

# PW-01. INSTALLING VIRTUAL MACHINES FOR ORACLE VIRTUALBOX.

## 1. TARGET OF THE WORK

Get the initial skills of working with Oracle VirtualBox Virtual Environment. Learn how to launch and log in to UNIX/Linux.

Other Popular Virtual Environments: QUEMI, VMWare ESX, Microsoft Hyper-V, XEN.

The Linux/UNIX console commands are used: **pwd, date, ping, tracepath, ifconfig, sudo, exit, logout, shutdown, apt, mc.**

## 2. TASKS FOR WORK

2.1. Install and test Oracle **VirtualBox** Virtual Environment. (Do only for your home Windows/Mac computer).

2.2. Install and test pre-built VM **UbuntuMini.OVA** from sys.academy.lv.

2.3. Select, install and test Linux VM from osboxes.org (for example, **Lubuntu18.04** VM).

2.4. Install and test Linux on Windows Subsystem for Linux (**WSL**) from Microsoft Store (Optional, do only for funs)

## 3. REPORT

The report is provided electronic form with Report Blank Form (docx).

The report includes **Screenshots 1-5**.

## 4. GUIDELINES

### 4.1. INSTALLING VIRTUALBOX

Remark. **Do only for your home Windows/Mac computer** if VirtualBox is not already installed!

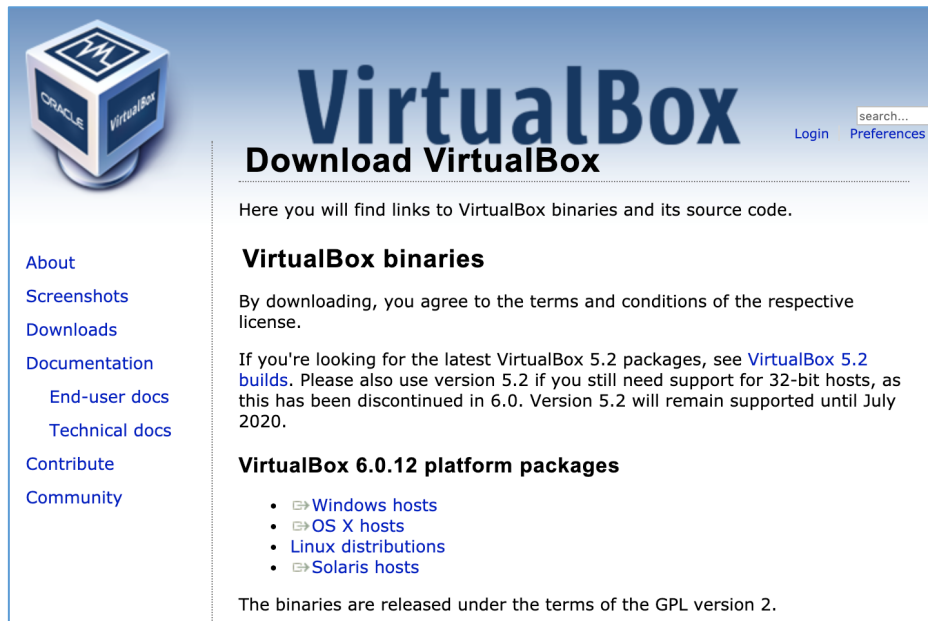
**4.1.1. Read** the article: <https://m.wikihow.com/Install-Ubuntu-on-VirtualBox>.

Virtual Box support OVA and VDI files.

- **OVA** – Open Virtualization Format Archive, which includes virtual machine settings – CPU, RAM, NET, other.
- **VDI** – default VirtualBox Disk Image format. VMDK – VM Ware disk (can split big file). VHD – Microsoft disk.

**4.1.2. Download** VirtualBox and Extensions Pack from here <http://www.virtualbox.org/wiki/Downloads>

**4.1.3. Install** VirtualBox, read help on site <http://help.ubuntu.ru/wiki/virtualbox>



The screenshot shows the VirtualBox website's download page. At the top left is the VirtualBox logo, a blue cube with 'ORACLE' and 'VirtualBox' on its sides. The main heading is 'VirtualBox' in large blue letters, with 'Download VirtualBox' below it. To the right of the heading are links for 'Login' and 'Preferences', and a search bar. A sidebar on the left contains navigation links: 'About', 'Screenshots', 'Downloads', 'Documentation' (with sub-links for 'End-user docs' and 'Technical docs'), 'Contribute', and 'Community'. The main content area starts with the text 'Here you will find links to VirtualBox binaries and its source code.' followed by a section titled 'VirtualBox binaries' with a disclaimer about terms and conditions. Below that is a note about the latest VirtualBox 5.2 packages. The next section is 'VirtualBox 6.0.12 platform packages' with a bulleted list of links for Windows, OS X, Linux, and Solaris hosts. At the bottom, it states 'The binaries are released under the terms of the GPL version 2.'

