File Permissions

Each file has defined permissions for the **file owner**, **file group** and **others**. **Others** are all of the users which do not belong to the file group and are also not the owner of the file. Each of these has a set of three characters representing the file permissions.

r represents **read permission**. If it is set on a file, that means that you can open and read the contents of that file. On a directory, this means that you can use **ls** to list the contents of that file.
w write permissions let's you edit file contents. If it is set on a directory, that means that you can add, remove and rename files within that directory.
x execute permissions is usually set on executable files, which means that you have the authorization to execute them. Those are usually binaries, executable programs and scripts, just like the commands we use from the shell. On a directory, this permissions let's us enter it with the **cd** command.

You can change the file permissions with the **chmod** command. You have two modes which you can use to change them. **Symbolic mode** lets you change permissions by writing letters. First you need to type which set of permissions you want to modify. **u** for user (which is the file owner), **g** for group, **o** for others and **a** for all of them at once.
Than you can define which permissions you want to set. You can do this with the **=** sing following the wanted permissions like **rwx**. You can also just add some permissions with **+**, e.g. **u+x** will add the execute permission to the file owner. Same goes for removing permissions with **-**.

After that you need to put the name of the file you want to modify.

```
$ chmod a+w filename
```

In this example I added the write permission to all.

There is also a **numeric mode**. Each permission has an assigned number. x has 1, w has 2 and r has 4. By combining these numbers, you can set the permissions on a file. In this mode, you are setting all of the permissions at once, so you don't need to define which set you want to change.

```
$ chmod 766 filename
```

This example will change the permissions to **776**. This resolves to **rwxrwxrw-**. r(4) + w(2) + x(1) gives us rwx(7). This is set for file owner and file group. The last number is **6** because r(4) + w(2) is rw-(6).