南昌大学实验报告

姓名：**陈华豪**

学号：**6130116238**

邮箱地址：**6130116238@email.ncu.edu.cn**

专业班级：**网络工程161班**

实验日期：**2019.4.1**

课程名称：**云计算技术**

实验项目名称

homework 2

实验目的

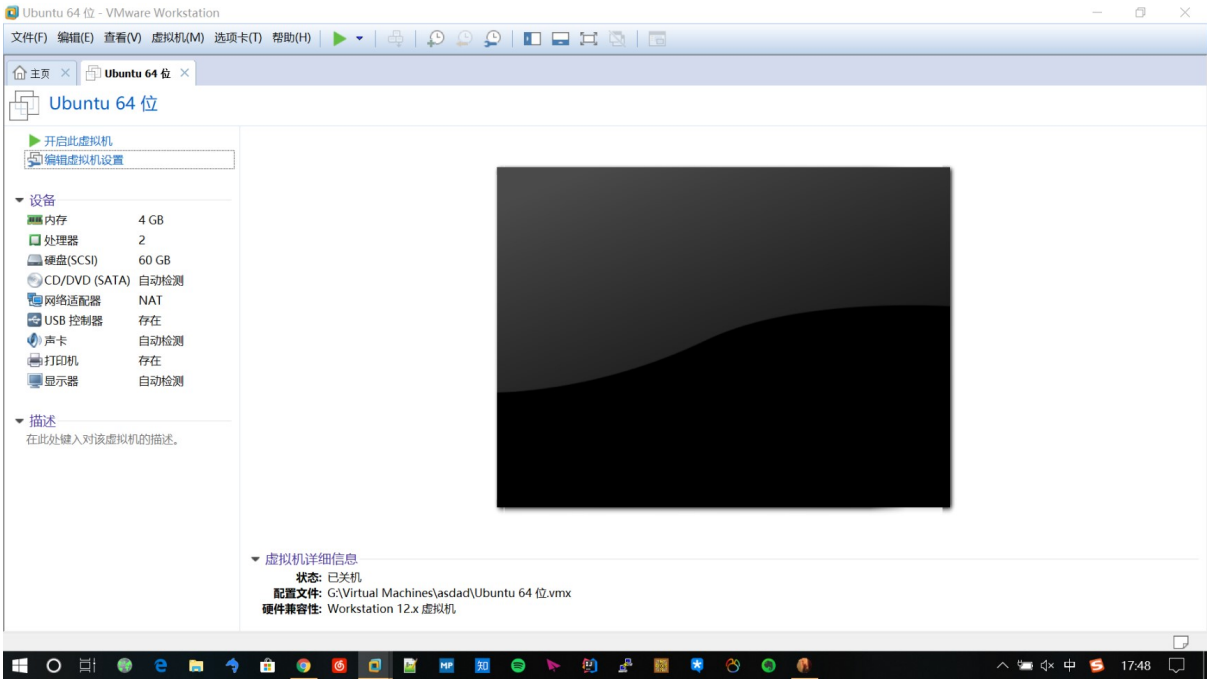
This assignment will be done using KVM, a popular type-2 hypervisor. KVM is built on the Linux kernel to reuse its existing functions to support virtualization. As a part of this assignment, you will be experimenting with KVM and gaining familiarity with the development environment and add new features to it. KVM can run on many different architectures, but the specific platform we will be targeting is the x86_64 CPU family.

实验基础

We will use VMware Workstation/Fusion in this assignment so your custom hypervisor can be isolated from the rest of your system. VMware Workstation/Fusion supports nested virtualization, allowing you to install, run and develop hypervisors in a virtual machine. You will first install a Linux/KVM host on VMware, and then create virtual machines on the host. Note that this is different from deployment in production platforms which the hypervisor runs directly on bare metal.

实验步骤

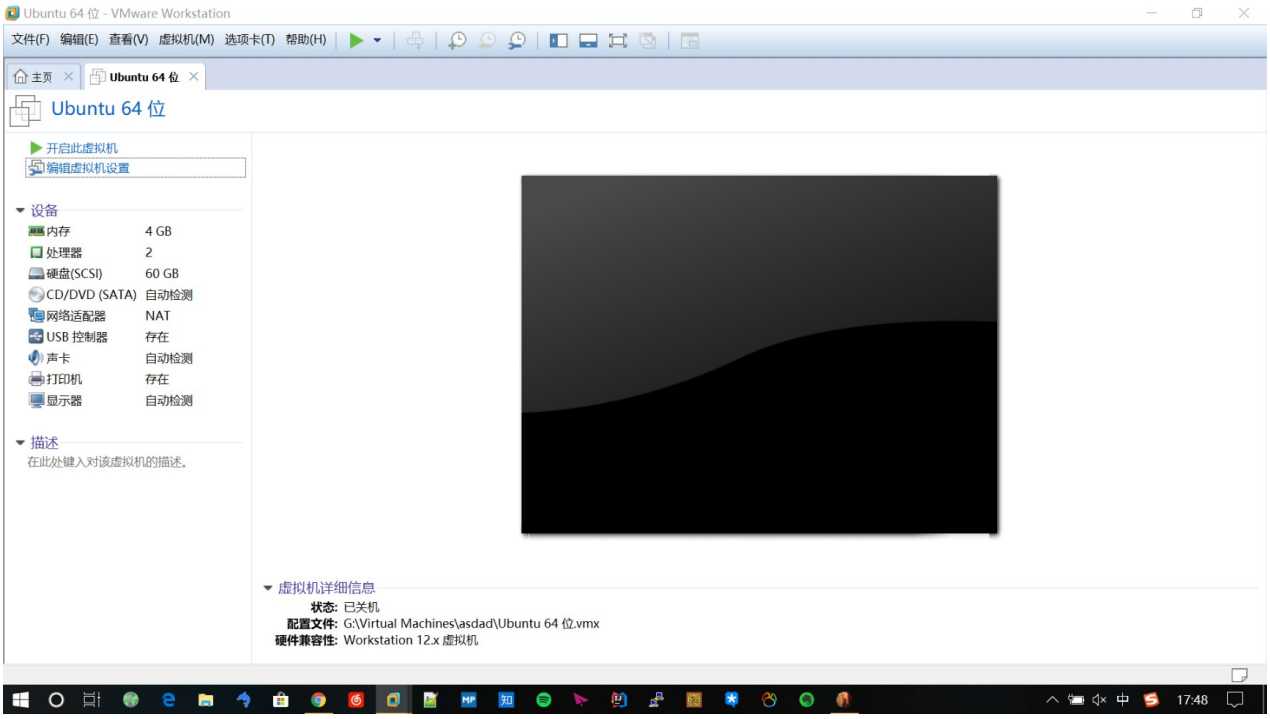
1. Create a New Virtual Machine.



2. Select "Custom (advanced) and click Next".

3. Click next until you reach the page "Guest Operating System Installation"

4. Download the iso image for Ubuntu-XX.XX.X from here.
5. Continue to setup your VM spec.
6. We then need to expose the hardware virtualization feature to the KVM running in the VM. On VMware Workstation, go to Processors of your
   VM configuration, then select both "Virtualize Intel VT-x/EPT and AMD-V/RVI" and "Virtualize CPU performance counters".
   NOTE: The exact location to the virtualization hardware to the VM might be different depending on the VMware version.
   NOTE: You may need to enable hardware virtualization (Intel VT) features for your computer in the BIOS. You can get more information from
   here.
7. Click "Finish" and Install Ubuntu-XX.XX.X on your VM.
   Once your VM is set up, you can use the terminal directly or ssh into the VM to run commands.
   Recommended VM Spec: At least 4 VCPU, 2GB RAM, NAT network, 50GB virtual disk.



In "Processors", set "Preferred mode" as "Automatic" to leverage hardware features to accelerate the VM.

