

1. How do you edit the current user's crontab?

crontab -e

2. How do you list scheduled cron jobs for the current user?

crontab -l

3. How do you delete all cron jobs for the current user?

crontab -r

4. Cron Syntax Questions

a. Schedule a job to run every day at 3:30 AM :

30 3 * * * date

b. Run a script every Monday at 5:15 PM:

15 17 * * 1 date

c. Execute a command every 10 minutes :

***/10 * * * * date**

d. Schedule a task to run every weekday (Mon-Fri) at 6:30 PM

30 18 * * 1-5 date

e. Run a job on the 1st and 15th of each month at 8:00 AM

0 8 1,15 * * date

5. How do you restrict users from using cron?

echo "user" >> /etc/cron.deny

6. Set UserID

a. Create File and Set Execution and setuid permission

b. Check if setuid is enabled on File

```
daniel@daniel-G5-5590:~$ cat main.c
#include <unistd.h>
int main() {
    execl("/bin/ls", "ls", "/root", NULL);
    return 0;
}
```

```
daniel@daniel-G5-5590:~$ gcc main.c -o main
daniel@daniel-G5-5590:~$ sudo mv main /usr/bin/main
daniel@daniel-G5-5590:~$ ls -al /usr/bin/main
-rwxrwxr-x 1 daniel daniel 15960 Mar 27 20:46 /usr/bin/main
daniel@daniel-G5-5590:~$ sudo chown root:root /usr/bin/main
daniel@daniel-G5-5590:~$ /usr/bin/main
ls: cannot open directory '/root': Permission denied
daniel@daniel-G5-5590:~$ sudo chmod u+s /usr/bin/main
daniel@daniel-G5-5590:~$ /usr/bin/main
snap
daniel@daniel-G5-5590:~$ whoami
daniel
daniel@daniel-G5-5590:~$ ls /root
ls: cannot open directory '/root': Permission denied
daniel@daniel-G5-5590:~$ sudo ls /root
snap
daniel@daniel-G5-5590:~$ cat main.c
```

7. SetGroupID

- Create directory testdir and set setgid
- Check if setgid is enabled on directory
- Logout and login as root
- Create testfile in testdir and verify ownership

```
daniel@daniel-G5-5590:~$ ls -dl testing/
drwxrwxr-x 2 daniel daniel 4096 Mar 27 20:54 testing/
```

```
root@daniel-G5-5590:~# cd testing
-bash: cd: testing: No such file or directory
root@daniel-G5-5590:~# cd /home/daniel/testing/
root@daniel-G5-5590:/home/daniel/testing# touch tello
root@daniel-G5-5590:/home/daniel/testing# ls -al
total 8
drwxrwxr-x  2 daniel daniel 4096 Mar 27 21:00 .
drwxr-x--- 53 daniel daniel 4096 Mar 27 20:54 ..
-rw-r--r--  1 root   root    0 Mar 27 21:00 tello
```

```
daniel@daniel-G5-5590:~$ chmod g+s testing
```

```
root@daniel-G5-5590:/home/daniel/testing# touch hello2
root@daniel-G5-5590:/home/daniel/testing# ls -al
total 8
drwxrwsr-x  2 daniel daniel 4096 Mar 27 21:01 .
drwxr-x--- 53 daniel daniel 4096 Mar 27 20:54 ..
-rw-r--r--  1 root   daniel    0 Mar 27 21:01 hello2
-rw-r--r--  1 root   root      0 Mar 27 21:00 tello
```

