1 Things you need know before getting started

- Your CS account used on CLIC machines;
- VMware machine assigned to you;
  An email has been sent to you with an assignment that looks like
  `username@hostname.clic.cs.columbia.edu`
  For example, `zhao@lima.clic.cs.columbia.edu` means that user `zhao` is assigned
  to CLIC machine `lima.clic.cs.columbia.edu`. You can find your VM copy at
  `/local/vmware/username/Ubuntu.vmx` (replace `username` with your CS account).
  Each of you is assigned a different machine in CLIC lab.
- There is a “student” user with login “osw4118” on your VM; `sudo -s` and the same
  password grants root privileges. Please change your login passwords immediately, if
  you do not want your homework tampered by others.

2 How to start VMware in CLIC Lab

The easiest way to start VMware is to sit in front of any machine in CLIC lab and work from
there directly. Each CLIC machine has a unique name, say `paris.clic.cs.columbia.edu`.
It is not necessary to choose the physical machine that has been assigned to you since you
can always run SSH through the high-speed network.

Step 1
Log into the CLIC machine with your CS account username and passwd. By now, you
should be able to do that through the practice of homework assignment 1.

Step 2
Type `hostname` to check which machine you are sitting at.
`zhao@amman /home/zhao: hostname`
`amman.clic.cs.columbia.edu`
If it is the same as the machine assigned to you, skip step 3 and go to step 4 directly.
Step 3
Run SSH to log into the CLIC machine assigned to you.
zhao@amman /home/zhao: ssh -X zhao@lima.clic.cs.columbia.edu
Try ssh -Y zhao@lima.clic.cs.columbia.edu if Step 4 or Step 6 fails.

Step 4
Type startx to initialize a session of X window system.
zhao@lima /home/zhao: startx

Step 5
Open a terminal, and type vmware /local/vmware/username/Ubuntu.vmx. You’ll see the
vmware window popped out as in Figure 1.
zhao@lima /home/zhao: vmware /local/vmware/zhao/Ubuntu.vmx

Figure 1: Open vmware window

Step 6
Click the Power On button (press Ctrl + Alt to release cursor if you want), and let the
Ubuntu kernel boot up. The login window is to be displayed as in Figure 2.

Step 7
Log in with user student and passwd osw4118. Type sudo -s with the same password to
gain privilege access.

Step 8
Type useradd user1 to add the first user, and use passwd user1 to setup a password for
user1. Do it repeatedly for user2 (see Figure 3).

Step 9
Make sure to change root/student passwd by typing passwd root/student for security.
Figure 2: Power on vmware and boot kernel

Figure 3: Adding users
3 How to start VMware remotely

As many of you may want to work on your vmware machines remotely, you need to:

1. Start the vncserver on your assigned machine;
2. Install and run appropriate vncclient on your personal computer.

All the CLIC machines have vncserver installed already. You just need to start the server by typing the command vncserver& on your assigned machine. You only need to start the server once even you may remote login many times, and keep the display number assigned to you. You will be also asked for a passwd by running the vncserver for the first time (it can be different from your CS account passwd). Both the display number and passwd are required when you run vncclient on your PC.

In case you forget your display number, you can always check it by logging into the CLIC machine assigned to you, and type the following command, and 1 is the display number assigned to you by VNC server in this example.

```
zhao@lima /home/zhao: vncserver&
... ...
New 'lima:1 (zhao)' desktop is lima:1
Starting applications specified in /home/zhao/.vnc/xstartup
Log file is /home/zhao/.vnc/lima:1.log
... ...
```

3.1 For Linux Users

Remote login from your own Linux machine is quite similar as using any machines in CLIC lab. Make sure you have SSH installed for your Linux system. Run SSH as specified in Step 3 Section 2, and the rest just follows.

3.2 For Windows Users

One of the available vncclient for Windows users is VNC Viewer from RealVNC, which can be downloaded here: http://www.realvnc.com/products/free/4.0/winvncviewer.html.

Run VNC Viewer, enter the Server address as machine_name:display_number, and then type your vncserver Password. Note that both display_number and Password can be obtained through the first start of vncserver on your assignment machine. You do not need to supply a username since your identification is bounded with the assigned display_number (see Figure 4, 5).
Once you are remotely connected to your assigned machine, the rest just follows from **Step 5** in Section 2.

### 3.3 For MAC Users

One of the available `vncclient` for MAC users is **Chicken VNC**, which can be downloaded here: [http://sourceforge.net/projects/cotvnc/](http://sourceforge.net/projects/cotvnc/).

Run **Chicken VNC**, enter correct **Host**, **Display** and **Password**, then click **Connect** button (see Figure 6). **Host** is the machine assigned to you. **Display** and **Password** can be obtained through the first start of `vncserver` on your assignment machine. Once you are remotely connected to your assigned machine, the rest just follows from **Step 5** in Section 2.
4 A Few Hints

1. The VM running on CLIC machine has a host-only connection. So you could program on the host machine and upload files onto your VM using the `scp` command. Before that, you need to figure out the IPs for that host-only connection. Type `dhclient&` with root privilege to make sure DHCP is running on your VM (see Figure 7). Then use `ifconfig` to find the IPs for your VM (in Figure 8, it is 192.168.53.128) and the host machine (likely to be 192.168.53.1). Now you can push files to or pull files from the host machine (see Figure 9).

![Figure 7: Run dhclient&](image)

2. If you are connecting to your host machine remotely through a Unix/Linux platform, you may need to modify the `.vnc/xstartup` file in your home directory. For example, my file should be found at `/home/zhao/.vnc/xstartup`. Make sure that the first two lines are uncommented.

3. Once you are done with your homework, please kill your vncserver process to release the resource. Also power off your VM, so the TAs can login and grade your homework.

4. In your homework submission, you need to include the passwords of your VM user accounts (including root) for the TAs to grade your homework.

5. Test your VM as soon as possible and don’t wait until the last minute. Contact CRF by sending a trouble ticket to crf@cs.columbia.edu (Please don’t send email to CRF staff directly).
Figure 8: Find out IP for your VM

```
root@ubuntu:~# ifconfig
eth2  Link encap:Ethernet  HWaddr 00:0c:29:05:64:11
     inet addr:192.168.53.128  Bcast:192.168.53.255  Mask:255.255.255.0
     UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
     RX packets:0  errors:0  dropped:0  overruns:0  frame:0
     TX packets:0  errors:0  dropped:0  overruns:0  carrier:0
     collisions:0  txqueuelen:1000
     RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

root@ubuntu:~# ls

To release cursor, press Ctrl-Alt.
```

Figure 9: Two examples of scp command: (1) pull the file `test-host` from host machine to your VM; (2) push the file `test-vm` from your VM to host machine

```
root@ubuntu:~# scp zhang@192.168.53.1:/home/zhang/test-host zhang@192.168.53.1:
password: [Password]
test-host
root@ubuntu:~# cat test-host
This is a test file sending from host machine to VM.

root@ubuntu:~# scp test-vm zhang@192.168.53.1:/home/zhang/.
password: [Password]
test-vm
root@ubuntu:~# cat test-vm
This is a test file sending from VM to host machine.
```

To release cursor, press Ctrl-Alt.