UNIX File Permission Representations

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Alphabetic Character representation

Octal Numeric representation

Alphabetic Character representation

(what you get with **`ll`** or **`ls -l`**)

Alphabetic Character representation

-rwxrwxrwx

Alphabetic Character representation

- **rwx rwx rwx**

(9 characters)

Alphabetic Character representation

- **rwx rwx rwx**

the 4 sets:

directory or file **owner permissions** **group permissions** **permissions for other users**

Alphabetic Character representation

- rwx rwx rwx

the 4 sets:

directory or file	**owner permissions**	**group permissions**	**permissions for other users**
d or -	read, write, execute permissions (in this order) absence of a permission is shown by a dash in the corresponding position		

Alphabetic Character representation

- rwx rwx rwx

the 4 sets:

directory or file | **owner permissions** | **group permissions** | **permissions for other users**

d or -

.....but there are other subtleties

Octal Numeric representation

Octal Numeric representation

(comes in handy
with setting permissions
e.g. using chmod)

Octal Numeric representation

0755

Octal Numeric representation

0755

(4 octal digits, each ranging from 0 to 7)

Octal Numeric representation

0755

000 111 101 101

(Converting each octal digit to 3-bit binary)

Octal Numeric representation

0755

000 111 101 101

- rwx r-x r-x

Translating the binary to character representation to easily visualize permissions

Octal Numeric representation

0755

000 111 101 101

- rwx r-x r-x

Translating the binary to character representation to easily visualize permissions

Octal Numeric representation

0755

000 111 101 101

- rwx r-x r-x

This neat translation for the latter 9 bits becomes a bit messy when any of the first three bits are set

Octal Numeric representation

0755

000 111 101 101

?

- rwx r-x r-x

Octal Numeric representation

0755

000 111 101 101

setUID bit/setGID bit/sticky bit

Octal Numeric representation

4755

100 111 101 101

setUID bit/setGID bit/sticky bit

Octal Numeric representation

4755

For a setUID program the first octal digit will be >=4

100 111 101 101

setUID bit/setGID bit/sticky bit

Octal Numeric representation

4755

100 111 101 101

- rws r-x r-x

Other such changes would happen in the character representation if the GUID/sticky bits are set.

Octal Numeric representation

4755

100 111 101 101

- rws r-x r-x

END