15:39

In the ETC/Passwd file what functionality are the five accounts used for : Shutdown, Sync, Halt, News and Netdump ? Are these logins or are they just command files? And why don't they have a Nologin at the end of their paths?

Thanks Jerry

[reply](#) [link](#)

Manoj

Apr 27, 2011 @ 8:42

In RHEL, every process runs under a particular user. Users corresponding to certain processes don't have the need to login. So, they have been assigned with a nologin shell. We can use the option "-s /sbin/nologin" while creating the user/while using "usermod".

[reply](#) [link](#)



Jun 4, 2008 @ 15:46

nologin is shell which displays a message that an account is not available. It is intended as a replacement shell field for accounts that have been disabled or only use by system internally.

[reply](#) [link](#)

DG12

Jul 10, 2008 @ 21:33

In general the /etc/password and associated shadow files are very *nix dependent. (AIX, HP-UX, linux...)

Praveen: passwords are updated by the passwd command.

Jenny: the star in the password field means "password is in shadow file". If the password field is null (i.e. ::) account is not passworded (bad)!

[reply](#) [link](#)

ariel R. Cabuga

Feb 17, 2015 @ 2:33

what can i do??

[reply](#) [link](#)

Charity

Oct 16, 2008 @ 17:46

Similar to Jenny's question... what if the second field (password) in the /etc/passwd file is "*" but the /etc/shadow file is not in use?

[reply](#) [link](#)

Manoj

Apr 27, 2011 @ 8:47

If the /etc/shadow file is not there, a login attempt will first refer the /etc/passwd file which will in turn try to search for the /etc/shadow file. When it is not able to find that file, it will throw an error saying that the permission is denied(to login)

[reply](#) [link](#)

lida

Nov 7, 2008 @ 18:36

how to line for only ftp user?

example

user:x:1000:(www-data id):(?):(?)

is true?

[reply](#) [link](#)

Martin

Dec 10, 2008 @ 12:54

Hi, a am migrating from Solaris 8 to Solaris 10, and i have a lot of users that i want to migrate. Is there a quick way to do this not by hand one by one?

I was thinking that maybe copying the /etc/passwd, /etc/shadow and /etc/group files would do the job?

[reply](#) [link](#)

 **nixCraft**

Dec 10, 2008 @ 15:04

Please see [this faq](#) about migrating user accounts.

[reply](#) [link](#)

viola

Dec 15, 2008 @ 9:19

how to read the password and compair it with the one that is in the /etc/passwd or /etc/shadow

[reply](#) [link](#)

sparta_tushar

Dec 18, 2008 @ 9:03

anybody knows how to expire user's password whos entry is there in /etc/passwd file

[reply](#) [link](#)

MrMe

Oct 28, 2015 @ 18:32

passwd -f userid

[reply](#) [link](#)

 **nixCraft**

Dec 18, 2008 @ 9:28

@sparta_tushar,

Use [chage command](#).

[reply](#) [link](#)

Nadeem

Jan 27, 2009 @ 11:50

Kindly define all 7th points beriefly like Username Password UID GID Comments Home Directory Shell with respect of /etc/passwd File

[reply](#) [link](#)

Nadeem

Jan 27, 2009 @ 11:51

Any one can aswer kindly do ASAP

[reply](#) [link](#)

Volker

Feb 6, 2009 @ 0:24

If any of you have access to root than you wouldn't be asking how to view/expire/delete, etc the password in the shadow file. There is absolutely no need to if you are root. If you want to expire a password it would be more efficient to su into the user (of course assuming you are root), and passwd yourself your own password. Again, there is no need to see an encrypted password for whatever reason. Just by glancing at the things some of you want to do makes me wonder whether you guys are either trying to hack into someone's account, or play a prank on them, etc...

[reply](#) [link](#)

dht

Mar 3, 2009 @ 11:00

pleas tel me in what format passwords are stored in shadow file?means i want ask you that what encryption is used in shadow file to store password?