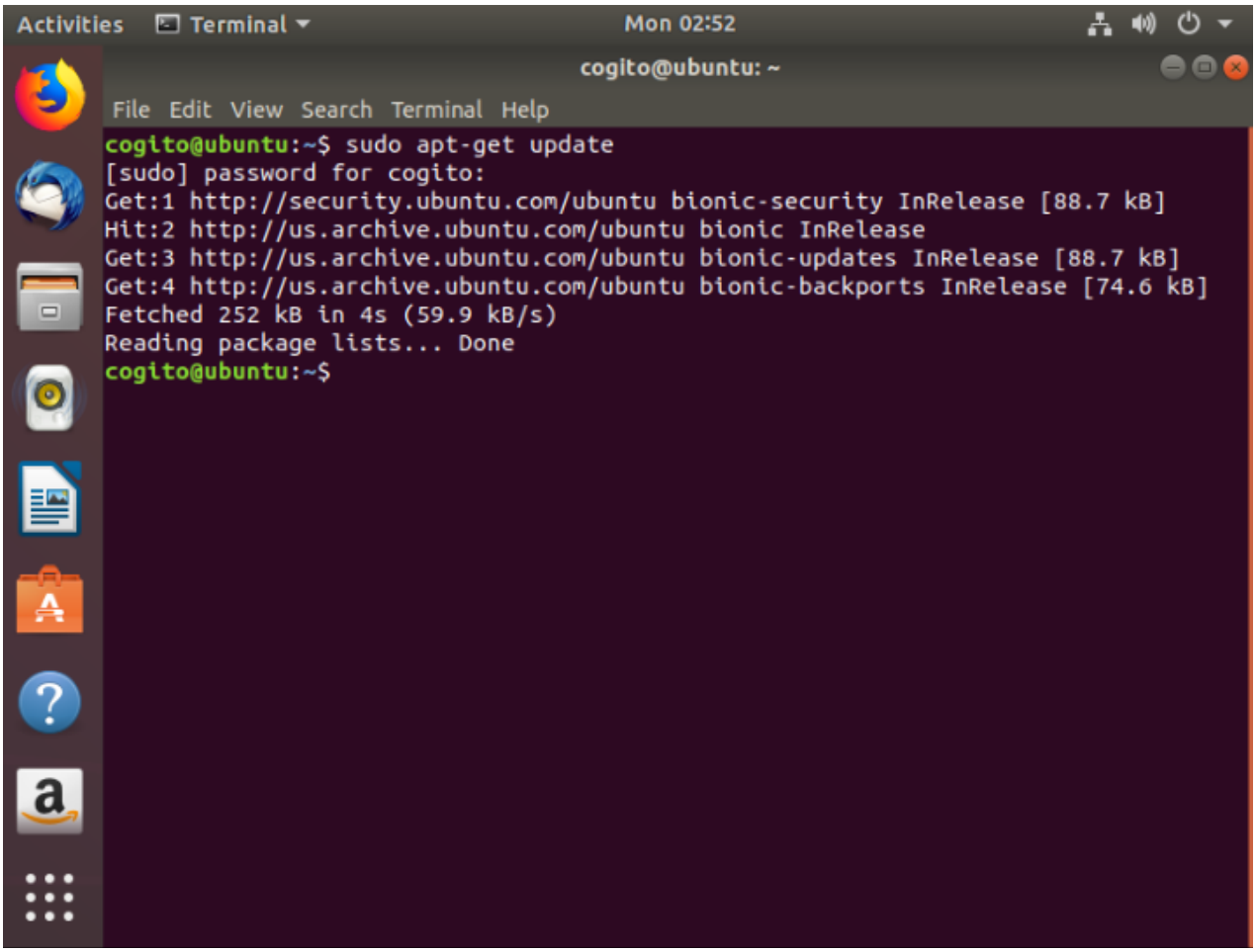
Once you finish installing Ubuntu, it's time to configure the environment for KVM.

In libguestfs-tools install, YES should be selected when it prompts about supermin.

sudo apt-get update

sudo apt-get install qemu-kvm libvirt-bin ubuntu-vm-builder bridge-utils \

libosinfo-bin libguestfs-tools virt-top virtinst



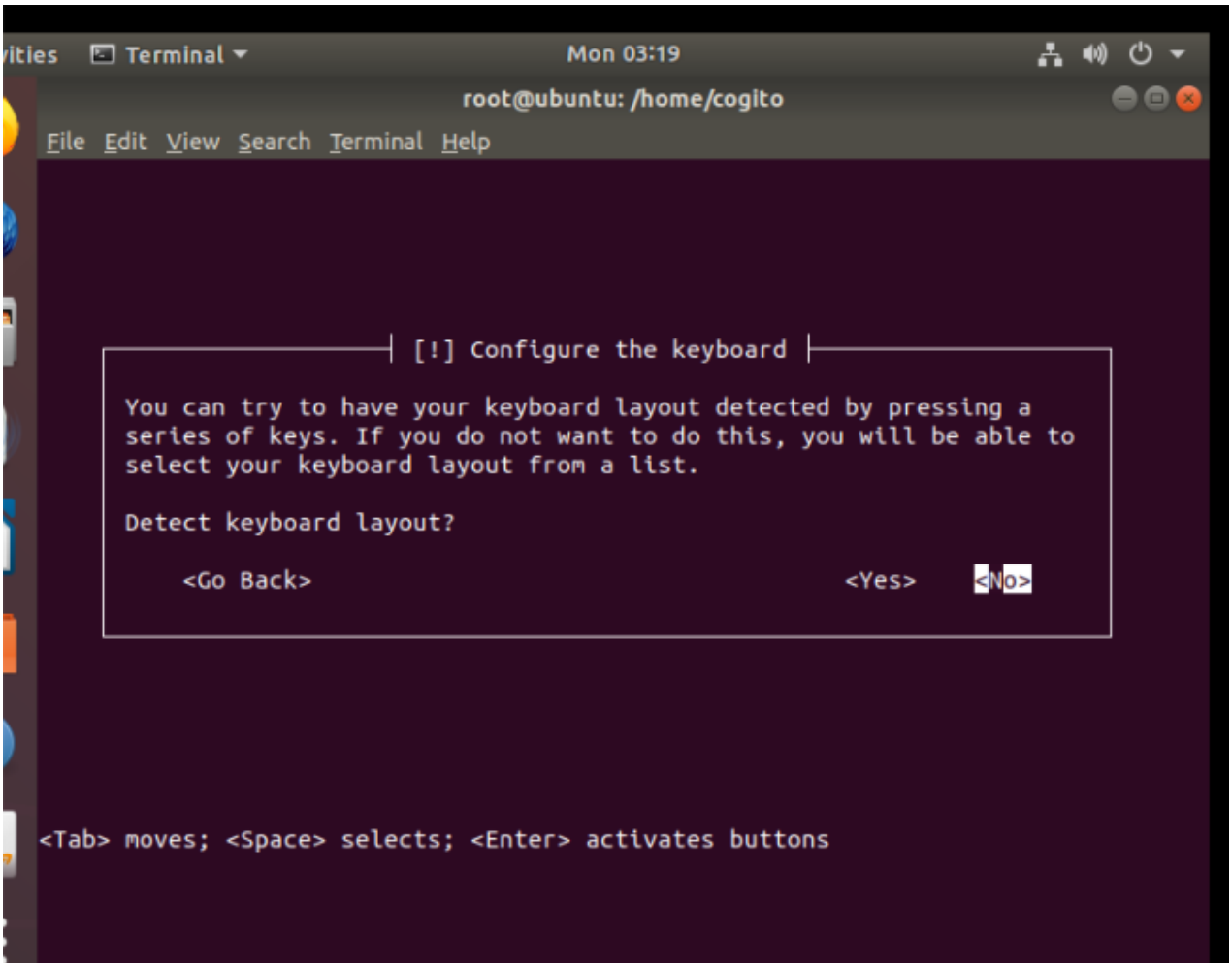
Now we are ready to install a VM (nested VM) on KVM. Type the following command to install a Ubuntu XX.XX.X guest.

```
virt-install \
--name guest0 \
--virt-type=kvm \
--ram 1024 \
--disk path=guest0.img,size=25 \
--vcpus 2 \
--os-type linux \
--graphics none \
--console pty,target_type=serial \
--location 'http://us.archive.ubuntu.com/ubuntu/dists/trusty/main/installer-amd64/' \
--extra-args 'console=ttyS0,115200n8 serial'
```

