

User Management

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? (1996-2018)

國立陽明交通大學資工系資訊中心

Information Technology Center of Department of Computer Science, NYCU

Handbook and Manual pages

- Official guide and be found at
 - <https://www.freebsd.org/doc/en/books/handbook/users-synopsis.html>
 - https://www.freebsd.org/doc/zh_TW/books/handbook/users-synopsis.html
 - <https://wiki.debian.org/UserAccounts>

Adding New Users

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ID

- User ID, Group ID
 - `$ id tsaimh`
 - `uid=12134(tsaimh) gid=1010(faculty) groups=1010(faculty),2000(taever)`
 - `$ id 12134`
- Super user
 - `$ id root`
 - `uid=0(root) gid=0(wheel) groups=0(wheel),5(operator)`
- Other Important Users
 - daemon: owner of unprivileged software
 - bin: owner of system commands
 - sys: owner of the kernel and memory images
 - nobody: owner of nothing

Steps to add a new user

1. Edit the password and group files
 - `vipw, pw`
2. Set an initial password
 - `passwd tsaimh`
3. Set quota (optional)
 - `edquota tsaimh`
4. Create user home directory
 - `mkdir /home/tsaimh`
5. Copy startup files to user's home (optional)
6. Set the file/directory owner to the user
 - `chown -R tsaimh:dcsc /home/tsaimh`

Step to add a new user –

1. password and group file (1)

- /etc/passwd
 - Store user information:
 - Login name
 - Encrypted password (* or x)
 - UID
 - Default GID
 - GECOS information
 - Full name, office, extension, home phone
 - Home directory
 - Login shell
 - Each is separated by ":"

```
% grep tsaimh /etc/passwd  
tsaimh:*:1065:1001:Meng-Hsun Tsai:/home/tsaimh:/bin/tcsh
```

Step to add a new user –

1. password and group file (2)

- Encrypted password
 - The encrypted password is stored in shadow file for security reason
 - `/etc/master.passwd` (BSD)
 - `/etc/shadow` (Linux)

```
$ grep tsaimh /etc/passwd
tsaimh:*:1065:20:Meng-Hsun Tsai:/home/tsaimh:/bin/tcsh
$ sudo grep tsaimh /etc/master.passwd
tsaimh:$1$4KQcUPbi$/nVs5bPDUXoyLLxw9Yp9D.:1065:20::0:0:Meng-Hsun
Tsai:/home/tsaimh:/bin/tcsh
```

BSD

```
$ grep tsaimh /etc/passwd
tsaimh:x:1065:20:Meng-Hsun Tsai:/home/tsaimh:/bin/tcsh
$ sudo grep tsaimh /etc/shadow
tsaimh:$1$4KQcUPbi$/nVs5bPDUXoyLLxw9Yp9D.:14529:0:99999:7:::
```

Linux

Step to add a new user –

1. password and group file (3)

- Encrypted methods
 - des
 - Plaintext: at most 8 characters
 - Cipher: 13 characters long
 - vFj42r/HzGqXk
 - md5
 - Plaintext: arbitrary length
 - Cipher: 34 characters long started with "\$1\$"
 - \$1\$xbFdBaRp\$zXSp9e4y32ho0MB9Cu2iV0
 - blf
 - Plaintext: arbitrary length
 - Cipher: 60 characters long started with "\$2a\$"
 - \$2a\$04\$jn9vc7dDJOX7V335o3.RoujuK/uoBYDg1xZs1OcBOrIXve3d1Cbm6
 - sha512
 - Plaintext: arbitrary length
 - Cipher: 106 characters long started with "\$6\$"
 - \$6\$o4B4Pa/ql3PpRAQo\$196.cCzrTCOIpPqk.VX7EqR0YNtf0dRLdx5Hzl6S7uGaPz4EDJdoXnmsSf.A21xS2ziml1XsHAg1CR2Pw7ols1
- [login.conf\(5\)](#), "AUTHENTICATION"
 - section: passwd_format

Step to add a new user –

1. password and group file (4)

- GECOS
 - General Electric Comprehensive Operating System
 - Commonly used to record personal information
 - ",", separated
 - [finger\(1\)](#) command will use it
 - Use [chfn\(1\)](#) to change your GECOS

```
# Changing user information for tsaimh
Shell: /bin/tcsh
Full Name: User &
Office Location:
Office Phone:
Home Phone:
Other information:
```

Step to add a new user –

1. password and group file (6)

- Login shell
 - Command interpreter
 - /bin/sh
 - /bin/csh
 - /bin/tcsh
 - /bin/bash (/usr/ports/shells/bash)
 - /bin/zsh (/usr/ports/shells/zsh)
 - Use [chsh\(1\)](#) to change your shell

```
# Changing user information for tsaimh
Shell: /bin/tcsh
Full Name: User &
Office Location:
Office Phone:
Home Phone:
Other information:
```

Step to add a new user –

1. password and group file (7)

- /etc/group
 - Contains the names of UNIX groups and a list of each group's member:
 - Group name
 - Encrypted password
 - GID
 - List of members, separated by ","

```
wheel:*:0:root,tsaimh  
daemon:*:1:daemon  
staff:*:20:
```

- In FreeBSD, by default, only users in wheel group can "su" as root.
- In Linux, by default, everyone can "su" as root.