#### VirtualBox 6.1.18 Oracle VM VirtualBox Extension Pack

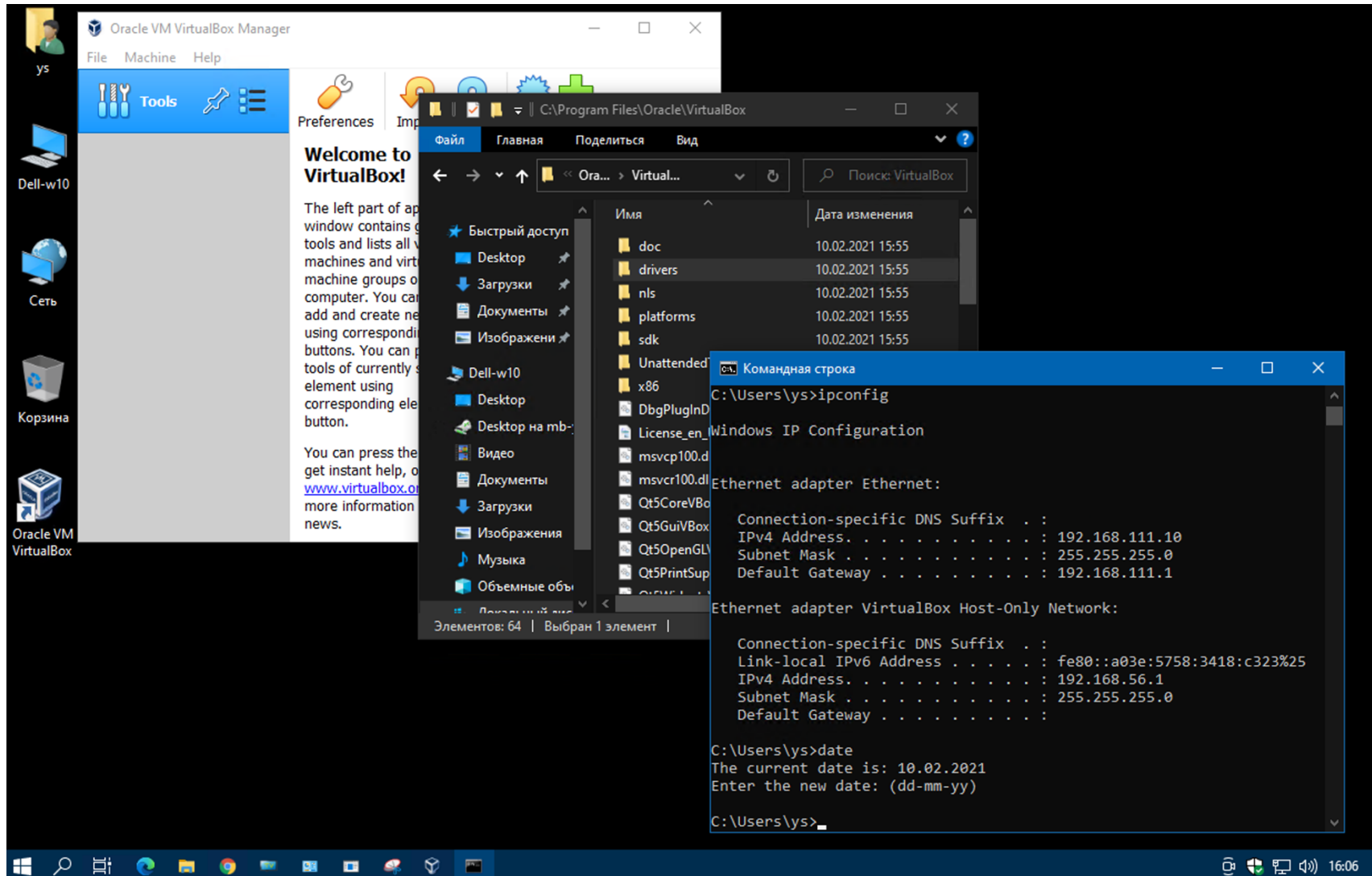
- [All supported platforms](#)

Support for USB 2.0 and USB 3.0 devices, VirtualBox RDP, disk encryption, NVMe and PXE boot for Intel cards. See [this chapter from the User Manual](#) for an introduction to this Extension Pack. The Extension Pack binaries are released under the [VirtualBox Personal Use and Evaluation License \(PUEL\)](#). *Please install the same version extension pack as your installed version of VirtualBox.*

After installing Virtual Box make a **Screenshot** 1 include: your computer IP, current date and date of creation (Look example on next page).

