AINUX

TASTE OF LINUX

WELCOME TO THE WORLD OF LINUX

DAY - 9

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Linux File System Permissions

File have 3 categories of users to which permissions apply.

1. **File Owner:- User who create the file.**
2. **Group Owner: - The file is also owned by a single group. (Usually Primary group but can be changed).**
3. **Other: - All other users of the system.**

There are also three categories of permission which can be applied.

Permission	Effect on Files	Effect on Directories
r (Read)	Contents of the file can be read.	Contents of the directory can be listed
w (Write)	Contents of the file can be changed.	Any file in the directory may be created or deleted.
x (Execute)	Files can be executed as commands.	Contents of the directory can be accessed .

We can found the file or directory permissions by ‘ls –l’ command like below

drwxr-xr-x	root	root	25	Sep 12 22:10	Desktop
Permissions	**File owner**	**Group owner**	**File size**	**Modified date**	**File or dir name**

Linux File System Permissions

d	rwx	r-x	r-x
Directory, file, soft-link	File owner permission	Group owner Permission	Other user Permission

can see the metadata of a file by below command

```
# stat ‘file-name’
```

We can set the ‘Permission’ with 2 ways

1. **Symbolic Method**
2. **Numeric Method**

Symbolic Permission

u	=	User	+	=	Add the Permission
g	**=**	**Group**	**-**	**=**	**Remove the Permission**
o	**=**	**Other**	**=**	**=**	**Only assign that Permission**
a	**=**	**All**	**d**	**=**	**Directory**
r	**=**	**Read**	**‘-’**	**=**	**File**
w	**=**	**Write**	**l**	**=**	**Soft-link**
x	**=**	**Execute**			

Linux File System Permissions

Numeric Permission

r (Read)	=	4
w (Write)	=	2
x (Execute)	=	1

Maximum value of the permission will be 7 (4+2+1)

Default Permission

1. If 'root' user creates a file then the default permission will be '644' means 'r w - r - - r - -'
2. If 'root' user creates a Directory then the default permission will be '755' means 'r w x r - x r - x'
3. If Normal user creates a file then the default permission will be '664' means 'r w - r w - r - -'
4. If 'root' user creates a Directory then the default permission will be '775' means 'r w x r w x r - x'

Note:

By Default all the directories are executable.
By Default all the files are non-executable.

To change the permission of a file in Symbolic Method.

```
# chmod u+w 'file-name'
# chmod g+wx 'file-name'
# chmod o+wx 'file-name'
```

```
# chmod u+x,g+wx,o+wx 'file-name'
# chmod a=rwx 'file-name'
# chmod go=rx 'file-name'
```

Linux File System Permissions

To change the permission of a file Numeric Method

```
# chmod 644 'file-name'
# chmod 777 'file-name'
```

Argument: -R (Recursive)

File or Group Ownership

Note:
Only root can change the 'File Ownership' and 'group Owenership'

To change the owner if a file

```
# chown 'user-name' 'file-name'
```

i.e, chown subha abc.txt
Argument: -R (Recursive)

To change the group owner if a file

```
# chgrp 'group-name' 'file-name'
```

i.e, chgrp sales abc.txt
Argument: -R (Recursive)

Note: - If 'root' user has changed a group ownership of a file and directory, only then previous user owner can change the group ownership.

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change the owner and group owner in single command.

```
# chown ‘user-name’:‘group-name’  ‘file-name’
```

i.e, chown subha:rajesh abc.txt

Argument: -R (Recursive)

To create all the files and directory with changing group owner.

```
# newgrp “group-name”
# mkdir “dir-name”
```

Linux File System Permissions

Special Permission

Special Permission	Value	Effect on File	Effect on Dir
setuid	4	Execute with user id (uid) of the file instead of uid of current user	Not Applicable
setgid	2	Execute with group id (gid) of the file instead of gid of current user	All files & directory created in the setgid dir will belong to the group owning the setgid
sticky bit	1	Not Applicable	Users with write on the directory can only remove files that they own.

Linux File System Permissions

set the suid.

```
# chmod u+s ‘file-name’
```

To set the sgid.

```
# chmod g+s ‘file-name’
```

To set the sticky bit.

```
# chmod o+t ‘file-name’
```

To find the file with special permission.

```
# find  /  -perm  -4000’
```

```
# chmod 4777 ‘file-name’
# chmod 2777 ‘file-name’
# chmod 1777 ‘file-name’
# chmod 7777 ‘file-name’
```

Small ‘s’ – Executable + Setuid
Small ‘S’ – Only setuid

Default Permission

All the default permission of the files and directories comes form *‘UMASK’*

To see the default umask.

```
#umask
```

To Change the default umask.

```
# umask 007
# umask 077
# umask 033
```

Linux File System Permissions

To modify the default umask.

# you have to change into “/etc/bashrc” and “/etc/profile” file

```
if [ $UID -gt 199 ] && [ "`/usr/bin/id -gn`" = "`/usr/bin/id -un`" ]; then
      umask 022                    [change 022 to 077 or as you decide]
   else
      umask 022
   fi
SELL=/bin/bash
```

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THANK YOU

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