Installing Applications in FreeBSD

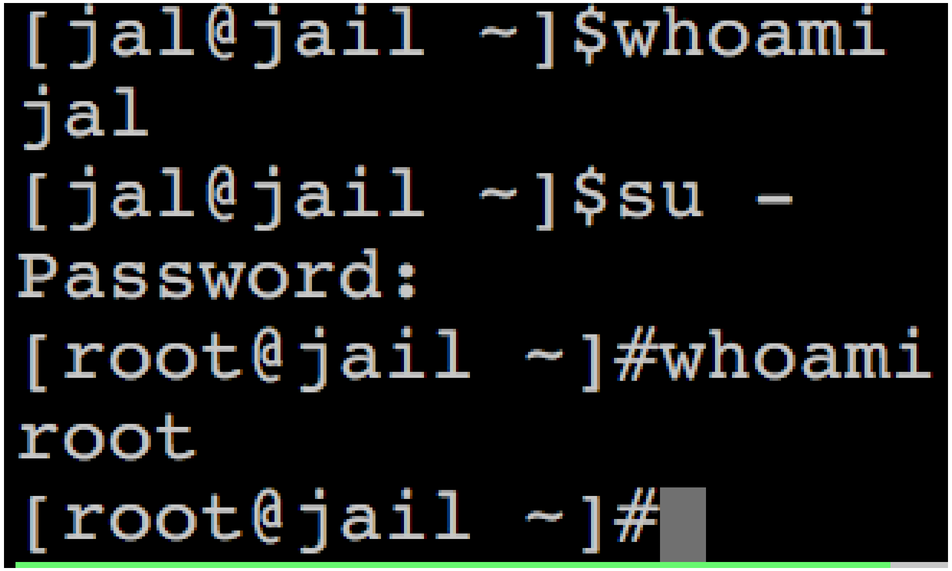
pschiu

Before we start

- ❑ Permission issue
  - root: the super user
  - Like administrator in M$ Windows
- ❑ Don’t execute commands as root directly
  - It’s DANGEROUS
  - Such as #rm –rf / tmp
- ❑ But sometimes you still need to be root to do something
  - Install software
  - Manage system file
  - Create/modify users

Before we start

- ❑ Become root
  - Console login with root
  - By default, cannot login with root via SSH
- ❑ Change current user
  - Don’t need to login with console
  - Use command ‘su -’, and them type root’s password
  - To see which credit you are using, use ‘whoami’



```
[jal@jail ~]$whoami
jal
[jal@jail ~]$su -
Password:
[root@jail ~]#whoami
root
[root@jail ~]#
```

Before we start

- As mentioned before, don’t run as root directly

- Can we execute with root’s credential only for some specific commands?
  - Like ‘Run as administrator’ in Windows
  - Is there similar commands in FreeBSD?