## Screenshot 1a Example for Windows

include: your computer IP, current date and date of creation



## Screenshot 1b Example for Mac.

include: your computer IP, current date and date of creation

The screenshot displays a Mac desktop environment. In the foreground, the Oracle VM VirtualBox Manager application is open, showing a list of virtual machines: MikroTik\_RouterOS\_2.6 (Выключена), UbuntuMini (Выключена), Lubuntu18-64 (Выключена), and IE11 - Win7 (Выключена). A terminal window is open in the foreground, showing the output of the 'date' and 'ifconfig' commands. The 'date' command shows the current date and time as 'Wed Feb 10 16:20:56 EET 2021'. The 'ifconfig' command shows the network configuration for the 'en0' interface, including the IP address '192.168.111.15' and the netmask '0xffffffff'. In the background, the Applications folder is open, showing a list of installed applications, including Photo Booth.app, PiPifier.app, QuickTimeX.plugin, RemoteApp.plugin, Safari.app, ScreamingMee.app, Siri.app, Skype.app, SweetHome3D.app, SynologyDrive.app, TeamViewer.app, TextEdit.app, Time Machine.app, Tor Browser.app, TV.app, VirtualBox.app, Visual Studio Code.app, VLC.app, vSSH.app, WhatsApp.app, Yandex.app, and zoom.us.app. The VirtualBox.app is highlighted, and its details are shown on the right, including the size '247,3 МБ' and the creation date 'Вторник, 12 января 2021 г. в 15:39'.

```
MB-YS:~ ys$ date
Wed Feb 10 16:20:56 EET 2021
MB-YS:~ ys$ ifconfig
lo0: flags=8049<UP,LOOPBACK,RUNNING,MULTICAST> mtu 16384
options=1203<RXCSUM, TXCSUM, TXSTATUS, SW_TIMESTAMP>
inet 127.0.0.1 netmask 0xff000000
inet6 ::1 prefixlen 128
inet6 fe80::1%lo0 prefixlen 64 scopeid 0x1
nd6 options=201<PERFORMNUD,DAD>
gif0: flags=8010<POINTOPOINT,MULTICAST> mtu 1280
stf0: flags=0<> mtu 1280
en0: flags=8863<UP,BROADCAST,SMART,RUNNING,SIMPLEX,MULTICAST> mtu 1500
options=400<CHANNEL_IO>
ether a8:66:7f:19:ab:47
inet6 fe80::444:33dd:f6b0:b3fa%en0 prefixlen 64 secured scopeid 0x4
inet 192.168.111.15 netmask 0xffffffff broadcast 192.168.111.255
nd6 options=201<PERFORMNUD,DAD>
media: autoselect
status: active
p2p0: flags=8843<UP,BROADCAST,RUNNING,SIMPLEX,MULTICAST> mtu 2304
options=400<CHANNEL_IO>
```

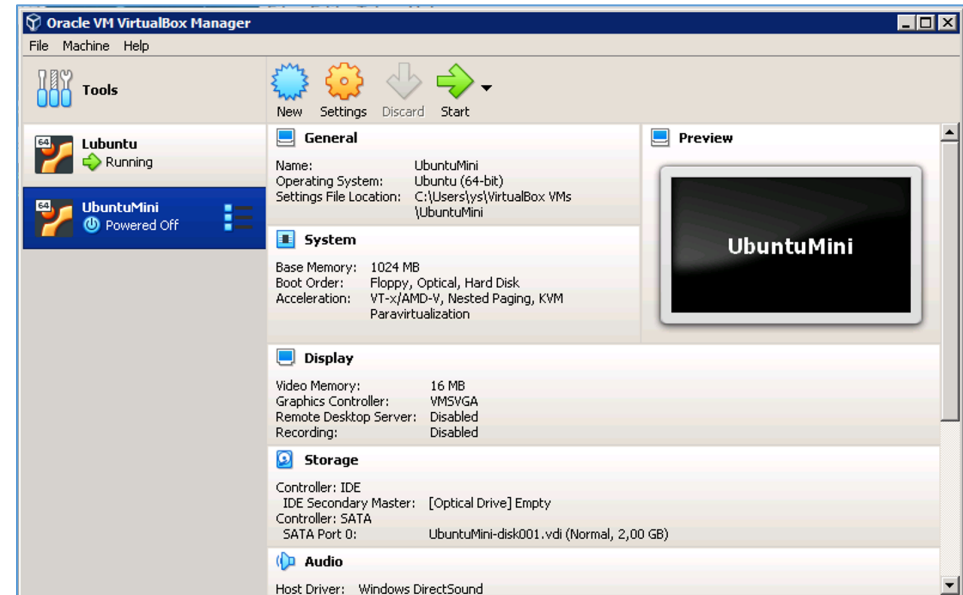
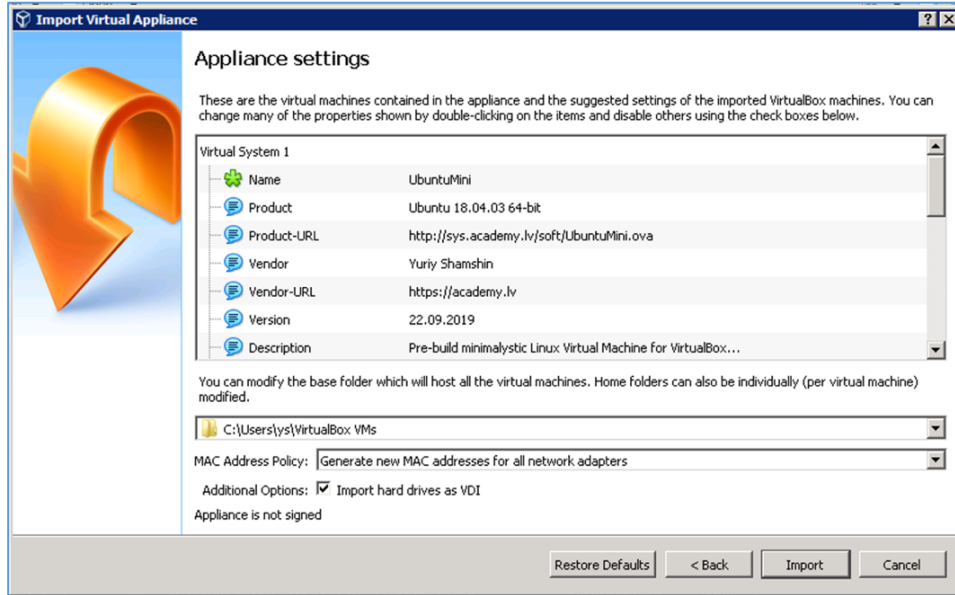
## 4.2. INSTALLING PRE-BUILT VM UBUNTUMINI.OVA FROM SYS.ACADEMY.LV