[reply](#) [link](#)

pappu

Apr 6, 2009 @ 10:52

thanks

[reply](#) [link](#)

amar

Apr 26, 2009 @ 6:36

nice notes for engg students

[reply](#) [link](#)

turkan

Jul 30, 2009 @ 8:22

Hi,

We are using solaris 10 on jumpstart. We have tried to change the password for root since we have forgotten it. But know the system cannot find user root.

Can you help us to recreate root user? Is there anyway?

Thanks.

[reply](#) [link](#)

Alex

Aug 18, 2009 @ 17:03

I have a question about the /etc/passwd file

I have a number of users accessing a system and while my security is very good by use of firewall and strict permissions on all files I would like to stop users from viewing the /etc/passwd file purely because I don't want my clients to know who my other clients are.

Is there any way, other than using chroot to do this?

[reply](#) [link](#)

sunil Meher

Dec 9, 2011 @ 18:42

we can change the permission of the file /etc/passwd using the command chmod

[reply](#) [link](#)

vipin

Aug 20, 2009 @ 16:01

thanks sir

[reply](#) [link](#)

vipin

Aug 20, 2009 @ 17:52

sir tell me predefined accounts
for example

[reply](#) [link](#)

Dennis

Aug 20, 2009 @ 22:58

Alex:

There are several reasons that the /etc/password file is read all.
Most expect a cooperative community of users.

There are many other issues you need to address to prevent users from knowing who
other users are. like ls /home

It would seem that your users have telnet access. Have you looked into "jail" shell.
or removing shell access to from your users.

PS since this is much more complicated that /etc/password please start a new thread.

[reply](#) [link](#)

Dennis

Aug 20, 2009 @ 23:02

Vipin:

To see predefined users for the distribution you are using (they are all different)

see /etc/passwd however

note that users like like nobody, daemon, have user numbers below 100

may have the default shell of something like /usr/bin/false which prevents these users from logging in.

[reply](#) [link](#)

ashwini

Sep 4, 2009 @ 5:20

hi sir i want file access permission by using simble -c,b,c,i,p and s

[reply](#) [link](#)

prakar

Sep 22, 2009 @ 6:51

Application crashes on solaris if there is an empty line at the end of /etc/passwd, Please let me know why this happens.

[reply](#) [link](#)

Atif Zaka

Oct 6, 2009 @ 7:07

Can any one explain below mentioned entry? Is it ok to remove or its kind a wild card?

?:x:60020:1::/home/?:/bin/sh

[reply](#) [link](#)

Dennis

Oct 6, 2009 @ 23:19

Although you have not mentioned what system you are seeing this on, I believe this is an error on the part of someone who tried to mkuser

[reply](#) [link](#)

shrik

Nov 4, 2009 @ 13:21

I have a question about the /etc/passwd file:

Usually a normal user do not have direct permission to write in a passwd/shadow file.

Though when user changes his password then ultimately he is altering the /etc/passwd or /etc/shadow file.

What is the mechanism behind this?

[reply](#) [link](#)

Manoj

Apr 27, 2011 @ 8:53

Good question.

A concept called SUID is used here.

“The SUID permission makes a script to run as the user who is the owner of the script, rather than the user who started it.”

The “passwd” command is present located under “/usr/bin”. Check the permissions for this file using.

```
ll /usr/bin/passwd
```

(Note that an extra 's' is added to the rwx permissions)

For any further queries, mail to s.manoj89@gmail.com

[reply](#) [link](#)

Rey

Feb 14, 2014 @ 14:04

Hi,

We are having a problem with our controller card log-in, one of the staff was resign and change the root user password, hoping you could help us recover it. by the way we could log-in as other user "apadmin" but we need to use as "root" since we need to configure sometimes the controller. hoping for your help and quick response..... thanks a lot and godbless

[reply](#) [link](#)

DG12

Nov 5, 2009 @ 19:58

Notice that the command to change your password is

```
-r-sr-xr-x 1 root wheel 70352 Jun 18 22:39 /usr/bin/passwd
```

Owned by root and the s in the permissions is the SETUID bit.

This means that, when you run this program, your User ID is set to root, and since root is the owner of the /etc/passwd you can update it!