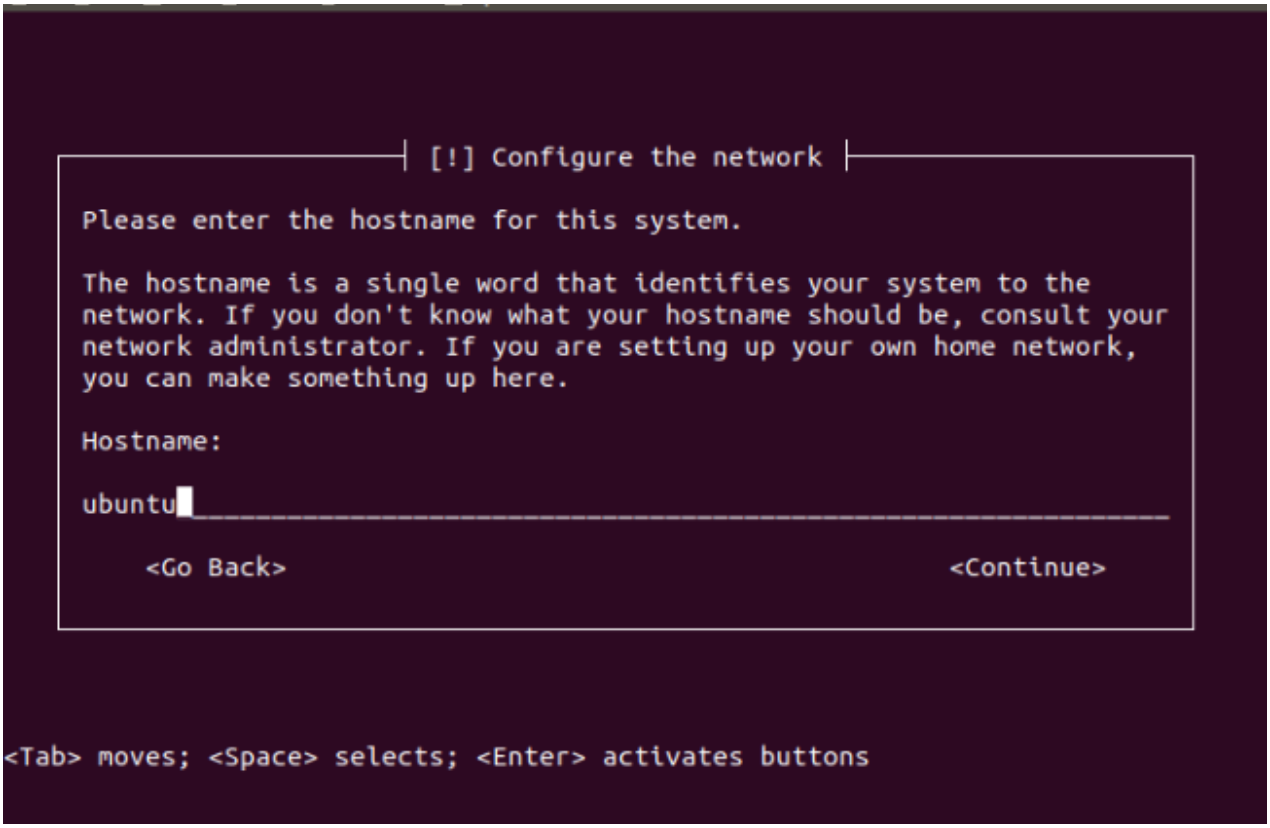
遇到报错：Host does not support domain type kvm for virtualization type 'hvm' arch 'x86_64'
百度后找到解决方法：

```
1.modprobe kvm
2.去掉命令中的--virt-type=kvm
```