Step to add a new user –

1. password and group file (8)

- In FreeBSD
 - Use "[vipw\(8\)](#)" to edit /etc/master.passwd
 - Three additional fields
 - **Login class**
 - Refer to an entry in the /etc/login.conf
 - Determine user resource limits and login settings
 - default
 - **Password change time**
 - **Account expiration time**

```
$ grep tsaimh /etc/passwd
tsaimh:*:1065:20:User &:/home/tsaimh:/bin/tcsh
$ sudo grep tsaimh /etc/master.passwd
tsaimh:$1$4KQcUPbi$/nVs5bPDUXoyLLxw9Yp9D.:1065:20::0:0:User &:/home/tsaimh:/bin/tcsh
```



Step to add a new user –

1. password and group file (9)

- /etc/login.conf of FreeBSD
 - Set account-related parameters (login class)
 - Resource limits
 - Process size, number of open files
 - Session accounting limits
 - When logins are allowed, and for how long
 - Default environment variable
 - Default PATH
 - Location of the message of the day file
 - Host and tty-based access control
 - Default umask
 - Account controls
 - Minimum password length, password aging
 - [login.conf\(5\)](#)

Step to add a new user –

1. password and group file (10)

```
default:\
:passwd_format=sha512:\
:copyright=/etc/COPYRIGHT:\
:welcome=/etc/motd:\
:setenv=MAIL=/var/mail/$,BLOCKSIZE=K:\
:path=/sbin /bin /usr/sbin /usr/bin /usr/games /usr/local/sbin /usr/local/bin ~/bin:\
:nologin=/var/run/nologin:\
:cputime=unlimited:\
:datasize=unlimited:\
:stacksize=unlimited:\
:memorylocked=64K:\
:memoryuse=unlimited:\
:filesize=unlimited:\
:coredumpsize=unlimited:\
:openfiles=unlimited:\
:maxproc=unlimited:\
:sbsize=unlimited:\
:vmemoryuse=unlimited:\
:swapuse=unlimited:\
:pseudoterminals=unlimited:\
:priority=0:\
:ignoretime@:\
:umask=022:
```

Step to add a new user –

1. password and group file (11)

- In Linux
 - Edit /etc/passwd and /etc/group
 - Use "pwconv" to transfer into /etc/shadow
- Fields of /etc/shadow
 - Login name
 - Encrypted password
 - Date of last password change
 - Minimum number of days between password changes
 - Maximum number of days between password changes
 - Number of days in advance to warn users about password expiration
 - Number of inactive days before account expiration
 - Account expiration date
 - Flags

```
$ sudo grep tsaimh shadow
tsaimh:$1$4KQcUPbi$/nVs5bPDUXoyLLxw9Yp9D.:14529:0:99999:7:::
```

Step to add a new user – 2, 3, 4

- Initialize password: [passwd\(1\)](#)
 - `$ passwd tsaimh`
- Set quota: [edquota\(8\)](#)
 - `$ edquota tsaimh`
 - `$ edquota -p quotatemplate tsaimh`
 - `-p`: duplicate quota settings from other user

Quotas for user tsaimh:

```
/raid: kbytes in use: 705996, limits (soft = 4000000, hard = 4200000)
       inodes in use: 9728, limits (soft = 50000, hard = 60000)
```

- <https://www.freebsd.org/doc/handbook/quotas.html>
- Home directory
 - `$ mkdir /home/tsaimh`

Step to add a new user – 5, 6

- Startup files
 - System wide
 - /etc/{csh.cshrc, csh.login, csh.logout, profile}
 - Private
 - csh/tcsh => .login, .logout, .tcshrc, .cshrc
 - sh => .profile
 - vi => .exrc
 - vim => .vimrc
 - startx => .xinitrc
 - In this step, we usually copy private startup files
 - /usr/share/skel/dot.*
 - /usr/local/share/skel/zh_TW.UTF-8/dot.* (pkg install zh-auto-tw-l10n)
- Change owner
 - `$ chown -R tsaimh:dcx /home/tsaimh`

Remove accounts

- Delete the account entry
 - [FreeBSD] vipw, pw userdel
 - [Linux] remove the row in /etc/passwd and pwconv
 - deluser (Debian, Ubuntu), userdel (Redhat, CentOS, Fedora)
- Backup file and mailbox
 - `$ tar jcf tsaimh-home-20220910.tar.bz /home/tsaimh`
 - `$ tar jcf tsaimh-mail-20220910.tar.bz /var/mail/tsaimh`
 - `$ chmod 600 tsaimh-*-20220910.tar.bz`
- Delete home directory and mailbox
 - `$ rm -rf /home/tsaimh /var/mail/tsaimh`

