

LXLE BIAR VM version 4.6

Installation instructions

In order to install and execute the virtual machine, follow the following steps:

1. Download and install VirtualBox for your OS/architecture at the following link
<https://www.virtualbox.org/wiki/Downloads>
2. Download the virtual machine OVA file from the shared folder either as a single OVA file or as separate zip fragments (zip.001, zip.002, zip.003, zip.004), when available.
3. In case zip fragments have been chosen, extract the OVA file by opening the zip.001 file with your zipper.
4. Import the OVA file in VirtualBox as shown at
https://docs.oracle.com/cd/E26217_01/E26796/html/qs-import-vm.html
5. Start the virtual machine.

Default User and Password

Username: biar

Password: biar

Notes on specific supported languages

Java

The virtual machine contains three installed versions of Java, in particular 8, 11 (default) and 17. If you want to switch the default version, for the command line, you can use the script on the desktop. If a password is required, you can find it inside the CREDENTIALS file on the desktop.

Python

Python 3.7, 3.8 and 3.10 are installed on the virtual machine. The `python3` and `pip3` command points by default to Python 3.7. If you want to install new packages we suggest using the specific commands for the required python installation. E.g., for Python 3.10 `pip3.10 install [package_name]` (without sudo), which install libraries visible from command line, jupyter notebook and idle. Alternatively you can create virtual environments by using `python3.10 -m venv` or `virtualenv`.

Considerations on some platforms

Apple Silicon Mx processors

VirtualBox recently started supporting **Apple Silicon processors**. However, the virtual machine **is not based on an ARM operating system**, thus emulation is anyway required (e.g., through QEMU/UTM). Be aware anyway that x64 emulation is significantly slower than arm64 virtualization (on M1, for example, a slow-down of 10X is reported). Some pointers:

- Here instructions to install UTM
<https://levelup.gitconnected.com/running-amd64-linux-on-apple-m1-with-qemu-utm-64d67cccd6f8>
- In order to create the VM you cannot directly use the OVA file. You must first extract the VMDK (or VDI) virtual hard drive from the OVA file opening with an unzipper (OVA files are common tar files), and then convert it to a QEMU compatible disk (see https://www.reddit.com/r/linuxquestions/comments/8fbrj6/does_qemu_support_vdi_disk_images/ for instructions on how to convert images for QEMU)
- Detailed instructions are available here
https://drive.google.com/file/d/1sosXXfDZgGNXq7l22Y2WX3zRgSp2a-5Q/view?usp=drive_link

Microsoft Windows with Hyper-V

On Windows platforms, users could not be able to run the virtual machine **if Hyper-V is installed**. The reason is that Hyper-V starts at system boot and only one Hypervisor can use the virtualization instructions of the CPU. Unfortunately, Hyper-V is required on Windows if you need native containerization (unless you want to run containerization platform inside a Linux Virtual Machine) of Windows containers and Linux containers (the latter through WSL2). **Fortunately, since version 6.1 of VirtualBox, it is possible to select Hyper-V paravirtualization, which allows the virtual machine to run without issues even if Hyper-V is installed. In this case, VirtualBox simply acts as a different GUI for Hyper-V.** In order to enable paravirtualization, follow the instructions at the link <https://us.informatiweb.net/tutorials/it/virtualization/virtualbox-use-virtualbox-and-hyper-v-at-the-same-time.html>.

Considerations on shared folders

The specific version of the VirtualBox guest addition installed on the machine prevents the automount functionality of shared folders. If you want to use at startup custom shared folders at home (shared folders in the lab are automatically mounted), you can modify the file `/etc/rc.local` taking inspiration from the previous lines. Please take into account that any changes to `/etc/rc.local` file require reboot.

Considerations on hardware requirements

The virtual machine requires a considerable amount of space; a free space of 50GB is suggested. From the point of view of RAM requirements instead, even though the OVA file is preconfigured with 8GB of RAM, at boot time the VM takes 0.5GB of RAM, thus making 4GB enough for the common usage.