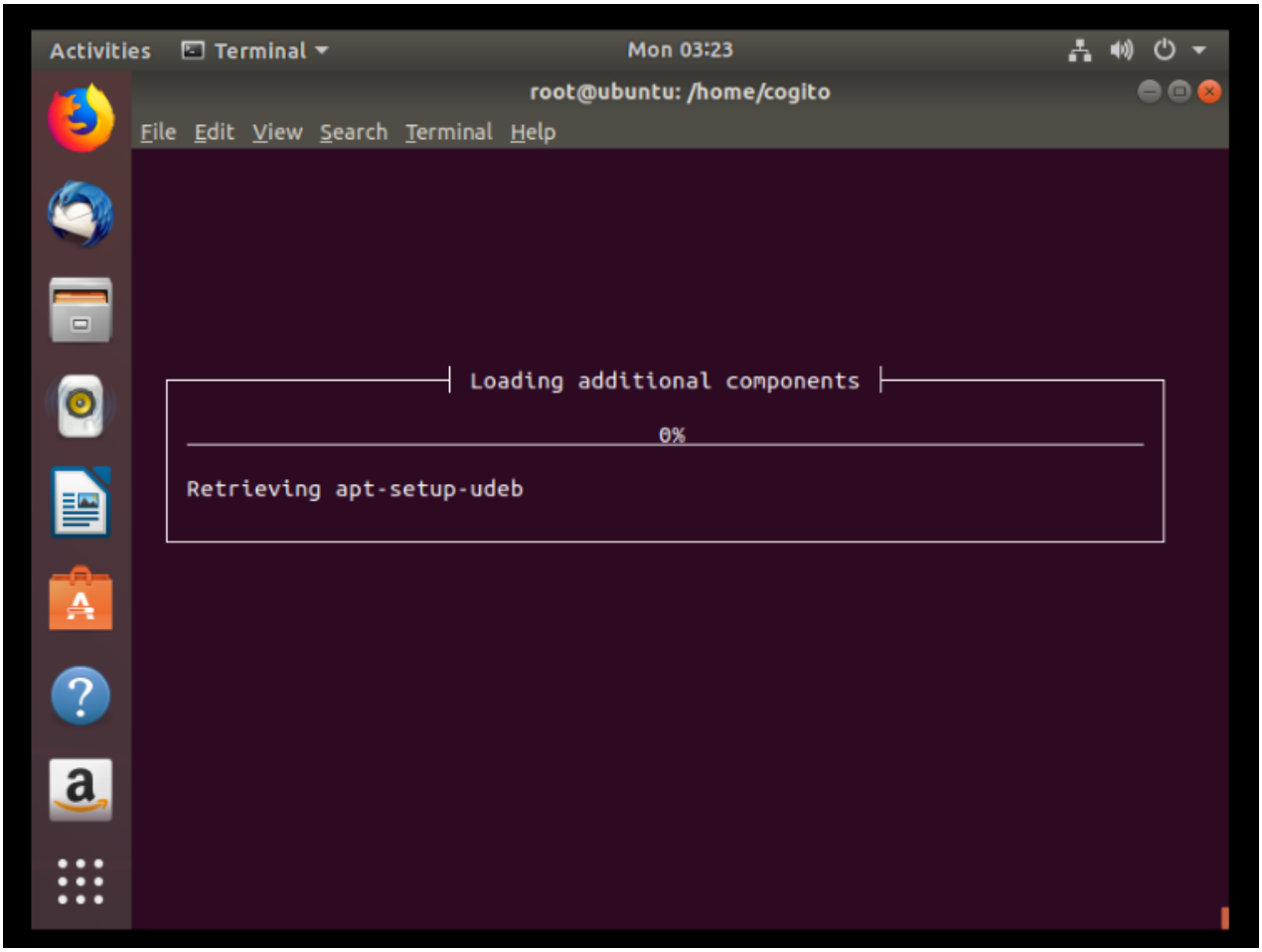
开始安装：

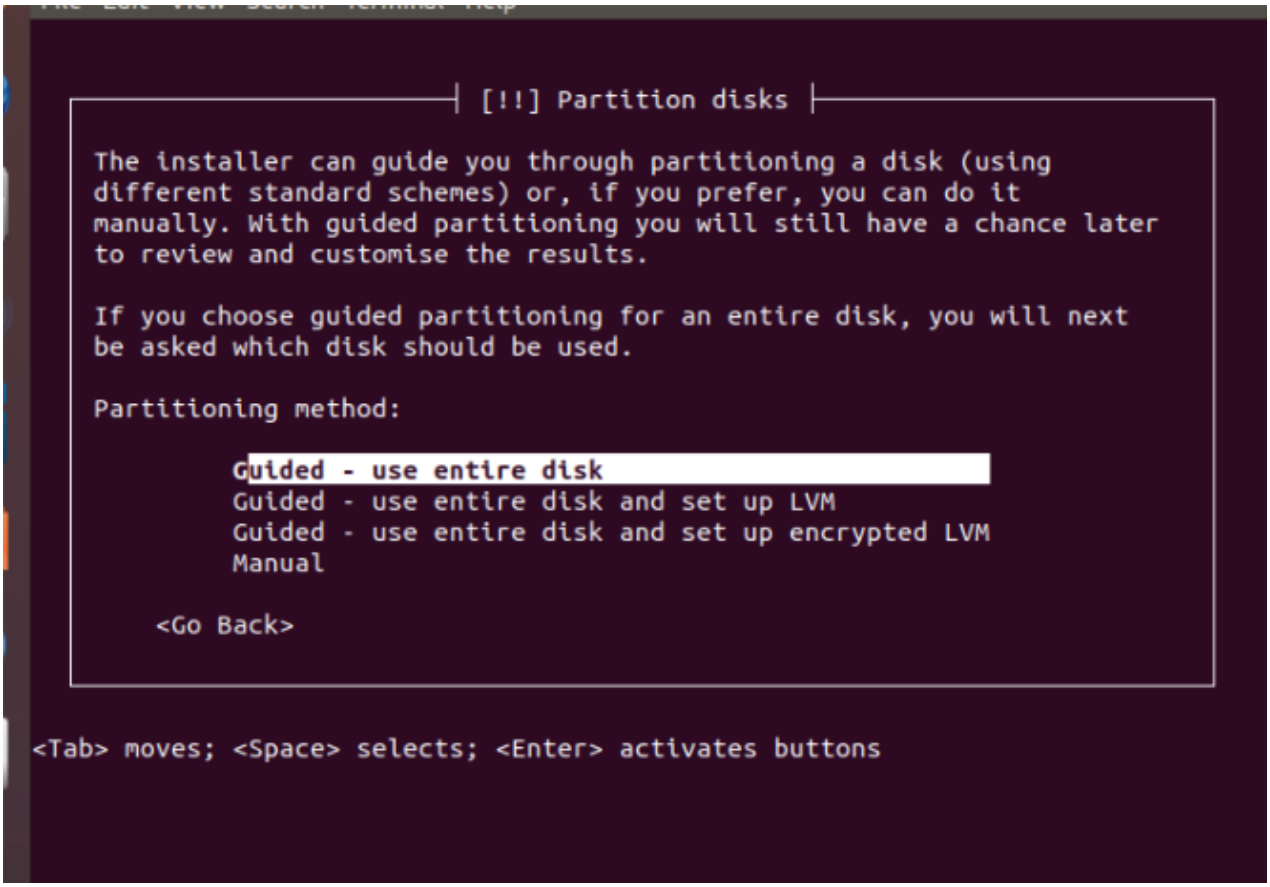

ities
Terminal
Mon 03:19
root@ubuntu: /home/cogito
File Edit View Search Terminal Help
[!] Configure the keyboard
You can try to have your keyboard layout detected by pressing a series of keys. If you do not want to do this, you will be able to select your keyboard layout from a list.
Detect keyboard layout?
<Go Back>
<Yes>
<No>
<Tab> moves; <Space> selects; <Enter> activates buttons

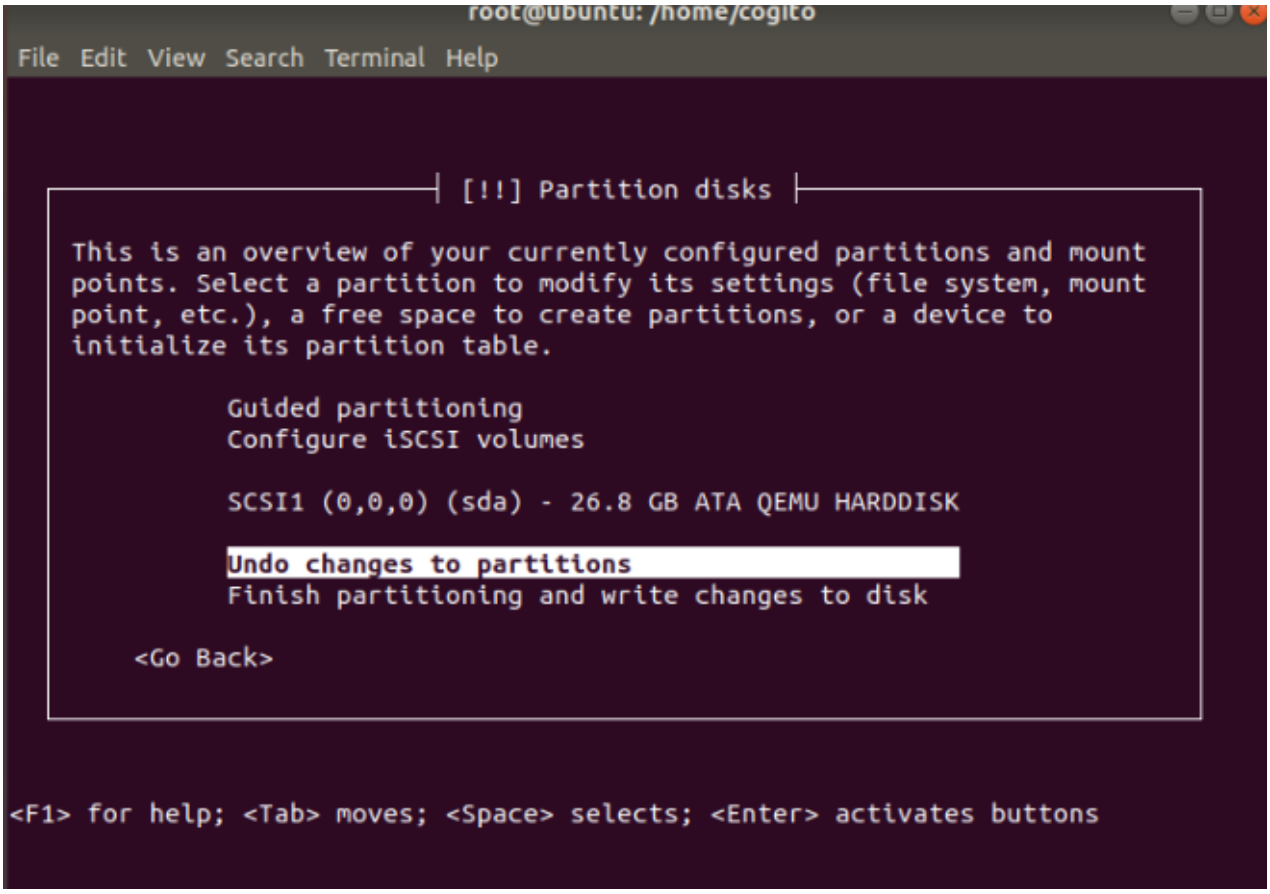

Detecting network hardware
95%
Loading module 'usb-storage' for 'USB storage'...