The same it true of:

at, atq, atrm, batch, chfn, chpass, chsh, crontab, cu, ipcs, login, lppasswd, newgrp, quota, rlogin, rsh, su, sudo, top, uucp, uuname, uustat, uux

[reply](#) [link](#)

Paul

Nov 13, 2009 @ 14:25

My hosting company expects me to SSH using password authentication (rather than key) . I have edited ssh_config and sshd_config to switch password authentication to yes, but do I need somehow to get the password into the shadow file – the server response does not even prompt me for a password – it just refuses the connect attempt.

[reply](#) [link](#)

ABDUL AWAL

Dec 4, 2009 @ 0:35

can u explain how the /etc/shadow and /etc/passwd directories are used in the authentication process?why are they two files used instead of one?how can i convert a system to use the /etc//shadow file to the store password?

thanks

[reply](#) [link](#)

ABDUL AWAL

Dec 4, 2009 @ 0:38

an example of absolute pathname is shown as: /home/student/myprogs while a relative pathname can be shown as : ../../documents what are differences between absolute and relative pathname and what is advantages.

[reply](#) [link](#)

DG12

Dec 4, 2009 @ 15:31

ABDUL AWAL: Pease read paragraph “Your password is stored in /etc/shadow file”

[reply](#) [link](#)

DG12

Dec 4, 2009 @ 15:35

ABDUL AWAL: Assuming you are referring to the above:

"#6 Home directory: The absolute path to the directory the user will be in when they log in...."

I seems unwise to use a relative path in the /etc/passwd file.

[reply](#) [link](#)

SARDAR GHULAM HAIDER KHAN NAWABI

Dec 29, 2009 @ 18:55

i say just thanks to every user of linux to every teacher of linux to every lover of linux
please send easy note easy commands of linux to me i will be pray for u are
just send good and easy way to improve my linux knowledge

[reply](#) [link](#)

Raj

Jan 28, 2010 @ 0:27

Excellent work dude.... Thanks..

[reply](#) [link](#)

vivek kandath

Mar 2, 2010 @ 11:55

i don't understand what is the setting s-bit and t-bit ??????
why it is relevant???

[reply](#) [link](#)

AlexP

Apr 8, 2010 @ 8:06

What if two users have the same UID and GID?

[reply](#) [link](#)

DG12

Apr 8, 2010 @ 15:25

Then they ARE the SAME user!

[reply](#) [link](#)

AlexP

Apr 8, 2010 @ 20:52

Actually I have learned that they are not the same user. In fact they can have separate home directories as well as passwords so they're not the same.

[reply](#) [link](#)

DG12

Apr 8, 2010 @ 22:28

AlexP,

Your are correct.

In addition to the password and home directories being unique, the UserId and command/shell are unique.

They are the same user with regard to file ownership as this is done by UID and GID.

Other authorizations like sudoers (who can execute what "priveledged commands" usually restricted to the SUpEr user) have both username and UID as options for the user.

ftpd users a separate authorization scheme only by username.
mail is also username (not UID) dependent.
findgerd, talk, write, who all seem to use username.

So I guess the real answer is ... depends!

[reply](#) [link](#)

Sandeep

Apr 15, 2010 @ 8:49

Hi,

I just wanted to know that how do I identify that a user is locked on the following OS

- 1) Linux: Is it guaranteed to be a single exclamation mark (!) before the encrypted password in shadow file across all flavours of linux
- 2) Solaris: I am aware that it also has a shadow file. But want to confirm whether ! is the token for locked user
- 3) HP-UX: What is the token
- 4) AIX: AIX doesn't have any shadow file. How do I come to know who all users are locked like I can do by reading /etcshadow file on other platforms.

[reply](#) [link](#)

Sanjay Katiyar

Jun 9, 2010 @ 8:11

Why there is another file (in Fedora)
/etc/passwd-

[reply](#) [link](#)

manan

Jun 17, 2010 @ 13:17

Not in fedora but also in Redhat ,Its for backup purpose ,if the /etc/passwd file is modified somehow , then it can be backed up from /etc/passwd-

[reply](#) [link](#)

Brian

Jun 29, 2010 @ 9:02

Hi, every time when i change or reset user's password it also changed the permissions in /etc/shadow which deny or lock-out database user's, this is very risky as i'm working in a production server. could you please help.