4.2.1. **Download** Pre-built UbuntuMini.ova [750 MiB] VM\* from <https://sys.academy.lv/labwork.php>.

4.2.2. **Copy** UbuntuMini.ova file to your folder on Desktop (or on your USB FlashDrive).

4.2.3. **Start** VirtualBox, run File → **Import Appliance** and select UbuntuMini.ova file for import this Virtual Machine to VirtualBox.

4.2.4. **Modify** the base folder to folder on your USB FlashDrive (example, create directory “myVMs” on FlashDrive) **Look** →.



4.2.5. **Start** UbuntuMini VM with username “student” and password “student”.

To run as root use "sudo command" for one bash command execution; for change full working session use “sudo -i” or “su”.

4.2.6. **Test** UbuntuMini VM:

```
$ uname -a
...
$ date
...
$ ping academy.lv //Press [Ctrl]+[C] for end after 3-5 pings.
...
$ tracepath academy.lv
...
```

After test Virtual Machine make a **Screenshot 2** include Linux screen content

```
student@ubuntumini:~$ uname -a
Linux ubuntumini 4.15.0-64-generic #73-Ubuntu SMP Thu Sep 12 13:16:13 UTC 2019 x86_64 x86_64 x86_64
GNU/Linux
student@ubuntumini:~$ date
Thu Apr 15 11:16:59 EEST 2021
student@ubuntumini:~$ ping academy.lv
PING academy.lv (83.99.169.65) 56(84) bytes of data.
64 bytes from balticom-169-65.balticom.lv (83.99.169.65): icmp_seq=1 ttl=63 time=3.72 ms
64 bytes from balticom-169-65.balticom.lv (83.99.169.65): icmp_seq=2 ttl=63 time=3.25 ms
64 bytes from balticom-169-65.balticom.lv (83.99.169.65): icmp_seq=3 ttl=63 time=3.19 ms
^C
--- academy.lv ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2004ms
rtt min/avg/max/mdev = 3.194/3.392/3.729/0.243 ms
student@ubuntumini:~$ tracepath www.lv
  1?: [LOCALHOST]           pmtu 1500
  1:  _gateway                0.433ms
  1:  _gateway                0.266ms
  2:  192.168.111.1           1.590ms asymm 64
  3:  10.49.183.254          2.385ms asymm 63
  4:  te-2401-29-72-65.balticom.lv 2.274ms asymm 62
  5:  r01-69-193.balticom.lv  1.906ms asymm 61
  6:  balticom-193-72-111.balticom.lv 2.725ms asymm 60
  7:  te-2403-32-72-100.balticom.lv 4.193ms asymm 59
  8:  SIGMANET.smile-ixp.net  4.121ms asymm 58
  9:  85.254.196.214         4.542ms asymm 57
 10:  92.240.66.25           3.439ms reached
Resume: pmtu 1500 hops 10 back 56
student@ubuntumini:~$
```

**4.2.7. Install and test mc (Midnight Commander) on your VM:**

```
$ sudo apt install mc
...
Do you want to continue? [Y/n] //type "y" and <Enter>
...
$ mc //look the mc interface and move between directories
...
```

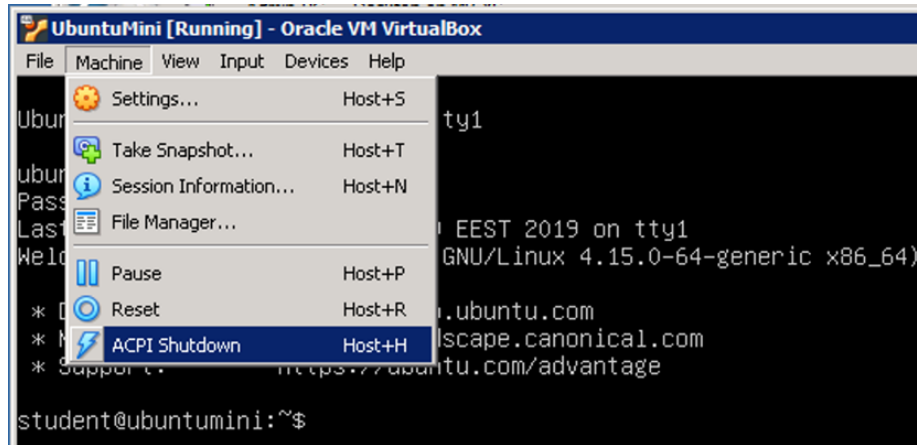
After test Midnight Commander make a **Screenshot 3** include Linux and mc screen content

```
$ exit // exit from mc
```

