

# Лабораторная работа №1. Установка ОС Linux

Дисциплина: Операционные системы

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# Информация

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# **Вводная часть**

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- Целью данной работы является приобретение практических навыков установки операционной системы на виртуальную машину, настройки минимально необходимых для дальнейшей работы сервисов.

# **Выполнение лабораторной работы**

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# Настройка виртуальной машины

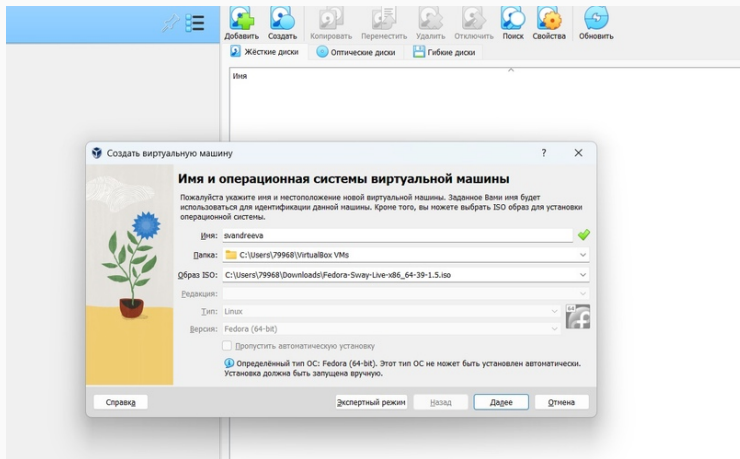


Рис. 1: Настройка виртуальной машины

# Настройка виртуальной машины

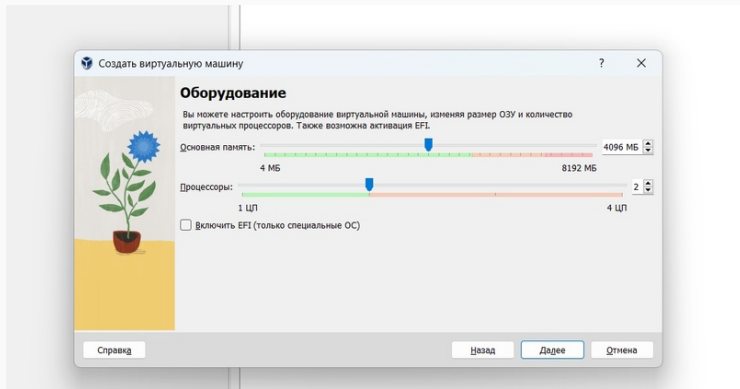


Рис. 2: Настройка виртуальной машины



# Настройка виртуальной машины

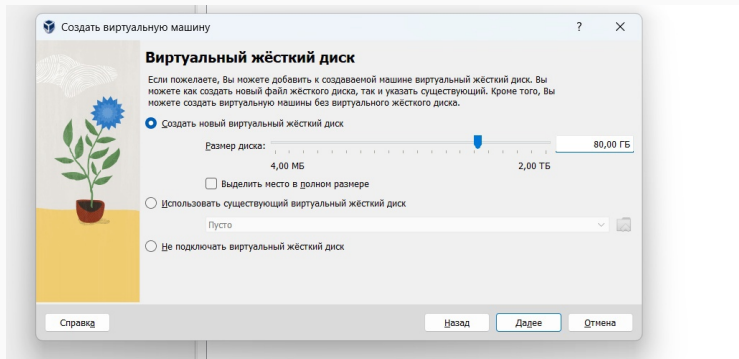


Рис. 3: Создание виртуального диска

# Настройка виртуальной машины

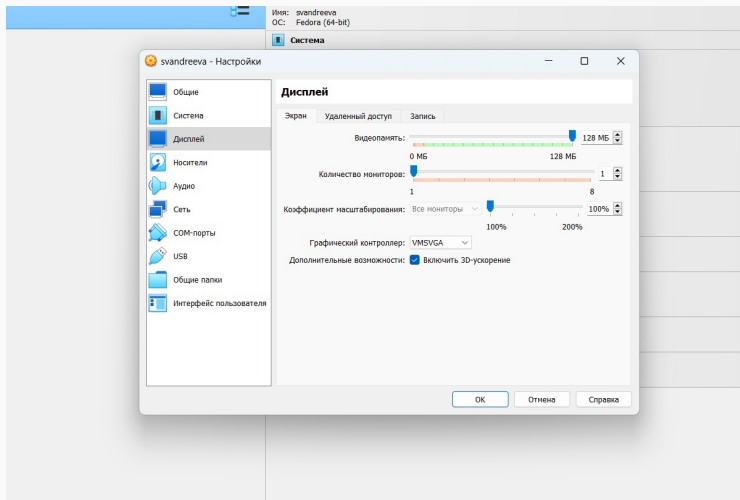


Рис. 4: Настройки дисплея

# Настройка виртуальной машины

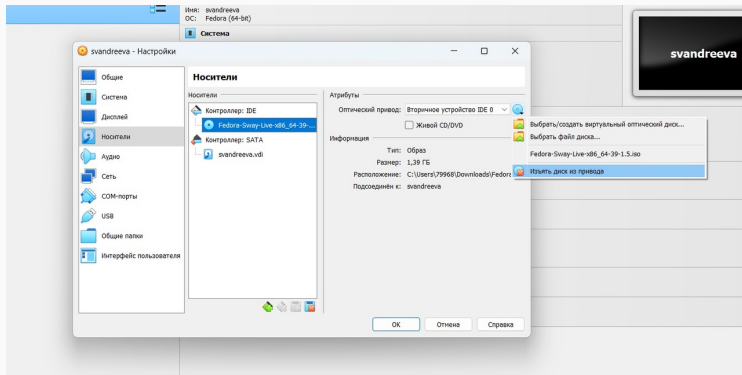


Рис. 5: Отключение диска

# Настройка виртуальной машины

## Обновляем все пакеты dnf -у update.

```
sssd-2.9.4-1.fc39.x86_64
sssd-client-2.9.4-1.fc39.x86_64
sssd-common-pac-2.9.4-1.fc39.x86_64
sssd-kcm-2.9.4-1.fc39.x86_64
sssd-krb5-common-2.9.4-1.fc39.x86_64
sssd-nfs-idmap-2.9.4-1.fc39.x86_64
sudo-1.9.15-1.p5.fc39.x86_64
sway-1.8.1-4.fc39.x86_64
systemd-254.9-1.fc39.x86_64
systemd-networkd-254.9-1.fc39.x86_64
systemd-resolved-254.9-1.fc39.x86_64
tcpdump-14:4.99.4-3.fc39.x86_64
tigervnc-license-1.13.1-11.fc39.noarch
time-1.9-23.fc39.x86_64
tpm2-tss-4.0.1-6.fc39.x86_64
tracker-miners-3.6.2-1.fc39.x86_64
tzdata-2024a-2.fc39.noarch
unbound-libs-1.19.0-7.fc39.x86_64
util-linux-2.39.3-5.fc39.x86_64
vim-data-2:9.1.076-2.fc39.noarch
virtualbox-guest-additions-7.0.14-1.fc39.x86_64
