

C

Frequently Asked Questions (FAQ)

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How to register ThoTh Lab as the first-time user?

Answer: ThoTh lab users first need to go to <https://www.thothlab.com>, click on **Enter** and follow the link at “Register a new membership” to register as a new ThoTh lab user, or directly access the link <https://www.thothlab.com/register> to register a new account. Once registered, an email from thethothlab@gmail.com with the content presented in Figure C.2.

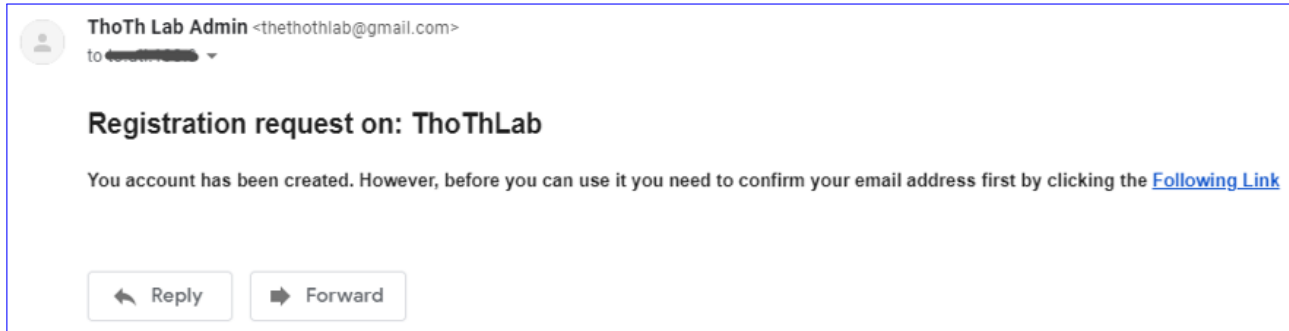


Figure C.2
Registration email content.

You should first active your account by clicking on the [Following link](#) in the email, and you will be redirected to a web page shown in Figure C.3.

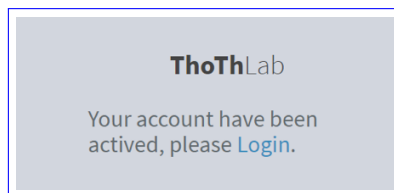


Figure C.3
ThoTh Lab account is activated.

Then, you may use the login <https://www.thothlab.com/login>. After the first time login, you will be redirect to user profile page as shown in Figure C.4. Then, you will need to provide your name and other basic information for setting up your user’s profile.

If you account is created by your instructor, then you may receive an invitation email from ThoTh lab:

```

Hello!
Your account on ThoTh Lab (www.thothlab.com) have been created for you.

Your ThoTh Lab username is:

touti1988@gmail.com

Please click on the button below to set password for your account.

Set Password

Warning: The link for updating password will only be valid for 12 hours. After that,
please use https://www.thothlab.com/password/reset to create your password.
  
```

Figure C.4
ThoTh Lab User Profile.

Regards,
ThoThLab

Then follow the instruction to set up your account.

What is my keyboard does not work?

Answer: After click on the blue bar, if the VM still cannot take the control of your keyboard, i.e., no response after typing, you may want to restart the VM first. If it still does not work, please contact your system admin.

What if typing a letter generates repeated characters?

Answer: When connecting ThoTh lab through Wi-Fi and network experiencing long latency, you may experience keyboard character repeating problem. This is due to the remote access timeout caused by a long delay due to long network latency. To address this problem, you can use on campus network computer with fixed network to reduce the delay. Additionally, you can change the keyboard setting in VM. For example, when using Ubuntu, you can go to setting and click on keyboard, and uncheck the *repeat key* option). However, this approach will disable your holding a key for continuously input the same character.

In CLI mode, you can issue the following command to disable the key repeating feature:

```
$ sudo setterm -repeat off % disable the key repeating feature; to enable it
"-repeat on"
```

How to copy documents/files from the VM?

