Lab 0. Prepare the Lab Environments

Linux environment

We highly recommend you use a virtual machine with Linux. If you really want to, you can build and install the tools on your own MacOS computers.

It should be possible to get this development environment running under windows with the help of [Cygwin](http://www.cygwin.com/). Install cygwin, and be sure to install the flex and bison packages (they are under the development header).

Following shows you how to install linux virtual machine on your machine:

Download and install the latest version of virtualbox at <https://www.virtualbox.org/wiki/Downloads> or

<https://mirror.tuna.tsinghua.edu.cn/help/virtualbox/>

VirtualBox is a free and cross platform virtual machine management software. You can install is on Windows, Linux and MacOS.

Once the virtualization platform is installed, download a boot disk image for the Linux distribution of your choice.

* [Ubuntu Desktop](https://mirror.tuna.tsinghua.edu.cn/ubuntu-releases/) is what we use.

This will download a file named something like ubuntu-16.04.1-desktop-i386.iso. Start up your virtualization platform and create a new (32-bit) virtual machine. Use the downloaded Ubuntu image as a boot disk; the procedure differs among VMs but is pretty simple.

Once you have the VM up and running, let’s initialize your VM for this course:

*# in the VM, install toolchain*

**[**vm**]** $ sudo apt-get update

**[**vm**]** $ sudo apt-get install -y build-essential gdb git gcc-multilib qemu nasm

Then you can run gcc --version to check your compiler.

**[vm]$ gcc --version**

**gcc (Ubuntu 5.4.0-6ubuntu1~16.04.11) 5.4.0 20160609**

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Then you can check your qemu installation.

**[vm]$ qemu-system-i386 --version**

**QEMU emulator version 2.5.0 (Debian 1:2.5+dfsg-5ubuntu10.46), Copyright (c) 2003-2008 Fabrice Bellard**

Then you can check your NASM installation.

**[vm]$ nasm -v**

**NASM version 2.11.08**