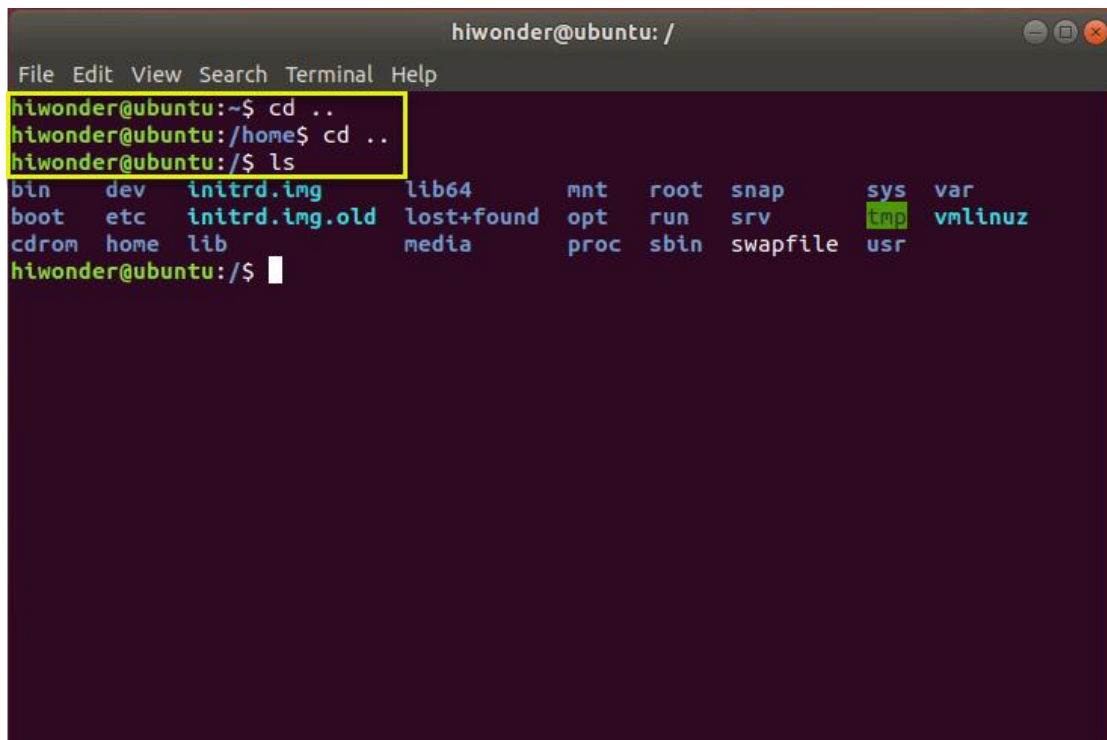


Lesson 5 Linux Directory Introduction

System directory refers to the directory where the major files of the operating system are stored. The files in the directory has direct influence on the normal function of the system. Therefore, having a basic understanding of these directories will facilitate your usage.

1. Open System Directory

Input “**cd ..**” twice and “**ls**” once in sequence in virtual machine. Note: there is space between “**cd**” and “**..**” , and press **Enter** whenever you finishing inputting.



```

hiwonder@ubuntu: /
File Edit View Search Terminal Help
hiwonder@ubuntu:~$ cd ..
hiwonder@ubuntu:/home$ cd ..
hiwonder@ubuntu:/$ ls
bin    dev    initrd.img  lib64    mnt    root    snap    sys    var
boot  etc    initrd.img.old  lost+found  opt    run    srv    tmp    vmlinuz
cdrom  home  lib         media     proc   sbin   swapfile  usr
hiwonder@ubuntu:/$

```

System directory of Linux refers to the following folders in red frame. Linux’s operating system is completely built upon files and file system. Any information is stored in the form of file and defined by file name and storing path.

Linux’s directory is in the form of dendrogram, and “/” represents the root,

which is also considered as root directory.

```
hiwonder@hiwonder-virtual-machine:/$ ls
bin    dev    initrd.img  lib64    mnt    root  snap    sys    var
boot  etc    initrd.img.old  lost+found  opt    run   srv      tmp    vmlinuz
cdrom  home  lib         media    proc   sbin  swapfile  usr    vmlinuz.old
```

2. Check System Directory

We can check the system directory on Linux through command. For clear demonstration and better understanding, check the system directory in the form of dendrogram.

