Tecnologías Multimedia - Study Guide - Milestone 0: OS (Operating System) Provisioning

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1. Description

The InterCom project [3] is a real-time application with a high computational (specially in terms of CPU) demand. It is written in Python [1], an interpreted languaje that has been ported to almost all the current OSs, including mobile devices.

This milestone (the installation of a dedicated Linux distribution for running InterCom) is optional, but it is highly recommend to do it because you'll receive technical support in a reasonable amount of time in the case you are in trouble. Futhermore, it is recommend to run InterCom in a Xubuntu 21.04 (Hirsute Hippo) [2], running natively (no virtualization). Xubuntu is fully functional (at least for developing our project) and demand a low amount of hardware resources.

The following "guide" helps you to install Xubuntu in an external USB drive, which must have at least 16GB of capacity (the minimal installation of Xubuntu needs about 5GB). You will need also a temporal external USB disk with at least 4GB to boot from it the installation Xubuntu image (or to burn an optical disk).

2. What do you have to do?

Supposing that you have decided to use Xubuntu in an USB disk, these are the steps you should perform (to install Xubuntu in a "hard" disk partition of your computer the instructions are almost the same):

1. Download the installation image from here.

2. "Burn" the 4GB USB drive with the image. Depending on your current OS, use the following instructions for Windows, OSX, Ubuntu (and derivatives), or the Linux console. Using the console (example):

```
[vruiz@pluton Descargas]$ ls -lh *.iso
-rw-r--r-- 1 vruiz vruiz 1,9G sep  9 16:00 xubuntu-21.04-d
vruiz@pluton Descargas]$ lsblk   # Before connecting the U
NAME        MAJ:MIN RM   SIZE RO TYPE MOUNTPOINTS
nvme0n1     259:0    0 238,5G  0 disk
+-nvme0n1p1 259:1    0 198,5G  0 part /home
+-nvme0n1p2 259:2    0     8G  0 part [SWAP]
```

```
    +-nvme0n1p3 259:3   0   513M  0 part /boot/efi
    +-nvme0n1p4 259:4   0  31,5G  0 part /
    [vruiz@pluton Descargas]$ lsblk  # After connecting the US
    NAME         MAJ:MIN RM   SIZE RO TYPE MOUNTPOINTS
    sda            8:0    1  29,2G  0 disk
    +-sda1         8:1    1   512M  0 part
    +-sda2         8:2    1  28,7G  0 part
    nvme0n1      259:0    0 238,5G  0 disk
    +-nvme0n1p1 259:1    0 198,5G  0 part /home
    +-nvme0n1p2 259:2    0     8G  0 part [SWAP]
    +-nvme0n1p3 259:3    0   513M  0 part /boot/efi
    +-nvme0n1p4 259:4    0  31,5G  0 part /
    [vruiz@pluton Descargas]$ sudo dd bs=4M if=xubuntu-21.04-d
    1929379840 bytes (1,9 GB, 1,8 GiB) copied, 151 s, 12,8 MB/
    466+1 registros leídos
    466+1 registros escritos
    1958051840 bytes (2,0 GB, 1,8 GiB) copied, 152,555 s, 12,8
```

3. Boot the image. Most of PCs can choose the boot device by pressing

the F12-key when the PC is booting. On a Mac, you need to keep pressed the alt-key when it is booting.

4. Select the option Try Xubuntu without installing.

5. Check the current storage devices (example):

```
xubuntu@xubuntu:~$ setxkbmap es  # This is for configure t
xubuntu@xubuntu:~$ lsblk
NAME        MAJ:MIN RM   SIZE RO TYPE MOUNTPOINT
loop0        7:0    0   1.6G  1 loop /rofs
sda          8:0    1  29.2G  0 disk  # <-- This is the U
+-sda1       8:1    1   1.8G  0 part /cdrom
+-sda2       8:2    1   4.9M  0 part
+-sda3       8:3    1   300K  0 part
+-sda4       8:4    1  27.4G  0 part /var/crash
nvme0n1    259:0    0 238.5G  0 disk  # <-- This is the h
+-nvme0n1p1 259:1    0 198.5G  0 part
+-vme0n1p2 259:2    0     8G  0 part
```

```
+-nvme0n1p3 259:3   0    513M  0 part
+-nvme0n1p4 259:4   0   31.5G  0 part
```

6. When the OS is running, configure the network. Thus, you will have access to the lastest verion of the packages during the installation.