Before we start

❑ Run commands with other user's permission

❑ 'sudo' command

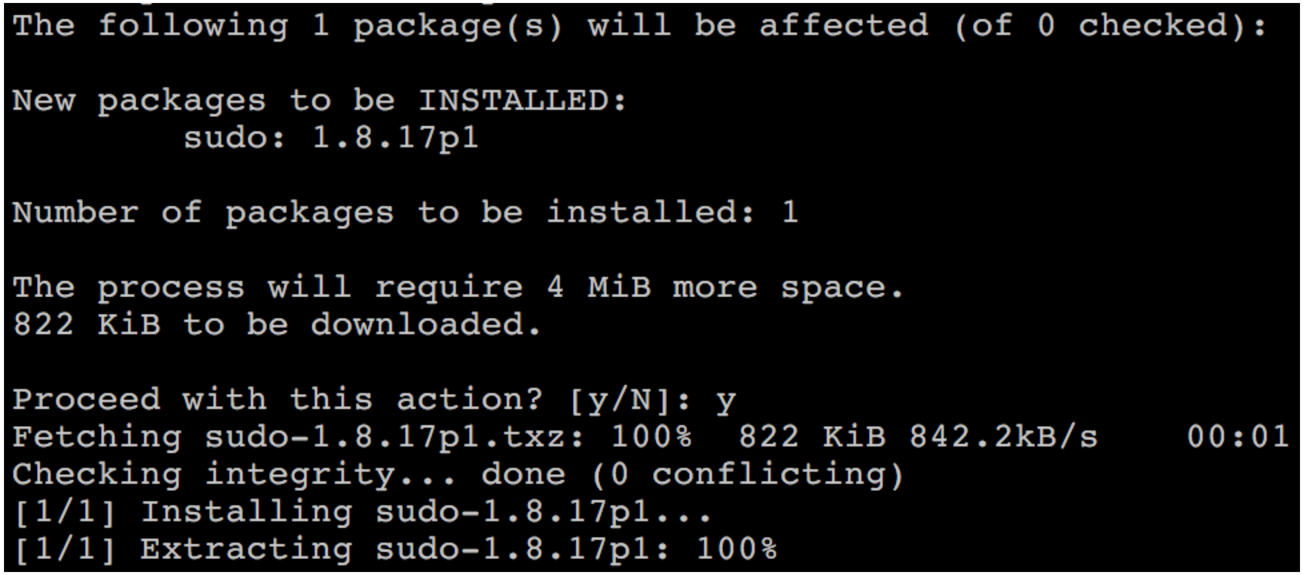
- Only simplest explanation here for basic usage
- 'sudo' syntax and other details will explain in later chapter
- Here only tell you how to simply enable 'sudo'

❑ How to enable sudo?

- 'sudo' is not a built-in command, need to be installed manually

Before we start – Enable ‘sudo’

- ❑ Install the package
  - Check Internet connection
    - ➢ `ping 8.8.8.8`
  - Become root (su -)
  - Execute ‘`pkg install sudo`’
    - ➢ This will install ‘sudo’ from Internet
    - ➢ Proceed with this action? [y/N]: y
    - ➢ Type ‘Y’(means yes) when it ask for conform



```
The following 1 package(s) will be affected (of 0 checked):

New packages to be INSTALLED:
        sudo: 1.8.17p1

Number of packages to be installed: 1

The process will require 4 MiB more space.
822 KiB to be downloaded.

Proceed with this action? [y/N]: y
Fetching sudo-1.8.17p1.txz: 100%   822 KiB 842.2kB/s    00:01
Checking integrity... done (0 conflicting)
[1/1] Installing sudo-1.8.17p1...
[1/1] Extracting sudo-1.8.17p1: 100%
```

Before we start – Enable ‘sudo’

❑ Allowing your user to execute ‘sudo’

- Switch to root first
- Type ‘setenv EDITOR ee’ to change your editor for this time
  - ➢ Will explain this in later chapter
  - ➢ This will allow you to use a notepad-like editor
  - ➢ If you are familiar with default editor ‘vi’, just skip this step
- Type ‘visudo’ to edit the sudoer file
  - ➢ Specific who can use ‘sudo’
  - ➢ Around line 87, type ‘jal ALL=(root) ALL’
    - – Please replace ‘jal’ with your own username
- Save the file and exit, back to normal user
  - ➢ Use ‘logout / exit’ command or press ctrl + d

Before we start – Using ‘sudo’

- ❑ Now, you can prepend ‘sudo’ before commands to run them as root
  - But please think carefully before you type

- ❑ Execute commands with ‘sudo’
  - `$ sudo whoami`
    - ➢ You have root’s credential
  - `$ sudo pkg install vim`
    - ➢ Install software without become root directly
  - You need to re-type your password
    - ➢ Don’t need to re-type within 5 minutes

Install software

❑ Package

- Pre-built
  - ➢ Like most of installer (.msi) in Windows
- Other Unix-Like system: rpm, yum, dpkg, apt-get…
- FreeBSD: pkg (default from 10.0)
  - ➢ Don't use old pkg_* commands!
  - ➢ pkg_add pkg_deinstall pkg_delete pkg_* only for version before 10