Answer: The remote access does not allow you to copy&paste from the VM console to your local computer. One approach to send the file directly from the VM is to open a web storage such as Dropbox, Google Drive, or any other network-based storage/editing services with web portals. Once connected, you can upload files into your shared storage. This solution requires the VM has the Internet access to the public storage services.

How to make the workspace full screen?

Answer: There is no a full screen mode for the remote desktop. However, you can increase the view size of the remote desktop area by click on the red circled area to reduce the width of the left menu bar or you can close the lab description. As shown in Figure C.5, you can also drag the separation bar between the description window and remote desktop window to increase or reduce the windows' size. To resume the lab description window if it is closed, you can click on the *Show Task* button shown on top of the workspace window to resume the project description window.

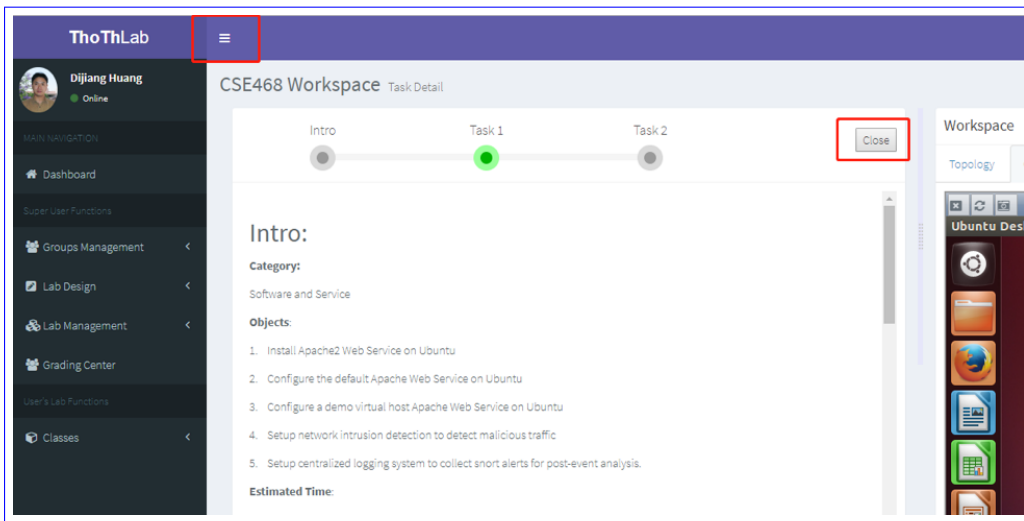


Figure C.5

How to change the workspace area size.

How to change the resolution of VM display with GUI?

Answer: Sometime, you might want to enlarge or reduce the display window size of your VM. It is up to how the OS of the VM to manage the screen resolution. For example, in Ubuntu, you can issue the following commands in command-line with root privilege to change the display resolution that suitable for your local computer's screen size.

```
$ xrandr --current % show existing available display resolution setup
$ xrandr --size 4:3 % change the ratio of the display
$ xrandr --size 1280x800 % change the display resolution based on an existing
  availabe setup
```

How to change the resolution of VM display with CLI mode only?

Answer: For CLI only, you need to modify the grub file to change the resolution setting and restart the VM.

```
$ vim /etc/default/grub % open the grub file and change the set up, e.g.,
GRUB_GFXPAYLOAD_LINUX=1024x768. Available resolutions such as 640x480 800x600
1024x768 1280x960 1600x1200 1920x1200
$ sudo update-grub
$ reboot
```

Note that after you reboot your machine, you may lost all you temporary setup, e.g., default gateway, IP forwarding, etc.

How to enable multiple CLI interfaces in the CLI mode?

Answer: In a CLI only mode (server mode), you may want to enable multiple CLI interfaces. To enable this feature, you can use "screen" app.

```
$ screen --version % run screen app and check and see if screen is running.
$ sudo apt-get install screen % install screen if the system does not have it.
$ screen % run screen
```

Create Multiple Windows:

After running screen, you can use the following short-key to enable various screen features.