[reply](#) [link](#)

himanshu

Aug 3, 2010 @ 18:12

hi

I am new to unix.If passwords are stored into /etc/shadow file and this file is readable by super user only then how user are log in into system i.e they must have access to password file for matching password .plz help me

[reply](#) [link](#)

internet trgovine

Sep 20, 2010 @ 17:10

Thank you for this informative post. Just what i have needed to understand login relation with passwd. Also well written users with a lack of unix knowledge.

Best one so far, keep it up!

[reply](#) [link](#)

kris

Oct 18, 2010 @ 19:54

List from the /etc/passwd the UID and the user having the highest UID

[reply](#) [link](#)

Bel

Nov 4, 2010 @ 18:42

Dear site owner,

Thanks for nice site! Keep it updated ;)

[reply](#) [link](#)

John E

Jan 6, 2011 @ 21:57

How do I change my user account password on my computer? I am using linux a friend put it on my computer for me but I wish to chage the password and dont know how to do it? can anyone help me?

[reply](#) [link](#)

DG12

Jan 7, 2011 @ 23:33

"I wish to change it" seeks to indicate that you can log on.

use

passwd

You will be prompted for your current password.

This prevents someone else from changing your password if you walked away and were still logged in.

Detailed info on your system is in the man pages since different versions of *unix are different in their requirements.

man passwd

[reply](#) [link](#)

jitender

Mar 12, 2011 @ 0:14

Very nice and usefull information

thanks a lot

I appriciate this one..

Blessings...

[reply](#) [link](#)

badhan

Mar 27, 2011 @ 12:29

what is pico in linux

[reply](#) [link](#)

DG12

May 3, 2011 @ 12:15

pico is a little tiny editor.

nano is even littler and tinyer editor

[reply](#) [link](#)

gunjankapoor

May 3, 2011 @ 9:54

The is a id thru which i can login but when i check it in /etc/passwd, its not there.
Any one knows the reason?

[reply](#) [link](#)

DG12

May 3, 2011 @ 12:18

What flavor of unix are you using? linux, bsd darwin (Mac) aix hpux ...
What distribution are your using?

[reply](#) [link](#)

laka

Jun 21, 2011 @ 21:52

how can i generate that encrypted passwds ...

means i want to assign a passwd to a user eg. laka is qwerty

then how can i encrypt dis string(qwerty)

as i want to make a entry of dis encrypted passwd in the shadow file manually...

plzz help me out... :)

[reply](#) [link](#)

s50j

Sep 25, 2011 @ 2:05

On FreeBSD machines a special program is run by vipw(8) after you edit the /etc/master.passwd file. That special program is what generates /etc/passwd as well as some special database files that speed up various

lookups of account information (e.g. mapping a uid to a username). What is the name of that special program?

Thanks in advance :)

[reply](#) [link](#)

blaze

Oct 17, 2011 @ 11:39

A user can change his own password.. That being the case, how does the passwd file which is owned by root, get modified??

I was asked this question in an interview and it left me puzzled. Any ideas people!?

[reply](#) [link](#)

Dennis

Oct 17, 2011 @ 16:41

Excellent question.

Short answer: While there are slight variations dependent on the specific version of unix the basic approach is the same and has the same answer for many “privileged” operations that can be performed by a user on their own objects.

under redhat-linux-gnu

which passwd displays /usr/bin/passwd

ls -l /usr/bin/passwd

-rwsr-xr-x 1 root root 27936 Aug 11 2010 /usr/bin/passwd

notice that the password program is owned by root and that the mode (aka permissions) include the “sticky” bit. This causes the password program to have the effective user ID of root when it runs. See <http://en.wikipedia.org/wiki/Setuid>

[reply](#) [link](#)

blaze

Oct 27, 2011 @ 6:07

thanks! btb,. I was asked wrt Solaris. I answered the question in an uncertain tone..
“sticky bit”. But the devil’s son smiled as if in mockery.. and i quit answering further.
damn that fellow!!

