Installing Applications in FreeBSD

lctseng

Before we start

- ❑ Permission issue
  - root: the superuser
    - ➢ In Unix-like system, root is the conventional name of the user who has all rights or permissions (to all files and programs) in all modes (single- or multi-user)
  - Like administrator in M$ Windows
- ❑ Don’t execute commands as root directly
  - It’s DANGEROUS
- ❑ But sometimes you still need to be root to do something
  - Install software
  - Manage system file
  - Create/modify/delete users

Before we start

❑ Become root

- Console login with root
- By default, you cannot login as root via SSH

❑ Change current user

- Don’t need to login with console
- Use command ‘su -’, and them type root’s password
  - ➢ Only user in ‘wheel’ group can use ‘su-’
- To see which credit you are using, use ‘whoami’

```
nctucs [~] -lctseng- whoami
lctseng
nctucs [~] -lctseng- su -
Password:
nctucs [~] -lctseng- whoami
root
```

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’ (1)

- ❑ Install the package
  - Check Internet connection
    - ➢ ping 8.8.8.8
  - Become root (su -)
  - Execute ‘pkg install sudo’
    - ➢ This will install ‘sudo’ from Internet
    - ➢ Type ‘Y’(means yes) when it asks for conformation

Before we start – Enable ‘sudo’ (2)

❑ 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’

```
##
## User privilege specification
##
root ALL=(ALL) ALL
lctseng ALL=(ALL) ALL
```

- Save the file and exit, back to normal user
  - ➢ Use ‘logout’ 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, …
- FreeBSD: pkg

❑ Source

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

Install software : Overview

- ❑ Three technologies
  - Packages
  - Ports
  - Tar ball
- ❑ 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*
- ❑ Tar ball
  - 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 ports collection
  - 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
    - By default invoking either of pkg install or pkg upgrade will cause repository catalogues to be updated automatically
  - Perform dependency check
    - Will install software that required by new software

Package System (2)

- ❑ Upgrade currently installed software
  - pkg upgrade <*names of packages…*>
    - ➢ pkg upgrade vim
  - pkg upgrade
    - ➢ Upgrade all installed software
  - This will also update the database
- ❑ Update packages database only
  - pkg update
- ❑ Delete a package
  - pkg delete <*names of packages*>
    - ➢ pkg delete php53
- ❑ Search
  - pkg search <keyword>
  - Search package repository catalogues

Package System (3)

- Show information about installed packages
  - pkg info
    - Show all installed packages
    - Use ‘grep’ to find specific packages
      - 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

```
nctucs [~] -lctseng- pkg version -v
bash-4.3.46_1                <   needs updating (remote has 4.4.12_2)
bind99-9.9.9P8_1             <   needs updating (remote has 9.9.10P3)
ca_root_nss-3.32             =   up-to-date with remote
```

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 tar ball
- Ask for configuration friendly
- Compile the source code
- Install your application

❑ Deinstall process

Obtaining the Ports Collection (1/2)

❑ portsnap(8)

- Fetch and update your port tree
- fetch, extract, update, cron
- sudo portsnap fetch extract update
- /etc/portsnap.conf
  - ➢ sudo vim /etc/portsnap.conf
  - ➢ SERVERNAME=portsnap.tw.FreeBSD.org

- https://www.freebsd.org/doc/en_US.ISO8859-1/books/handbook/ports-using.html

Obtaining the Ports Collection (2/2)