❑ Source

- Compile the source files first and then install
- Tarball, a pack of source code
- tar -xzvf certain-source.tar.gz
- cd certain-source
- ./configure --help
- ./configure [options …]
- make
- make install (root permission)

Install software : Overview

- ❑ Three technologies
  - Packages
  - Ports
  - Tarball
- ❑ Packages
  - pre-built ports, contain pre-compiled copies of all the commands for the application, as well as any configuration files or documentation.
- ❑ Ports
  - a collection of files designed to automate the process of compiling an application from source code and additional patches
    - ➢ a set of Makefile, patches, description files, …
- ❑ Both packages and ports understand *dependencies*
- ❑ Tarball
  - fetch it, configure the installation options, and compile it by yourself. NO DEPENDENCY CHECKING.

Overview

- ❑ Package benefits
  - Packages do not require any additional compilation
    - ➢ Benefit for slow machines
- ❑ Ports benefits
  - You can tweak the compilation options to generate code that is specific to a different processor – speed
  - Some applications have compile time options relating to what they can and cannot do – customization
- ❑ Why tar ball?
  - Some software cannot be found in port collections
  - Some latest version of software may have new configurations that do not exist in port

Package System (1)

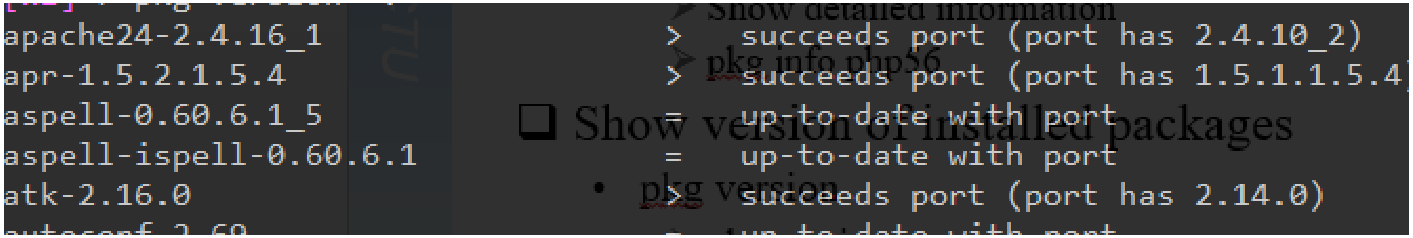
- ❑ pkg
  - New generation of FreeBSD package system
- ❑ Install new software
  - Fetch packages from Internet
  - `pkg install` *`<names of packages…>`*
    - ➢ `pkg install vim screen tmux`
  - Run with root’s permission (sudo)
  - Automatically update the database
  - Perform dependency check
    - ➢ Will install software that required by new software

Package System (2)

- ❑ Update packages database only
  - `pkg update`
- ❑ Upgrade currently installed software
  - `pkg upgrade <names of packages…>`
    - ➢ pkg upgrade vim
  - `pkg upgrade`
    - ➢ Upgrade all installed software
  - This will also update the database
- ❑ Delete a package
  - `pkg delete <names of packages>`
    - ➢ `pkg delete php53`
  - Will check dependency
  - `pkg delete -f <names of packages>`
    - ➢ -f : force
    - ➢ Disable dependency check

Package System (3)

- ❑ Show information about installed packages
  - `pkg info`
    - ➢ Show all installed packages
    - ➢ Use 'grep' to find specific packges
      - `pkg info | grep vim`
  - `pkg info <name of package>`
    - ➢ Show detailed information
    - ➢ `pkg info php56`
- ❑ Show version of installed packages
  - `pkg version`
    - ➢ `pkg version -v`



```
apache24-2.4.16_1                    >   succeeds port (port has 2.4.10_2)
apr-1.5.2.1.5.4                      >   succeeds port (port has 1.5.1.1.5.4
aspell-0.60.6.1_5                    =   up-to-date with port
aspell-ispell-0.60.6.1               =   up-to-date with port
atk-2.16.0                           >   succeeds port (port has 2.14.0)
```

