This is a brief HOW-TO create, boot, shutdown, and use virtual systems on the CIT network. Tasks are listed first. Some commands and their options are described in the second part of the document. Frequently asked questions are at the end.

**Task HOW-TO**

**To prepare the CIT account for using the virtual system.**

1. On any server, run “/qemu/bin/citv init”. Then log out, and log back in. This command need not be repeated.
2. On any server, run “citv getip course”, to find the IP addresses assigned to you for the course. If you forget the assigned IP(s), you can run this command again, and it will remind you. For course, use it1100, it3100, it4200, it4300, etc.

Below is a sample execution of the above steps, for the user cgl3, logged into caesar. The keyboard input by the user is underlined.

*User logs in to caesar here.*

cgl4@caesar:~$ /qemu/bin/citv init
Preparing your account for the CIT virtual server system.
You will see 3 prompts. Hit <enter> and accept the default for each one.
Generating public/private rsa key pair.

Enter file in which to save the key (/home/c/cgl4/.ssh/id_rsa): <enter>
Created directory '/home/c/cgl4/.ssh'.

Enter passphrase (empty for no passphrase): <enter>

Enter same passphrase again: <enter>
Your identification has been saved in /home/c/cgl4/.ssh/id_rsa.
Your public key has been saved in /home/c/cgl4/.ssh/id_rsa.pub.
The key fingerprint is:
Allowing key-based authentication between CIT hosts.
Making sure /qemu/bin is in your path.
cgl4@caesar:~$ exit

*User logs in to caesar again here.*
cgl4@caesar:~$ citv getip it1100
User has checked out the ips 144.38.206.104 – 144.38.206.111 for it1100.
To create a new virtual system

1. On any server, run
   ```
   "citv createvm machine_name RAM_size(MBytes) DISK_size(GBytes)".
   
   machine_name is a unique name you choose for this virtual system.
   
   RAM_size is the number of MBytes for your machine. A reasonable RAM_size for servers is
   128 or 256. Desktop systems should use 256 or 512.
   
   DISK_size is the number of GBytes for the disk. Most servers should be OK with 2 or 4
   GByte for disk. Desktop systems should use 4 Gbytes for disk.
   
   A sample execution is shown below. Note that most of the output is diagnostic information that
   can be ignored.
   
   cgl4@caesar:~$ citv createvm my-first-linux-system 256 4
   /usr/bin/ssh othello "/qemu/bin/qemu-new-image cgl4-my-first-linux-system
   4; /qemu/bin/qemu-initial-config 2 cgl4-my-first-linux-system 256
   52:54:00:08:00:02;"
   Formating '/qemu/images/cgl4-cgl4-my-first-linux-system.img', fmt=raw, size=4194304 kB
   User cgl4 has created the machine my-first-linux-system on othello : 2
   with 256 memory
   ```

To boot a virtual system from the CDROM drive, and install the base system.

1. On any server, run “citv bootvm machine_name d iso_name”.
   
   machine_name is the unique name used with createvm.
   
   d indicates that you want to boot from the CDROM drive.
   
   iso_name is the name of one of the available CDROM images.
   
   A sample execution is shown below. Note that most of the output is diagnostic information that
   can be ignored.
   
   cgl4@caesar:~$ citv bootvm my-first-linux-system d hardy_gui
   /usr/bin/ssh othello "/qemu/bin/qemu-boot 2 cgl4-my-first-linux-system
   256 52:54:00:08:00:02 ' ' 'hardy_gui' d '1' '1';"
   User cgl4 has booted the machine my-first-linux-system on othello : 2
   with 256 memory
   
   The CDROM “hardy_gui” is recommended for IT 1100. During the installation process, the
   mouse will appear to be in the wrong place, but you can work through the installation.
   
   The “hardy” CDROM is recommended for IT 3100 and IT 4200.
   
2. Use VNC to connect to the virtual console. This will require an ssh tunnel if you are connecting
   from off campus. VNC viewing and ssh tunnels are described later in this document.
   
3. Use the virtual console to do the base install of the operating system. Continue until the system
   says it is rebooting.
4. On any server, run “citv powerdownvm machine_name”.

A sample execution is shown below. Note that most of the output is diagnostic information that can be ignored.

cgl4@caesar:~$ citv powerdownvm my-first-linux-system
/usr/bin/ssh othello "/qemu/bin/qemu-stop cgl4-my-first-linux-system;"
Killing 11626
User cgl4 has powered down the machine my-first-linux-system on othello

To boot a virtual system from the hard drive.
1. Make sure that the system is not already running.
2. On any server, run “citv bootvm machine_name c”.

