

Модуль 1 Введение в Linux. Домашнее задание #1

VirtualBox

1. Проверим, что аппаратная виртуализация на ноутбуке включена.



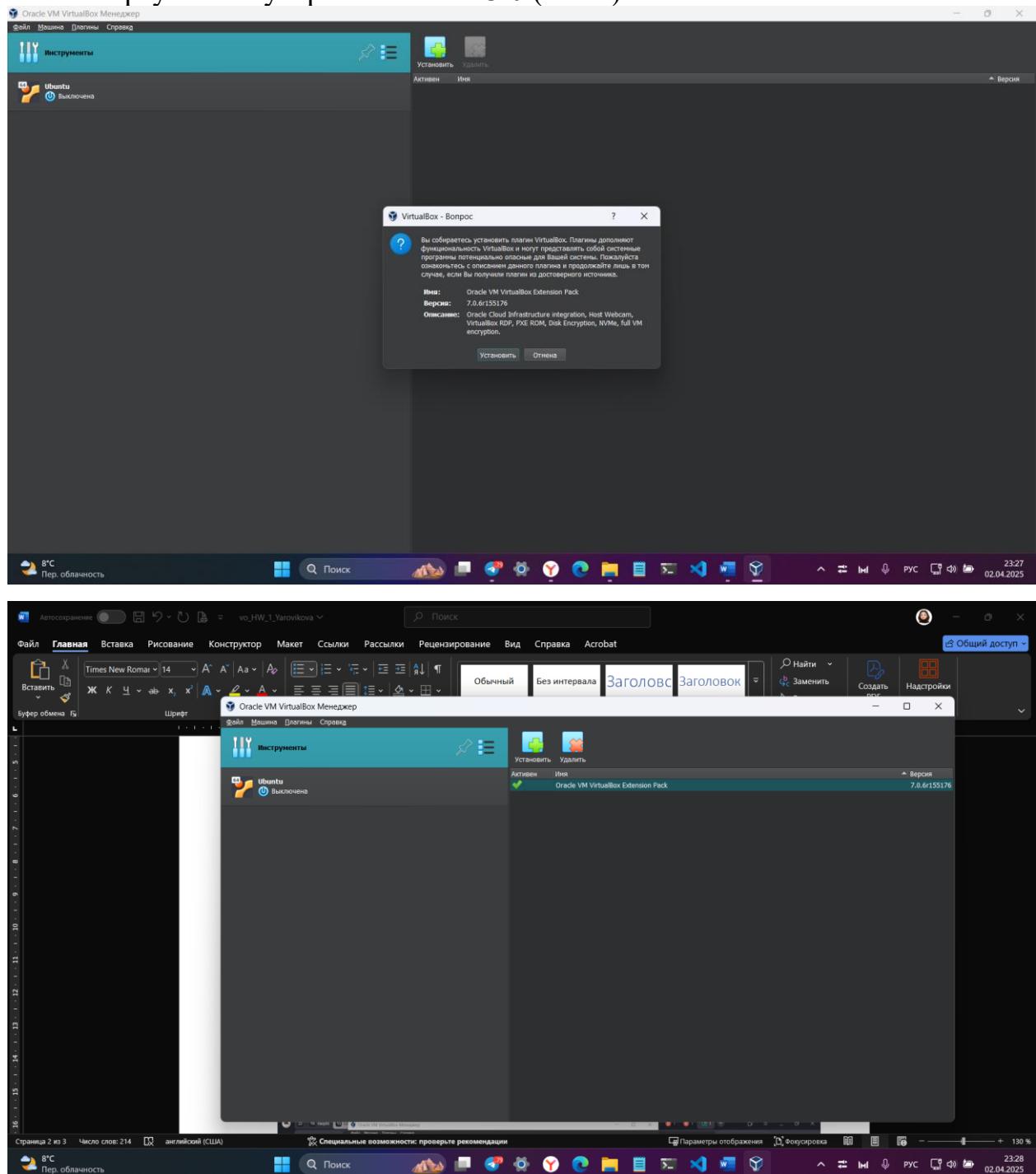
2. Скачиваем и устанавливаем VirtualBox версии 6.1 и выше. (На ноутбуке уже установлен VirtualBox версии 7.0)



3. Скачиваем и устанавливаем плагин VirtualBox Extension Pack:

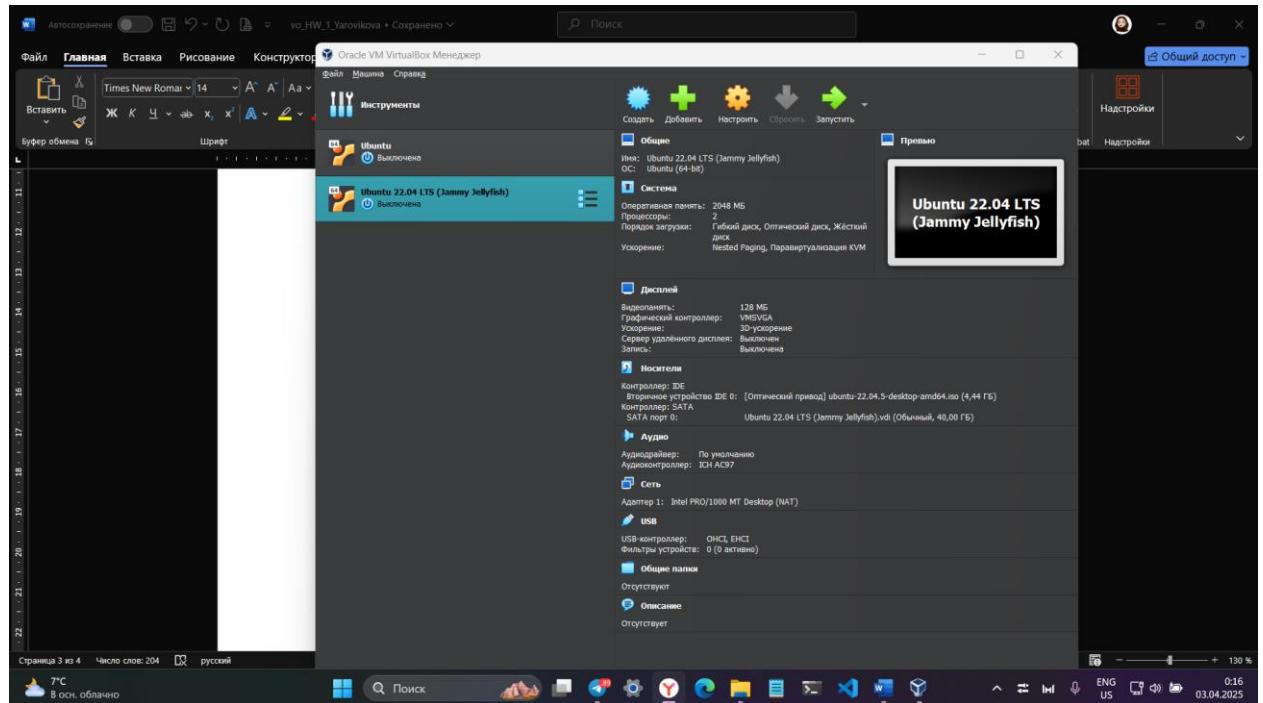
Список функций, которые предоставляет Extension Pack:

- Поддержка протокола удаленного рабочего стола VirtualBox (VRDP)
- Переброска веб-камеры хоста (Host webcam passthrough)
- Intel PXE boot ROM
- Шифрование образа диска алгоритмом AES
- Возможности облачной интеграции (Cloud integration features)
- Виртуальное устройство USB 2.0 (EHCI)
- Виртуальное устройство USB 3.0 (xHCI)

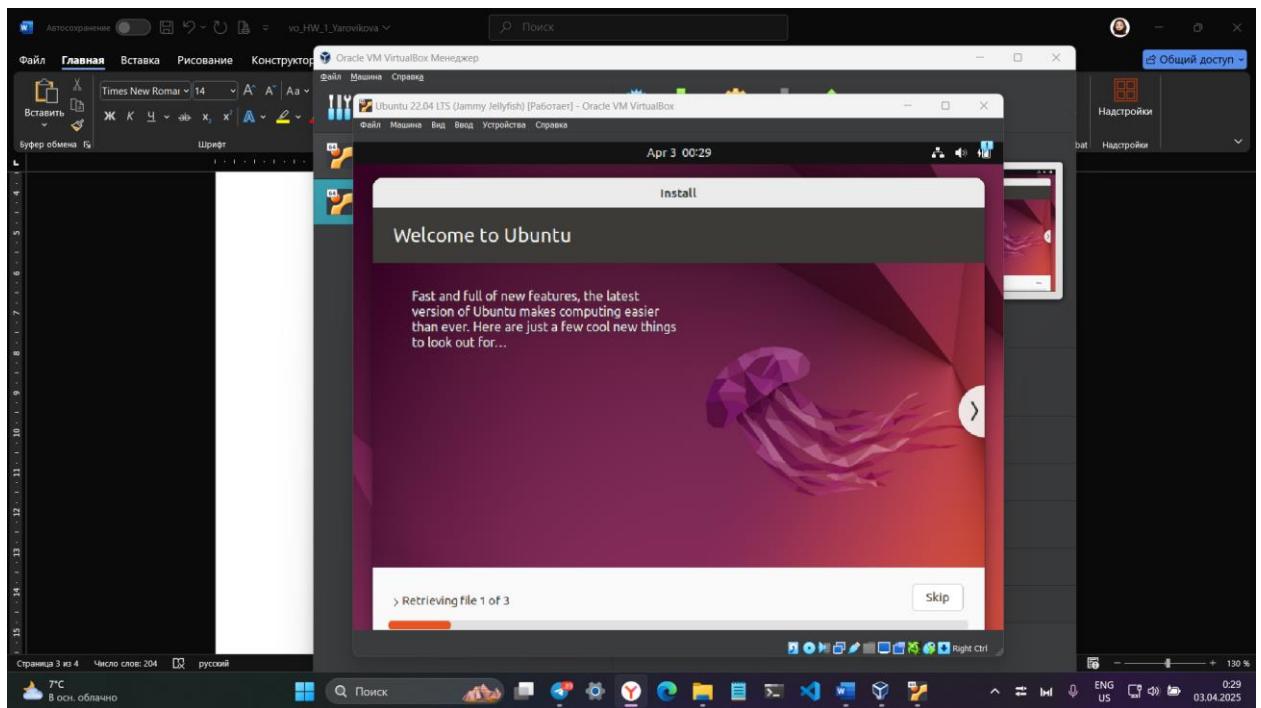


4. Скачиваем десктопную версию Ubuntu 22.04 LTS (Jammy Jellyfish) и создаем виртуальную машину с параметрами:

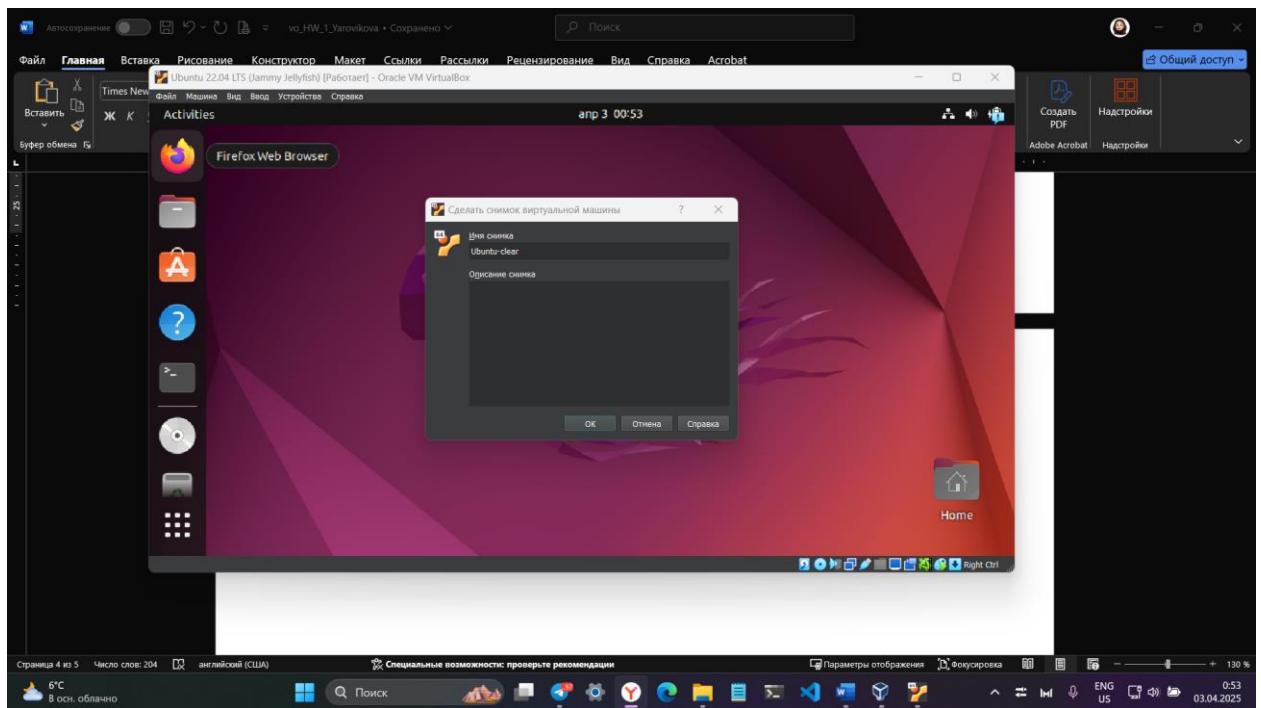
- 2 CPU.
- 2048 RAM.
- 128 МБ видеопамяти.
- 40 GB постоянной памяти (динамический VDI).
- Сетевой адаптер установить в режим NAT.



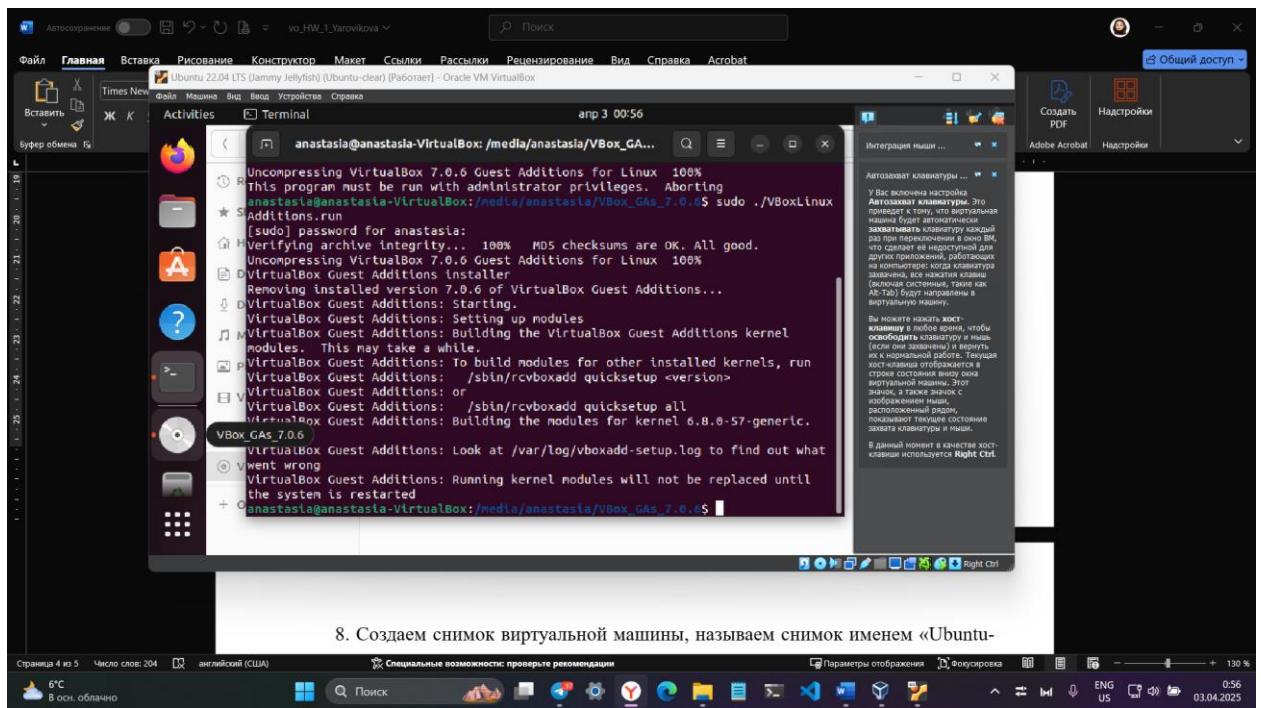
5. Производим установку ОС Ubuntu 22.04 LTS на виртуальную машину, следуя указаниям установщика.



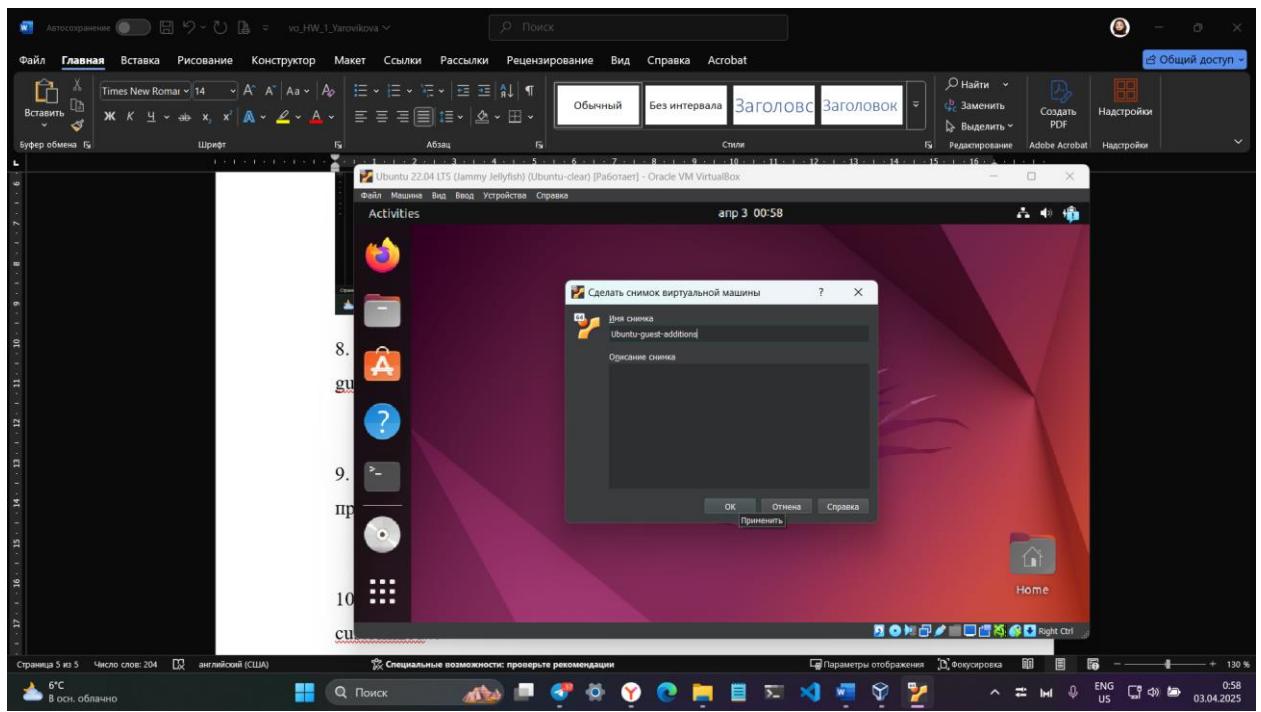
6. Создаем снимок виртуальной машины, называем снимок именем «Ubuntu-clear».



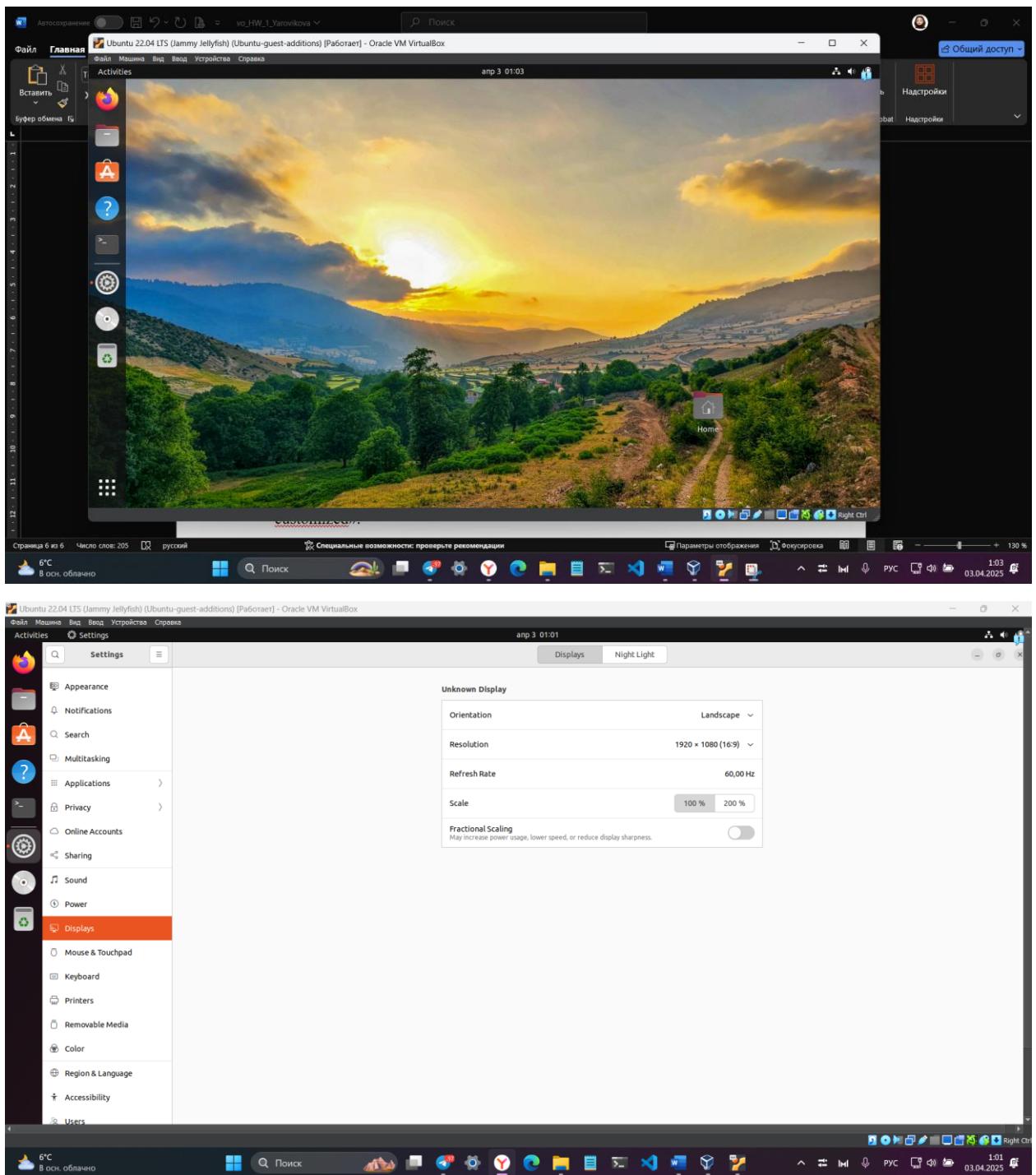
7. Производим установку гостевых дополнений и перезагружаем виртуальную машину.

