



# File Permissions in Linux

Security is a big concern  
For Linux which is  
clone of Unix the  
multiuser operating  
system

# Security is a Concern

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**Linux is  
Multi-user**

**Data can be  
corrupted,  
changed or stolen**



As Linux used Mainframe and service it is a vital to keep a safe for an user who can corrupted changed or Removed a crucial data. This is why effective security for Linux device Authorization into Two levels

# Authorization Levels

.. Ownership



.. Permission



# Ownership in Linux Files

- Every file in Linux Directory system is assigned three types of Owner

User



- Owner of the File
- User also called an Owner

# Ownership in Linux Files

## Group



- User- group can contain multiple users.
- All users in the group have the same file permissions.

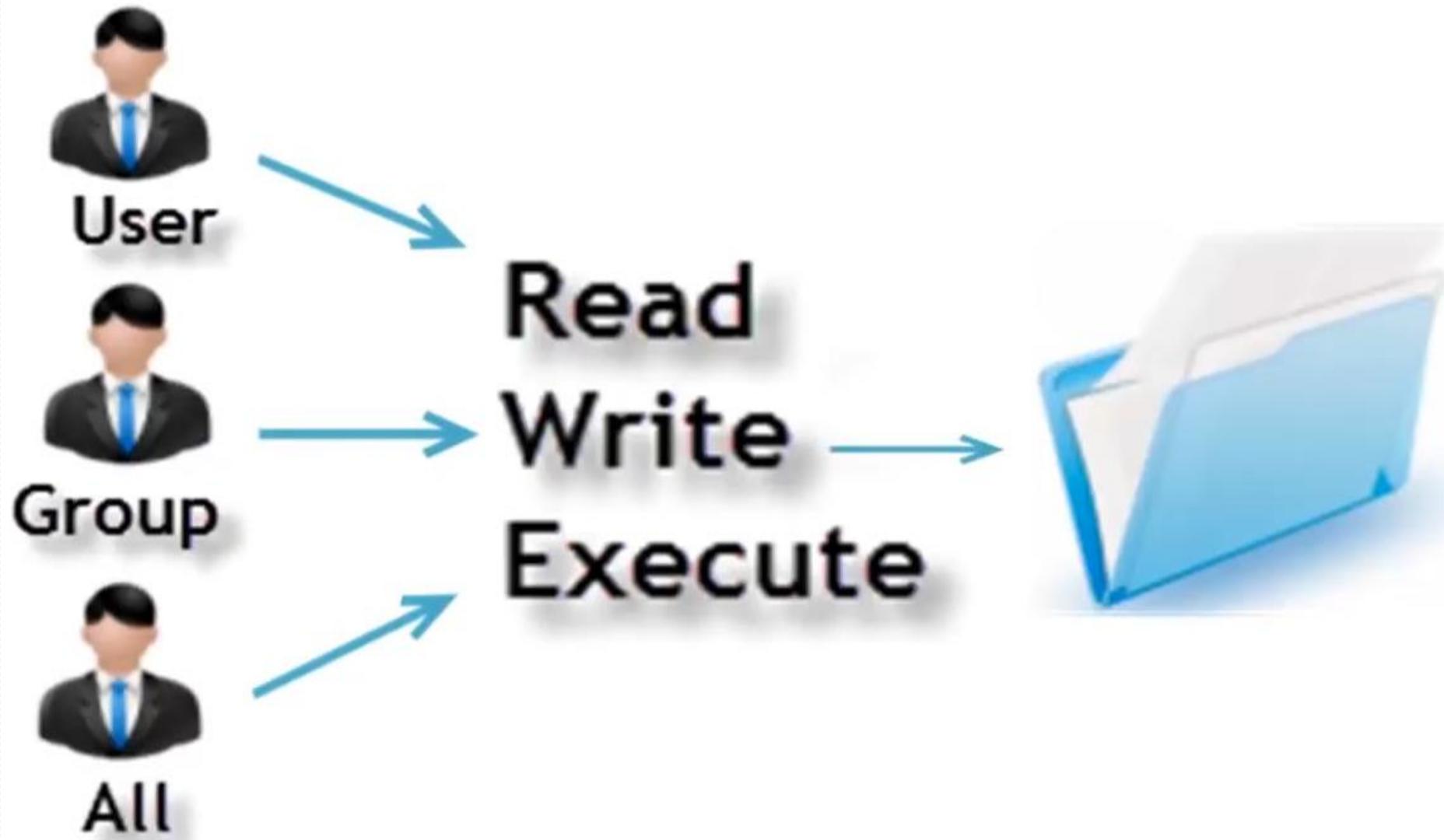
# Ownership in Linux Files

## Other



- Any other user who has access to a file
- Does not own the file
- Does not belong to a Usergroup

