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HAPPY LEC GRADUATION

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Contents

Chapter 1

Linux Basic

1 Boot Sequence

1. The process of the computer booting is:

1) The user presses the power button.
2) CPU jumps to BIOS in ROM.
3) BIOS runs a hardware test (POST).
4) If POST fails, booting stops.
5) If POST succeeds, the partition table is loaded.
6) Bootloader loads OS kernel into RAM.
7) Control handed over to OS kernel.

2. After the BIOS has loaded and performed the hardware test (POST), the boot-loader presents you with a menu or options to choose from the available operating systems installed on the system.

3. Here are a few approaches to deal with the bootloader situation:

1) Manual bootloader configuration:

   During the installation process of the second operating system, you can choose to manually configure the bootloader. This allows you to specify the installation location and prevent overwriting the existing bootloader. By configuring the

bootloader appropriately, you can ensure that both systems are recognized and available for selection during boot.

2) Bootloader software:

   You can use third-party bootloader software such as GRUB (Grand Unified Bootloader) or EasyBCD (for Windows systems) to manage the dual-boot configuration. These tools provide user-friendly interfaces for configuring and selecting different operating systems at startup.

3) Bootloader repair:

   In some cases, installing a new operating system may overwrite the existing bootloader, causing the original system to be inaccessible. To address this, you can use a bootable USB or DVD with a bootloader repair tool (e.g., Boot-Repair for Linux) to restore the bootloader and regain access to the original system.

2 Basic Commands

1. Two directories that exist in every directory are:

   1) "." (dot):

      This directory represents the current directory. It is used to refer to the directory itself.

   2) ".." (double dots):

      This directory represents the parent directory. It is used to refer to the directory's parent or the directory one level up in the file system hierarchy.

2. To jump to the previous level of the directory:

```
cd ..
```

3. To jump between two directories:

```
cd -
```

By using "cd -" repeatedly, you can keep switching back and forth between two directories without having to specify their full paths each time.

4. "Hidden file" or "Hidden directory" is a file or directory whose name begins with a dot (".") character. These files and directories are typically used to store configuration settings, sensitive data, or files that are not intended to be directly accessed or modified by regular users.

To find hidden files and directories, you can use these methods:

   1) Command Line:

```
ls -a
ls --all
```

2) File Managers:

   Graphical file managers, such as Nautilus (GNOME), Dolphin (KDE), or Thunar (Xfce), usually have the option to display hidden files and directories. This option is typically available in the "View" menu or can be activated using a keyboard shortcut (e.g., Ctrl+H).

3) Find Command:

   You can use the "find" command with the "-name" option to search for specific hidden files or directories.

   For example:

```
find . -type d -name ".*"
```

5. To check the permissions of a directory or file:

(using the "cd" command if necessary)

```
ls -l filename/directory
```

The permissions are represented by a combination of letters and symbols, typically in the format "rwxrwxrwx" or "-rwxrwxrwx". Each set of three characters represents the permissions for the owner, group, and other users, respectively. (r: read, w: write, x: execute)

6. To solve the error "permission denied":

1) Verify permissions:

   Use the "ls -l" command to check the permissions of the file or directory in question.

   If needed, you may need to contact the owner or administrator to request permission changes.

2) use "sudo":

```
sudo command
```

3) Change ownership or permissions:

   You can modify its ownership or permissions using the "chown" (change ownership) or "chmod" (change permissions) commands, respectively.

4) Access control lists (ACLs):

   You can use the "getfacl" and "setfacl" commands to view and modify ACLs, respectively.

5) Verify file/directory attributes:

   Sometimes, the "permission denied" error may be caused by special attributes or flags set on the file or directory. You can use the "lsattr" command to check for such attributes. If you find any unexpected attributes, you can use the "chattr" command to modify or remove them, if appropriate.

6) Check file system permissions:

   If the "permission denied" error occurs on a specific file or directory, it is also worth checking the permissions of the parent directories in the file system hierarchy. Ensure you have appropriate permissions on all relevant directories leading up to the file or directory.