7. Insert now the (at least) 16GB USB drive where Xubuntu will be installed. Be aware that this device will be formated, and therefore, all the current content will be lost. Check again the storage devices:

```
xubuntu@xubuntu:~$ lsblk
NAME       MAJ:MIN RM   SIZE RO TYPE MOUNTPOINT
loop0        7:0    0   1.6G  1 loop /rofs
sda          8:0    1  29.2G  0 disk
+-sda1       8:1    1   1.8G  0 part /cdrom
+-sda2       8:2    1   4.9M  0 part
+-sda3       8:3    1   300K  0 part
+-sda4       8:4    1  27.4G  0 part /var/crash
sdb          8:16   1 115.8G  0 disk  # <-- This is the >
```

```
+-sdb1        8:17   1   512M  0 part
+-sdb2        8:18   1   7.6G  0 part
+-sdb3        8:19   1  30.5G  0 part /media/xubuntu/dc7d4
+-sdb4        8:20   1  77.2G  0 part /media/xubuntu/def24
nvme0n1     259:0    0 238.5G  0 disk
+-nvme0n1p1 259:1    0 198.5G  0 part
+-nvme0n1p2 259:2    0     8G  0 part
+-nvme0n1p3 259:3    0   513M  0 part
+-nvme0n1p4 259:4    0  31.5G  0 part
```

Don't worry if the >16GB USB disk is mounted by Thunar (the default file manager in Xubuntu). The installer will ask to unmount the devices when this is necessary (notice that the destination device >16GB USB drive must be unmounted in order to modify the partition table).

8. Select Install Xubuntu 21.04.

9. Select English as the language used during the installation and the

installed system. This will help in the case you need to search information in the Internet, providing the error descriptions in English.

10. Select your keyboard layout (probably `Spanish`).

11. Select `Normal installation` (the default option).

12. Choose `Download updates while installing Xubuntu` and `Install third-party software for graphics and Wi-Fi hardware and additional media formats`, in order to have access to the ultimate software available for Ubuntu (and derivatives).

13. Choose `Erase disk and install Xubuntu`. Ignore the `Advanced Features`. Then, wait for a couple of minutes :-/

14. Select the drive corresponding to the $>= 16GB$ USB drive (`/dev/sdb` in the previous example). Don't choose `/dev/nvme01n1` (the main disk of the computer in the previous example)! Again, Select `/dev/sdb` (in the previous example)!! Use also the size and the label of the disks to confirm that you are selecting the right one.

15. At this point of the installation you should consider (depending on the amount of RAM memory installed in your computer and the size of the USB drive) to create an specific partition for doing swapping. The rule of the thumb is to create a partition with the same size that the RAM. However, probably you cannot do that in a 16GB USB drive because at least 5GB are needed for a Xubuntu installation. Anyway, keep in mind that this step is optional because you can always perform swapping on a file (a process slightly slower than using the dedicated partition). Consider also that InterCom requires only some MB of memory for running and therefore, probably you are not going to need to swap any memory page at all. Said that, if you decide to create a specific swap partition, click on `advanced partitioning tool` and do the modifications you want. Here you can also define different partitions for the root file system (which will hold the OS and the root files) and the home file system (that is uses for the file of the normal users), but notice that this is not necessary.

16. Very important: **double check that the boot loader (GRUB) will be installed in** /dev/sdb1 **(following our example)!!**.

17. Click on `Install Now`. You'll read something similar to:
    `If you continue, the changes listed below will be written`

    `WARNING: This will destroy all data on any partitions you`

    `The partition tables of the following devices are changed:`
    ` SCSI8 (0,0,0) (sdc)`

    `The following partitions are going to be formatted:`
    ` partition #1 of SCSI8 (0,0,0) (sdb) as ESP`
    ` partition #2 of SCSI8 (0,0,0) (sdb) as ext4`

18. Choose your time zone.

19. Configure you personal account (user and password), hostname and login process.

20. Wait for the end of the installation and boot your new Xubuntu. Don't worry if GRUB labels Xubuntu as Ubuntu. This is normal.

3.   Timming

You should reach this milestone at most in one week.

4. Deliverables

None.

5. Resources

[1] The Python Foundation. The Python Website.

[2] Canonical Ltd. xubuntu.

[3] The students of Tecnologías Multimedia at the UAL. The InterCom project.