How to use ports

❑ Obtain the ports collection

- List of ports available to be installed into system

❑ We should…

- Find the application
- Change to the directory for the port

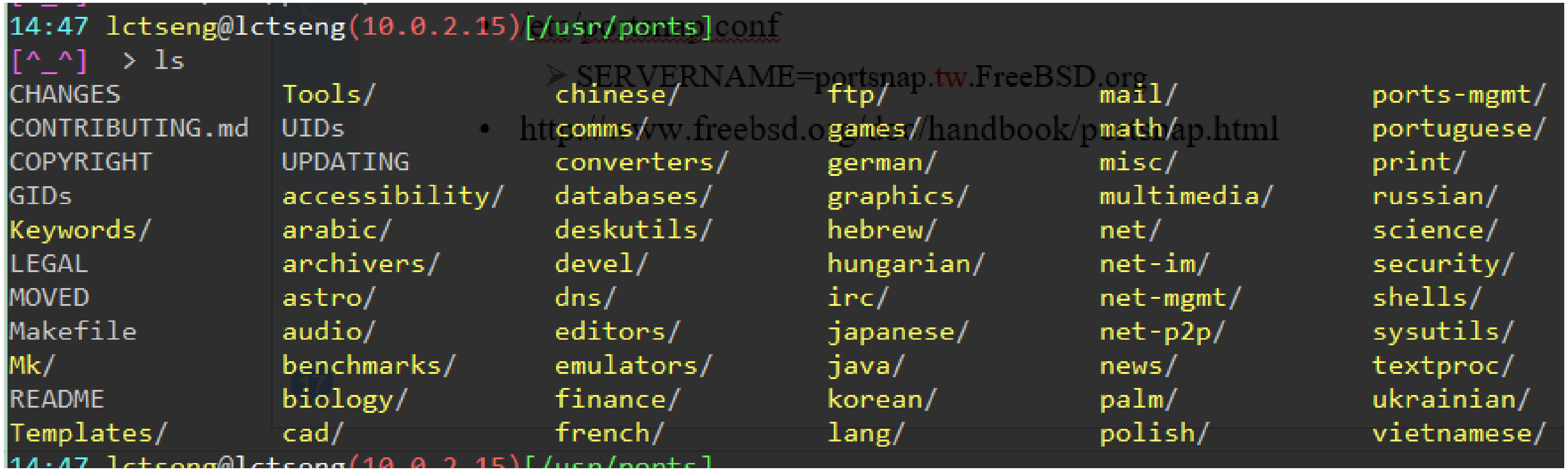
❑ Ports will

- Fetch the tarball from internet (FreeBSD website or original web)
- Ask for configuration friendly
- Compile the source code
- Install your application to DESTDIR/PREFIX

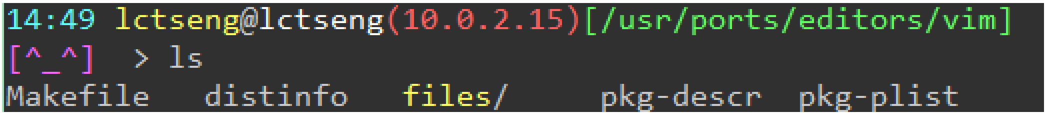
Obtaining the Ports Collection

❑ Port directory

- /usr/ports/<category>/<name>



```
14:47 lctseng@lctseng(10.0.2.15)[/usr/ports]
[^_^]  > ls
CHANGES          Tools/          chinese/      ftp/          mail/         ports-mgmt/
CONTRIBUTING.md  UIDs            comms/        games/        math/         portuguese/
COPYRIGHT        UPDATING        converters/   german/       misc/         print/
GIDs             accessibility/  databases/    graphics/     multimedia/   russian/
Keywords/        arabic/         deskutils/    hebrew/       net/          science/
LEGAL            archivers/      devel/        hungarian/    net-im/       security/
MOVED            astro/          dns/          irc/          net-mgmt/     shells/
Makefile         audio/          editors/      japanese/     net-p2p/      sysutils/
Mk/              benchmarks/     emulators/    java/         news/         textproc/
README           biology/        finance/      korean/       palm/         ukrainian/
Templates/       cad/            french/       lang/         polish/       vietnamese/
14:47 lctseng@lctseng(10.0.2.15)[/usr/ports]
```