8. Stick bit
 - a. Create public directory dir1 with directorysticky bit
 - b. Check if sticky bit is enabled on
 - c. Logout and login as user1
 - d. Create userfile1 in dir1
 - e. Login as user2 and attempt to remove userfile1

```
root@daniel-G5-5590:~# mkdir /home/daniel/dir1
root@daniel-G5-5590:~# chmod 1777 /home/daniel/dir1
root@daniel-G5-5590:~# ls -ld /home/daniel/dir1
drwxrwxrwt 2 root root 4096 Mar 27 21:14 /home/daniel/dir1
root@daniel-G5-5590:~# touch /home/daniel/dir1/test
root@daniel-G5-5590:~# ls -al /home/daniel/dir1
total 8
drwxrwxrwt 2 root root 4096 Mar 27 21:16 .
drwxr-x--- 53 daniel daniel 4096 Mar 27 21:14 ..
-rw-r--r-- 1 root root 0 Mar 27 21:16 test
root@daniel-G5-5590:~# chmod 777 /home/daniel/dir1/test
root@daniel-G5-5590:~# chown root:daniel /home/daniel/dir1/test
root@daniel-G5-5590:~# exit
logout
daniel@daniel-G5-5590:~$ whoami
daniel
daniel@daniel-G5-5590:~$ rm ~/dir1/test
rm: cannot remove '/home/daniel/dir1/test': Operation not permitted
daniel@daniel-G5-5590:~$ ls -al ~/dir1/test
-rwxrwxrwx 1 root daniel 0 Mar 27 21:16 /home/daniel/dir1/test
daniel@daniel-G5-5590:~$ ls -ald ~/dir1
drwxrwxrwt 2 root root 4096 Mar 27 21:16 /home/daniel/dir1
daniel@daniel-G5-5590:~$ su -
Password:
root@daniel-G5-5590:~# chown daniel:root /home/daniel/dir1/test
root@daniel-G5-5590:~# exit
logout
daniel@daniel-G5-5590:~$ rm ~/dir1/test
daniel@daniel-G5-5590:~$ ls -al ~/dir1
total 8
drwxrwxrwt 2 root root 4096 Mar 27 21:19 .
drwxr-x--- 53 daniel daniel 4096 Mar 27 21:14 ..
```

9. Give user john read and write permissions on myfile.txt

```
daniel@daniel-G5-5590:~$ chmod o+rx /home/daniel/
daniel@daniel-G5-5590:~$ echo "hello john" >> myfile.txt
daniel@daniel-G5-5590:~$ chmod 700 myfile.txt
daniel@daniel-G5-5590:~$ su - john
Password:
$ cat /home/daniel/myfile.txt
cat: /home/daniel/myfile.txt: Permission denied
$ exit
daniel@daniel-G5-5590:~$ setfacl -m u:john:rw myfile.txt
daniel@daniel-G5-5590:~$ su john
Password:
$ cat /home/daniel/myfile.txt
hello john
$
```

10. How to view the ACL of a file named myfile.txt?

```
daniel@daniel-G5-5590:~$ getfacl myfile.txt
# file: myfile.txt
# owner: daniel
# group: daniel
user::rwx
user:john:rw-
group::---
mask::rw-
other::---
```

11. How do you give the group developers execute permissions on the directory /home/user/documents

setfacl -m g:developers:x /home/user/documents

12. How to remove the ACL entry for the user john on the file file1.txt?

```
daniel@daniel-G5-5590:~$ getfacl myfile.txt
# file: myfile.txt
# owner: daniel
# group: daniel
user::rwx
user:john:rw-
group::---
mask::rw-
other::---

daniel@daniel-G5-5590:~$ setfacl -x u:john myfile.txt
daniel@daniel-G5-5590:~$ getfacl myfile.txt
# file: myfile.txt
# owner: daniel
# group: daniel
user::rwx
group::---
mask::---
other::---
```

13. How do you set a default ACL for a directory so that all new files and directories created inside it inherit the same permissions?

```
daniel@daniel-G5-5590:~$ setfacl -d -m u:john:rwX john
daniel@daniel-G5-5590:~$ touch john/test
daniel@daniel-G5-5590:~$ mkdir john/dir1
daniel@daniel-G5-5590:~$ getfacl john/test
# file: john/test
# owner: daniel
# group: daniel
user::rw-
user:john:rwX          #effective:rw-
group::rwX             #effective:rw-
mask::rw-
other::r--

daniel@daniel-G5-5590:~$ getfacl john/dir1
# file: john/dir1
# owner: daniel
# group: daniel
user::rwX
user:john:rwX
group::rwX
mask::rwX
other::r-X
default:user::rwX
default:user:john:rwX
default:group::rwX
default:mask::rwX
default:other::r-X
```