[reply](#) [link](#)

Dennis

Oct 17, 2011 @ 16:49

Excellent question.

Short answer: While there are slight variations dependent on the specific version of unix the basic approach is the same and has the same answer for many “privileged” operations that can be performed by a user on their own objects.

under redhat-linux-gnu

which passwd displays /usr/bin/passwd

ls -l /usr/bin/passwd

-rwsr-xr-x 1 root root 27936 Aug 11 2010 /usr/bin/passwd

notice that the password program is owned by root and that the mode (aka permissions) include the “SETUID” bit. This causes the password program to have the effective user ID of root when it runs. See <http://en.wikipedia.org/wiki/Setuid>

[reply](#) [link](#)

Jurieka

Nov 22, 2011 @ 8:25

Similar to Jenny’s question... what if the second field (password) in the /etc/passwd file is “*” but the /etc/shadow file is not in use?

[reply](#) [link](#)

Jurieka

Nov 22, 2011 @ 8:27

What does it mean if the second field (password) in the /etc/passwd file is “!” but the /etc/shadow file is not in use and the 7th field is /usr/bin/ksh?

[reply](#) [link](#)

Jim

Jan 6, 2012 @ 17:40

Anyone know what this means in Linux SLES 11 and can it be removed – audit says it should be there:

```
[root@imnalx0277 etc]# cat /etc/passwd |grep +
+:::::::
```

[reply](#) [link](#)

Jim

Jan 6, 2012 @ 17:41

Excuse me – “+” should not be there

[reply](#) [link](#)

rameez

Jul 26, 2012 @ 4:30

Which file stores Group members and User’s Login Shell

[reply](#) [link](#)

alan

Oct 11, 2012 @ 0:18

```
[framework@[192_168_15_244] framework]$ cat /etc/shadow
root:UbgIcihE85Xz.:10933:0:99999:7:::
daemon:*:10933:0:99999:7:::
```

```
bin:*:10933:0:99999:7:::  
sys:*:10933:0:99999:7:::  
sync:*:10933:0:99999:7:::  
operator:*:10933:0:99999:7:::  
sshd:*:10933:0:99999:7:::  
messagebus:*:10933:0:99999:7:::  
nobody:*:10933:0:99999:7:::  
default::10933:0:99999:7:::  
framework:$1$Cewr2/zS$SnxBS8yTMZelgf/Tk//Xo/:14033:0:99999:7:::  
how to figure out the real password of the account ROOT?
```

[reply](#) [link](#)

Umesh

Oct 12, 2012 @ 10:57

Can you please tell me about its windows counter-part. I am curious to understand the same mechanism for windows.

I'll be very much thankful for explanation.

[reply](#) [link](#)

seraki2

Dec 18, 2012 @ 8:41

Good information.

Thanks

[reply](#) [link](#)

kai

Jul 10, 2014 @ 1:35

Hi, i am a bit clueless with this qns:

- 1) what about does the login shell of operator do?
- 2) what is the r/s between operator and root?
- 3) what do you think is the purpose of operator userid in centos system?

[reply](#) [link](#)

Ruvendh

May 12, 2015 @ 10:55

Hi to all,

I want to know that how can i change the database password in etc/passwd file?

[reply](#) [link](#)

Riya

Jul 21, 2015 @ 8:52

how to find if the user is present or not?

[reply](#) [link](#)

aref ghobadi

Aug 27, 2015 @ 7:39

Hi,

thanks a lot

[reply](#) [link](#)

Sev

Oct 13, 2015 @ 21:38

What is the meaning of "passwd" in Unix?

[reply](#) [link](#)

lord volz

Oct 19, 2015 @ 15:47

hi everyone. I'm learning about unix. I have a question is how to auto login into an account without typing account and password.