#### 4.2.8. Shutdown UbuntuMini VM with command:

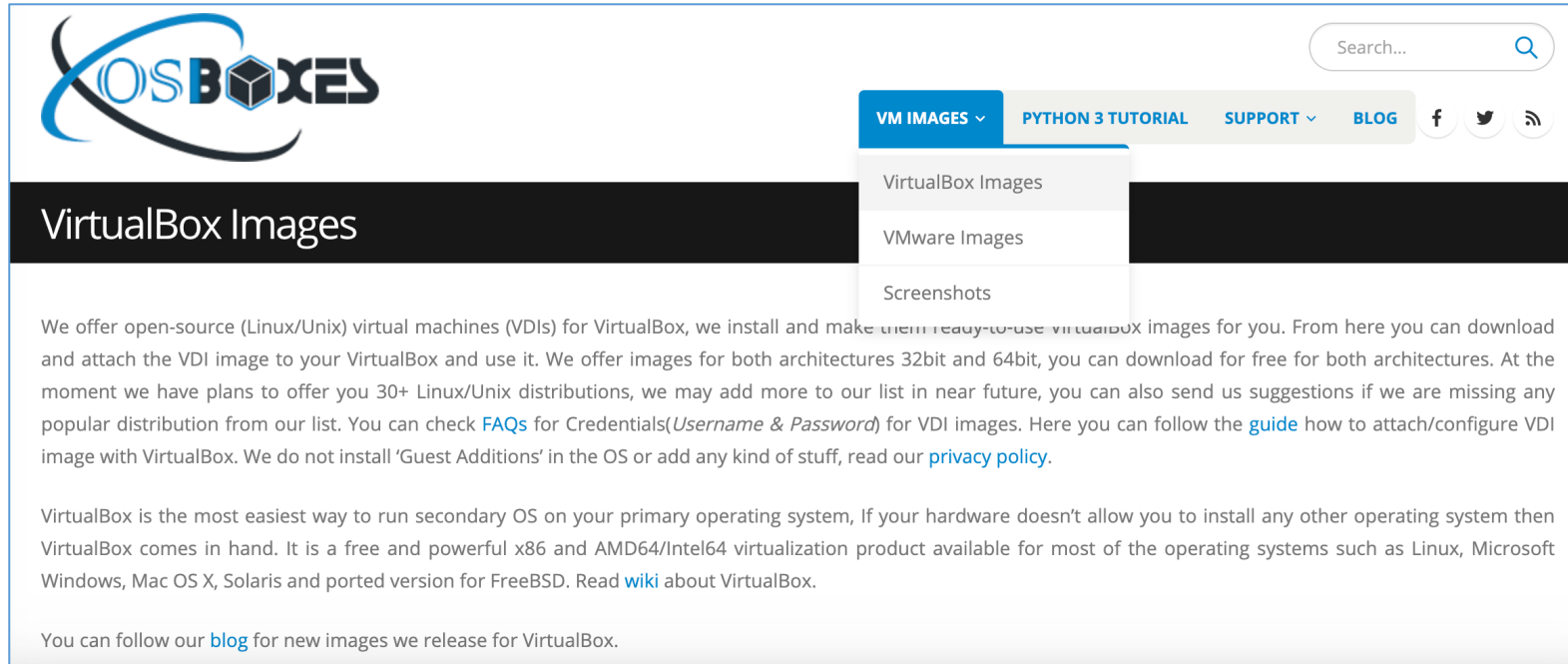
\$ sudo shutdown //enter the password for shutdown

or from VirtualBox menu select “Machine → ACPI Shutdown”



