

File and Directory Permissions

What will you learn:

- ❑ Different authorization levels on files and directories
- ❑ Ownerships and permissions of files and directories
- ❑ How to change file and directory permissions

Authorization levels

☐ Ownership

☐ Permission

Owner Types

User



Group



Other



Permission Types

Read



Write

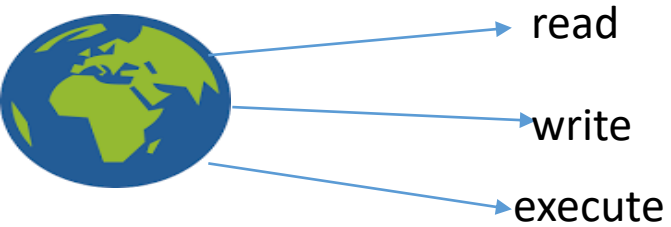
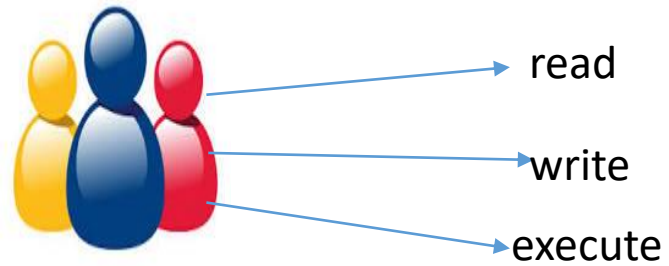
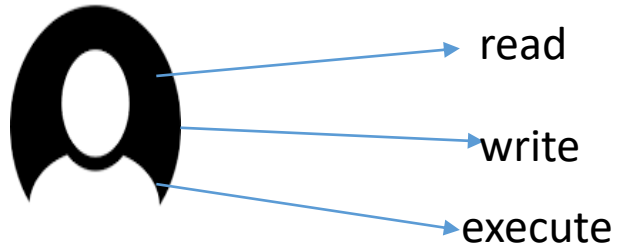


Execute

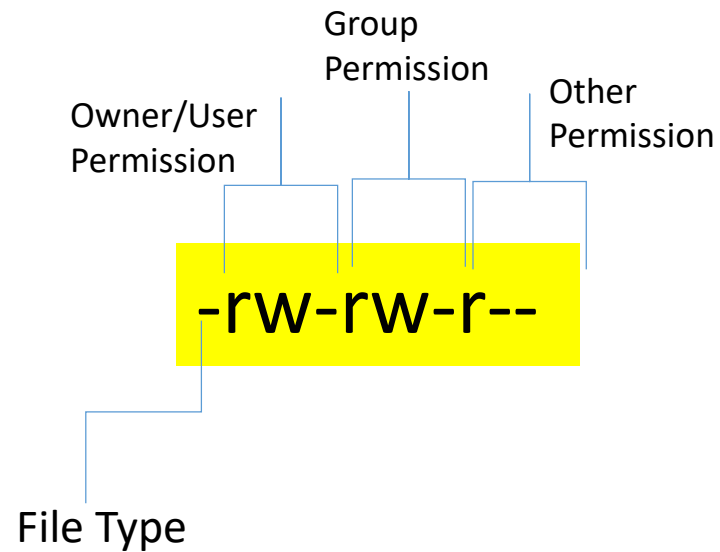


| Permission | symbol | File | Directory |
|------------|--------|---|---|
| Read | r | Allows a file to be read | Allows file names in the directory to be listed |
| Write | w | Allow a file to modify | Allows add, remove and rename actions on files in the directory |
| Execute | x | Allows the execution of a file (program file) | Allows access to the contents and meta data for entries |

How Permission sets on File/directory



```
-rw-rw-r--. 1 user1 user1 0 Sep 16 09:58 test.txt
```