Example my account is "working" and password is "Leona1234"

thanks

[reply](#) [link](#)

Robert Nix

Dec 16, 2015 @ 14:42

One mistake in the article: It does state that /etc/passwd holds only local users, but then goes on to state that "To see a list of all users, enter: cat /etc/passwd". You've just said that /etc/passwd holds only local users. To see a list of all users, you need to use the command "getent passwd", not "cat /etc/passwd".

[reply](#) [link](#)

khrris

Feb 10, 2016 @ 10:36

why do all system users have access to file /etc/passwd?and
what are the structures of the files /etc/group and /etc/shadow?

[reply](#) [link](#)

neha

Apr 3, 2016 @ 6:02

thank u for this information...!!!!

[reply](#) [link](#)

Anonymous

Jul 8, 2016 @ 18:14

I have a password file where the password part starts \$6\$Yct0VL8AzUzydaAX\$... and is very long (106 characters total) Any idea what format this is ?

[reply](#) [link](#)

superkid

Jul 13, 2016 @ 9:30

what is the encryption used to store passwords in /etc/shadow, I would like to use them.

[reply](#) [link](#)

CJ

Jul 28, 2016 @ 5:01

Apologies if this is a little OT – but your post has the best info on this file and I *think* this is my issue.

I am helping a client migrate mail accounts and content from a poorly configured addon domain in a cpanel environment to a new domain host.

The accounts, passwords and content have been copied across and IMAP is still working with old passwords and names, however they cannot access old emails from pre-migration. They receive new mail ok.

I found that the path links (section 6 in your post) in the “/etc/domain/passwd” file still point to the old host paths (/home/olddomainuser/mail/olddomainname/username).

I think this is their issue but need to know if updating these paths is safe or will it cause a flow-on issue with other scripts.

Our host (Netregistry) is pathetic at support and I’m left trying to fix this issue for the

client myself.

I'm also concerned that the user IDs and groups may be different so am not game to edit as they are currently receiving new emails but just can't see old content.

For additional info: webmail shows a correct count including old emails, however when going through pages of webmail pre-migration, they come up with "no messages in this mailbox" thats in any webmail client too – roundcube, squirrel, horde.

It's like a index file or checksum file needs repairing too maybe...

Can any ninjas out there shed some light on this?

Many thanks and great description of the file structure in your post thankyou

[reply](#) [link](#)

Hardik Patel

Sep 7, 2016 @ 18:40

1. What is the user id and group id of for your username (found in the passwd file)?
2. What is the user id and group id of the root user (found in the passwd file)?
3. What hash function is used to generate the hash value for your username and password

that is stored in the shadow file?

4. What is salt and stored hash value of the password for your username (found in the shadow file)?
5. What command can you use to regenerate and verify the stored hash value for the password for your username?

[reply](#) [link](#)

TingJeremy

Sep 29, 2020 @ 1:34

Really helpful! Thanks!

[reply](#) [link](#)

David

Oct 25, 2020 @ 9:38

Yes client can login if
public key is previously transferred from client to server side at

```
~/.ssh/authorized_keys
```

Assuming that transfer is already done, private-public key login using ssh client is like this:

```
ssh -i ~/.ssh/id_rsa user@ipaddress
```

```
~/.ssh/id_rsa
```

is default location on client side of file containing private key...

[reply](#) [link](#)

Adrian Marrow

May 23, 2021 @ 20:21

The /etc/passwd file keeps track of all Linux user accounts on the server and I needed to understand it. Your page was very much useful. Better than man pages. Thank you kind Sir.

[reply](#) [link](#)

Anonymous

Feb 27, 2022 @ 2:56

Thank you, Vivek Sensei. Sayōnara.

[reply](#) [link](#)

sam

Mar 15, 2022 @ 6:29

yes was helpful

[reply](#) [link](#)

valentina

Apr 18, 2022 @ 0:12

me gusta mucho

[reply](#) [link](#)

Anonymous

Dec 4, 2022 @ 23:00

When trying to bypass maintenance pw.
Ctl d redirects me to the advanced menu.
Still no access to root

[reply](#) [link](#)

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