File Security: Standard File Permissions in Linux

```
vikasnehra@VIKASNEHRA-PC:/etc$ ls -lih
total 313K
281474977411668  drwxr-xr-x  1  root  root     512  Aug   5  2020  NetworkManager
281474977411671  drwxr-xr-x  1  root  root     512  Aug   5  2020  PackageKit
281474977411674  drwxr-xr-x  1  root  root     512  Aug   5  2020  X11
281474977411707  -rw-r--r--  1  root  root    3.0K  Aug   5  2020  adduser.conf
281474977411708  drwxr-xr-x  1  root  root     512  Aug   5  2020  alternatives
281474977411823  drwxr-xr-x  1  root  root     512  Aug   5  2020  apparmor
281474977412010  -rw-r-----  1  root  daemon   144  Nov  12  2018  at.deny
281474977412484  lrwxrwxrwx  2  root  root      21  Jul  15  2020  os-release ->../usr/lib/os-releas
```

File Inode Number

File Type & Permissions For Owner, Group & Others

Number of Links To File

Owner of File

Group Owner of File

File Size

Date & Time Stamp

Name of File

drwxr-xr-x

File Type

Permissions For User (Owner)

Permissions For Group

Permissions For Other Users

first character	file type
-	normal file
d	directory
l	symbolic link
p	named pipe
b	block device
c	character device
s	socket

permission	on a file	on a directory
r (read)	read file contents (cat)	read directory contents (ls)
w (write)	change file contents (vi)	create files in (touch)
x (execute)	execute the file	enter the directory (cd)

Permissions Bit Weightage:

Read Permission → r = 4

Write Permission → w = 2

Execute Permission → x = 1

Maximum Permissions (Full Permission) → rwx = 4+2+1 = 7

Minimum Permissions (No Permission) → --- = 0+0+0 = 0

Permissions can be represented by 8 numbers starting from number 0 to number 7, Which means by Octal number system having a base of 8.

Octal Number System → $(0-7)_8$

We need three binary bits to represent Octal numbers. These three bits can be used to represent permission, here first bit represent read (r), second bit represent write (w) and third bit represents execute (x) permissions.

Octal Number	Binary	Permissions
0	000	---
1	001	--x
2	010	-w-
3	011	-wx
4	100	r--
5	101	r-x
6	110	rw-
7	111	rwx