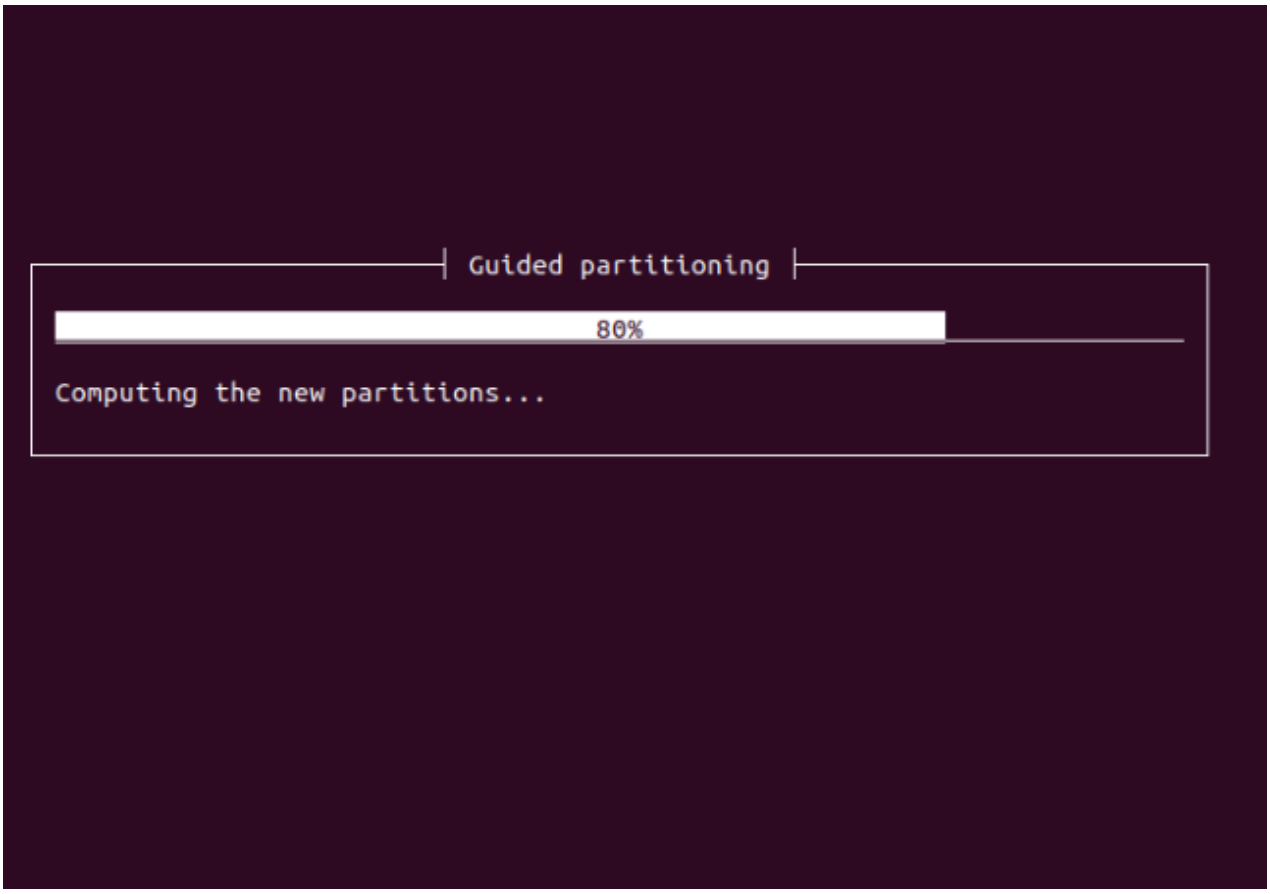

[!] Configure the network
Please enter the hostname for this system.
The hostname is a single word that identifies your system to the network. If you don't know what your hostname should be, consult your network administrator. If you are setting up your own home network, you can make something up here.
Hostname:
ubuntu
<Go Back>
<Continue>
<Tab> moves; <Space> selects; <Enter> activates buttons


[!] Choose a mirror of the Ubuntu archive
Please select an Ubuntu archive mirror. You should use a mirror in your country or region if you do not know which mirror has the best Internet connection to you.
Usually, <your country code>.archive.ubuntu.com is a good choice.
Ubuntu archive mirror:
us.archive.ubuntu.com
<Go Back>
<Tab> moves; <Space> selects; <Enter> activates buttons

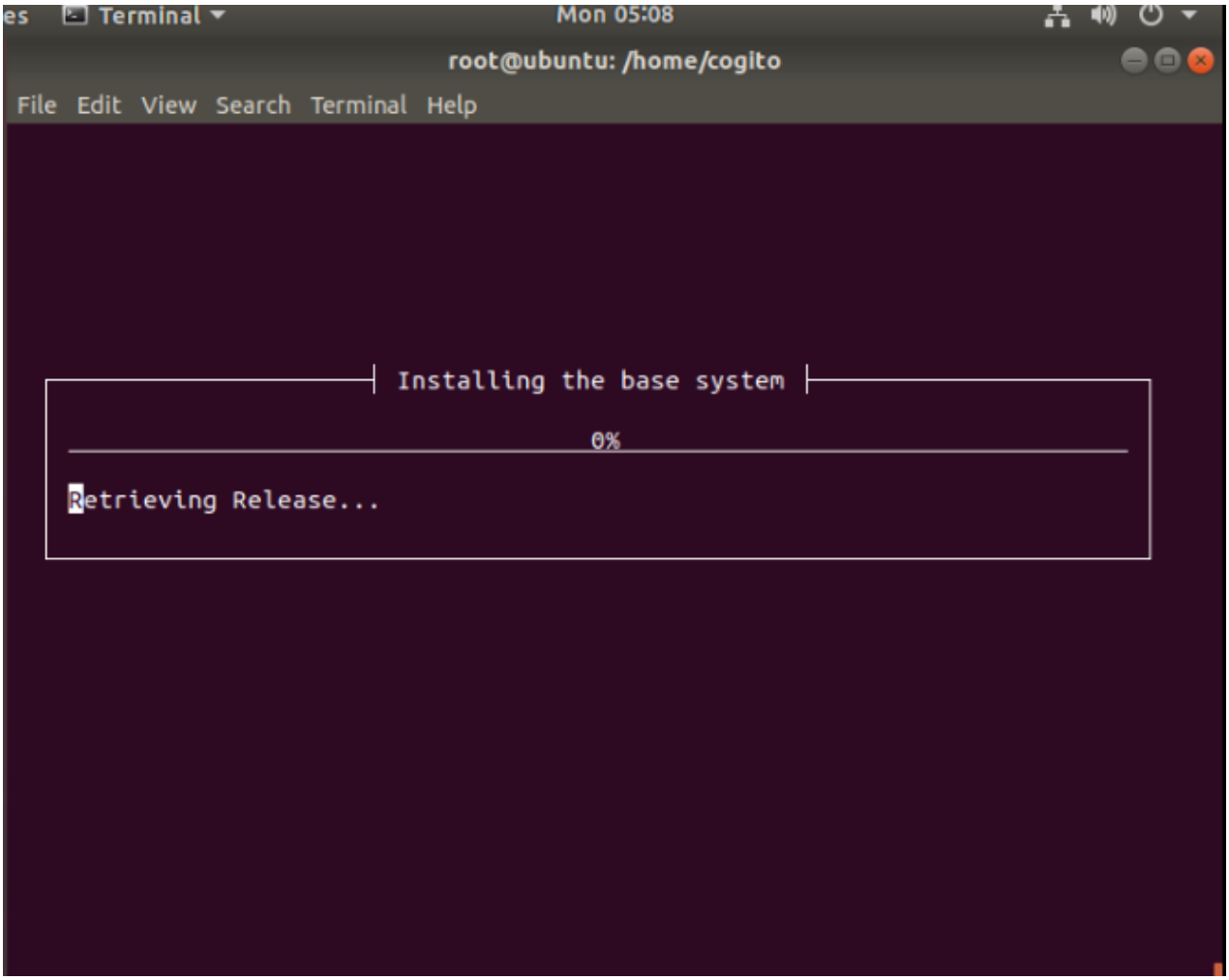

Activities
Terminal
Mon 03:23
root@ubuntu: /home/cogito
File Edit View Search Terminal Help
Loading additional components
0%
Retrieving apt-setup-udeb


[!!] Partition disks
The installer can guide you through partitioning a disk (using different standard schemes) or, if you prefer, you can do it manually. With guided partitioning you will still have a chance later to review and customise the results.
If you choose guided partitioning for an entire disk, you will next be asked which disk should be used.
Partitioning method:
Guided - use entire disk
Guided - use entire disk and set up LVM
Guided - use entire disk and set up encrypted LVM
Manual
<Go Back>
<Tab> moves; <Space> selects; <Enter> activates buttons

