

# Access Control Lists

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**Access Control List (ACL)** provides an additional, more flexible permission mechanism for file systems. It is designed to assist with UNIX file permissions. ACL allows you to give permissions for any user or group to any disc resource.

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## Installation

Install the `acl` (<https://www.archlinux.org/packages/?name=acl>) package which is available from the official repositories by `pacman`:

```
# pacman -S acl
```

## Configuration

### Enabling ACL

To enable ACL - edit `/etc/fstab` and add the `acl` attribute in options on the partition which you want to use ACL:

```
/etc/fstab
#
# /etc/fstab: static file system information
#
# <file system>      <dir>      <type>      <options>      <dump> <pass>
none                /dev/pts    devpts       defaults        0      0
none                /dev/shm    tmpfs        defaults        0      0
/dev/cdrom /media/cdrom auto      ro,user,noauto,unhide 0      0
/dev/dvd /media/dvd auto      ro,user,noauto,unhide 0      0
UUID=5de01fca-7c63-49b0-9b2b-8b1790f8428e swap swap defaults 0 0
UUID=822dd720-e35f-424c-b012-2c84b4aa265a /data reiserfs defaults 0 1
UUID=8e5259dd-26fc-411a-88e2-f38d4dc36724 /home reiserfs defaults,acl 0 1
UUID=c18f753e-0039-49bd-930f-587d48b7e083 / reiserfs defaults 0 1
UUID=f64bfc77-7958-49c5-a244-1fa2517d676f /tmp reiserfs defaults 0 1
```

Save the file and remount the partition:

```
# mount -o remount /home
```

### Set ACL

To modify ACL use `setfacl` command. To add permissions use `setfacl -m`.

Add permissions to some user:

```
# setfacl -m "u:username:permissions"
```

or

```
# setfacl -m "u:uid:permissions"
```

Add permissions to some group:

```
# setfacl -m "g:groupname:permissions"
```

or

```
# setfacl -m "g:gid:permissions"
```

Remove all permissions:

```
# setfacl -b
```

Remove each entry:

```
# setfacl -x "entry"
```

To check permissions use:

```
# getfacl filename
```

## Examples

Set all permissions for user johny to file named "abc":

```
# setfacl -m "u:johny:rwX" abc
```

Check permissions

```
# getfacl abc
# file: abc
# owner: someone
# group: someone
user::rw-
user:johny:rwX
group::r--
mask::rwX
other::r--
```

Change permissions for user johny:

```
# setfacl -m "u:johny:r-x" abc
```

Check permissions

```
# getfacl abc
# file: abc
# owner: someone
# group: someone
user::rw-
user:johny:r-x
group::r--
mask::r-x
other::r--
```

Remove all extended ACL entries:

```
# setfacl -b abc
```

Check permissions

```
# getfacl abc
# file: abc
# owner: someone
# group: someone
user::rw-
group::r--
other::r--
```

## Output of ls command

You will notice that there is an ACL for a given file because it will exhibit a + (plus sign) after its Unix permissions in the output of `ls -l`.

```
$ ls -l /dev/audio
crw-rw----+ 1 root audio 14, 4 nov.  9 12:49 /dev/audio

$ getfacl /dev/audio
getfacl: Removing leading '/' from absolute path names
# file: dev/audio
# owner: root
# group: audio
user::rw-
user:solstice:rw-
group::rw-
mask::rw-
other::---
```

## Increase security of your web server

You can now add permissions to our home directory and/or site directory only to nobody user any anyone else - without "whole world" to increase

your security.

Add permissions **+x** for nobody user on your home directory via ACL:

```
# setfacl -m "u:nobody:--x" /home/homeusername/
```

Now you can remove whole world rx permissions:

```
# chmod o-rx /home/homeusername/
```

Check our changes:

```
# file: username/  
# owner: username  
# group: users  
user::rwx  
user:nobody:--x  
group::r-x  
mask::r-x  
other::--
```

As we can see others do not have any permissions but user nobody have "x" permission so they can "look" into users directory and give access to users pages from their home directories to www server. Of course if www server work as nobody user. But - whole world except nobody - do not have any permissions.

## Additional Resources

- Man Page - `man getfacl`
- Man Page - `man setfacl`

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Category: Security

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