Disabling login

- Ways to disable login
 - Change user's login shell as /sbin/nologin
 - Put a "#" in front of the account entry
 - Put a "-" in front of the account entry
 - Put a "*" or "!" in the encrypted password field
 - passwd -l (for Linux)
 - Add *LOCKED* at the beginning of the encrypted password field
 - pw lock/unlock (for FreeBSD)
 - [pw\(8\)](#) 、 [adduser\(8\)](#) 、 [pwd_mkdb\(8\)](#)

Rootly Powers

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The Root

- Root
 - Root is God, A.K.A. super-user (some systems also have "toor" user)
 - UID is 0
- UNIX permits super-user to perform any valid operation on any file or process, such as:
 - Changing the root directory of a process with chroot
 - Setting the system clock
 - Raising anyone's resource usage limits and process priorities (renice, edquota)
 - Setting the system's hostname (hostname command)
 - Configuring network interfaces (ifconfig command)
 - Shutting down the system (shutdown command)
 - ...

Becoming root (1)

- Login as root
 - Console login (multiuser mode)
 - Allow root login on console.
 - If you don't want to permit root login in the console (in /etc/ttys)
 - ttyv1 "/usr/libexec/getty Pc" cons25 on ~~secure~~
 - ttyv1 "/usr/libexec/getty Pc" cons25 on **insecure**
 - Remote login (login via ssh)
 - sshd:
 - /etc/ssh/sshd_config
 - #PermitRootLogin yes
 - **DON'T DO THAT !!!**

Becoming root (2)

- [su\(1\)](#) : substitute user identity
 - su, su -, su username
 - Environment is unmodified with the exception of USER, HOME, SHELL which will be changed to target user
 - "su -" will simulate as a full login. (All environment variables changed)
 - [sudo\(8\)](#) : a limited su (security/sudo)
 - Subdivide power of superuser
 - **Who** can execute **what command** on **which host** as **whom**.
 - Each command executed through sudo will be logged (/var/log/auth.log)
- ```
Sep 20 02:10:08 NASA sudo: tsaimh : TTY=pts/1 ; PWD=/tmp ;
 USER=root ; COMMAND=/etc/rc.d/pf start
```
- Edit /usr/local/etc/sudoers using [visudo\(8\)](#) command
    - visudo can check mutual exclusive access of sudoers file
    - Syntax check
    - Change editor
      - setenv EDITOR <editor you familiar with>

# Becoming root (3)

- sudoers format
  - **Who** can execute **what command** on **which host** as **whom**
    - The user to whom the line applies
    - The hosts on which the line should be noted
    - The commands that the specified users may run
    - The users as whom they may be executed
  - Use absolute path

|            |                                        |
|------------|----------------------------------------|
| Host_Alias | BSD=bsd1,bsd2,alumni                   |
| Host_Alias | LINUX=linux1,linux2                    |
|            |                                        |
| Cmnd_Alias | DUMP=/usr/sbin/dump, /usr/sbin/restore |
| Cmnd_Alias | PRINT=/usr/bin/lpc, /usr/bin/lprm      |
| Cmnd_Alias | SHELLS=/bin/sh, /bin/tcsh, /bin/csh    |

# Becoming root (4)

|             |                                     |
|-------------|-------------------------------------|
| Host_Alias  | BSD=bsd1,bsd2,alumni                |
| Host_Alias  | LINUX=linux1,linux2                 |
|             |                                     |
| Cmnd_Alias  | PRINT=/usr/bin/lpc, /usr/bin/lprm   |
| Cmnd_Alias  | SHELLS=/bin/sh, /bin/tcsh, /bin/csh |
| Cmnd_Alias  | SU=/usr/bin/su                      |
|             |                                     |
| User_Alias  | wwwTA=tsaimh,, wangth               |
| User_Alias  | printTA=lctseng, jnlin              |
|             |                                     |
| Runas_Alias | NOBODY=nobody                       |
|             |                                     |
| wangth      | ALL=ALL                             |
| tsaimh      | ALL=(ALL)ALL,!SHELLS,!SU            |
| printTA     | csduty=PRINT                        |
| wwwTA       | BSD=(NOBODY)/usr/bin/more           |
| %wheel      | ALL=NOPASSWD:/sbin/shutdown         |

# Becoming root (5)

- Example
  - Execute "more" as user "nobody"
    - % sudo -u nobody more /usr/local/etc/apache/httpd.conf
- Blacklist is not always safe...
  - % cp -p /bin/csh /tmp/csh; sudo /tmp/csh

|           |                                     |
|-----------|-------------------------------------|
| Cmd_Alias | SHELLS=/bin/sh, /bin/tcsh, /bin/csh |
| Cmd_Alias | SU=/usr/bin/su                      |
| tsaimh    | ALL=(ALL)ALL,!SHELLS,!SU            |

# sudoers Example

- tsaimh ALL=(ALL) ALL
- %wheel ALL=(ALL) NOPASSWD: ALL

```

User privilege specification

root ALL=(ALL) ALL
tsaimh ALL=(ALL) ALL

Uncomment to allow members of group wheel to execute any command
#%wheel ALL=(ALL) ALL

Same thing without a password
%wheel ALL=(ALL) NOPASSWD: ALL
```