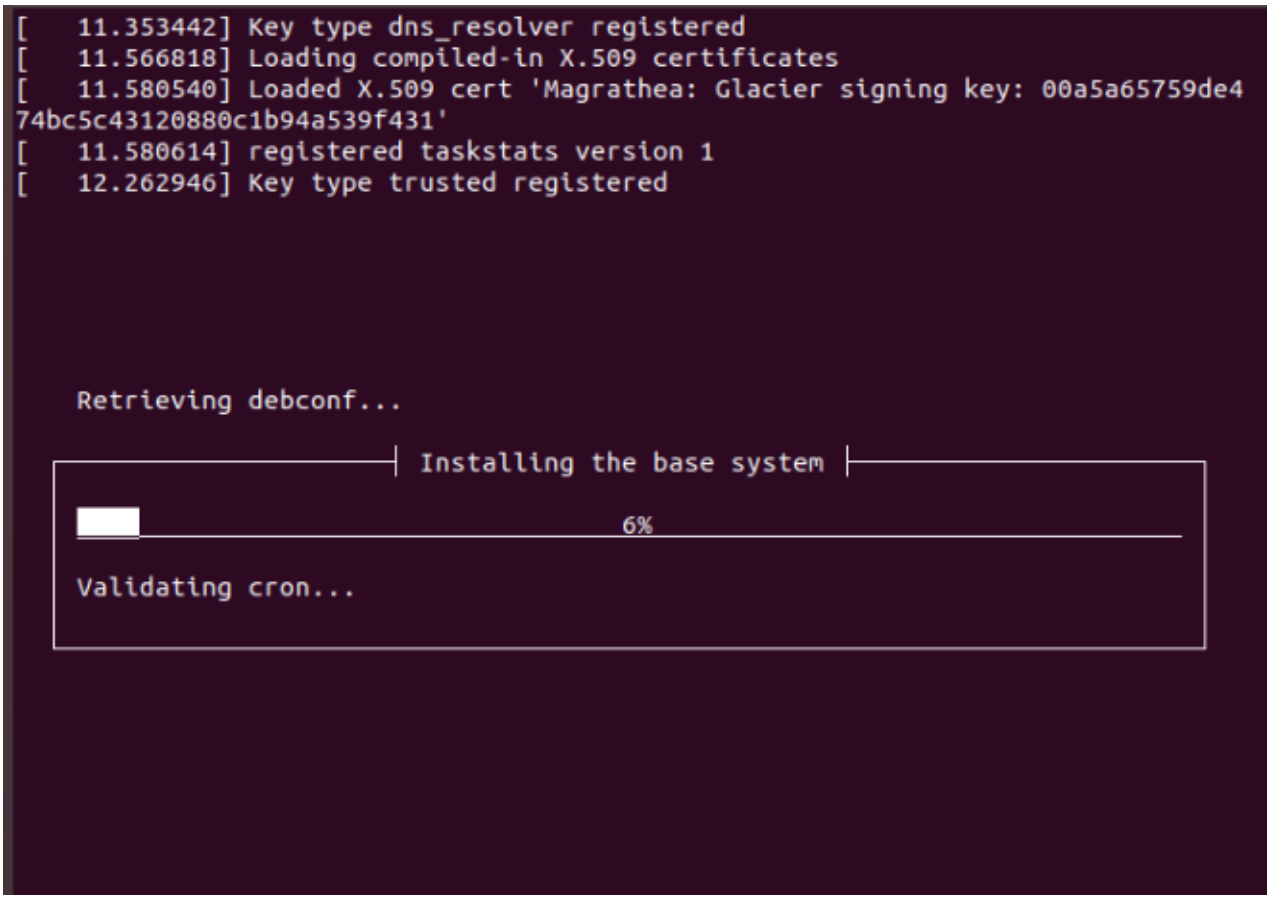

root@ubuntu: /home/cogito
File Edit View Search Terminal Help
[!!] Partition disks
This is an overview of your currently configured partitions and mount points. Select a partition to modify its settings (file system, mount point, etc.), a free space to create partitions, or a device to initialize its partition table.
Guided partitioning
Configure iSCSI volumes
SCSI1 (0,0,0) (sda) - 26.8 GB ATA QEMU HARDDISK
Undo changes to partitions
Finish partitioning and write changes to disk
<Go Back>
<F1> for help; <Tab> moves; <Space> selects; <Enter> activates buttons



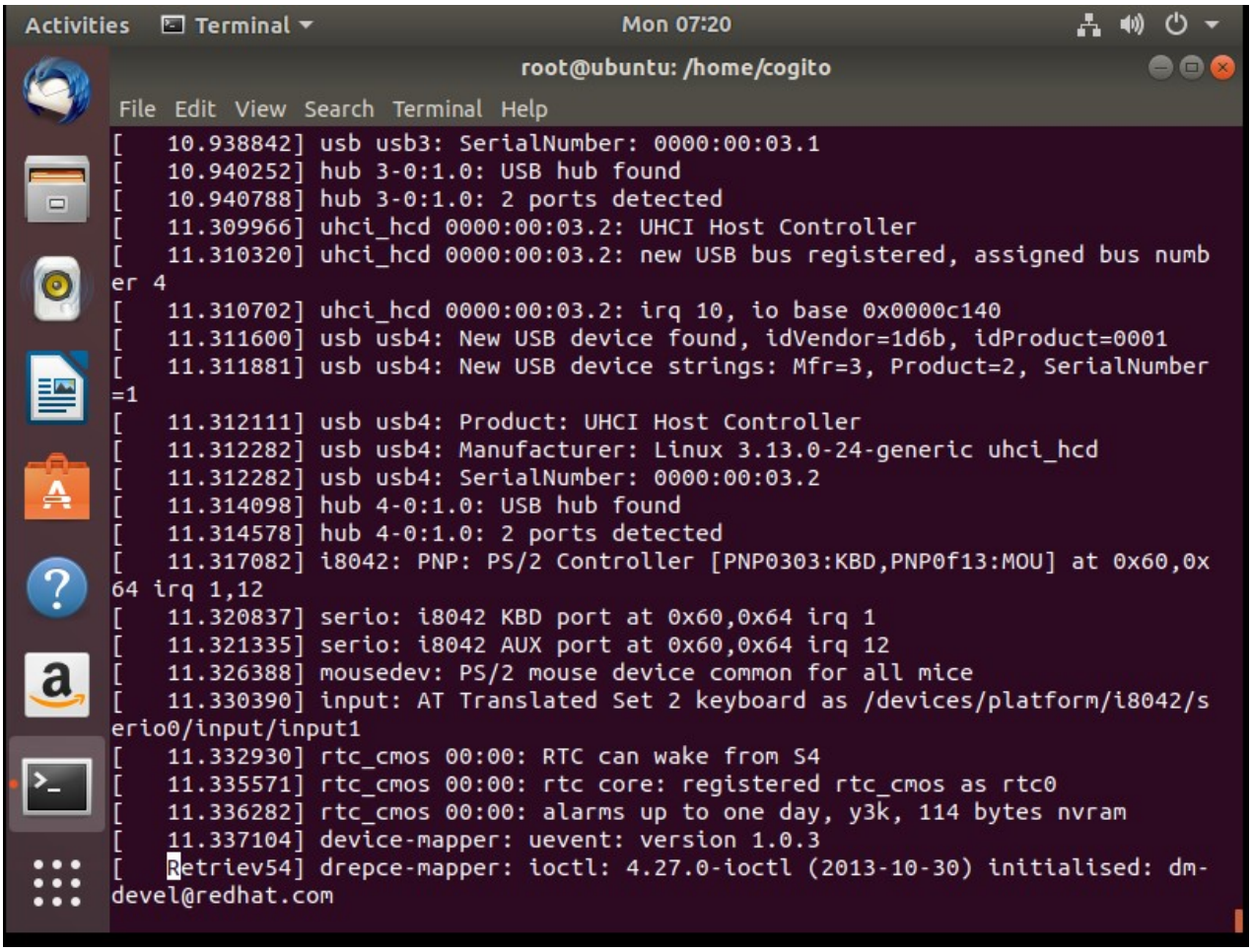
经过漫长的等待。。


es
Terminal
Mon 05:08
root@ubuntu: /home/cogito
File Edit View Search Terminal Help
Installing the base system
0%
Retrieving Release...

