

# Chapter 3

## Rootly Powers

# Charlie Root

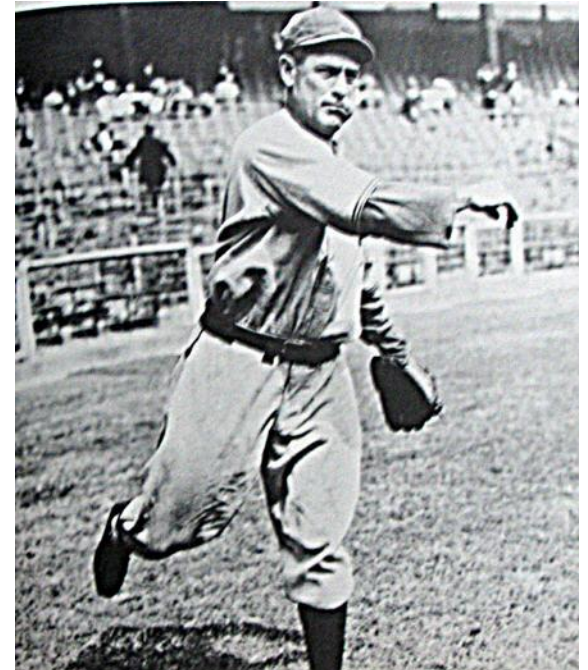
- ◎ `/usr/share/calendar/calendar.freebsd`
  - > `(src/usr.bin/calendar/calendars/calendar.freebsd)`
  - > 06/19 Charlie Root <root@FreeBSD.org> born in Portland, Oregon, United States, 1993

- > Who's Charlie Root?

<http://lists.freebsd.org/pipermail/freebsd-questions/2005-September/098410.html>

- > Charlie &

<http://lists.freebsd.org/pipermail/freebsd-advocacy/2007-June/003253.html>



# The Root

- ◎ Root
  - > Root is God, also called super-user.
  - > UID is 0
- ◎ UNIX permits the superuser to perform any valid operation on any file or process, such as (but not limited to):
  - > Changing the root directory of a process with **chroot**
  - > Creating device files (**mknod**)
  - > 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

- Allow root login on console but not cross network.
- If you don't want to permit root login in the console
- /etc/ttys:

```
    ttyv1    "/usr/libexec/getty Pc"           cons25  on  secure
→ ttyv1    "/usr/libexec/getty Pc"           cons25  on  insecure
```

### > Remote login (login cross network)

- sshd:  
/etc/ssh/sshd\_config  
#PermitRootLogin yes
- Not recommended!

# Becoming root (2)

- su : 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.
- Sudo (/usr/ports/security/sudo): a limited su
  - > Subdivide superuser’s power
    - **Who** can execute **what command** on **which host** as **whom**
  - > Each command executed through sudo will be logged

```
Oct 7 16:09:20 csduty sudo: lwhsu : TTY=ttys0 ; PWD=/usr/src ; USER=root ; COMMAND=/usr/bin/make update
```

- > Edit /usr/local/etc/sudoers using **visudo** command
  - **visudo** can check mutual exclusive access of sudoers file
- > Log bad users:

```
> sudo -s
Password:
wayne is not in the sudoers file. This incident will be reported.
```

```
*** SECURITY information for knight.lwhsu.ckefgisc.org ***
```

# 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	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
Cmnd_Alias	SU=/usr/bin/su
User_Alias	wwwTA=chenpc, silin
User_Alias	printTA=yzlin, yzlin
lwhsu	ALL=ALL
chwong	ALL=(ALL)ALL,!SHELL,!SU
printTA	csduty=PRINT
wwwTA	BSD=(nobody)/usr/bin/more
%wheel	ALL=NOPASSWD:/sbin/shutdown

# Becoming root (5)

- ◎ `$ sudo -u nobody more \`  
`/usr/local/etc/apache/httpd.conf`
- ◎ `$ cp -p /bin/csh /tmp/csh; sudo /tmp/csh`



# Advantage of sudo

- ⦿ Accountability is much improved because of command logging
- ⦿ Operators can do chores without unlimited root privileges
- ⦿ The real root password can be known to only one or two people
- ⦿ It's faster to use sudo than to run su or login as root
- ⦿ Privileges can be revoked without the need to change the root password
- ⦿ A canonical list of all users with root privileges is maintained
- ⦿ There is less chance of a root shell being left unattended
- ⦿ A single file can be used to control access for an entire network

# Why not su nor sudo?

- ⦿ Becoming other users

- > A pseudo-user for service, sometimes shared by multiple users

```
User_Alias NOTFTP_ADMINS=manic
Runas_Alias NOTFTP=notftp,notftpadm
ICANFTP_ADMINS ALL=(NOTFTP) ALL
```

- > `sudo -u notftpadm -s` (?) **Too dirty!**

- ⦿ `/etc/inetd.conf`

```
login stream tcp nowait root /usr/libexec/rlogind logind
```

- ⦿ `~notftpadm/.rhosts`

```
localhost manic
```

- ⦿ `login -l notftpadm localhost`