Permissions Defined

Mac OS X incorporates a subsystem based on a UNIX-style operating system that uses **permissions** in the file system. Every file and folder on your hard disk has an associated set of permissions that determines who can read, write to, or execute it. Using the Word application and one of its documents as an example, this is what the permissions mean:

- **Read (r--)**You can open a Word document if you have the read permission for it.
- **Write (-w-)**You can save changes to a Word document if you have the write permission for it.
- **Execute (--x)**You can open the Word application if you have the execute permission for it. Also note that you must have execute permission for any folder that you can open.

When you can do all three, you have "**rwx**" permission. Permissions for a folder behave similarly. With read-only permission to a folder containing documents, you can open and read documents but not save changes or add new documents to the folder. Read-only (**r--**) permission is common for sharing files with guest access, for example.

Owner, Group, Others

Abbreviations like "rwx" and "r-x" describe the permission for one user or entity. The permissions set for each file or folder defines access for three entities: **owner**, **group**, and **others**.

- **Owner** - The owner is most often the user who created the file. Almost all files and folders in your home directory will have your username listed as the owner.
- **Group** - Users are members of the groups called

"6thGrade" and "7thGrade".

- **Others** - Others refers to all other users that are not the owner or part of the group for a file or folder.

Since each entity has its own permission, an example of a complete permission set could look like "-rwxrw-r--". The leading hyphen designates that the item is a file and not a folder. Folder privileges appear with leading "d," such as "drwxrw-r--". The "d" stands for **directory**, which is what a folder represents. Figure 2, below, depicts how this looks in the Terminal application.

Abbreviating permissions as numerals

After a while, you might think that "-rwxrwxr-x" is a lot to type. And you'd be right. That's why there's a simple way to abbreviate permissions as numerals, ranging from 777 (-rwxrwxrwx) down to 000 (no access). An "rwx" becomes a 7, the sum of 1, 2, and 4, where 4=Read, 2=Write, and 1=Execute. A zero means no access. Each of the three numerals is the sum of permissions for Owner, Group, and Other, respectively. Thus our example of "-rwxrwxr-x" becomes 775.

Example: Creating a TextEdit document

Suppose you create a TextEdit document and save it in the Documents folder of your home directory. The document has privileges of "-rw-r--r--", so you can read and write to the file; but the assigned group and any other users can only read it. Because you saved the file in your Documents folder (drwx------), the group and other users cannot even see your file. The enclosing folder's permissions effectively supersede the file's own permissions. This is how the home directory structure of Mac OS X provides privacy. If you drag the file to your Public folder (drwxr-xr-x) and log out,

another user could log in to the computer and read your public file.

Default settings for new files and folders

**Ownership settings**

- User is the user that creates the new file or folder.
- Group is default group of the user who created the file or folder.

**Permissions**

- Folders or directories: `drwxr-xr-x`

Files: `-rw-r--r—`

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