仍然是漫长的等待。。



遇到问题：滑轮不能下拉，见不到下面的进度条



尝试等待

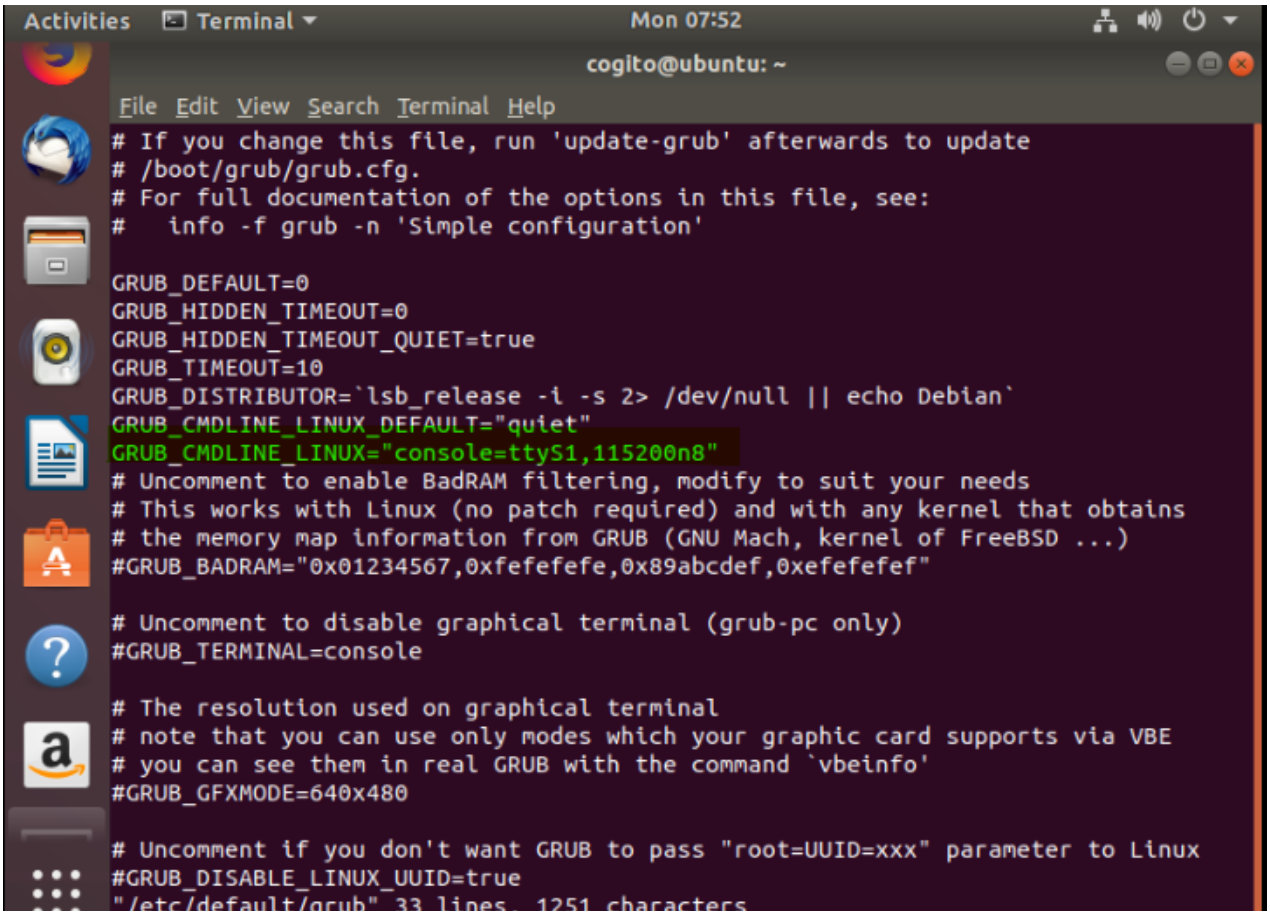
两小时过后依旧如此

全选终端中文本，复制到Windows下记事本，发现文本中底部和终端显示内容相同，即全选文本无法获取下面的进度条内容。

尝试关闭终端，测试是否安装好虚拟机。

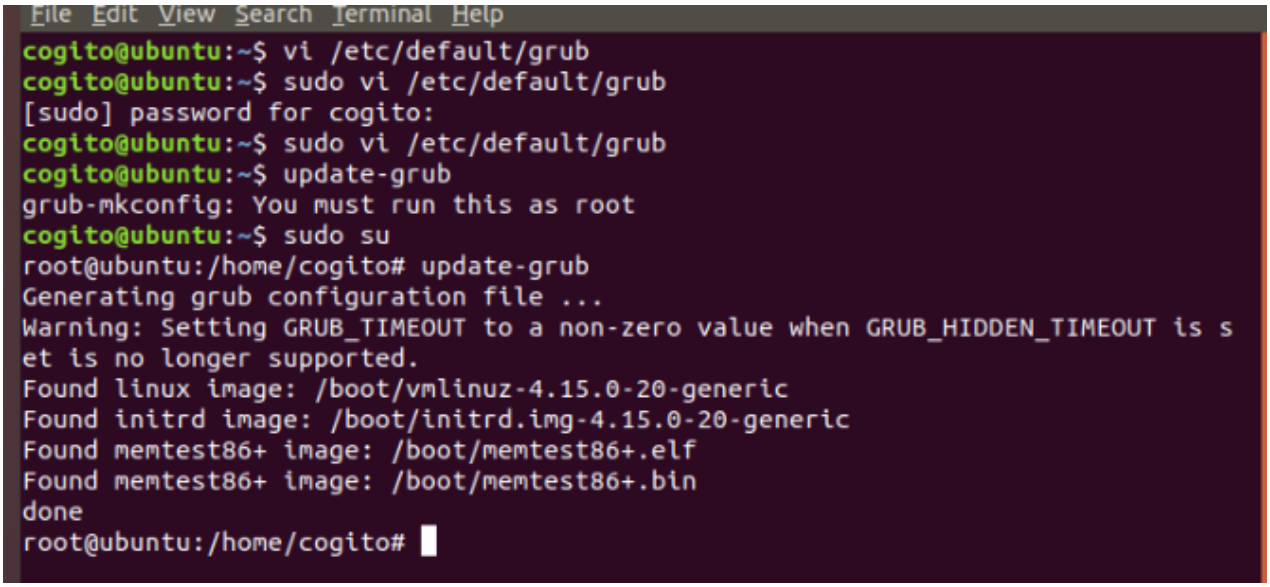
更改/etc/default/grub中的一行为GRUB_CMDLINE_LINUX="console=ttyS0,115200n8"

```
...
GRUB_CMDLINE_LINUX="console=ttyS0,115200n8"
...
```

