

4.25 Summary of File Access Permission Bits

We've covered all the file access permission bits, some of which serve multiple purposes. Figure 4.26 summarizes these permission bits and their interpretation when applied to a regular file and a directory.

Constant	Description	Effect on regular file	Effect on directory
S_ISUID	set-user-ID	set effective user ID on execution	(not used)
S_ISGID	set-group-ID	if group-execute set, then set effective group ID on execution; otherwise, enable mandatory record locking (if supported)	set group ID of new files created in directory to group ID of directory
S_ISVTX	sticky bit	control caching of file contents (if supported)	restrict removal and renaming of files in directory
S_IRUSR	user-read	user permission to read file	user permission to read directory entries
S_IWUSR	user-write	user permission to write file	user permission to remove and create files in directory
S_IXUSR	user-execute	user permission to execute file	user permission to search for given pathname in directory
S_IRGRP	group-read	group permission to read file	group permission to read directory entries
S_IWGRP	group-write	group permission to write file	group permission to remove and create files in directory
S_IXGRP	group-execute	group permission to execute file	group permission to search for given pathname in directory
S_IROTH	other-read	other permission to read file	other permission to read directory entries
S_IWOTH	other-write	other permission to write file	other permission to remove and create files in directory
S_IXOTH	other-execute	other permission to execute file	other permission to search for given pathname in directory

Figure 4.26 Summary of file access permission bits

The final nine constants can also be grouped into threes, as follows:

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S_IRWXU = S_IRUSR | S_IWUSR | S_IXUSR
S_IRWXG = S_IRGRP | S_IWGRP | S_IXGRP
S_IRWXO = S_IROTH | S_IWOTH | S_IXOTH

```

4.26 Summary

This chapter has centered on the `stat` function. We've gone through each member in the `stat` structure in detail. This, in turn, led us to examine all the attributes of UNIX files and directories. We've looked at how files and directories might be laid out in a file