14. Allow group developers to read all files in ~/Music recursively

setfacl -R -m g:developers:r ~/Music

15. How to remove all ACLs from the file file1.txt and revert to the standard Unix permissions?

```
daniel@daniel-G5-5590:~$ getfacl john/dir1/hello
# file: john/dir1/hello
# owner: daniel
# group: daniel
user::rw-
user:john:rw-          #effective:rw-
group::rw-            #effective:rw-
mask::rw-
other::r--

daniel@daniel-G5-5590:~$ setfacl -b john/dir1/hello
daniel@daniel-G5-5590:~$ getfacl john/dir1/hello
# file: john/dir1/hello
# owner: daniel
# group: daniel
user::rw-
group::rw-
other::r--
```

16. Set a mask on myfile.txt to limit all non-owners to r--.

```
daniel@daniel-G5-5590:~$ touch myfile.txt
daniel@daniel-G5-5590:~$ setfacl -m m::r myfile.txt
daniel@daniel-G5-5590:~$ getfacl myfile.txt
# file: myfile.txt
# owner: daniel
# group: daniel
user::rw-
group::rw-          #effective:r--
mask::r--
other::r--
```

17. How would you allow user 'john' to run only the 'apt' command as root?

```
$ whoami
john
$ sudo apt update
[sudo] password for john:
john is not in the sudoers file.
This incident has been reported to the administrator.
$ exit

john ALL=(root) /usr/bin/apt
```

```

daniel@daniel-G5-5590:~$ su john
Password:
$ sudo apt update
[sudo] password for john:
Get:1 https://download.docker.com/linux/ubuntu noble InRelease [48.8 kB]
Hit:2 https://apt.releases.hashicorp.com noble InRelease
Hit:3 http://eg.archive.ubuntu.com/ubuntu noble InRelease
Get:4 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]
Get:5 https://dl.google.com/linux/chrome/deb stable InRelease [1,825 B]
Get:6 http://eg.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Hit:7 https://baltocdn.com/helm/stable/debian all InRelease
Hit:9 https://repo.mongodb.org/apt/ubuntu noble/mongodb-org/8.0 InRelease

```

18. How would you allow a group 'developers' to run any command as root without a password?

```

groupadd: cannot lock /etc/group; try again later.
daniel@daniel-G5-5590:~$ sudo groupadd developers
daniel@daniel-G5-5590:~$ sudo usermod -aG developers john
daniel@daniel-G5-5590:~$ su john
Password:
$ groups
john developers
$ sudo apt update
john is not in the sudoers file.
This incident has been reported to the administrator.
$ exit

```

```

#includedir /etc/sudoers.d

%developers ALL=(ALL) NOPASSWD: ALL

```

```

daniel@daniel-G5-5590:~$ su john
Password:
$ sudo apt update
Hit:1 https://apt.releases.hashicorp.com noble InRelease
Hit:2 https://download.docker.com/linux/ubuntu noble InRelease
Hit:4 https://dl.google.com/linux/chrome/deb stable InRelease
Hit:5 http://eg.archive.ubuntu.com/ubuntu noble InRelease
Hit:6 http://security.ubuntu.com/ubuntu noble-security InRelease
Hit:7 https://baltocdn.com/helm/stable/debian all InRelease
Hit:8 http://eg.archive.ubuntu.com/ubuntu noble-updates InRelease
Hit:9 https://repo.mongodb.org/apt/ubuntu noble/mongodb-org/8.0 InRelease
Hit:3 https://prod-cdn.packages.k8s.io/repositories/isv:/kubernetes InRelease
Hit:10 http://eg.archive.ubuntu.com/ubuntu noble-backports InRelease
Hit:11 https://ngrok-agent.s3.amazonaws.com buster InRelease
Reading package lists... Done

```