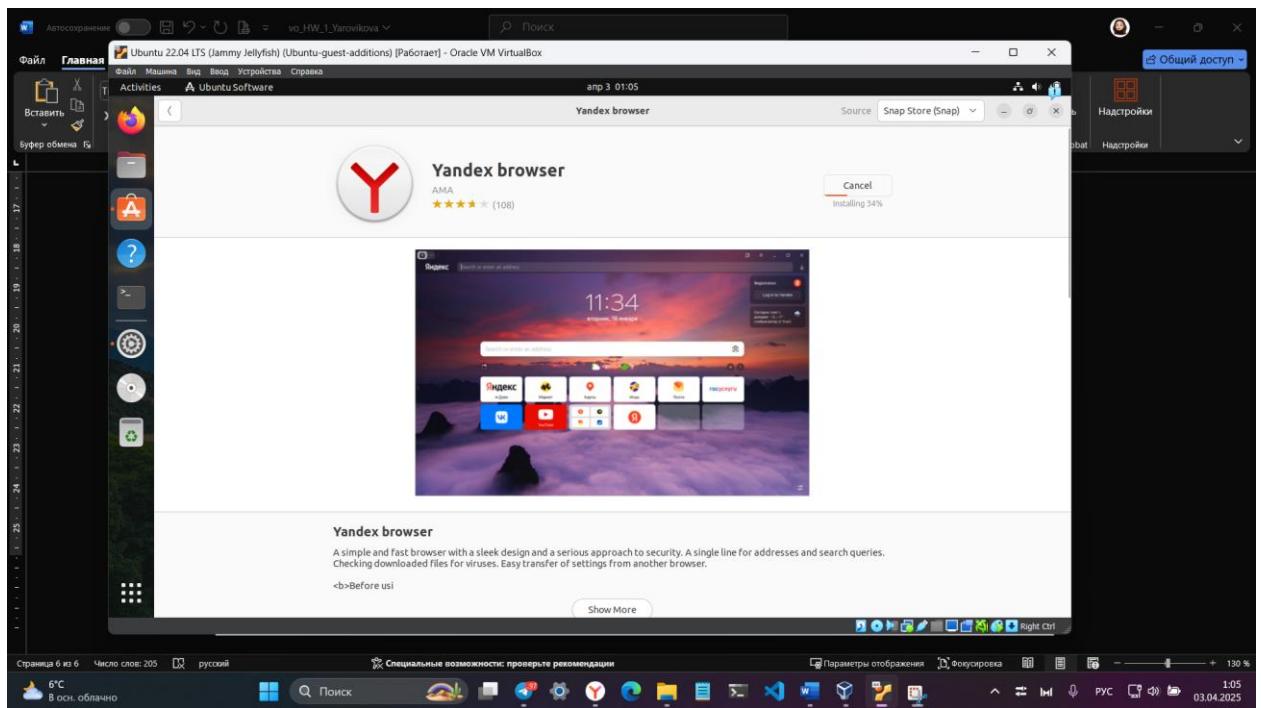


8. Создаем снимок виртуальной машины, называем снимок именем «Ubuntu-guest-additions».

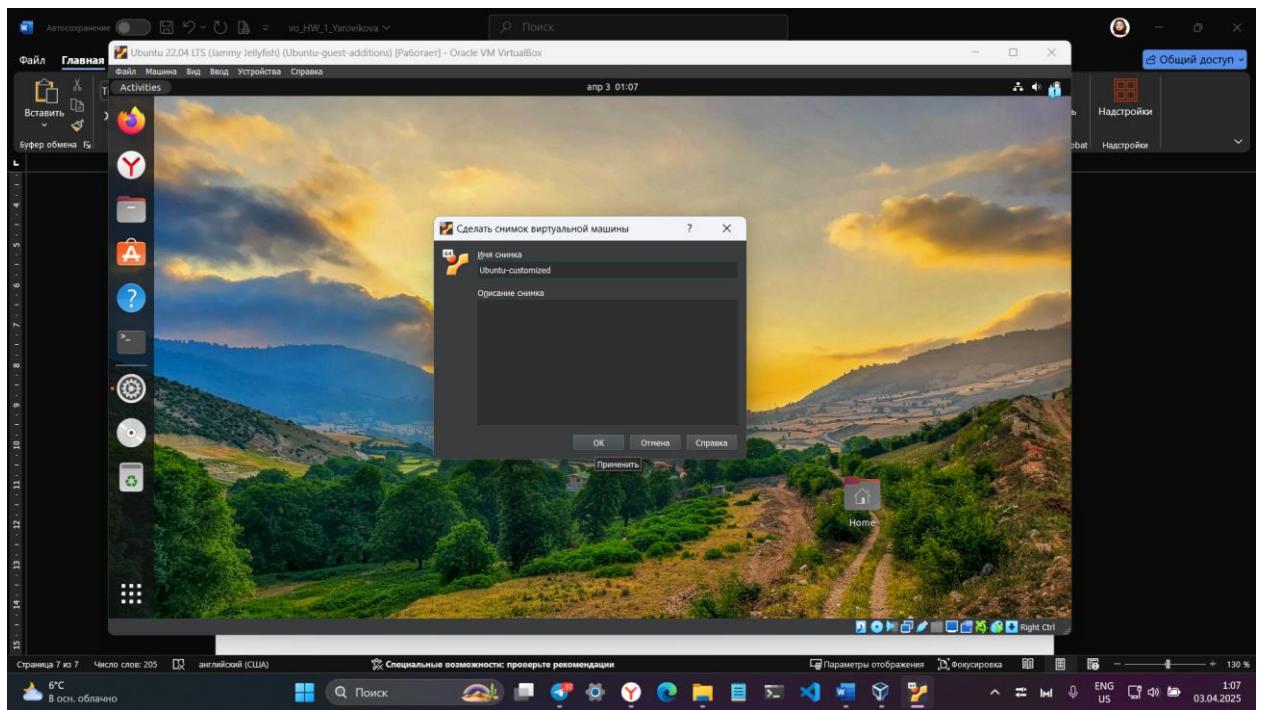


9. Производим настройку операционной системы в соответствии с личными предпочтениями (смена обоев, устанавливаем браузер, меняем разрешение экрана).

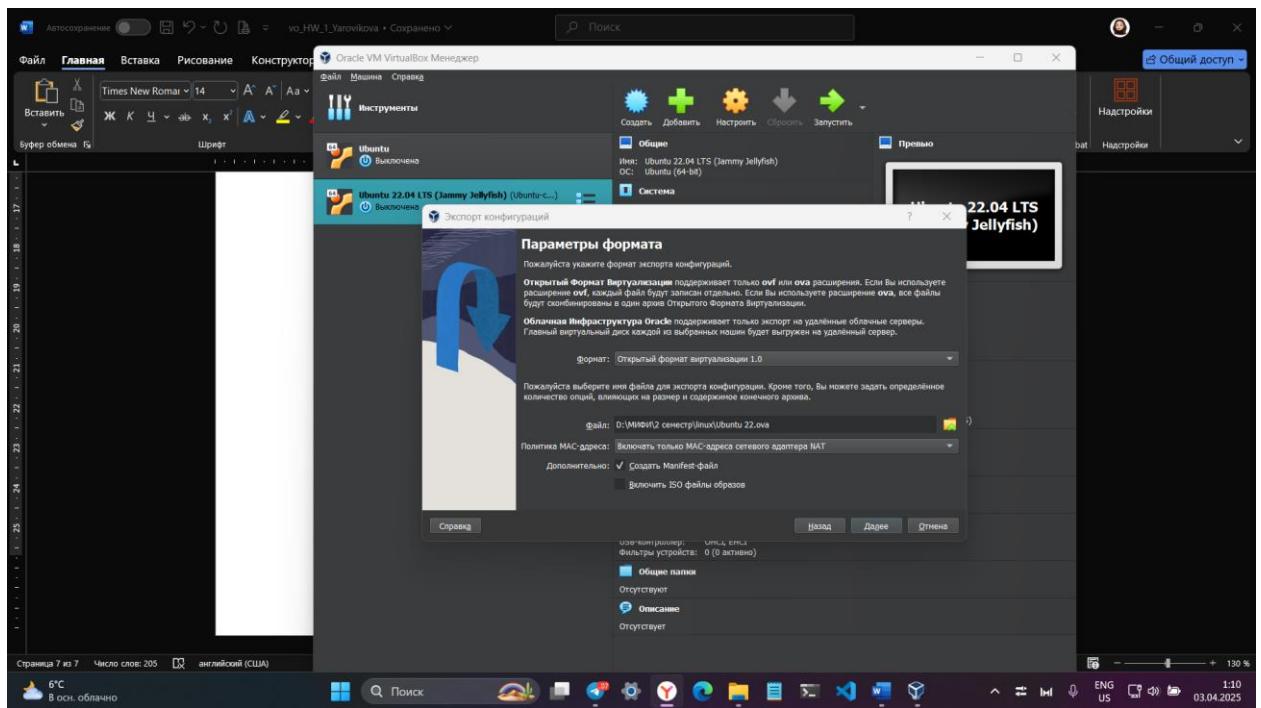




10. Создаем снимок виртуальной машины, называем снимок именем «Ubuntu-customized».

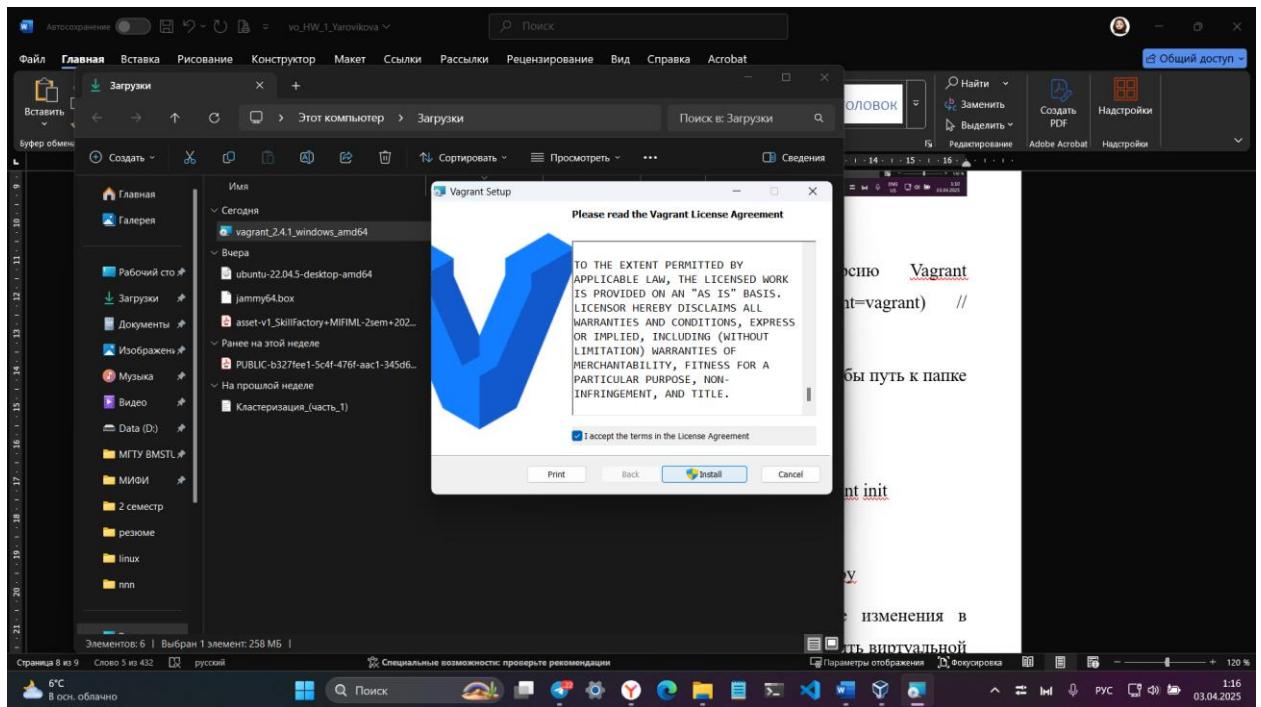


11. Производим экспорт виртуальной машины в формате OVA.