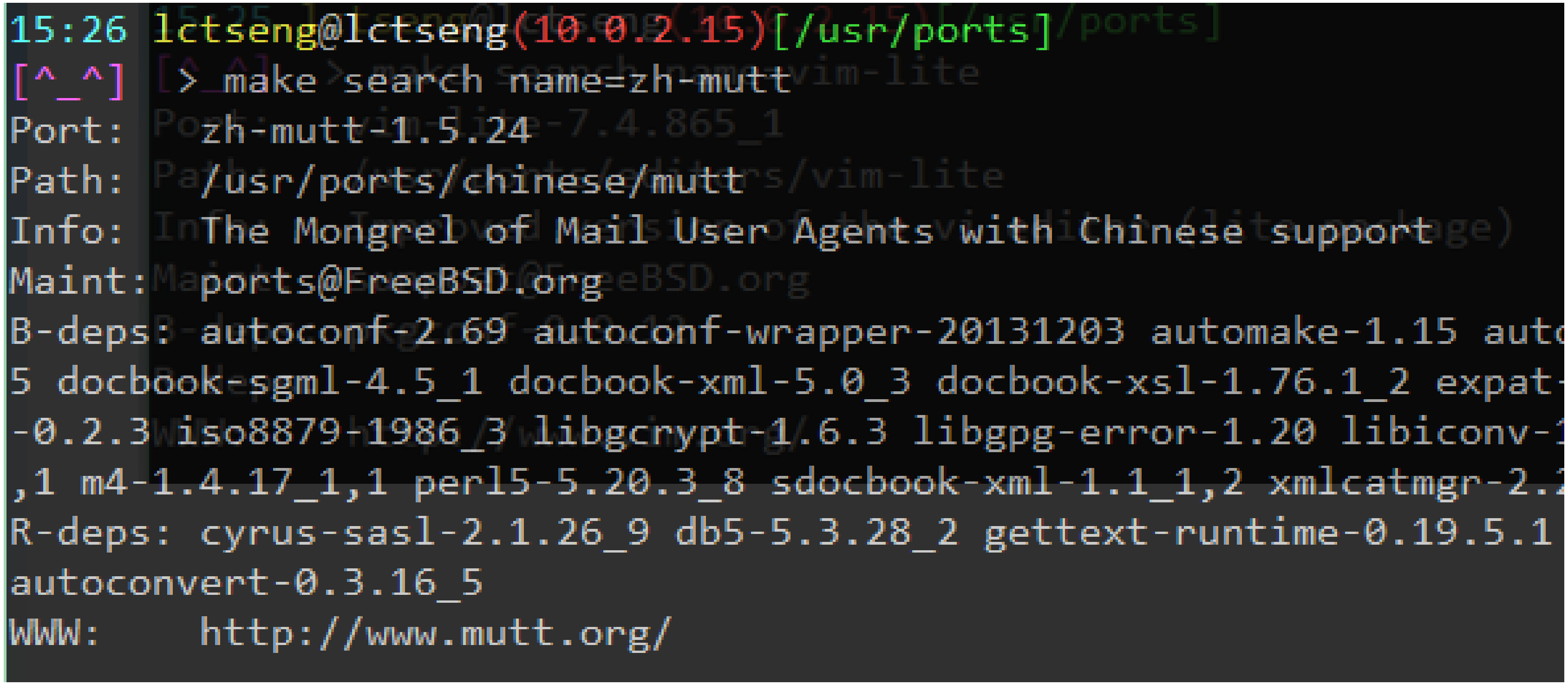
```
14:49 lctseng@lctseng(10.0.2.15)[/usr/ports/editors/vim]
[^_^]  > ls
Makefile   distinfo   files/    pkg-descr  pkg-plist
```