7) Troubleshoot other factors:

   Sometimes, "permission denied" errors can be caused by factors other than file permissions, such as disk space limitations, SELinux or AppArmor restrictions, or specific application restrictions.

7. To add execution permission to the current user:

(using the "cd" command if necessary)

```
chmod +x filename
```

("x" represents the execution permission itself.)

8. Shell:

In the context of computing, a shell refers to a program that acts as an interface between the user and the operating system. It provides a command-line environment where users can interact with the operating system by entering commands and receiving corresponding output.

The Onion Chart analogy is often used to explain the concept of a shell. It represents the layers of an onion, where each layer represents a shell or command-line interface with varying levels of complexity and functionality. The outermost layer, which is the simplest and provides basic functionalities, is called the "kernel shell" or "Bourne shell" (sh). As you move towards the inner layers, you encounter more advanced and feature-rich shells like the C shell (csh), Bourne-Again shell (bash), Korn shell (ksh), and the Z shell (zsh).

9. The three types of Shell are:

1) Bourne Again shell (bash)
2) C shell
3) Korn shell (ksh)

10. The configuration file for Bash is typically named ".bashrc". It is a shell script that is executed each time a new interactive Bash shell is started. The ".bashrc" file resides in the user's home directory.

11.

1) Use the "export" command to add the variable and its value.

```
export VARIABLE_NAME=variable_value
```

2) The variable is now added to the current shell session. If you want the variable to be available in subsequent sessions, you can add the "export" command to your shell's configuration file, such as ".bashrc" for Bash.

3) To print the value of an environment variable, you can use the "echo" command followed by the variable name.

```
echo $VARIABLE_NAME
```

12.

No, when you type export "NAME=Rey" in the terminal, the environment variable "NAME" is not permanent by default. It is only available for the current session or shell.

To make the environment variable persistent:

1) Open ".bashrc"

```
nano ~/.bashrc
```

2) Scroll to the bottom of the file and add the line "export NAME=Rey".

3) Save the file and exit the text editor (if in nano, press Ctrl+X, then Y, and Enter).

4) To apply the change to the current session:

```
source ~\.bashrc
```

13. To make something happen automatically every time you open the terminal, you can add a command or script to the shell's initialization file. In the case of Bash, you can add the command to the .bashrc file in your home directory.

To make a cow say "hello":

1) Install the "cowsay" package.

```
sudo apt-get install cowsay
```

2) Open the ".bashrc" file in a text editor.

```
nano ~/.bashrc
```

3) Scroll to the bottom of the file and add the following line:

```
cowsay "hello"
```

4) Save the file and exit the text editor.

5) Apply the changes:

```
source ~/.bashrc
```

14. To check your IP address:

Using the "IP" or "ifconfig" command.

```
ip addr show
ifconfig
```

3 VPN Matters

1.

It is a software program that provides a graphical user interface (GUI) for managing Clash, which is a rule-based network traffic proxy tool. Clash itself is typically used on command-line interfaces or as a configuration file-based proxy solution.

Regarding compatibility, "Clash for Windows" is primarily developed for the Windows operating system, hence the name. It provides an easy-to-use interface for configuring and controlling the Clash proxy on a Windows system. However, it's worth noting that Clash itself is not exclusive to Windows and can be used on other operating systems like Linux and macOS through command-line interfaces or other compatible software implementations.

2.

1) Linux:

   Clash.for.Windows-0.20.23-arm64-linux.tar.gz

   OR

   Clash.for.Windows-0.20.23-x64-linux.tar.gz

2) MAC:

   Clash.for.Windows-0.20.23-arm64-mac.7z

   OR

   Clash.for.Windows-0.20.23-mac.7z

3) Jeston Nano:

   Clash.for.Windows-0.20.23-arm64-linux.tar.gz

3. To make the Firefox use CFW:

1) "Setting" $\rightarrow$ "Connection Setting" $\rightarrow$ " Manual proxy configuration"

2) In the "HTTP Proxy" and "HTTPS Proxy" fields, enter "localhost" or the IP address of your local machine if the proxy server is running on a different machine.