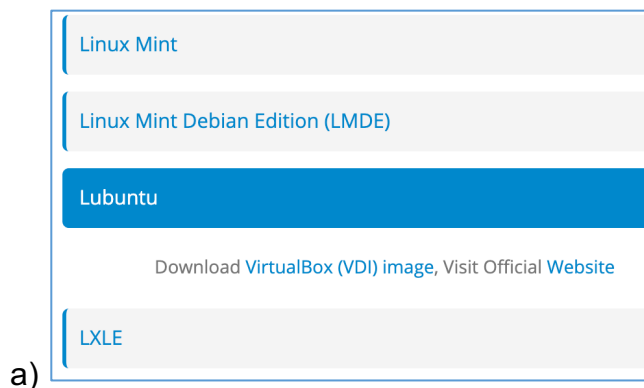
## 4.3. SELECTING, INSTALLING AND TESTING LINUX VM FROM OSBOXES.ORG

4.3.1. Look, select and download any Linux virtual machine here <https://www.osboxes.org/virtualbox-images/>.

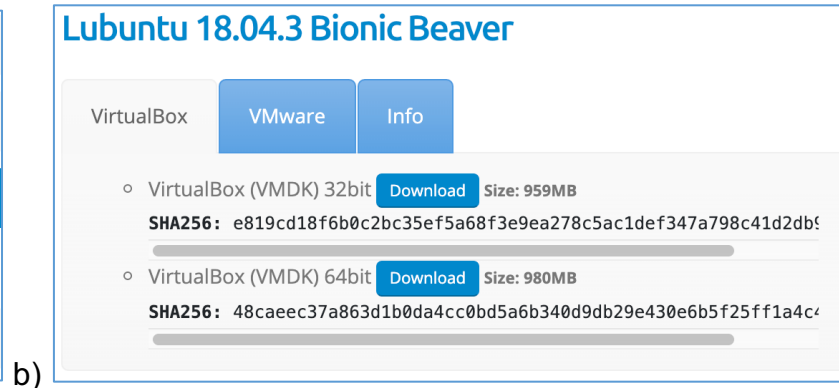


The screenshot shows the OSBoxes website interface. At the top left is the OSBoxes logo. A search bar is located at the top right. Below the logo, there is a navigation menu with 'VM IMAGES' selected, which has opened a dropdown menu showing 'VirtualBox Images', 'VMware Images', and 'Screenshots'. The main content area is titled 'VirtualBox Images' and contains two paragraphs of text. The first paragraph explains that the site offers open-source Linux/Unix virtual machines (VDIs) for VirtualBox, available for both 32-bit and 64-bit architectures. It mentions that there are 30+ distributions and provides links to FAQs, a guide for attaching VDI images, and a privacy policy. The second paragraph describes VirtualBox as a free and powerful x86 and AMD64/Intel64 virtualization product. At the bottom, there is a link to the blog for new images.

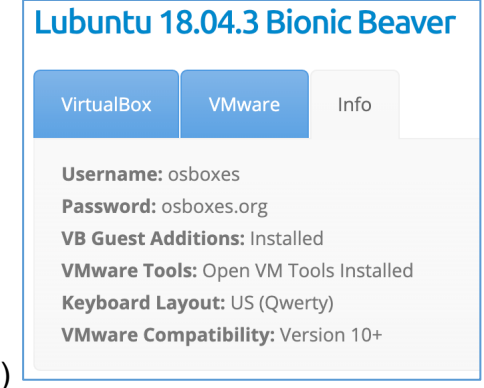
4.3.2. For example, choose Lubuntu 18.04.VDI (small image for light GUI edition) <https://www.osboxes.org/lubuntu/#lubuntu-18-04-vbox>



This screenshot shows the selection page for Lubuntu 18.04.VDI. It features a list of operating systems: Linux Mint, Linux Mint Debian Edition (LMDE), Lubuntu (highlighted in blue), and LXLE. Below the list, there is a link that says 'Download VirtualBox (VDI) image, Visit Official Website'.



This screenshot shows the download options for Lubuntu 18.04.3 Bionic Beaver. It has tabs for 'VirtualBox', 'VMware', and 'Info'. Under the 'VirtualBox' tab, there are two options: 'VirtualBox (VMDK) 32bit' with a 'Download' button and a size of 959MB, and 'VirtualBox (VMDK) 64bit' with a 'Download' button and a size of 980MB. Each option includes a SHA256 hash.