Obtaining the Ports Collection

- portsnap(8)
  - Fetch and update your port tree
  - fetch, extract, update, cron
  - `$ portsnap fetch extract update`
    - With root permission
  - /etc/portsnap.conf
    - `$ sudo ee /etc/portsnap.conf`
    - SERVERNAME=portsnap.FreeBSD.org

Ports system (1)

- ❑ Find your application
  - cd /usr/ports
  - make search name=program name
  - make search key=string



```
15:26 lctseng@lctseng(10.0.2.15)[/usr/ports]
[^_^]  > make search name=zh-mutt
Port:   zh-mutt-1.5.24
Path:   /usr/ports/chinese/mutt
Info:   The Mongrel of Mail User Agents with Chinese support
Maint:  ports@FreeBSD.org
B-deps: autoconf-2.69 autoconf-wrapper-20131203 automake-1.15 auto
5 docbook-sgml-4.5_1 docbook-xml-5.0_3 docbook-xsl-1.76.1_2 expat-
-0.2.3 iso8879-1986_3 libgcrypt-1.6.3 libgpg-error-1.20 libiconv-1
,1 m4-1.4.17_1,1 perl5-5.20.3_8 sdocbook-xml-1.1_1,2 xmlcatmgr-2.2
R-deps: cyrus-sasl-2.1.26_9 db5-5.3.28_2 gettext-runtime-0.19.5.1
autoconvert-0.3.16_5
WWW:    http://www.mutt.org/
```

Ports system (3)

- ❑ Type “make install clean” to install your application
  - make config (/var/db/ports/)
  - make fetch (/usr/ports/distfiles/)
  - make checksum
  - make extract
  - make patch
  - make configure
  - make build
    - ➢ “make” means all of the above
  - make install
  - make clean
  - make distclean
    - ➢ Clean files generated by configure process

Ports system (4)

- ❑ The ports system uses fetch(1) to download the files
  - MASTER_SITES environment variable
  - /etc/make.conf

```
MASTER_SITE_BACKUP?=    \
        ftp://ftp6.tw.freebsd.org/FreeBSD/distfiles/${DIST_SUBDIR}/   \
        ftp://ftp.tw.freebsd.org/pub/distfiles/${DIST_SUBDIR}/            \
        http://FreeBSD.cs.nctu.edu.tw/distfiles/${DIST_SUBDIR}/
MASTER_SITE_OVERRIDE?=  ${MASTER_SITE_BACKUP}
WITHOUT_X11="YES”
WITH_THREADS=yes
CPUTYPE?=native
```

- ❑ Options for ports
  - make config
    - ➢ Won’t build or install the port
    - ➢ Use this to re-configure ports (otherwise , it uses old one instead)
  - hidden options (not shown in ‘make config’)
    - ➢ Edit the Makefiles under that port directory

Ports system (5)

- ❑ I installed the application but
  - Command not found…
  - Logout, and then login.
  - If you use (t)csh
    - ➢ rehash

Deinstall Applications

❑ Two methods

- pkg delete
  - ➢ Find the package name via pkg info
  - ➢ Dependency check
  - ➢ pkg delete -f : disable dependency check
- make deinstall
  - ➢ Change to the ports directory
  - ➢ make deinstall
  - ➢ Delete it anyway
  - ➢ Similar to ‘ pkg delete -f ’

Upgrading Ports using Portmaster

❑ ports-mgmt/portmaster

- A utility for easily upgrading and installing ports
- It was designed to make use of the tools found in the base system
  - ➢ ports-mgmt/portupgrade

-
  ```
  $ cd /usr/ports/ports-mgmt/portmaster
  $ make install clean
  ```