- **Ctrl+a c** Create a new window (with shell)
- **Ctrl+a "** List all window
- **Ctrl+a p** Switch to previous window
- **Ctrl+a n** Switch to next window
- **Ctrl+a 0** Switch to window 0 (by number 0-9)
- **Ctrl+a A** Rename the current window
- **Ctrl+a w** Show window list. The status bar lists windows.
- **exit** exit current shell will close current window
- **Ctrl+a k** Kill the current window if it halts

Screen manages a session consisting of one or more windows each containing a shell or other program. Furthermore, screen can divide a terminal display into multiple regions, each displaying the contents of a window.

Create Multiple Regions:

GNU screen can also divide the terminal display into separate regions, each providing a view of a screen window. This allows you to view 2 or more windows at the same time. To split the terminal horizontally, type the command **Ctrl+a S**, to split it vertically, type **Ctrl+a |**. Newly created regions are empty (i.e., they are not associated with a window). To display a window in a region, first move the focus to the new region by typing **4 Tab** and then either create a new window.

- **Ctrl+a S** Split current region horizontally into two regions

- **Ctrl+a |** Split current region vertically into two regions
- **Ctrl+a tab Switch** the input focus to the next region
- **Ctrl+a Ctrl+a** Toggle between the current and previous region
- **Ctrl+a Q** Close all regions but the current one
- **Ctrl+a X** Close the current region

Copy & Paste:

To enable copy & paste between windows, first, you need to enter what is called scrollback mode. In this mode, *screen* allows the text cursor to move freely throughout the current window and through the contents of the scrollback buffer, which contains previous contents of the window.

You can start scrollback mode by typing **Ctrl+a [**. In scrollback mode, we can use the arrow keys and the Page Up and Page Down keys to navigate the scrollback buffer. To copy text, you first need to mark the beginning and end of the text we want to copy. This is done by moving the text cursor to the beginning of the desired text and pressing the **space** bar. Next, we move the cursor to the end of the desired text (which is highlighted as we move the cursor) and press the **space** bar again to mark the end of the text to be copied. Marking text exits scrollback mode and copies the marked text into the *screen*'s internal buffer. We can now paste the text into any screen window. To do this, we go to the desired window and type **Ctrl+a]**.

The following command will show all *screen* commands.

- **Ctrl+a ?** List all Screen commands

An alternative of *screen* is *tmux*. You can refer to more details at http://linuxcommand.org/lc3_adv_termmux.php.

How to transfer in/out files to the CLI only VMs?

When connecting to ThoTh Lab VM via noVNC web portal, there are no copy & paste features. In addition, you cannot transfer files into and out from the VM directly. To address these issues, here are work-around.

Transferring files into VM

Transferring files into VM is relatively straightforward. Suppose you have a file “copypaste.txt” on your dropbox folder *Temp*. You can right-click on it in your local dropbox folder and copy the dropbox link from it, which is shown in Figure C.6.

You can past the link url in one of you text editor, such as:

```
https://www.dropbox.com/s/9x159it3r0szgc9/copypaste.txt?dl=0
```

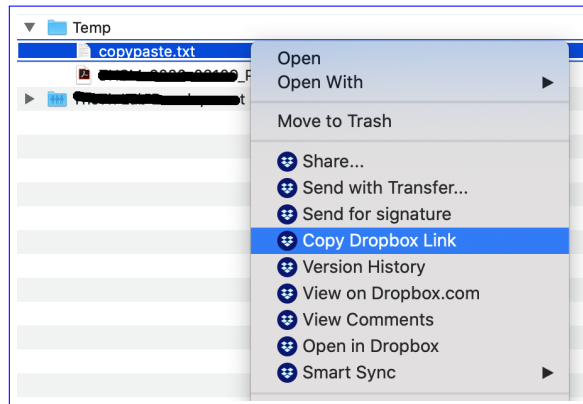
You can download the file by using either *wget* or *curl* from your CLI-mode VM:

```
$ wget -O copypaste.txt
  https://www.dropbox.com/s/9x159it3r0szgc9/copypaste.txt?dl=0
$ curl -L https://www.dropbox.com/s/9x159it3r0szgc9/copypaste.txt?dl=0 -output
  copypaste.txt % -L option allows curl to download through a redirected link.
```