Input “**sudo apt-get install tree**” command and install the software package.

```
hiwonder@ubuntu:~$ sudo apt-get update
Hit:1 http://mirrors.aliyun.com/ubuntu bionic InRelease
Hit:2 http://mirrors.aliyun.com/ubuntu bionic-updates InRelease
Hit:3 http://mirrors.aliyun.com/ubuntu bionic-backports InRelease
Hit:4 http://mirrors.aliyun.com/ubuntu bionic-security InRelease
Get:5 http://mirrors.aliyun.com/ubuntu bionic/universe i386 Packages [8,531 kB]
Get:6 http://mirrors.aliyun.com/ubuntu bionic/universe amd64 Packages [8,570 kB]
Get:7 http://mirrors.aliyun.com/ubuntu bionic/universe Translation-en [4,941 kB]
Get:8 http://mirrors.aliyun.com/ubuntu bionic/universe amd64 DEP-11 Metadata [3,287 kB]
Get:9 http://mirrors.aliyun.com/ubuntu bionic/universe DEP-11 48x48 Icons [2,151 kB]
Get:10 http://mirrors.aliyun.com/ubuntu bionic/universe DEP-11 64x64 Icons [8,420 kB]
Get:11 http://mirrors.aliyun.com/ubuntu bionic/multiverse amd64 Packages [151 kB]
Get:12 http://mirrors.aliyun.com/ubuntu bionic/multiverse i386 Packages [144 kB]
Get:13 http://mirrors.aliyun.com/ubuntu bionic/multiverse Translation-en [108 kB]
Get:14 http://mirrors.aliyun.com/ubuntu bionic/multiverse amd64 DEP-11 Metadata [49.7 kB]
Get:15 http://mirrors.aliyun.com/ubuntu bionic/multiverse DEP-11 48x48 Icons [8,931 B]
```

Note: if the message below is threw, the installation ends in failure.

```
hiwonder@ubuntu:~$ sudo apt-get install tree
Reading package lists... Done
Building dependency tree
Reading state information... Done
E: Unable to locate package tree
```

Input command "**sudo apt-get update**" to update the source.

```
hiwonder@ubuntu:~$ sudo apt-get update
Hit:1 http://mirrors.aliyun.com/ubuntu bionic InRelease
Hit:2 http://mirrors.aliyun.com/ubuntu bionic-updates InRelease
Hit:3 http://mirrors.aliyun.com/ubuntu bionic-backports InRelease
Hit:4 http://mirrors.aliyun.com/ubuntu bionic-security InRelease
Get:5 http://mirrors.aliyun.com/ubuntu bionic/universe i386 Packages [8,531 kB]
Get:6 http://mirrors.aliyun.com/ubuntu bionic/universe amd64 Packages [8,570 kB]
Get:7 http://mirrors.aliyun.com/ubuntu bionic/universe Translation-en [4,941 kB]
Get:8 http://mirrors.aliyun.com/ubuntu bionic/universe amd64 DEP-11 Metadata [3,287 kB]
Get:9 http://mirrors.aliyun.com/ubuntu bionic/universe DEP-11 48x48 Icons [2,151 kB]
Get:10 http://mirrors.aliyun.com/ubuntu bionic/universe DEP-11 64x64 Icons [8,420 kB]
Get:11 http://mirrors.aliyun.com/ubuntu bionic/multiverse amd64 Packages [151 kB]
Get:12 http://mirrors.aliyun.com/ubuntu bionic/multiverse i386 Packages [144 kB]
Get:13 http://mirrors.aliyun.com/ubuntu bionic/multiverse Translation-en [108 kB]
Get:14 http://mirrors.aliyun.com/ubuntu bionic/multiverse amd64 DEP-11 Metadata [49.7 kB]
Get:15 http://mirrors.aliyun.com/ubuntu bionic/multiverse DEP-11 48x48 Icons [8,931 B]
```

After update, input command "**sudo apt-get install tree**" to install again.

After installation, we can use tree related commands to check the directory.

tree: Display all files in the form of dendrogram.

tree -L N: All folders are displayed in the form of dendrogram, and Nth layer of the subfolders will be displayed. (There is a space between "**tree**" and "-", and between "**L**" and "**N**". N needs to be replaced by a specific number which indicates the layer of folder.)

3) Enter the "**tree -L 1**" command to display the subfolders to the first layer, as shown in the figure below. The Windows system also adopts dendrogram, but it takes disk as root partition. The C disk and D disk are equivalent to the first layer of subfolders.

For Linux systems, "/" is equal to integrate disk which is divided into several partitions such as "/etc", "/dev", and "/lib".

```
hiwonder@hiwonder-virtual-machine:/$ tree -L 1
.
├── bin
├── boot
├── cdrom
├── dev
├── etc
├── home
├── initrd.img -> boot/initrd.img-5.4.0-113-generic
├── initrd.img.old -> boot/initrd.img-5.4.0-84-generic
├── lib
├── lib64
├── lost+found
├── media
├── mnt
├── opt
├── proc
├── root
├── run
├── sbin
├── snap
├── srv
├── swapfile
├── sys
├── tmp
├── usr
├── var
├── vmlinuz -> boot/vmlinuz-5.4.0-113-generic
└── vmlinuz.old -> boot/vmlinuz-5.4.0-84-generic

22 directories, 5 files
hiwonder@hiwonder-virtual-machine:/$
```

The function of each directory is listed below.

| Directory | Function |
|-----------|---|
| bin | Store commonly used Linux commands |
| boot | Store Linux's startup file. |
| dev | Store Linux's external device |
| etc | Store various configuration files and sub directories required by system management |
| home | Store home directory |

| | |
|-------|--|
| lib | Store dynamic link shared libraries. |
| media | Provide conventional mount points for all removable devices. |
| mnt | Mount point for temporary files. |
| proc | Store information about system resources. |
| root | Home directory of the root user. |
| sbin | Store non-essential and unimportant system binary files and network application tools in the system. |
| sys | Store kernel, firmware and system files. |
| tmp | Store temporary files. |
| usr | Store user documents, games, graphics files, libraries, other user, management commands and files. |
| var | Store the frequently modified directory. |