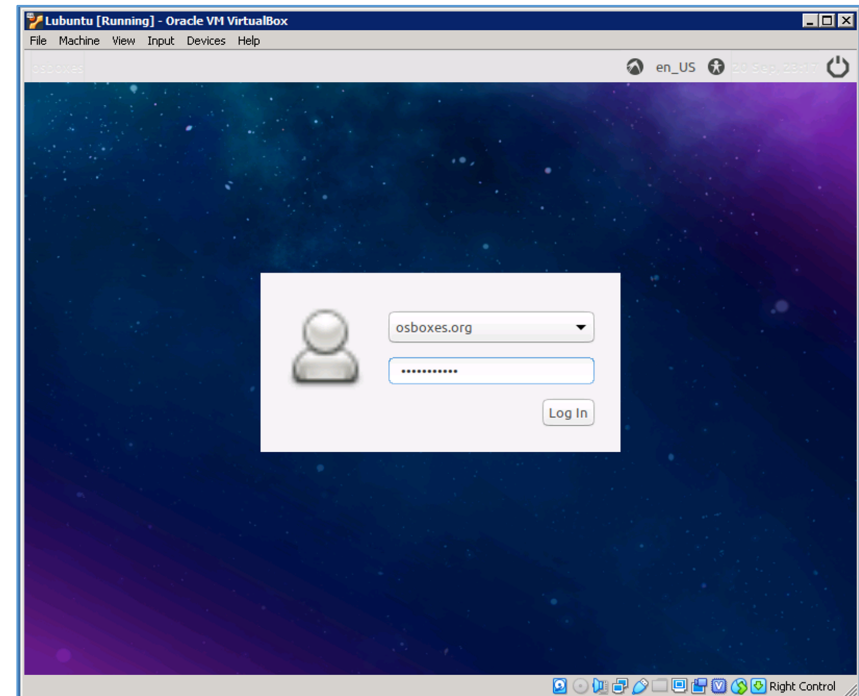
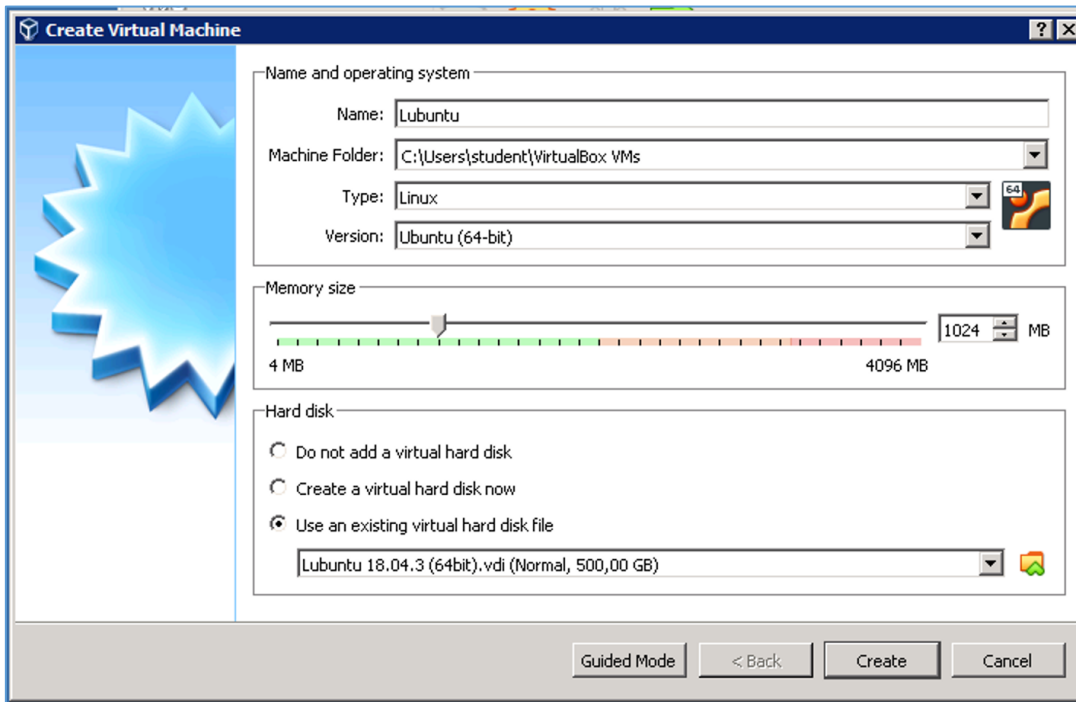
This screenshot shows the system details for Lubuntu 18.04.3 Bionic Beaver. It has tabs for 'VirtualBox', 'VMware', and 'Info'. The 'Info' tab is active, displaying the following details: Username: osboxes, Password: osboxes.org, VB Guest Additions: Installed, VMware Tools: Open VM Tools Installed, Keyboard Layout: US (Qwerty), and VMware Compatibility: Version 10+.



### 4.3.3. Uncompressing the VM.7z file.

### 4.3.4. Add a VM to VirtualBox.

Choose "New", then select Type: Linux and select Version: Your-Distributive (32-bit) or Your-Distributive (64-bit). Then, when asked for hard drive, choose "existing" and point to the unpacked VDI file (VDI - Virtual Disk Image). If need, then modify Machine folder to you USB Flash Drive "myVMs" directory.



**4.3.5. Start the VM.** The **username and password** for the VM have on Your Concrete Distributive description on the site (example for Lubuntu 18.04 Username: osboxes.org and Password: osboxes.org).