3) In the "Port" field, enter "7890" or the port number on which your proxy server is running.

4) Click "OK"

4.

```
export http_proxy=http://username:password@localhost:7890
export https_proxy=http://username:password@localhost:7890
```

If you want to make it persistent across multiple sessions, you can add the export statement to your shell's configuration file (e.g. ".bashrc" for Bash) in your home directory.

5.

In such a scenario, it is not possible for someone else to directly use your VPN without having access to your VPN credentials or configuration.

To use a VPN, you typically need to have the following information:

1) VPN Server Address:

   The IP address or domain name of the VPN server.

2) VPN Protocol:

   The type of VPN protocol used, such as OpenVPN, IKEv2, or WireGuard.

3) VPN Authentication: The username and password or other credentials required to authenticate with the VPN server.

6. To use VPN in WindowsOS computer:

1) Install a VPN Client
2) Launch the VPN Client
3) Log in or Create an Account
4) Connect to the VPN Server

4 Conda Matters

1. (Using anaconda as an example

1) Windows:

   a. Visit the Anaconda website: https://www.anaconda.com/products/individualwindows
   b. Download the Anaconda installer for Windows.
   c. Choose the option to "Add Anaconda to my PATH environment variable" during the installation process.

2) Linux:

   a. Visit the Anaconda website: https://www.anaconda.com/products/individuallinux
   b. Download the Anaconda installer for Linux.
   c.

```
chmod +x Anaconda3-latest-Linux-x86_64.sh
./Anaconda3-latest-Linux-x86_64.sh
```

2. Using the "base" environment in Conda directly is generally not recommended for several reasons:

1) Risk of Package Conflicts:

   The "base" environment is the default environment created during the Conda installation. Installing packages directly into the "base" environment can lead to conflicts between different packages, especially when different projects or applications require different versions of the same package.

2) Difficulty in Managing Dependencies:

   Installing packages directly into the "base" environment can make it challenging to manage the dependencies of different projects or applications. It becomes difficult to isolate and maintain separate sets of packages and their dependencies, leading to potential compatibility issues.

3) Potential System Instability:

   Modifying the "base" environment can have an impact on the stability of your system. If a critical package or system component in the "base" environment gets corrupted or conflicts with other packages, it can disrupt the functioning of your entire system.

3. To create a new Conda environment with a specific Python version:

```
conda create --name myenv python=3.9
conda activate myenv
```

4. To list all existing Conda environments:

```
conda env list
conda info --envs
```

5. To enter a specific Conda environment every time you open a terminal:

1)
```
conda activate myenv
```

2) Open ".bashrc" or ".zshrc"

3)
```
conda activate /path/to/myenv
```

4) Save and close

5)
```
source ~/.bashrc
//or
source ~/.zshrc
```

6.

1) Use Virtual Environments
2) Use a Package Manager
3) Specify Dependencies

4) Use Version Control
5) Document Dependencies
6) Update Packages Regularly
7) Test Compatibility
8) Use a Package Index
9) Document Package Usage
10) Consider Package Licensing

5 VIM Matters

1.

1) ":q" to quit
2) ":wq" to write the changes and exit
3) ":q!" to quit without any changes

2.

1) "h" to move left
2) "j" to move down
3) "k" to move up
4) "l" to move right
5) "w" to move to the beginning of the next word
6) "b" to move to the beginning of the previous word
7) "e" to move to the end of the current word
8) "0" to move to the beginning of the current line
9) "$" to move to the end of the current line
10) "gg" to move to the first line of the file
11) "G" to move to the last line of the file
12) "Ctrl + f" to move forward one page
13) "Ctrl + b" to move backward one page
14) "/" followed by a search term and Enter to search forward in the file
15) "?" followed by a search term and Enter to search backward in the file
16) "n" to jump to the next occurrence of the search term
17) "N" to jump to the previous occurrence of the search term

3. Press the "i" key to enter insert mode.

4. Press "gg" to the first line

Press "G" to the end

5. Press the "dw" command while in command mode to delete a word

Press the "cw" command while in command mode to change a word

Difference: Deleting a word (dw) removes the word without entering insert mode, while changing a word (cw) deletes the word and puts you into insert mode for replacing it with new text.