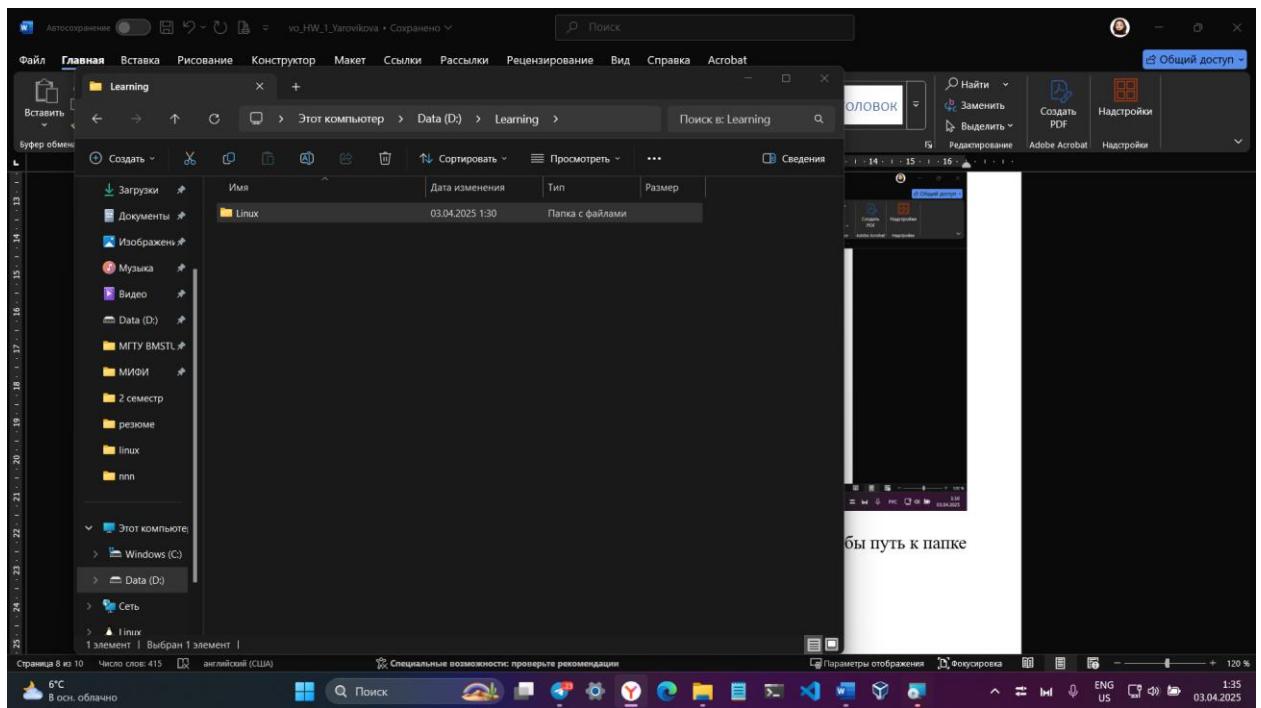


Vagrant

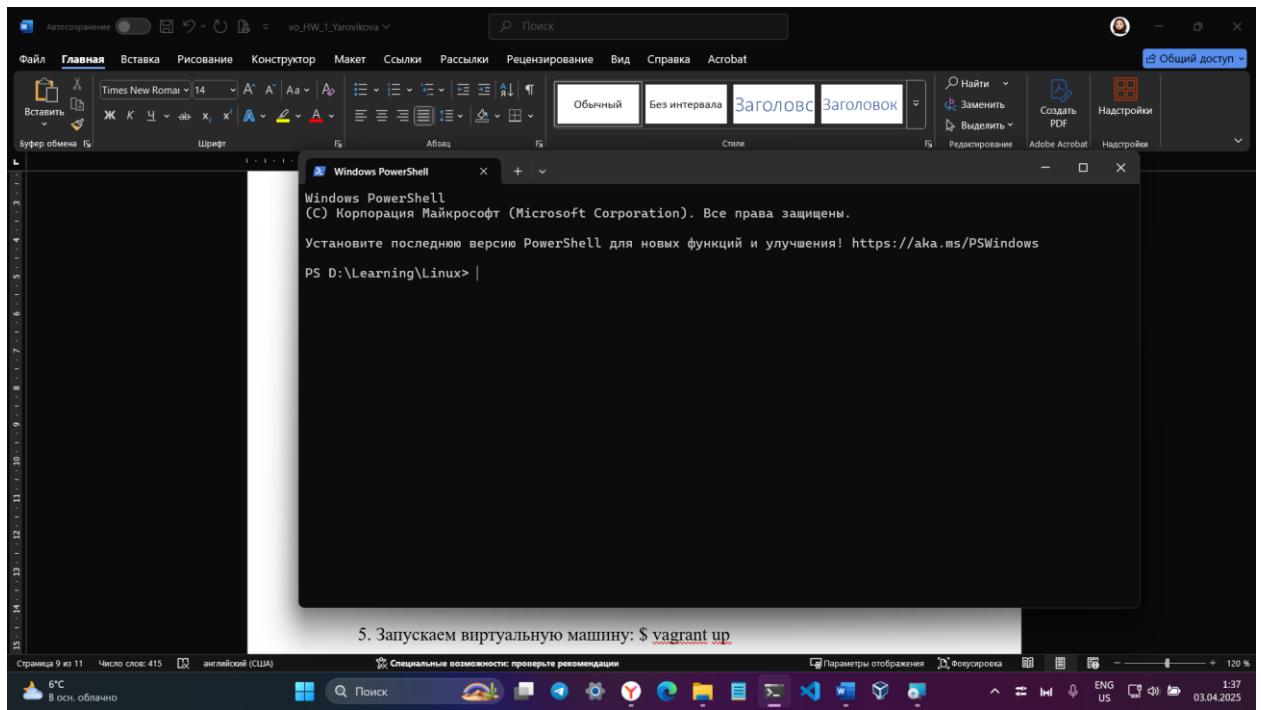
1. Скачиваем и устанавливаем Vagrant



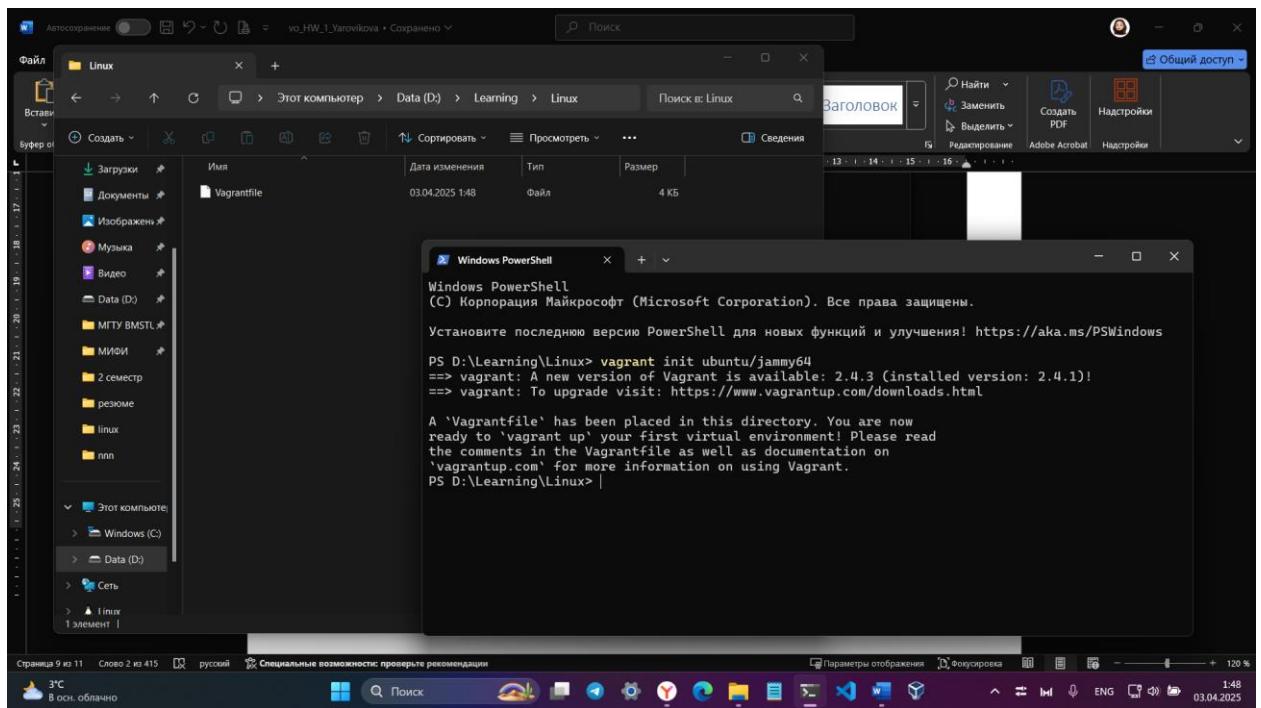
2. Создаем папку с именем «Linux» на компьютере (важно, чтобы путь к папке не содержал кириллических символов).



3. Открываем папку Linux в терминале.



4. Производим инициализацию образа ubuntu/jammy64:



5. Запускаем виртуальную машину:

5. Запускаем

```
PS D:\Learning\Linux> vagrant up
Bringing machine 'default' up with 'virtualbox' provider...
==> default: Box 'ubuntu/jammy64' could not be found. Attempting to find and install...
    default: Box Provider: virtualbox
    default: Box Version: >= 0
==> default: Loading metadata for box 'ubuntu/jammy64'
    default: URL: https://vagrantcloud.com/api/v2/vagrant/ubuntu/jammy64
==> default: Adding box 'ubuntu/jammy64' (v20241002.0.0) for provider: virtualbox
    default: Downloading: https://vagrantcloud.com/ubuntu/boxes/jammy64/versions/20241002.0.0/providers/virtualbox/unknown/vagrant.box
    default:
==> default: Successfully added box 'ubuntu/jammy64' (v20241002.0.0) for 'virtualbox'!
==> default: Importing base box 'ubuntu/jammy64'...
==> default: Matching MAC address for NAT networking...
==> default: Checking if box 'ubuntu/jammy64' version '20241002.0.0' is up to date...
==> default: Setting the name of the VM: Linux_default_1743634327741_45429
Vagrant is currently configured to create VirtualBox synced folders with the 'SharedFoldersEnableSymlinksCreate' option enabled. If the Vagrant guest is not trusted, you may want to disable this option. For more information on this option, please refer to the VirtualBox manual:
```

8. С помощью

- В командной строке
- Выполнить
- Указать

```
https://www.virtualbox.org/manual/ch04.html#sharedfolders
```

This option can be disabled globally with an environment variable:
VAGRANT_DISABLE_VBOXSYMLINKCREATE=1
or on a per folder basis within the Vagrantfile:

9. Производим

```
config.vm.synced_folder '/host/path', '/guest/path', SharedFoldersEnableSymlinksCreate: false
==> default: Clearing any previously set network interfaces...
==> default: Preparing network interfaces based on configuration...
default: Adapter 1: nat
==> default: Forwarding ports...
default: 22 (guest) => 2222 (host) (adapter 1)
==> default: Running 'pre-boot' VM customizations...
==> default: Booting VM...
==> default: Waiting for machine to boot. This may take a few minutes...
default: SSH address: 127.0.0.1:2222
default: SSH username: vagrant
default: SSH auth method: private key
default:
```