**4.3.6. Install and test mc** (Midnight Commander) on your VM.

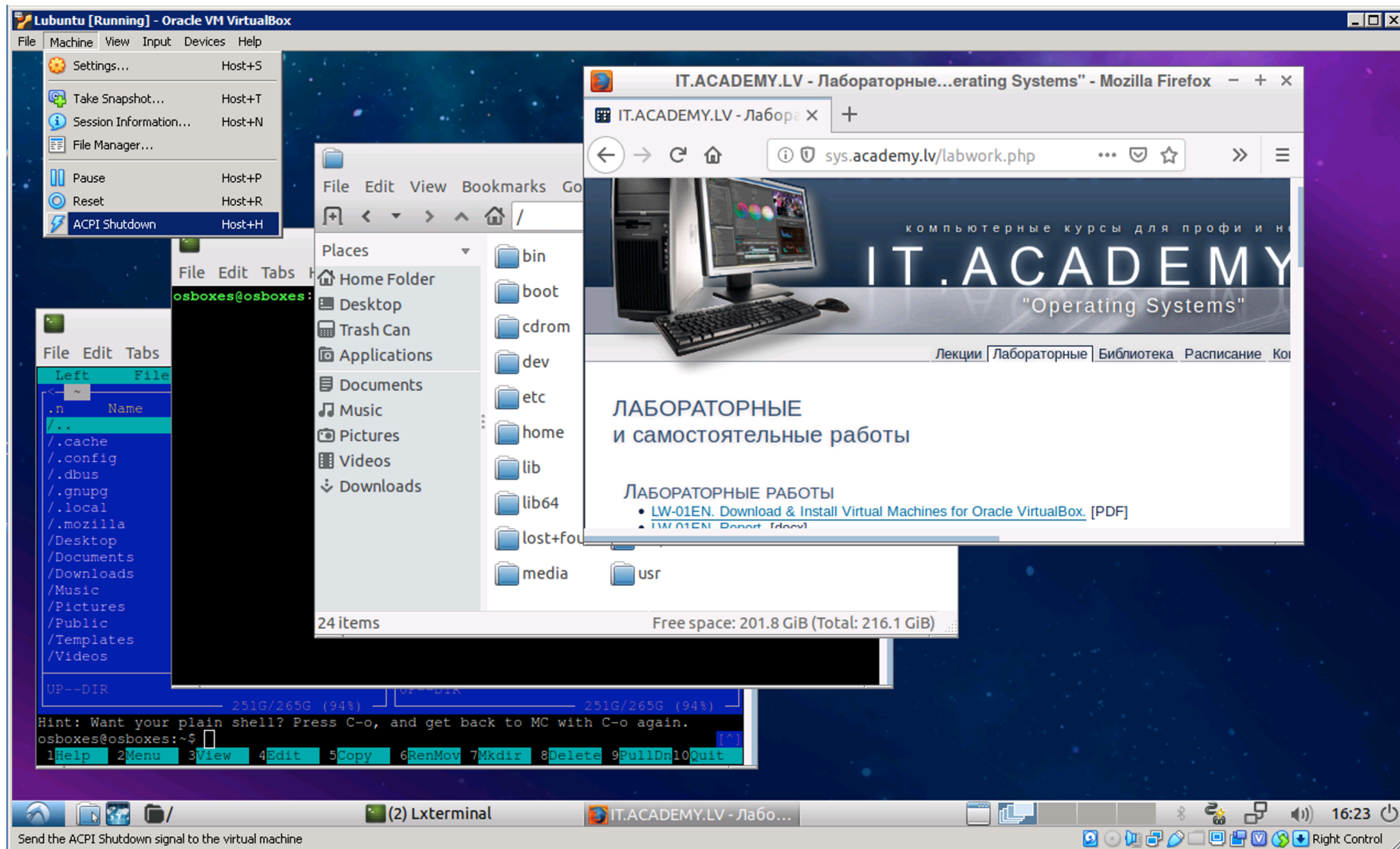
Install Midnight Commander: Start → System Tools → Software → Utilities → Midnight Commander → Install.

Test Midnight Commander: Start → Other → Midnight Commander.

**4.3.7. Test** Your VM. Get to know about your system. Start Applications: Midnight Commander, Terminal, File Manager, Browser, Package Manager.

Make a **Screenshot 4** include workspace with many apps window.

Example of Lubuntu work space Screenshot:



**4.3.8. Shutdown** your VM: or select Start → Logout → Shutdown, or on VirtualBox menu select Machine → ACPI Shutdown.

**4.3.9. If You have problem with selected distributive, then install my pre-built VM Lubuntu18-64.ova** [1.7 GiB] (login:password - student:student) from <https://sys.academy.lv/labwork.php>.

## 4.4. WINDOWS SUBSYSTEM FOR LINUX (WSL) INSTALLATION GUIDE (FOR WINDOWS FUNS ONLY)

Follow the instruction from <https://learn.microsoft.com/en-us/windows/wsl/install> to install Windows Subsystem for Linux.

### 4.4.1. Enable the Windows Subsystem for Linux

1. Before installing any Linux distros for WSL, you must ensure that the "Windows Subsystem for Linux" optional feature is enabled. Open PowerShell as Administrator and run PowerShell command:  
Enable-WindowsOptionalFeature -Online -FeatureName Microsoft-Windows-Subsystem-Linux
2. Restart your computer when prompted.

### 4.4.2. Install your Linux Distribution of Choice

1. Download and install from the Microsoft Store: choose your favorite Linux distribution and select "Get" →
2. Download and install from the Command-Line/Script (read the manual installation instructions - <https://docs.microsoft.com/en-us/windows/wsl/install-manual>)
3. Download and manually unpack and install (for Windows Server - instructions here <https://docs.microsoft.com/en-us/windows/wsl/install-on-server>)

### 4.4.3. Complete initialization of your distro

1. You must initialize your new Linux distro instance once, before it can be used  
<https://docs.microsoft.com/en-us/windows/wsl/initialize-distro>

### 4.4.4. Test

Open "Bash on Linux on Windows", and run the following commands:  
sudo apt-get update  
sudo apt-get install -y mc

Make a **Screenshot 5** include workspace Linux on Windows.