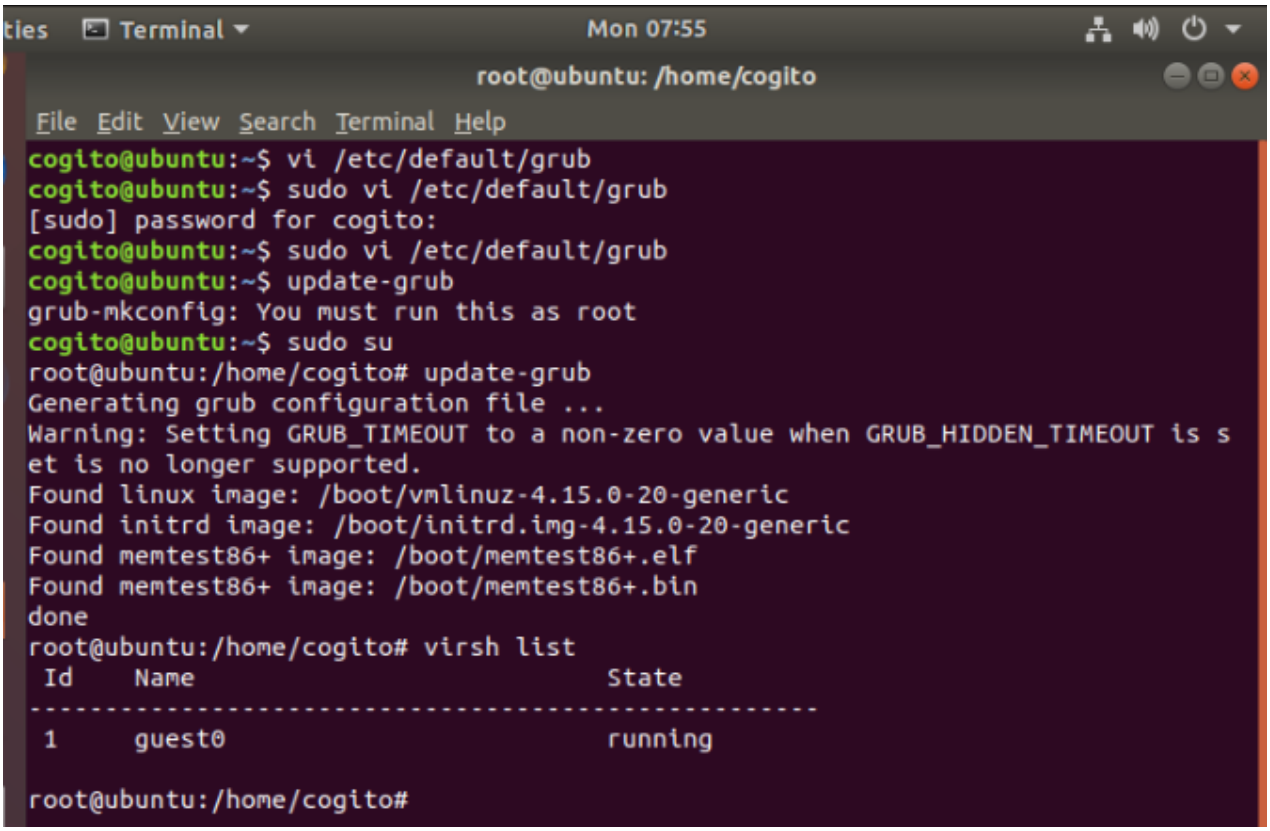


运行几条命令来使用虚拟机

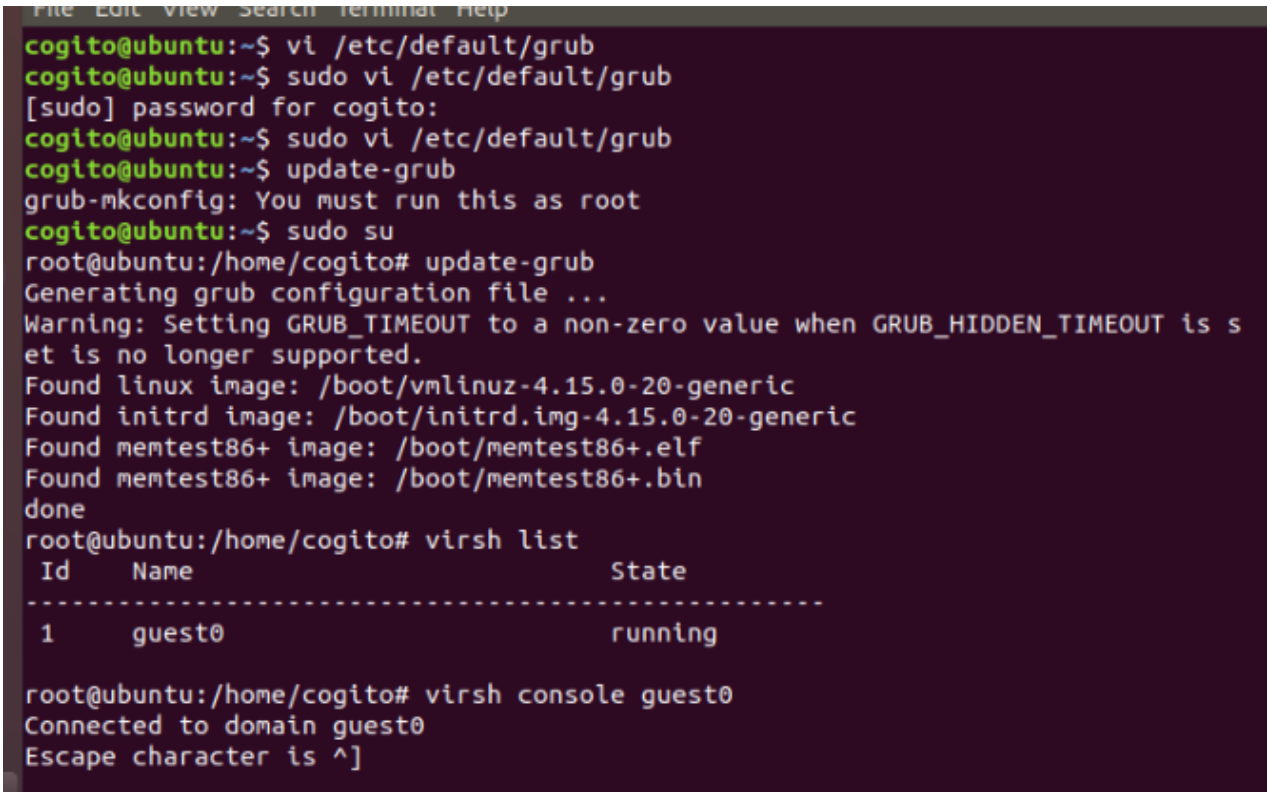
```
update-grub //更新引导项
```



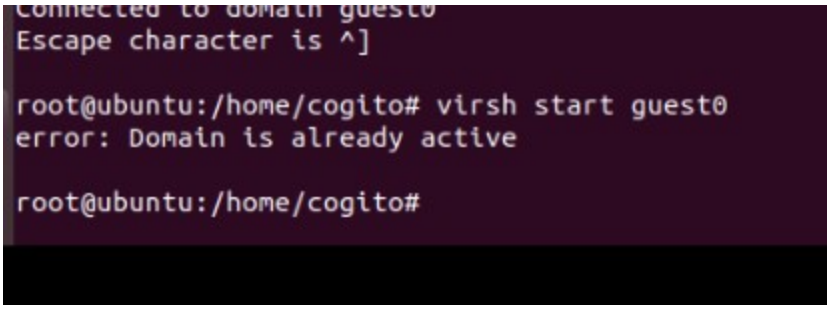

```
virsh list  //查看数据
```



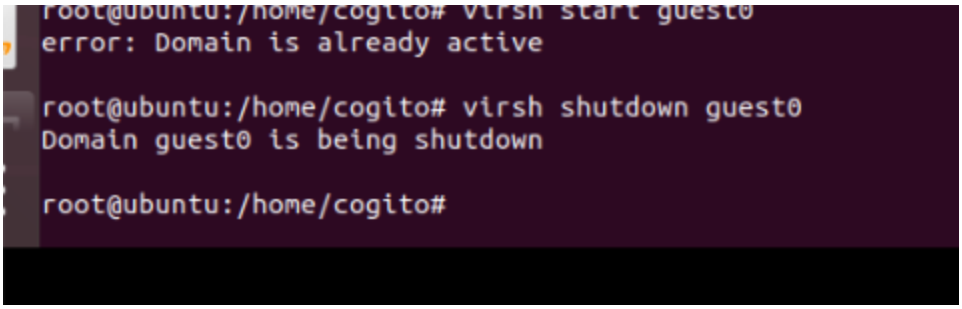

```
virsh console guest0  //连接客户机
```



```
virsh start guest0  //开启客户机
```




```
virsh shutdown guest0 //关闭客户机
```



实验结束

实验数据或结果

数据及结果在上述实验步骤中。

实验思考

即使成熟的工业软件，也有不如人意的明显错误

这次作业体验了从Windows下安装ubuntu虚拟机以及在虚拟机下构建KVM，实现hypervisor管理虚拟机下的虚拟机。虚拟机下安装虚拟机让人极度痛苦，在linux中建议换国内源，以更快的更新或安装软件。

参考资料