# Permission system in Linux



# Permission System in Linux

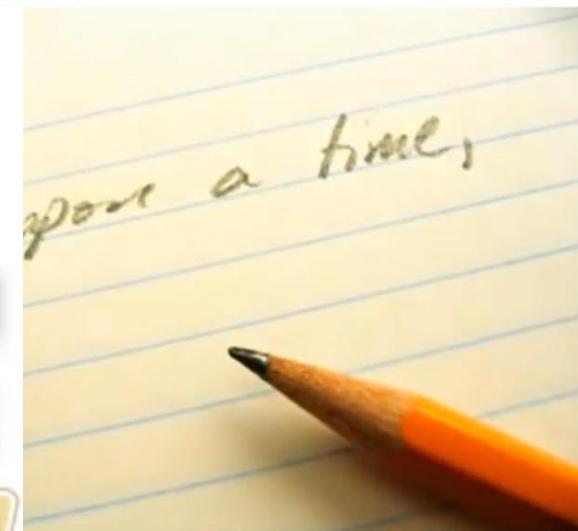
Read Permission

I like to



Write Permission

Execute Permission



# Permission System in Linux

**r** = read permission

**w** = write permission

**x** = execute permission

**-** = no permission

## PERMISSION SLIP

I, \_\_\_\_\_,

give myself permission to:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# ● Permission System in Linux

## Changing file/directory permissions

**chmod** permissions **filename**

- Stands for ‘**change mode**’.
- Using the command, we can **set permissions** (read, write, execute) on a file/directory for the owner, group and the world.

# Permission System in Linux

There are Two ways to use a command

**'chmod'** can be used in 2 ways

- Absolute mode
- Symbolic mode



# Absolute(Numeric) Mode

Number	Permission Type	Symbol
0	No Permission	---
1	Execute	--X
2	Write	-W-
3	Execute + Write	-WX
4	Read	r--
5	Read + Execute	r-X
6	Read +Write	rW-
7	Read + Write + Execute	rwx

```
drwxr-xr-x 3 uct uct 4096 Oct 15 00:05 Desktop
drwxr-xr-x 2 uct uct 4096 Oct 14 13:42 Documents
drwxr-xr-x 2 uct uct 4096 Oct 14 20:24 Downloads
-rw-r--r-- 1 uct uct 8980 Oct 14 13:11 examples.desktop
drwx----- 3 uct uct 4096 Oct 14 21:45 .gnome
drwx----- 3 uct uct 4096 Oct 14 13:45 .gnupg
-rw-r--r-- 1 uct uct 61063428 Oct  9 06:26 google-chrome
_amd64.deb
-rw----- 1 uct uct 2544 Oct 15 23:37 .ICEauthority
drwx----- 3 uct uct 4096 Oct 14 13:41 .local
drwx----- 5 uct uct 4096 Oct 14 14:11 .mozilla
drwxr-xr-x 2 uct uct 4096 Oct 14 13:42 Music
drwxr-xr-x 2 uct uct 4096 Oct 14 13:42 Pictures
drwx----- 3 uct uct 4096 Oct 14 21:45 .pki
-rw-r--r-- 1 uct uct 807 Oct 14 13:11 .profile
drwxr-xr-x 2 uct uct 4096 Oct 14 13:42 Public
drwx----- 2 uct uct 4096 Oct 14 13:45 .ssh
-rw-r--r-- 1 uct uct 0 Oct 14 13:55 .sudo_as_admin
drwxr-xr-x 2 uct uct 4096 Oct 14 13:42 Templates
-rw-r--r-- 1 uct uct 43 Oct 15 23:39 test
drwxr-xr-x 2 uct uct 4096 Oct 14 13:42 Videos
drwxr-xr-x 2 uct uct 4096 Oct 15 09:16 work
-rw-rw-r-- 1 uct uct 131 Oct 14 18:54 .xinputrc
```

File Edit View Search Terminal Help

```
uct@ubuntu:~$ ls -la test  
-rwxrw-r-- 1 uct uct 43 Oct 15 23:39 test  
uct@ubuntu:~$ 
```

# 764



User



Read  
Write  
Execute



Group



Read  
Write



All



Read

# Symbolic Mode

	Description
	Adds a permission to a file or directory
	Removes the permission
	Sets the permission and overrides the permissions set earlier.