10. Создаем

```
PS D:\Learning\Linux>
```

5. Запускаем

```
PS D:\Learning\Linux> vagrant up
Bringing machine 'default' up with 'virtualbox' provider...
==> default: Box 'ubuntu/jammy64' could not be found. Attempting to find and install...
    default: Box Provider: virtualbox
    default: Box Version: >= 0
==> default: Loading metadata for box 'ubuntu/jammy64'
    default: URL: https://vagrantcloud.com/api/v2/vagrant/ubuntu/jammy64
==> default: Adding box 'ubuntu/jammy64' (v20241002.0.0) for provider: virtualbox
    default: Downloading: https://vagrantcloud.com/ubuntu/boxes/jammy64/versions/20241002.0.0/providers/virtualbox/unknown/vagrant.box
    default:
==> default: Successfully added box 'ubuntu/jammy64' (v20241002.0.0) for 'virtualbox'!
==> default: Importing base box 'ubuntu/jammy64'...
==> default: Matching MAC address for NAT networking...
==> default: Checking if box 'ubuntu/jammy64' version '20241002.0.0' is up to date...
==> default: Setting the name of the VM: Linux_default_1743634327741_45429
Vagrant is currently configured to create VirtualBox synced folders with the 'SharedFoldersEnableSymlinksCreate' option enabled. If the Vagrant guest is not trusted, you may want to disable this option. For more information on this option, please refer to the VirtualBox manual:
```

8. С помощью

- В командной строке
- Выполнить
- Указать

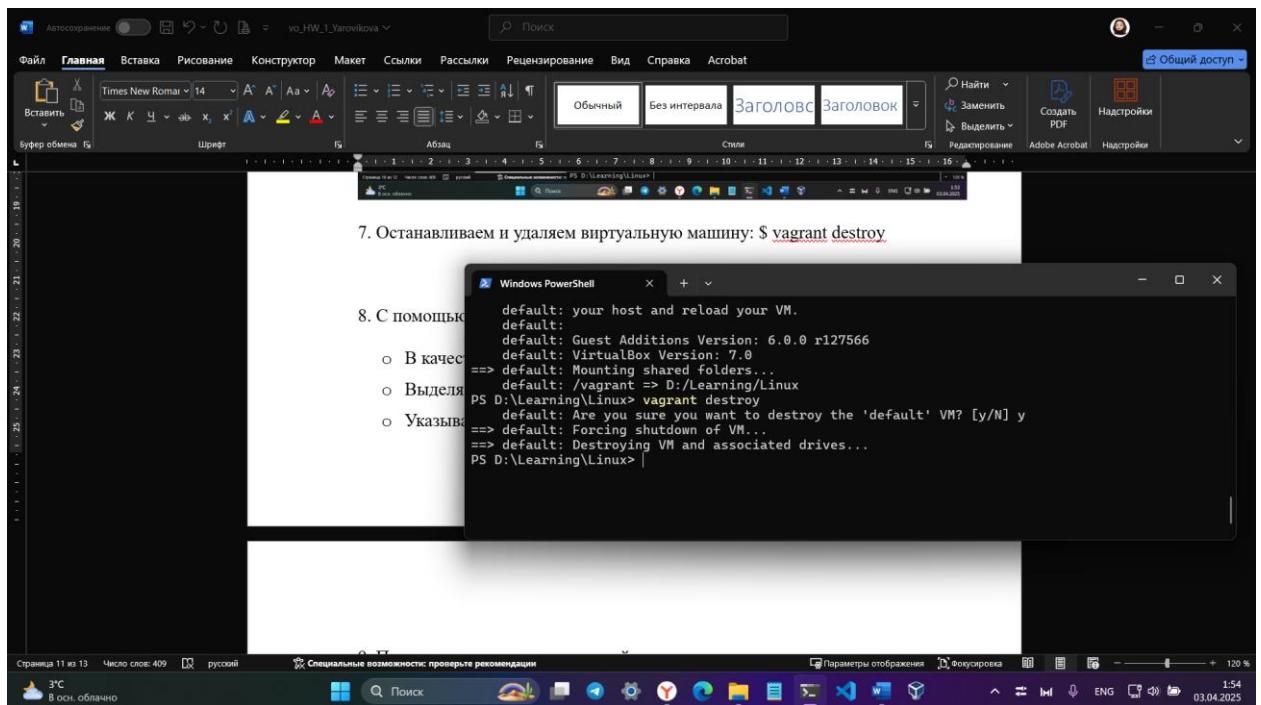
```
https://www.virtualbox.org/manual/ch04.html#sharedfolders
```

This option can be disabled globally with an environment variable:
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or on a per folder basis within the Vagrantfile:

9. Производим

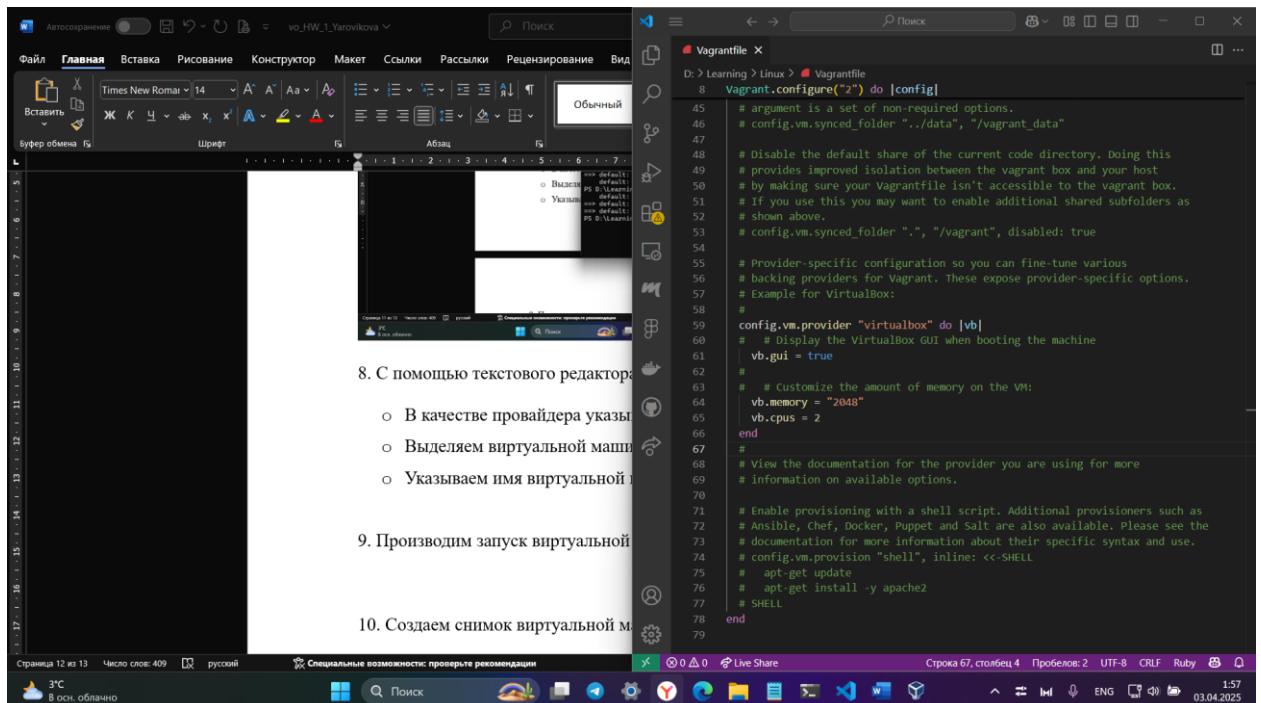
```
config.vm.synced_folder '/host/path', '/guest/path', SharedFoldersEnableSymlinksCreate: false
==> default: Clearing any previously set network interfaces...
==> default: Preparing network interfaces based on configuration...
default: Adapter 1: nat
==> default: Forwarding ports...
default: 22 (guest) => 2222 (host) (adapter 1)
==> default: Running 'pre-boot' VM customizations...
==> default: Booting VM...
==> default: Waiting for machine to boot. This may take a few minutes...
default: SSH address: 127.0.0.1:2222
default: SSH username: vagrant
default: SSH auth method: private key
default:
default: Vagrant insecure key detected. Vagrant will automatically replace
default: this with a newly generated keypair for better security.
default:
default: Inserting generated public key within guest...
default: Removing insecure key from the guest if it's present...
default: Key inserted! Disconnecting and reconnecting using new SSH key...
==> default: Machine booted and ready!
==> default: Checking for guest additions in VM...
default: The guest additions on this VM do not match the installed version of
default: VirtualBox! In most cases this is fine, but in rare cases it can
default: prevent things such as shared folders from working properly. If you see
default: shared folder errors, please make sure the guest additions within the
default: virtual machine match the version of VirtualBox you have installed on
default: your host and reload your VM.
default:
default: Guest Additions Version: 6.0.0 r127566
default: VirtualBox Version: 7.0
==> default: Mounting shared folders...
default: /vagrant => D:/Learning/Linux
PS D:\Learning\Linux>
```

7. Останавливаем и удаляем виртуальную машину: \$ vagrant destroy

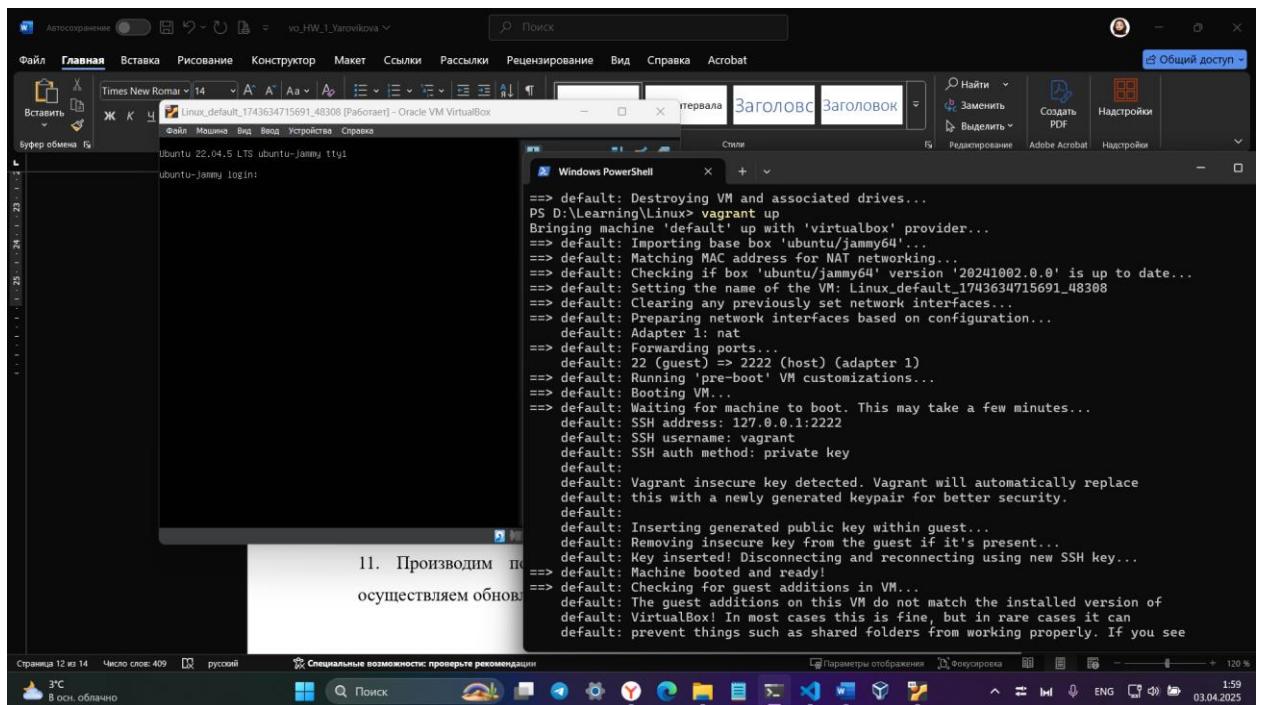


8. С помощью текстового редактора вносим изменения в VagrantFile:

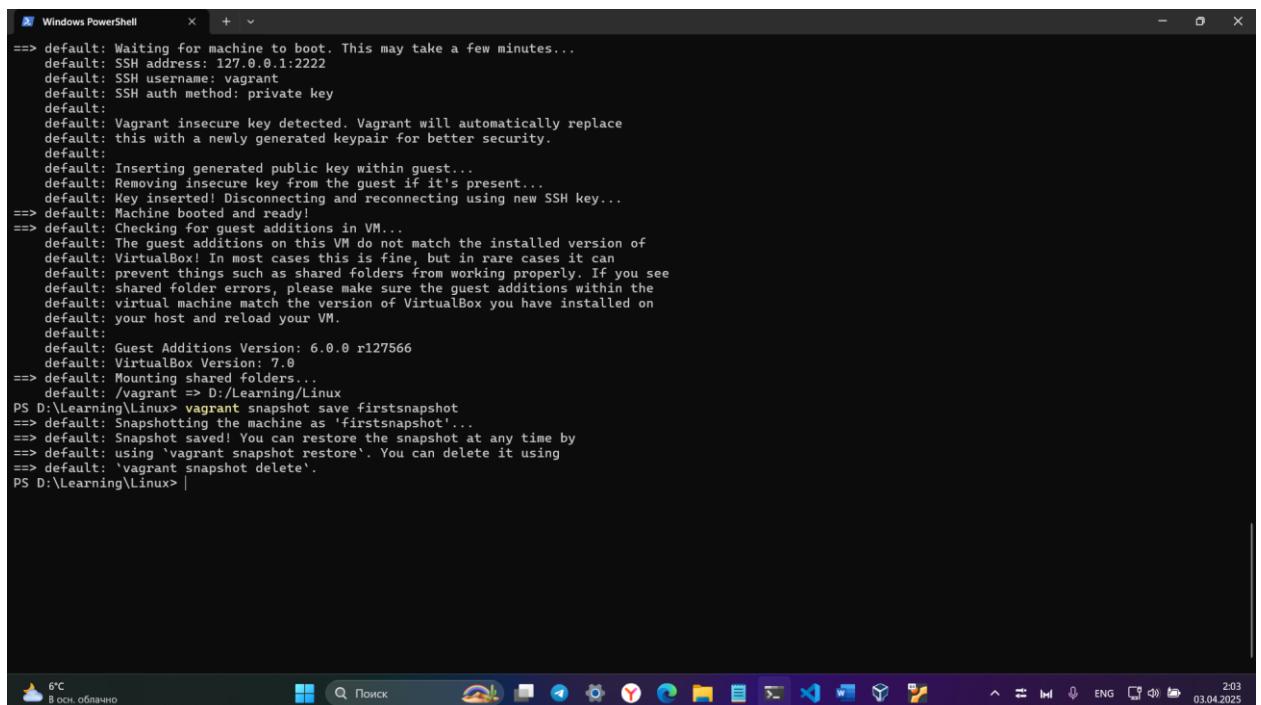
- В качестве провайдера указываем VirtualBox.
- Выделяем виртуальной машине 2048 МБ ОЗУ и 2 VPCU.
- Указываем имя виртуальной машины "ubuntu".



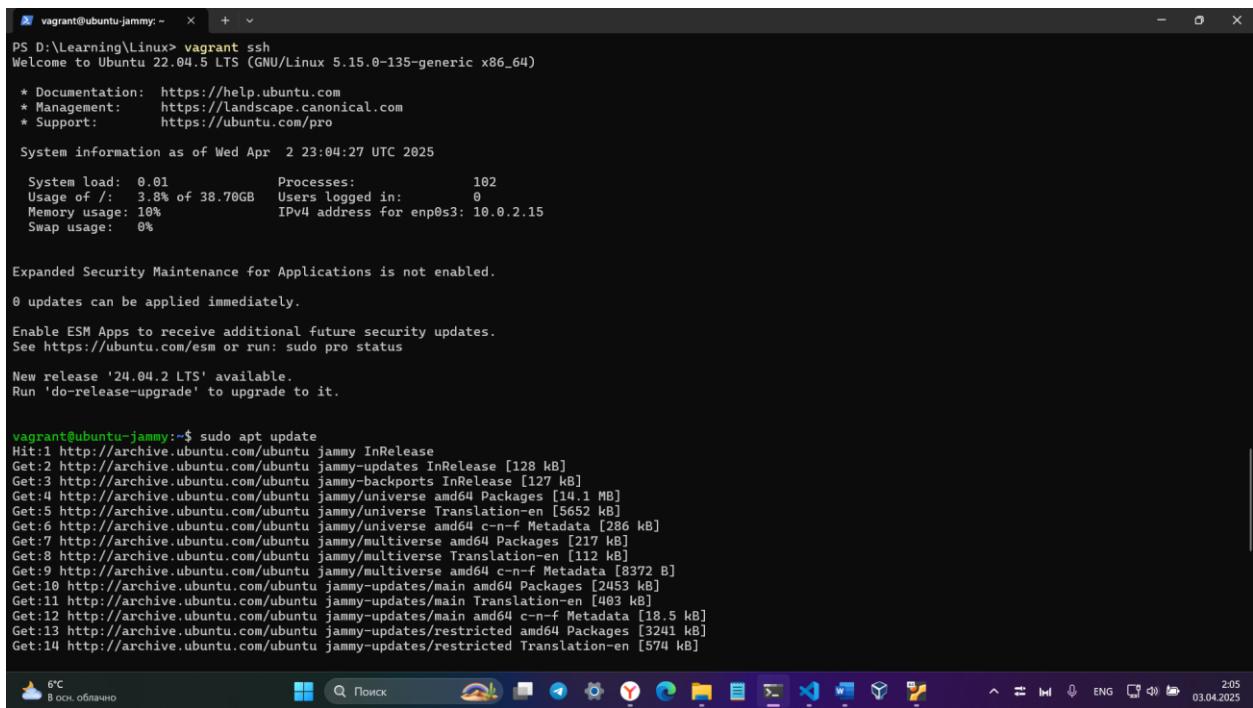
9. Производим запуск виртуальной машины.



10. Создаем снимок виртуальной машины.



11. Производим подключение к виртуальной машине через SSH и осуществляем обновление системы.



```
vagrant@ubuntu-jammy:~ x + v
PS D:\Learning\Linux> vagrant ssh
Welcome to Ubuntu 22.04.5 LTS (GNU/Linux 5.15.0-135-generic x86_64)

 * Documentation: https://help.ubuntu.com
 * Management: https://landscape.canonical.com
 * Support: https://ubuntu.com/pro

System information as of Wed Apr  2 23:04:27 UTC 2025

System load: 0.01      Processes:          102
Usage of /: 3.8% of 38.70GB  Users logged in:   0
Memory usage: 10%      IPv4 address for enp0s3: 10.0.2.15
Swap usage:  0%

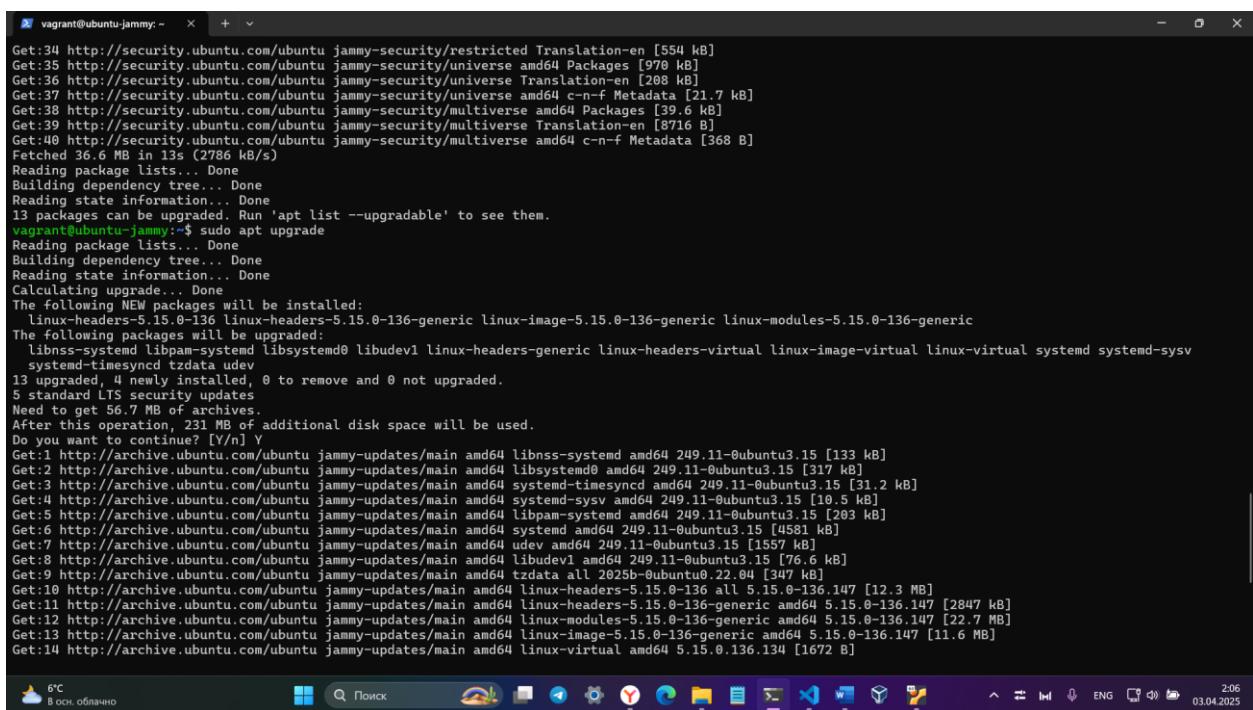
Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

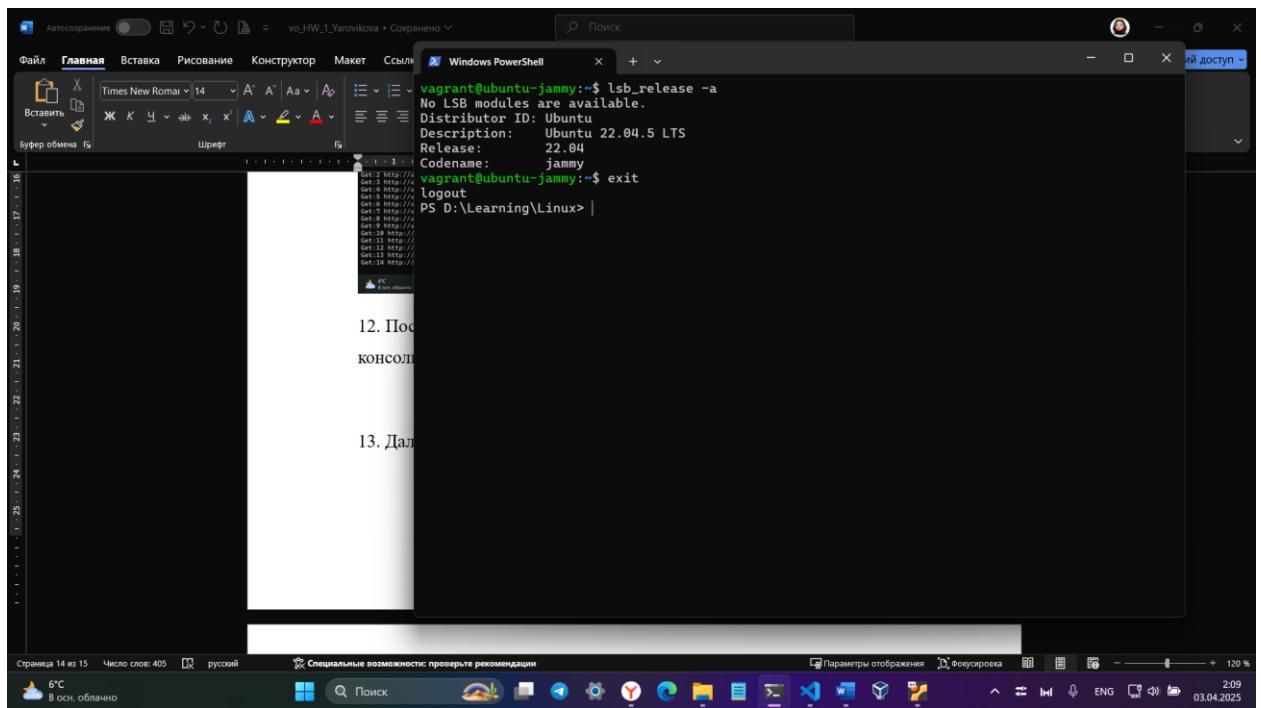
New release '24.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

vagrant@ubuntu-jammy:~$ sudo apt update
Hit:1 http://archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://archive.ubuntu.com/ubuntu jammy-updates InRelease [128 kB]
Get:3 http://archive.ubuntu.com/ubuntu jammy-backports InRelease [127 kB]
Get:4 http://archive.ubuntu.com/ubuntu jammy/universe amd64 Packages [14.1 MB]
Get:5 http://archive.ubuntu.com/ubuntu jammy/universe Translation-en [5652 kB]
Get:6 http://archive.ubuntu.com/ubuntu jammy/universe amd64 c-n-f Metadata [286 kB]
Get:7 http://archive.ubuntu.com/ubuntu jammy/multiverse amd64 Packages [217 kB]
Get:8 http://archive.ubuntu.com/ubuntu jammy/multiverse Translation-en [112 kB]
Get:9 http://archive.ubuntu.com/ubuntu jammy/multiverse amd64 c-n-f Metadata [8372 B]
Get:10 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [2453 kB]
Get:11 http://archive.ubuntu.com/ubuntu jammy-updates/main Translation-en [403 kB]
Get:12 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 c-n-f Metadata [18.5 kB]
Get:13 http://archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 Packages [3241 kB]
Get:14 http://archive.ubuntu.com/ubuntu jammy-updates/restricted Translation-en [574 kB]
```