Once downloaded, you can open the use of any text editor in the VM such as *vim* to open it. Also, please refer to the previous question on *screen* "copy & past" to copy and paste texts from a file to your desired target in the CLI.

Transferring files out from the VM

Transferring a file from the VM to your local computer is a bit tricky since it is not easy to transfer it directly. A common approach is to transfer the file indirectly by using a third-party storage service. For example, you can temporally transfer the file to **file.io** and then later download it from your local computer after

**Figure C.6**

How to get dropbox link.

the transferring finished. Assume that you have a file *test.txt* in your VM, then, the procedure is highlighted as follows:

```
$ curl -F "file=@test.txt" https://file.io % You can change the file name as you
    need to transfer any file
```

The output of the above command can be:

```
{"success":true,"key":"bRSwb7hw38VZ","link":"https://file.io/bRSwb7hw38VZ","expiry":"14
    days"}
```

Then you can open your local browser input the url:

```
https://file.io/bRSwb7hw38VZ
```

or, you can download it use *webget* to download it:

```
$ webget https://file.io/bRSwb7hw38VZ
```

How to permanently set up DNS server, and default GW IP addresses on Ubuntu 18.04?

On Ubuntu 18.04, the network configuration is managed by a new network tool: netplan. Note that in ThoTh lab, the system provides DHCP service to assign your VMs IP addresses and default gateway. You can change your system assigned IP addresses, however, you may lose some networking capabilities since ThoTh lab resource management cannot recognize the IP address and MAC address mapping in the system. Thus, you can only change the system from a dynamic DHCP supported system to a “Static” manually configured system with the same IP address assigned on each interface. To avoid any potential networking issues, you need to record your DHCP assigned IP address and use netplan to change it from dynamic to static with the same IP address. In this way, you can set up a permanent network setup and do not worry about your system restart or DHCP timeout to clear your DNS and default gateway setup. The following is a step-by-step procedure to set up your default gateway and DNS server using netplan:

1. create an initial network configuration file:

```
$ sudo cp /etc/50-cloud-init.yaml 01-netcfg.yaml
```

2. edit the 01-netcfg.yaml using vim or nano and create the following network setup:

```
network:
  version: 2
  renderer: networkd
  ethernets:
    ens3:
      dhcp4: no
      addresses:
        - 10.0.0.6/8
      gateway4: 10.0.0.4
      nameservers:
        addresses: [10.0.0.6,8.8.8.8]
        search: [demo-and-test.com]
```

Note that in this set up example, the default gateway is set to 10.0.0.4, and the DNS server is 10.0.0.6 and 8.8.8.8, and the search domain is set to demo-and-test.com.

3. run the following command to enable the change:

```
$ sudo netplan apply
```

Note that if you have multiple interfaces, you can follow each interface name such as ens3, ens4, ens5, etc., to set up each configuration. You only need to configure one interface with default gateway and other interfaces just configure DHCP by setting “dhcp4: yes” and removing other fields.

How to run a script at Ubuntu start up?

Suppose you want to automatically run an rc.firewall script at each time your system start up. A simple approach is to add your script in the rc.local file in the /etc folder. For example, add your script running in the /etc/rc.local file:

```
#!/bin/sh
setterm -repeat off
kbdrate -r 2.0 -d 1000
/home/ubuntu/./rc.firewall % added running script, and make sure it is inserted
    before “exit 0” to take effect.
exit 0
```