A sample execution is shown below. Note that most of the output is diagnostic information that can be ignored.

cgl4@caesar:~$ citv bootvm my-first-linux-system c
/usr/bin/ssh othello "/qemu/bin/qemu-boot 2 cgl4-my-first-linux-system
256 52:54:00:08:00:02 ' ' ' ' ' c '1' '1';"
User cgl4 has booted the machine my-first-linux-system on othello : 2 with 256 memory

To connect to a running system's virtual console from on-campus.
1. Use VNC viewer on the desktop machine to connect to the virtual console. VNC viewing is described later in this document.
2. Use the virtual console to log into the virtual system.

To connect to a running system's virtual console from off-campus.
1. Build the ssh tunnel from the desktop machine to the server machine where the virtual machine is running. Ssh tunnels are described later in this document.
2. Use VNC viewer on the desktop machine to connect to the virtual console. VNC viewing is described later in this document.
3. Use the virtual console to log into the virtual system.

To connect to alternate virtual consoles through VNC.
1. Use Alt-F1 – Alt-F6 to change virtual consoles.
2. If you are using an ubuntu GNOME desktop, then Alt-F? is bound to some desktop feature that you probably don't use. Go to System->Preferences->Keyboard Shortcuts. Find the Alt-F? short cut and change the short cut sequence to something else.

To list the running systems.
1. On any server, run “citv showrunningvm”. 
To shutdown a running system.
1. Log into the running system.
2. Issue the “reboot” command.
3. Wait 1-2 minutes for the system to shutdown.
4. On any server, run “citv powerdownvm machine_name”.

To destroy (permanently remove) an existing system.
1. Be sure that the system is shutdown.
2. On any server, run “citv removevm machine_name”.

Command Documentation
● Login to the host server.
  ◆ On Unix hosts, use ssh to connect to server host.
  ◆ On Windows hosts, use putty, or other ssh client to connect to server host.
● Connect to the image using vnc to the image-number (on-campus only).
  a) From Windows
    i. Start “VNC Viewer” from “All Programs/Remote Login/RealVNC/VNC Viewer/Run VNC Viewer”.
    ii. In the “Server” box, type “server: number”, where “server” is the name of the virtual server that holds your virtual machine (e.g. hamlet), and “number” is the number of your virtual machine on the server. If you forget the server and number, run the “citv showvm” command.
    iii. Press “OK”
  b) From Linux
    i. Use vinagre or xvncviewer. Use “server: number” as described above.
● Connect to the image using ssh-tunnel and vnc to the image-number.
  a) From Windows with Putty
    i. Start Putty
    ii. In the hostname/ip text box, type the name of the virtual server host machine. For example, hamlet.cs.dixie.edu.
    iii. On the left panel, find the “SSH” item. Expand it.
    iv. Find the “tunnels” item under “SSH”.
    v. Put 5901 result in “Source port”.
    vi. Add 5900 and your virtual machine number. Type “localhost:59xx” in “Destination”, where 59xx is the result of your addition.
    vii. Press the “Add” button.
    viii. Now select “Open” to log in and create the tunnel.
    ix. Start “VNC Viewer”
    x. In the “Server” box, type “:1”.
    xi. Press “OK”.
  b) From Linux
    i. ssh -L port=localhost:port host-name
       port is 5900 + the image-number.
       host-name is the name of the virtualization host system.
    ii. xvncviewer :vncport
       vncport is the port - 5900
Frequently Asked Questions

● Q: What are the important network configuration parameters?
   A: Netmask: 255.255.224.0
       Gateway: 144.38.192.1
       Nameservers: 144.38.192.2 144.38.192.3

● Q: How can I configure a fixed IP, instead of DHCP in ubuntu?
   A: When the DHCP starts, hit Tab, then enter to cancel the DHCP and continue with manual configuration.

● Q: Which ubuntu mirror should I use?
   A: “enter manually” at the top of the list. Use mirror.cs.dixie.edu.

● Q: What are the names of the of virtual servers.
   A: As of this writing, the servers are hamlet, lear, macbeth, caesar, othello, and edmund. All are part of cs.dixie.edu. So hamlet would be referred to as hamlet.cs.dixie.edu, from outside of the CIT network.

● Q: What ISO images are available?
   A: At least the following: hardy, hardy_gui, win_xp, win_server_2003, centos5.2.