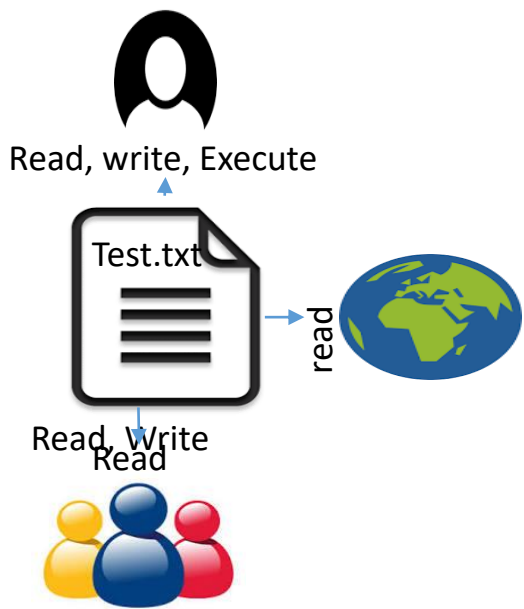


Set permissions on File and Directory

\$chmod -> to set permission on file and Directory

- Absolute(Numeric Mode)
- Symbolic Mode

Absolute (Numeric Mode)



`$chmod 764 Test.txt`

`$chmod 744 Test.txt`

`$chmod 740 Test.txt`

| Number | Permission Type |
|--------|------------------------|
| 0 | No permission |
| 1 | Execute |
| 2 | Write |
| 4 | Read |
| 3 | Write + execute |
| 5 | Read + execute |
| 6 | Read + write |
| 7 | Read + write + execute |

Summary:

- ❖ Authorization Level : permission level and ownership level
- ❖ Ownerships : User, Group, other
- ❖ Permissions : read, write, execute (r, w,x)
- ❖ Permission modes : Numeric Mode and Symbolic mode
- ❖ \$chmod -> to set permission on a file/Directory

| ❖ | Number | Permission Type |
|---|--------|------------------------|
| | 0 | No permission |
| | 1 | Execute |
| | 2 | Write |
| | 4 | Read |
| | 3 | Write + execute |
| | 5 | Read + execute |
| | 6 | Read + write |
| | 7 | Read + write + execute |

What will you learn:

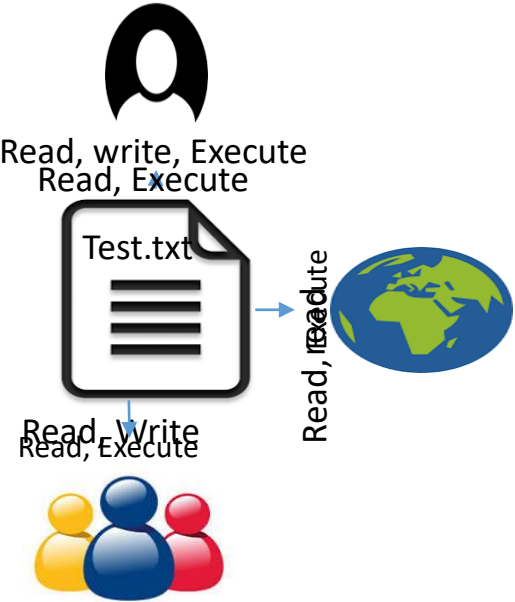
- ☐ Symbolic mode permission setting explained
- ☐ Practical : Permission setting using symbolic mode and numeric mode
- ☐ Practical: Change user Ownership and group Ownership

Symbolic Mode

| Operator | Description |
|----------|--|
| + | Adds a permission to a file or directory |
| - | Removes the permission from a file or folder |
| = | Set the permissions and overrides the permission set earlier |

| User denotations | Description |
|------------------|-------------|
| u | User/Owner |
| g | Group |
| o | Other |
| a | All |

| Permission denotations | Description |
|------------------------|-------------|
| r | Read |
| w | Write |
| x | Execute |



\$chmod u + rw x Test.txt

\$chmod u+rw,x,g+rw,o+r Test.txt

\$chmod o-r Test.txt

\$chmod a=rx Test.txt

```
$chmod u+r Test.txt
```

```
$chmod u=r Test.txt
```

Summary:

❖ Symbolic mode permission setting

| User denotations | Description |
|------------------|-------------|
| u | User/Owner |
| g | Group |
| o | Other |
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| Operator | Description |
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| + | Adds a permission to a file or directory |
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| Permission denotations | Description |
|------------------------|-------------|
| r | Read |
| w | Write |
| x | Execute |

- ❖ `$chown` -> to change user and group ownership
- ❖ `$chown <owner name> file` -> to change user ownership
- ❖ `$chown <.group name> file` -> to change group ownership
- ❖ `$chgrp <group name> file` -> to change group name
- ❖ `$groupadd <group name> file` -> to add a new group
- ❖ `$usermod -aG <group name> <user name>` -> to add a user to a group