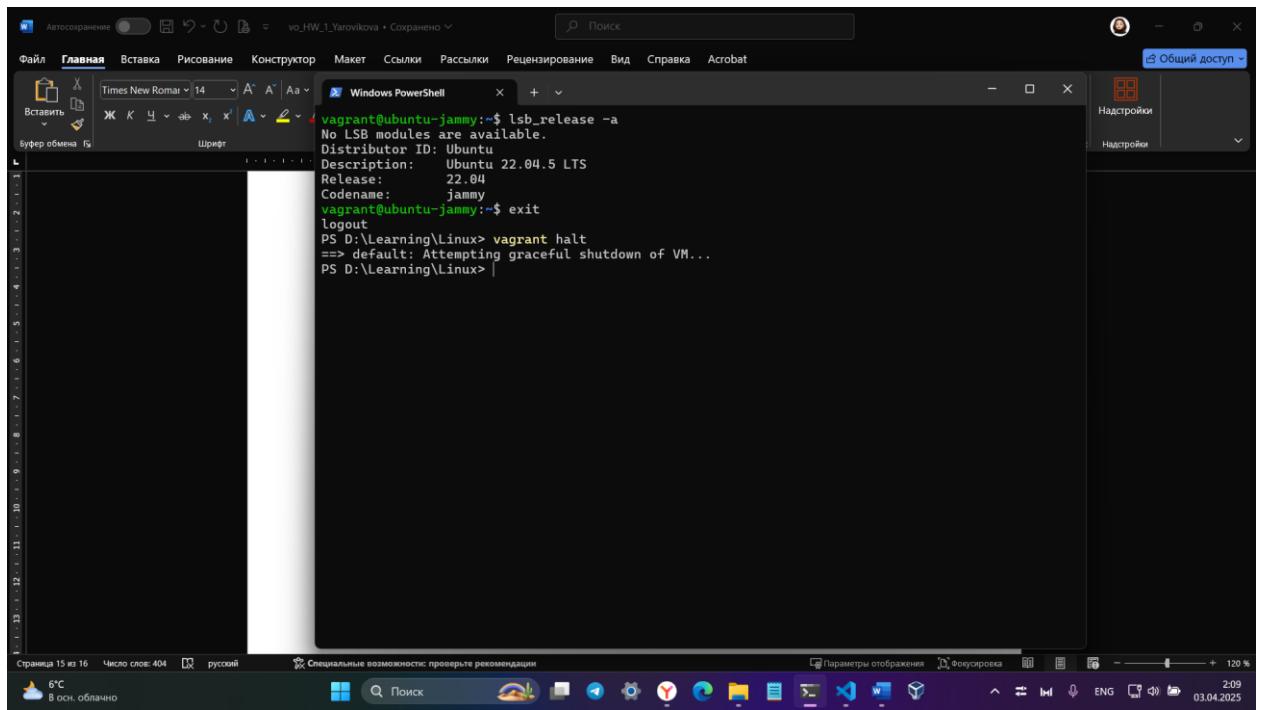


```
vagrant@ubuntu-jammy:~ x + v
Get:34 http://security.ubuntu.com/ubuntu jammy-security/restricted Translation-en [554 kB]
Get:35 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 Packages [978 kB]
Get:36 http://security.ubuntu.com/ubuntu jammy-security/universe Translation-en [208 kB]
Get:37 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 c-n-f Metadata [21.7 kB]
Get:38 http://security.ubuntu.com/ubuntu jammy-security/multiverse amd64 Packages [39.6 kB]
Get:39 http://security.ubuntu.com/ubuntu jammy-security/multiverse Translation-en [8716 B]
Get:40 http://security.ubuntu.com/ubuntu jammy-security/multiverse amd64 c-n-f Metadata [368 B]
Fetched 36.6 MB in 13s (2786 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
13 packages can be upgraded. Run 'apt list --upgradable' to see them.
vagrant@ubuntu-jammy:~$ sudo apt upgrade
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following NEW packages will be installed:
  linux-headers-5.15.0-136 linux-headers-5.15.0-136-generic linux-image-5.15.0-136-generic linux-modules-5.15.0-136-generic
The following packages will be upgraded:
  libnss-systemd libpam-systemd libsystemd0 libudev1 linux-headers-generic linux-headers-virtual linux-image-virtual linux-virtual systemd systemd-sysv
  systemd-timesyncd tzdata udev
13 upgraded, 4 newly installed, 0 to remove and 0 not upgraded.
5 standard LTS security updates
Need to get 56.7 MB of archives.
After this operation, 231 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libnss-systemd amd64 249.11-0ubuntu3.15 [133 kB]
Get:2 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libsystemd0 amd64 249.11-0ubuntu3.15 [317 kB]
Get:3 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 systemd-timesyncd amd64 249.11-0ubuntu3.15 [31.2 kB]
Get:4 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 systemd-sysv amd64 249.11-0ubuntu3.15 [10.5 kB]
Get:5 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libpam-systemd amd64 249.11-0ubuntu3.15 [203 kB]
Get:6 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 systemd amd64 249.11-0ubuntu3.15 [4581 kB]
Get:7 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 udev amd64 249.11-0ubuntu3.15 [1557 kB]
Get:8 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 libudev1 amd64 249.11-0ubuntu3.15 [76.6 kB]
Get:9 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 tzdata all 2025b-0ubuntu0.22.04 [3497 kB]
Get:10 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 linux-headers-5.15.0-136 all 5.15.0-136.147 [12.3 MB]
Get:11 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 linux-headers-5.15.0-136-generic amd64 5.15.0-136.147 [2847 kB]
Get:12 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 linux-modules-5.15.0-136-generic amd64 5.15.0-136.147 [22.7 MB]
Get:13 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 linux-image-5.15.0-136-generic amd64 5.15.0-136.147 [11.6 MB]
Get:14 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 linux-virtual amd64 5.15.0-136.134 [1672 kB]
```

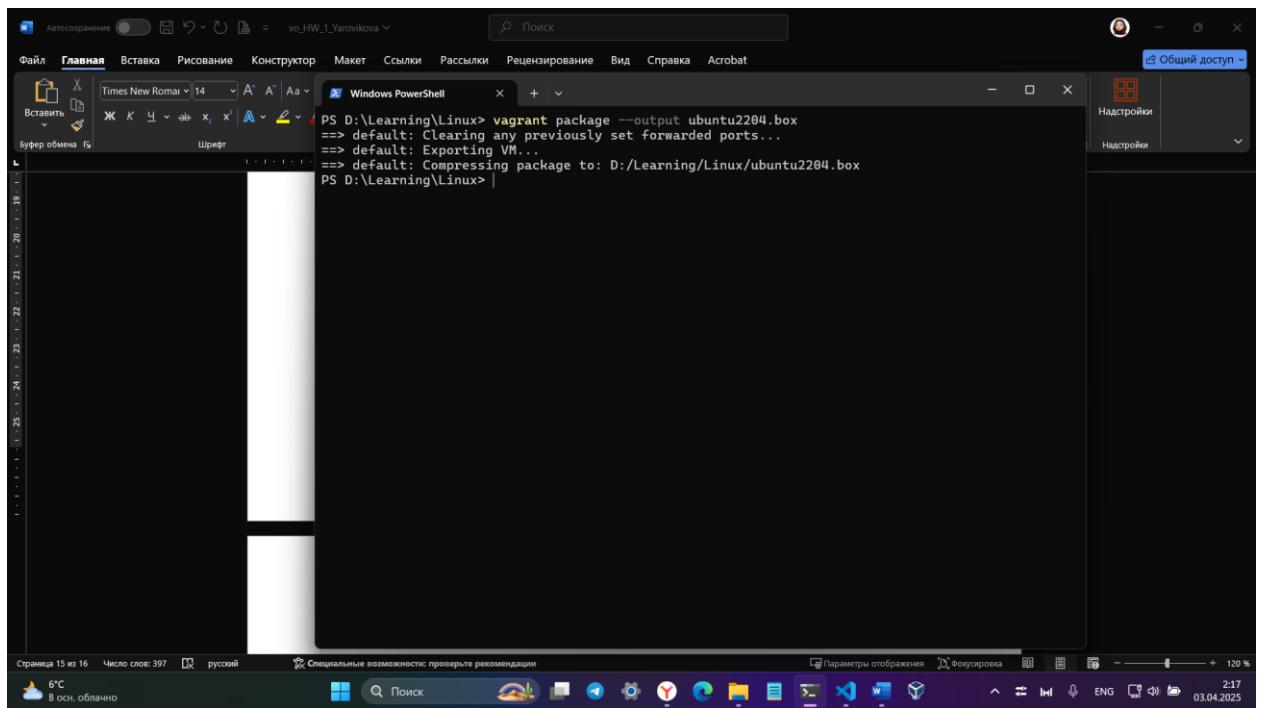
12. После того как виртуальная машина была настроена производим выход из консоли с помощью команды: exit