Additional notes for instructors

Exam distribution dashboard

The dashboard to upload exams in the “esame” folder on the desktop can be reached at the address <http://dashboard.tibur.lab> (please do not forget http:// as recent browsers may try to force https). Alternatively you can reach it at the IP address 192.168.49.228.

Teleconferencing in the lab

The host operating system does not support the headphone 3.5mm jack of the computers in the lab. In order to do teleconferencing you will need a USB **active** headphone or speaker. At this point it is possible to connect the device to the virtual machine using the CTRL (right) + U combination and selecting the USB device corresponding to the speaker.

Among the different connectable devices you may also find (for example in Lab 16) the minarray device, which represents the lab camera. Zoom is already installed on the virtual machine.

Unfortunately, Zoom is quite strict in terms of required updates, and this may require sometimes to do a manual update. This can be done selecting 64bit Ubuntu from the download page you are redirected to by the Zoom app and simply executing the installation package (if a password is required please refer to the beginning of this document).

Ticketing form

If you experience any problems with the virtual machine please contact us through the google form at the link <https://forms.gle/XG4ZK3q9WwGYex826>

Additional notes for all users

Please remember that the virtual machine installations are periodically (weekly usually) reset in Via Tiburtina laboratories, thus any changes (including new packages installed) will be discarded sooner or later. If you want to propose new software to install, please use the ticketing form. New versions of the virtual machines will be deployed periodically.

Google Chrome may show some problems at upgrading from the GUI. In such a case, open a terminal and execute the following command (user password is reported at the beginning of this document): `sudo apt-get --only-upgrade install google-chrome-stable`

Additional notes for maintainers

The VDI disk associated with the virtual machine is set to dynamically grow. This could lead to an allocated space due to canceled files which is bigger than expected, which impacts the size of exported OVAs too. In this case it could be helpful to use zerofree in combination to VBoxManage to compact the virtual disk, as indicated in [virtualbox - zerofree on ubuntu 18.04 - Ask Ubuntu](#).

Change log

v4.0 - 2022/02/21

Initial version

v4.1 - 2022/02/23

- Idle set up as default program for .py extension
- Bump from PgAdmin III to PgAdmin IV
- Installed psycopg library for Python
- Fixed an issue with Idle python path preventing the employment of libraries installed through pip3
- Guest additions v6.1 installed
- Lock screen key combination moved from F5 to Ctrl+Alt+L

v4.2 - 2022/02/24

- Downgrade of VBox guest additions to 5.2.44 for lab compatibility
- Fixes on shared folders, `/etc/rc.local` file added

v4.3 - 2022/02/28

- Date format on desktop changed to DD/MM/YYYY
- Java 8 and Java 17 added to Apache Netbeans list by default without requiring adding them manually
- Virtual disk resized to 80GB
- Fixed an issue preventing pandas from being imported from Jupyter Lab/Notebook
- CLion installed with a trial version

v4.4 - 2023/09/07

- OpenCL support fixed
- libc-dbg:i386 installed. ~/.gdbinit added and filled as suggested in <https://season-lab.github.io/SC/training/tools/gdb>
- Spyder IDE installed
- Gedit and Geany temporarily removed waiting to fix the issue with the shared folder. Visual studio code is now the default editor for most file extensions.
- C/C++, Python and Java extensions added to Visual Studio code
- OpenGL and GLUT installed

v4.5 - 2023/09/22

- Fixed issue with repeated save on shared folders by upgrading VirtualBox and VirtualBox Guest Additions to 6.1.46
- Gedit and Geany reinstalled but not selected as default editors

v4.6 - 2024/09/07

- Ubuntu bump to Jammy (22.04 LTS)
- Spyder IDE version 6 installed
- Only Java 17 kept for the sake of space
- Removed CLion, Idea, PyCharm, Netbeans
- LibreOffice installed

Scheduled improvements for future versions

- Upgrade Eclipse
- USB 2.0 or 3.0 selected in VirtualBox image settings
- Disable automatic snap of windows to desktop borders
- Add script to change default action on Python files as open with idle
- Vagrant IaC script to generate the virtual machine