## User Denotations

u	user/owner
g	group
o	other
a	all

Desktop  
Documents  
Downloads  
examples.desktop  
**google-chrome-stable\_current\_amd64.deb**  
Music  
Pictures  
Public  
Templates  
**test**  
Videos  
work

uct@ubuntu:~\$ clear

```
uct@ubuntu:~$ chmod o=rwx test
uct@ubuntu:~$ ls -la test
-rwxrw-rwx 1 uct uct 43 Oct 15 23:39 test
uct@ubuntu:~$ chmod g+x test
uct@ubuntu:~$ ls -l test
-rwxrwxrwx 1 uct uct 43 Oct 15 23:39 test
uct@ubuntu:~$ chmod u-r test
uct@ubuntu:~$ ls -l test
```

# Changing Ownership and Group

**chown user <filename>**

**chown user:group <filename>**





```
drwxr-xr-x 2 uct uct 4096 Oct 16 00:29 Pictures
drwxr-xr-x 2 uct uct 4096 Oct 14 13:42 Public
drwxr-xr-x 2 uct uct 4096 Oct 14 13:42 Templates
--wxrwxrwx 1 root uct 43 Oct 15 23:39 test
drwxr-xr-x 2 uct uct 4096 Oct 14 13:42 Videos
drwxr-xr-x 2 uct uct 4096 Oct 15 09:16 work
```

uct@ubuntu:~\$ sudo chown uct:uct test

uct@ubuntu:~\$ ls -l

total 59692

```
drwxr-xr-x 3 uct uct 4096 Oct 15 00:03 Desktop
drwxr-xr-x 2 uct uct 4096 Oct 14 13:42 Documents
drwxr-xr-x 2 uct uct 4096 Oct 14 20:24 Downloads
-rw-r--r-- 1 uct uct 8980 Oct 14 13:11 examples.desktop
-rw-r--r-- 1 uct uct 61063428 Oct 9 06:26 google-chrome
```

d64.deb

```
drwxr-xr-x 2 uct uct 4096 Oct 14 13:42 Music
drwxr-xr-x 2 uct uct 4096 Oct 16 00:29 Pictures
drwxr-xr-x 2 uct uct 4096 Oct 14 13:42 Public
drwxr-xr-x 2 uct uct 4096 Oct 14 13:42 Templates
--wxrwxrwx 1 uct uct 43 Oct 15 23:39 test
drwxr-xr-x 2 uct uct 4096 Oct 14 13:42 Videos
drwxr-xr-x 2 uct uct 4096 Oct 15 09:16 work
```

uct@ubuntu:~\$ sudo chown root:root test

# Tips on Usergroups

- /etc/group
- Command '**groups**'
- Command '**newgrp**'
- 2 Groups cannot own the same file

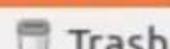
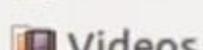
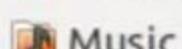
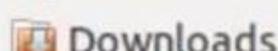
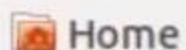




## Computer



home Home



## Network



bin



boot



cdrom



etc



home



lib



media



mnt



opt



root



run



sbin



srv



sys



tmp



1  
10  
101  
1010

# Summary

- Linux being a multi-user system uses permissions and ownerships for security.
- There are three user types on a Linux system viz. User, Group and Other.
- Linux divides the file permissions into read, write and execute denoted by r, w and x.

# Summary

- The permissions on a file can be changed by '**chmod**' command which can be further divided into Absolute and Symbolic mode.
- The 'chown' command can change the ownership of a file/directory. Use the following commands:  
**chown user file** or **chown user:group file**.
- The 'chgrp' command can change the group ownership with **chgrp group filename**.