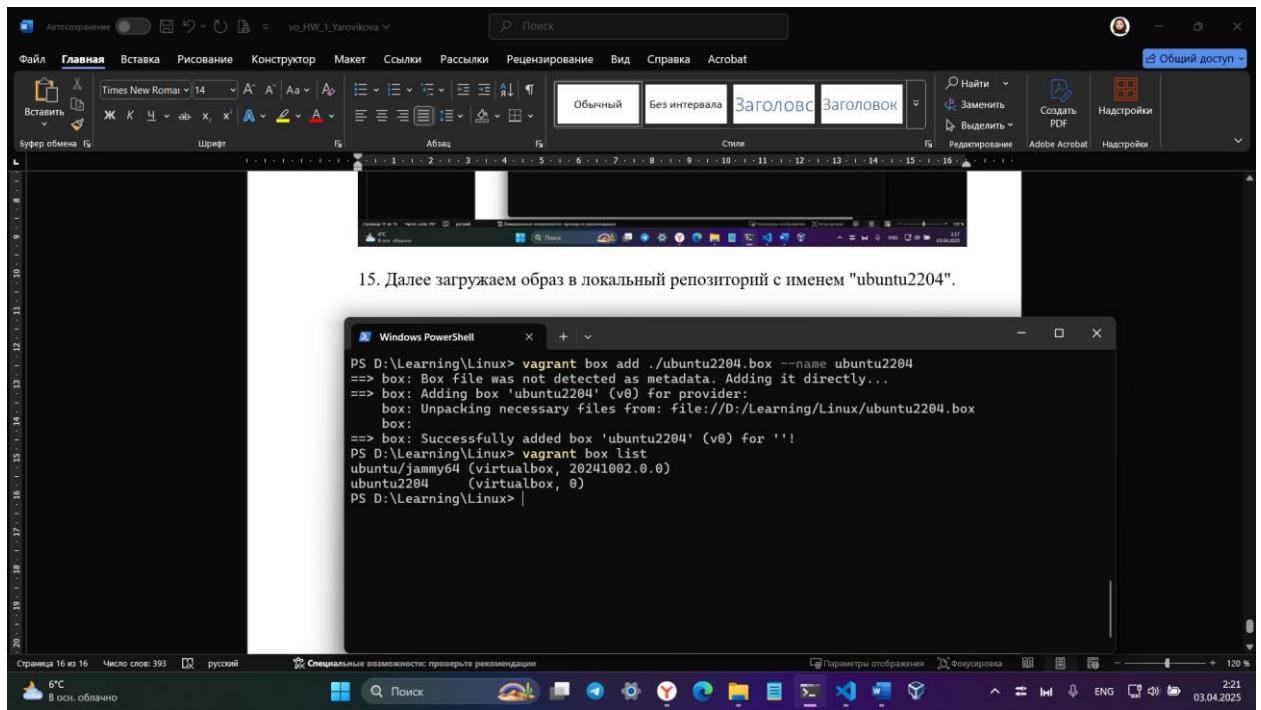
13. Далее останавливаем виртуальную машину.



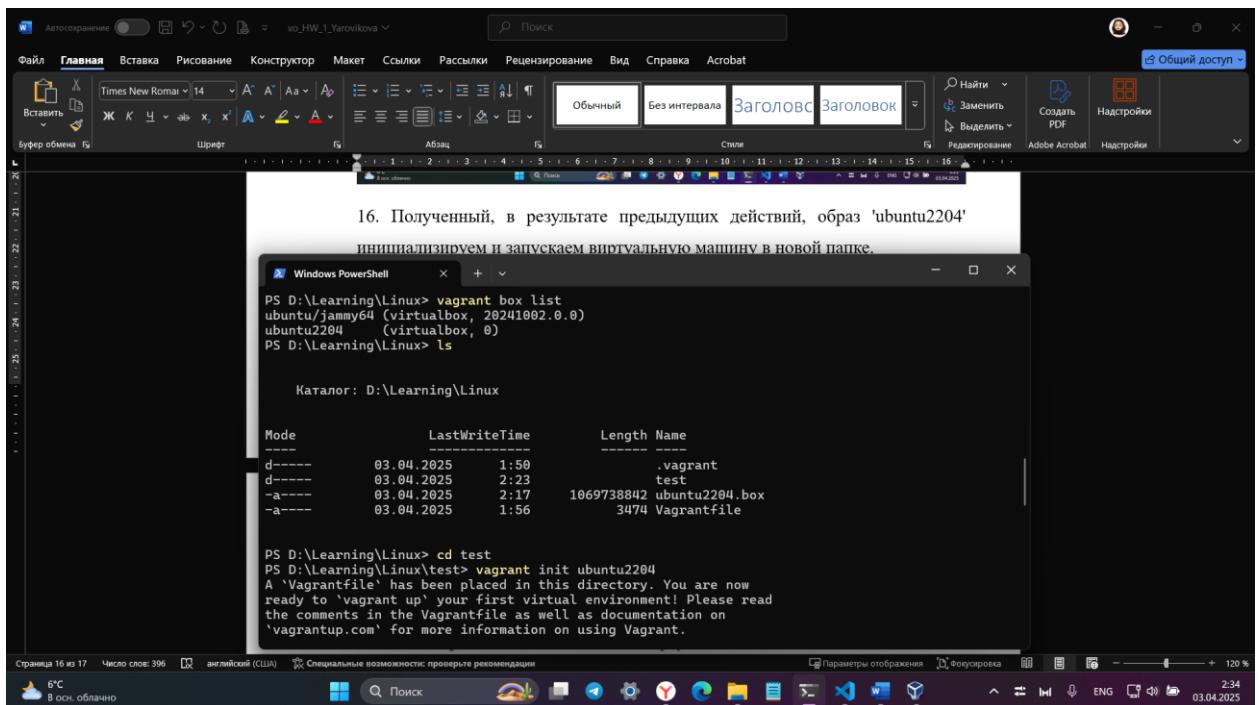
14. После запускаем процесс упаковки виртуальной машины в образ с именем "ubuntu2204.box".



15. Далее загружаем образ в локальный репозиторий с именем "ubuntu2204".

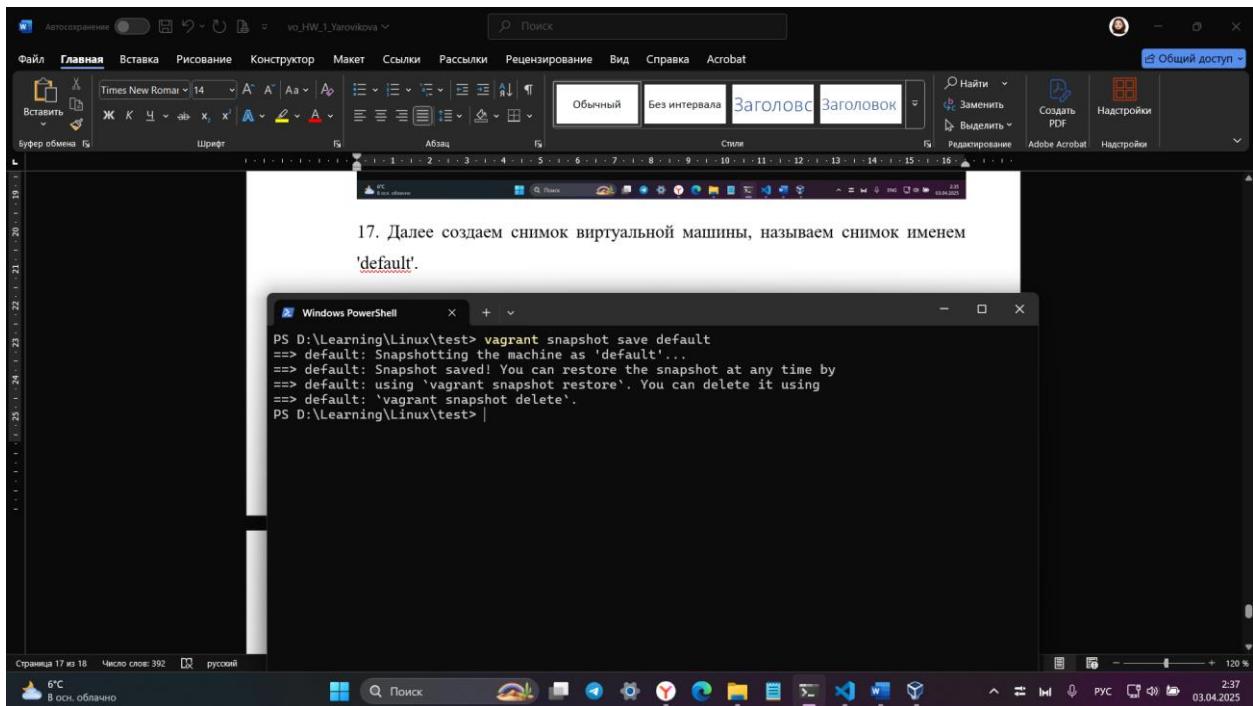


16. Полученный, в результате предыдущих действий, образ 'ubuntu2204' инициализируем и запускаем виртуальную машину в новой папке.



```
PS D:\Learning\Linux\test> vagrant up
Bringing machine 'default' up with 'virtualbox' provider...
==> default: Importing base box 'ubuntu2204'...
==> default: Matching MAC address for NAT networking...
==> default: Setting the name of the VM: test_default_1743636774630_21231
==> default: Clearing any previously set network interfaces...
==> default: Preparing network interfaces based on configuration...
    default: Adapter 1: nat
==> default: Forwarding ports...
    default: 22 (guest) => 2222 (host) (adapter 1)
==> default: Booting VM...
==> default: Waiting for machine to boot. This may take a few minutes...
    default: SSH address: 127.0.0.1:2222
    default: SSH username: vagrant
    default: SSH auth method: private key
    default: Warning: Connection reset. Retrying...
    default: Warning: Connection aborted. Retrying...
==> default: Machine booted and ready!
==> default: Checking for guest additions in VM...
    default: The guest additions on this VM do not match the installed version of
    default: VirtualBox. In most cases this is fine, but in rare cases it can
    default: prevent things such as shared folders from working properly. If you see
    default: shared folder errors, please make sure the guest additions within the
    default: virtual machine match the version of VirtualBox you have installed on
    default: your host and reload your VM.
    default:
    default: Guest Additions Version: 6.0.0 r127566
    default: VirtualBox Version: 7.0
==> default: Mounting shared folders...
    default: /vagrant => D:/Learning/Linux/test
PS D:\Learning\Linux\test> |
```

17. Далее создаем снимок виртуальной машины, называем снимок именем 'default'.



18. После производим изменения в виртуальной машине (создаем файл testfile)

```
PS D:\Learning\Linux\test> vagrant ssh
Welcome to Ubuntu 22.04.5 LTS (GNU/Linux 5.15.0-136-generic x86_64)

 * Documentation: https://help.ubuntu.com
 * Management: https://landscape.canonical.com
 * Support: https://ubuntu.com/pro

System information as of Wed Apr 2 23:38:23 UTC 2025

 System load: 0.0      Processes:          106
 Usage of /: 5.1% of 38.70GB  Users logged in: 0
 Memory usage: 10%      IPv4 address for enp0s3: 10.0.2.15
 Swap usage: 0%

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

New release '24.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Wed Apr 2 23:04:27 2025 from 10.0.2.2
vagrant@ubuntu-jammy:~$ touch testfile
vagrant@ubuntu-jammy:~$ ls
testfile
vagrant@ubuntu-jammy:~$ exit
logout
PS D:\Learning\Linux\test>
```

Далее восстанавливаемся со снимка 'default' и проверяем, что ранее внесенные изменения отсутствуют (файла нет).

```
vagrant@ubuntu-jammy:~ % + - x
PS D:\Learning\Linux\test> vagrant snapshot restore default
==> default: Forcing shutdown of VM...
==> default: Restoring the snapshot 'default'...
==> default: Resuming suspended VM...
==> default: Booting VM...
==> default: Waiting for machine to boot. This may take a few minutes...
    default: SSH address: 127.0.0.1:2222
    default: SSH username: vagrant
    default: SSH auth method: private key
==> default: Machine booted and ready!
==> default: Machine already provisioned. Run 'vagrant provision' or use the '--provision'
==> default: flag to force provisioning. Provisioners marked to run always will still run.
PS D:\Learning\Linux\test> vagrant ssh
Welcome to Ubuntu 22.04.5 LTS (GNU/Linux 5.15.0-136-generic x86_64)

 * Documentation: https://help.ubuntu.com
 * Management:   https://landscape.canonical.com
 * Support:      https://ubuntu.com/pro

System information as of Wed Apr  2 23:41:29 UTC 2025

System load: 0.0          Processes:           105
Usage of /: 5.1% of 38.70GB  Users logged in:     0
Memory usage: 9%          IPv4 address for enp0s3: 10.0.2.15
Swap usage:  0%

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

New release '24.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Wed Apr  2 23:04:27 2025 from 10.0.2.2
vagrant@ubuntu-jammy:~$ ls
vagrant@ubuntu-jammy:~$ |
```