6. Press "dd" in command mode to delete a whole line

7. Press ":1,$d" in command mode

8.
Press "yw" to copy the current word

Press "yy" to copy the current line

press "p" to paste the copied text after the cursor

press "P" to pause before the cursor

9. Place the cursor at the beginning of the block you want to select.

Press "Ctrl + v" to enter visual block mode. This mode allows you to select a rectangular block of text.

Use the arrow keys or movement commands to select the desired block of text. The selected area will be highlighted.

Once the block is selected, press "y" to yank (copy) the selected block.

Move the cursor to the desired location where you want to paste the copied block.

Press "p" while in command mode to paste the copied block after the cursor. If you want to paste before the cursor, use "P" instead.

10. Press "u" in command mode to undo the last action or change

11. Press "Ctrl + r" in command mode

12. Being used. 

Chapter 2

Latex Basics

1 Commands

1.

```
\textbf{}
\bfseries
Ctrl + B
```

2.

```
\underline{}
```

3.

```
\textit{}
\itshape
Ctrl + I
```

4.

```
$...$
```

5.

```
\begin{enumerate}
    \item First item
    \item Second item
    \item Third item
\end{enumerate}
```

6.

```
\usepackage{graphicx}
\includegraphics[]{image_filename}
```

7.

```
\usepackage{geometry}
\geometry{left=2cm, right=2cm, top=2cm, bottom=2cm}
```

8.

```
\begin{tabular}{|c|c|c|}
    \hline
    \multicolumn{3}{|c|}{Table Heading} \\
    \hline
    Column 1 & Column 2 & Column 3 \\
    \hline
    Row 1, Cell 1 & Row 1, Cell 2 & Row 1, Cell 3 \\
     Row 2, Cell 1 & Row 2, Cell 2 & Row 2, Cell 3 \\
    \hline
\end{tabular}
```

9.

```
\documentclass{article}

\begin{document}

\section{Section Title}

Section content goes here.

\end{document}
```

10.

```
\usepackage[style=authoryear, backend=biber]{biblatex}
\addbibresource{references.bib}

According to \cite{author2023}, this is some information.

\printbibliography
```

11.

```
{\Large This is larger text.}
```

```
\usepackage{xcolor}
...
\textcolor{red}{This is red text.}

\usepackage{xcolor}
...
\color{blue}
```

12.

```
This is some text with a footnote.\footnote{This is the content of the
```

13.

```
\begin{enumerate}
    \item First item
    \item Second item
    \begin{enumerate}
        \item Subitem 1
        \item Subitem 2
        \begin{itemize}
            \item Subsubitem a
            \item Subsubitem b
        \end{itemize}
    \end{enumerate}
    \item Third item
\end{enumerate}
```

2 Sort Following Hierarchical Concepts From Highest To Lowest

Chapter

Section

Subsection

Subsubsection

Paragraph

3 Multiple Choice

1. I don't see any options other than B.

2. B

3. D

4. C

5. A

6. B

Chapter 3

Love Basics

1 SAQ

1. 12.26 (I have memorized)

2. Appendices

3. /'eksit/

4. I didn't care about the song, my attention was on President Lei.

5. D1001

6. $\binom{3}{2}$ (Not including me)

7. President Lei (convinced)

8. 17th day of the 3rd lunar month

9. Netherlands

10. Learning Linux (not playing badminton of course)

11. Advanced Technology for Financial Computing (I hope I remember correctly)

12. Jeston Nano

13. Catching the ball with the hand (100% hit rate)

14. "That person made a difference to me" (that's probably what it means)

15. Xiangyu Cui

2 Judgement Question

1. False

2. False (Cilantro is the most sinful species in the world)

3. Of course

4. False!

5. True

6. True

7. Of course!