❑ Install or upgrade a port

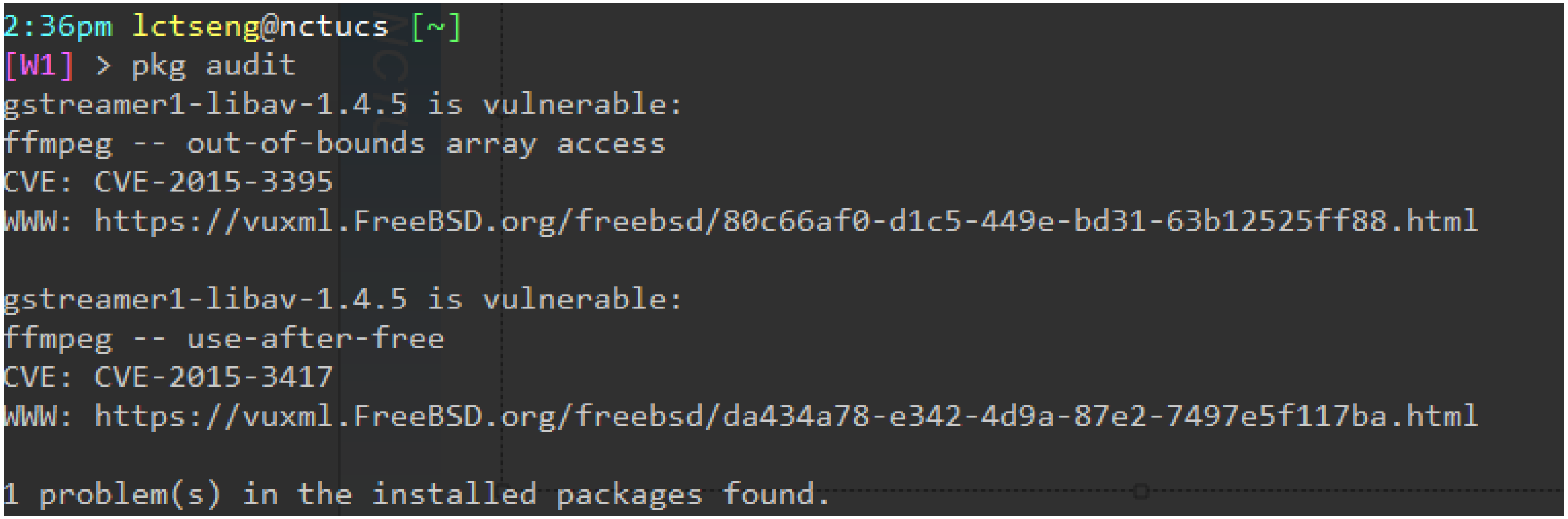
- `$ portmaster sysutils/lsof`
- /usr/ports/UPDATING
  - ➢ Read before you update any port or software!!

❑ Useful options

- -B, -D, -a, -r, -y, -H, -w
- `$ portmaster -dyBwH editors/vim`

Package/Port Security Issue

- ❑ Show security issues about installed packages
  - No matter from port or from package
  - `pkg audit`
  - Upgrade these packages to avoid security problems



```
2:36pm lctseng@nctucs [~]
[W1] > pkg audit
gstreamer1-libav-1.4.5 is vulnerable:
ffmpeg -- out-of-bounds array access
CVE: CVE-2015-3395
WWW: https://vuxml.FreeBSD.org/freebsd/80c66af0-d1c5-449e-bd31-63b12525ff88.html

gstreamer1-libav-1.4.5 is vulnerable:
ffmpeg -- use-after-free
CVE: CVE-2015-3417
WWW: https://vuxml.FreeBSD.org/freebsd/da434a78-e342-4d9a-87e2-7497e5f117ba.html

1 problem(s) in the installed packages found.
```

Try to install from ports

- screen, tmux
- vim, emacs
- mutt
- wget, curl
- irssi
- expect
- nmap
- mtr
- ca_root_nss
- lftp
- lynx, w3m