❑ svn(1) / svnlite

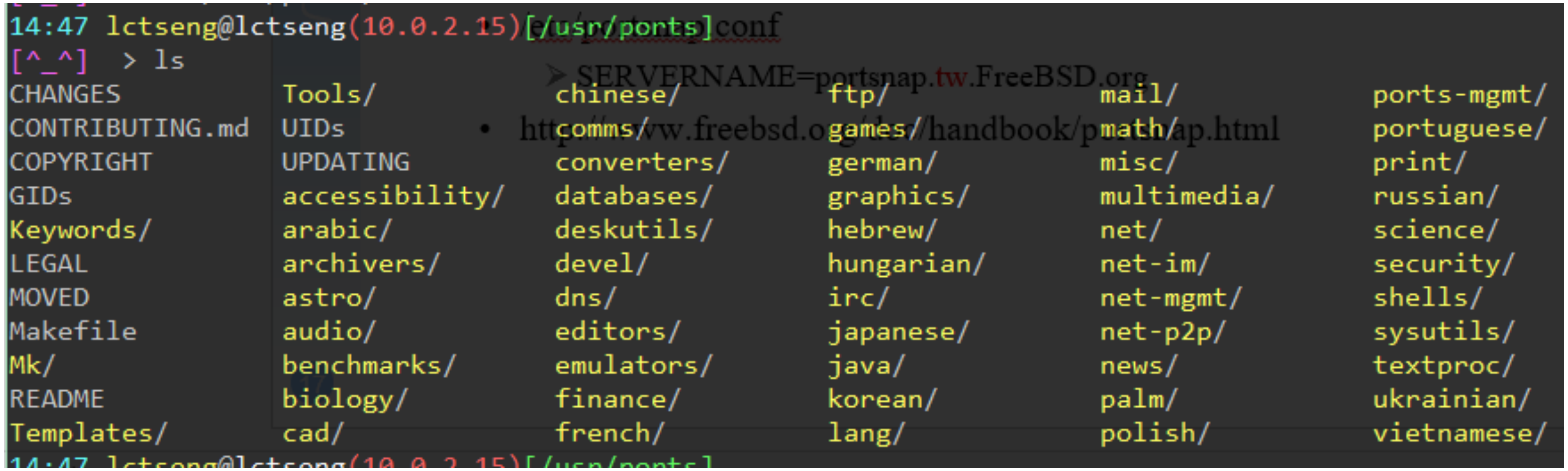
- Install Root SSL certificates to allows Subversion to verify the identity of HTTPS repository servers
  - ➢ pkg install ca_root_nss
- Checkout from a given repository
  - ➢ svn checkout https://svn.FreeBSD.org/repository/branch lwcdir
    - – sudo svn checkout https://svn.FreeBSD.org/ports/head /usr/ports
- Update the local working copy
  - ➢ svn update lwcdir
    - – sudo svn update /usr/ports

- https://www.freebsd.org/doc/handbook/svn.html

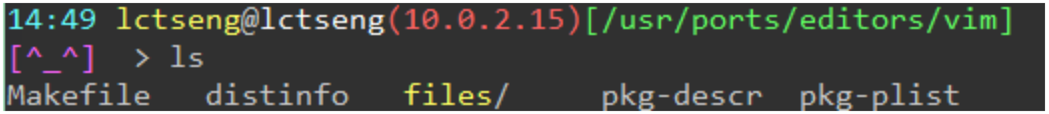
Obtaining the Ports Collection

❑ 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
```

Ports system (1)

❑ Find your application

- cd /usr/ports
- make search name=program name
- make search key=string

```
nctucs [/usr/ports] -lctseng- make search name=zh-mutt
Port:   zh-mutt-devel-1.5.20_20090629
Path:   /usr/ports/chinese/mutt
Info:   The Mongrel of Mail User Agents with Chinese support
Maint:  rafan@FreeBSD.org
B-deps: autoconf-2.62 autoconf-wrapper-20071109 automake-1.10.1 automake-wrapper-20071109
gettext-0.17_1 libiconv-1.13.1 m4-1.4.13,1 perl-5.8.9_3 zh-autoconvert-0.3.16
R-deps: gettext-0.17_1 libiconv-1.13.1 mime-support-3.46.1 zh-autoconvert-0.3.16
WWW:    http://www.mutt.org/
```

Ports system (2)

- psearch(1)
  - Simple but useful tool to find ports
  - ports-mgmt/psearch
    - Install it before you use
  - psearch *<name of port>*
    - psearch vim

```
nctucs [~] -lctseng- psearch vim
audio/vitunes            Curses-based media player with vim-like keybinds
devel/clewn              Clewn provides Gdb support within Vim
devel/p5-Shell-EnvImporter Inherit different shell environments and restore previous
editors/cream            Gvim extension with many features
editors/neovim            Next generation Vim
editors/p5-Vimana          Vim script manager
editors/vim             Improved version of the vi editor
editors/vim-lite         Improved version of the vi editor (lite package)
…
```

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?=    \
      http://FreeBSD.cs.nctu.edu.tw/distfiles/${DIST_SUBDIR}/
MASTER_SITE_OVERRIDE?=  ${MASTER_SITE_BACKUP}
```

- ❑ 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 have 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
    - ➢ Disable dependency check
      - – -f : force
      - – pkg delete -f <names of packages>
  - 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

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

- Install or upgrade a port
  - portmaster <category>/<name>
    - portmaster sysutils/lsof
  - /usr/ports/UPDATING
    - Read before attempting any port upgrades!!!
- 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

```
nctucs [~] -lctseng- pkg audit
lynx-2.8.8.2_3,1 is vulnerable:
lynx -- multiple vulnerabilities
CVE: CVE-2016-9179
CVE: CVE-2014-3566
WWW: https://vuxml.FreeBSD.org/freebsd/03532a19-d68e-11e6-9171-
14dae9d210b8.html
```

Try to install from ports

- screen, tmux
- vim, emacs
- mutt
- wget, curl
- lftp
- lynx, w3m
- expect
- zh-telnet
- zsh, bash