# Homework #7

Due Time: 2015/6/22 (Mon.) 17:00
Contact TAs: `vegetable@csie.ntu.edu.tw`

## Submission

- Compress all your files into a file named "⟨**studentID**⟩.**zip**".

- **Submit your zip file to ceiba.**

## Instructions and Announcements

- Discussions with others are encouraged. However, you should write down your solutions `in your own words`. In addition, for each problem you have to specify the references (the Internet URL you consulted with or the people you discussed with) on the first page of your solution to that problem.

- Problems below would be related to the material taught in the class and might be far beyond that. Try to search for additional informaition on the Internet and give an reasonable anwser.

- Some problems below might not have standard solution. We would give you the point if your answer is followed by reasonable explainations.

- If you get stuck in problems below, feel free to contact TAs.

- **NO LATE SUBMISSION IS ALLOWED**.

# System Administration

## VM Installation and Management

Install a KVM or Xen virtual machine using tools provided by libvirt. You should install a Unix-like OS and setup the following things:

1. Both KVM and Xen support text consoles that can be used to connect to your VM, so you can fix your VM without GUI even if the SSH server running in the guest OS is unusable. The text console can be accessed using `virsh console` command or the menu item View > Text Consoles > Text Console 1 in `virt-manager`. Please make sure the text console is usable when things go wrong.

   a. You should be able to see the boot menu provided by your bootloader and choose different options on the text console.

   b. You should be able to use any bootloader commands on the text console.

   c. You should be able to enter single user mode and access the root shell on the text console.

   d. You should be able to login to the system using the text console when the system runs normally.

2. Configure the network to make your VM accessible from other hosts. You should be able to connect to your VM using another computer, so your VM can be used as a server.

3. Check whether your guest OS have needed balloon driver installed and loaded, so you can resize the memory allocated to your VM without rebooting the VM using `virsh setmem` command.

   Please submit a report that describes how you complete these requirements. The report should include the name and the version of your guest OS and distribution, output of `virsh dumpxml` and `virsh domxml-to-native`, commands and methods you use to make things work. You can also include a few screenshots.

   If you find something just works without any configuration, a screenshot with explanation is sufficient.

   **Note**

   Some things that you may find to be useful.

1. Both KVM and Xen supports serial console and paravirtualized console. KVM has VirtIO console and Xen has Xen console.

2. NetBSD guest may refuse to resize the memory when the difference is too big. You may need run `virsh setmem` many times with smaller difference.

3. KVM supports shared folders using Plan 9 protocol over VirtIO (virtio-9p).

4. KVM and Xen 4.4 and later version support using Spice as the graphical console. Spice supports many addtional features that VNC does not have, including audio, clipboard sharing and USB redirection. It is possible to attach your USB flash drive to your VM over the network.