waybar-0.9.24-1.fc39.x86_64
webp-pixbuf-loader-0.2.6-1.fc39.x86_64
wireplumber-libs-0.4.17-1.fc39.x86_64
wlr-randr-0.4.0-1.fc39.x86_64
xdg-desktop-portal-1.18.2-1.fc39.x86_64
xdg-desktop-portal-wlr-0.7.1-1.fc39.x86_64
xfconf-4.18.3-1.fc39.x86_64
xorg-x11-server-Xwayland-23.2.4-1.fc39.x86_64
xorg-x11-xinit-1.4.2-1.fc39.x86_64
yt-dlp-bash-completion-2023.12.30-1.fc39.noarch
zchunk-libs-1.4.0-1.fc39.x86_64
zimg-3.0.5-1.fc39.x86_64
Установлен:
amd-ucode-firmware-20240115-2.fc39.noarch
intel-audio-firmware-20240115-2.fc39.noarch
kernel-modules-6.7.4-200.fc39.x86_64
libdisplay-info-0.1.1-2.fc39.x86_64
libltpoff-0.4.1-1.fc39.x86_64
python3-packaging-23.1-4.fc39.noarch
tpm2-tss-fapi-4.0.1-6.fc39.x86_64
sssd-ad-2.9.4-1.fc39.x86_64
sssd-common-2.9.4-1.fc39.x86_64
sssd-ipa-2.9.4-1.fc39.x86_64
sssd-krb5-2.9.4-1.fc39.x86_64
sssd-ldap-2.9.4-1.fc39.x86_64
sssd-proxy-2.9.4-1.fc39.x86_64
sudo-python-plugin-1.9.15-1.p5.fc39.x86_64
system-config-language-3.5.0-12.fc39.noarch
systemd-libs-254.9-1.fc39.x86_64
systemd-pan-254.9-1.fc39.x86_64
systemd-udev-254.9-1.fc39.x86_64
thunar-archive-plugin-0.5.2-1.fc39.x86_64
tigervnc-server-minimal-1.13.1-11.fc39.x86_64
tmux-3.3a-7.20230918gitb202a2f.fc39.x86_64
traceroute-3:2.1.5-1.fc39.x86_64
tumbler-4.18.2-1.fc39.x86_64
unbound-anchor-1.19.0-7.fc39.x86_64
usbutils-017-1.fc39.x86_64
util-linux-core-2.39.3-5.fc39.x86_64
vim-minimal-2:9.1.076-2.fc39.x86_64
vulkan-loader-1.3.268-0.1.fc39.x86_64
webkit2gtk4.1-2.42.5-1.fc39.x86_64
wireplumber-0.4.17-1.fc39.x86_64
wl-clipboard-2.2.1-1.fc39.x86_64
wlroots-0.17.1-1.fc39.x86_64
xdg-desktop-portal-gtk-1.15.1-1.fc39.x86_64
xfce4-panel-4.18.5-1.fc39.x86_64
xkeyboard-config-2.40-1.fc39.noarch
xorg-x11-server-common-1.20.14-30.fc39.x86_64
yrt-dlp-2023.12.30-1.fc39.noarch
yum-4.18.2-1.fc39.noarch
zenity-4.0.1-1.fc39.x86_64
cirrus-audio-firmware-20240115-2.fc39.noarch
kernel-6.7.4-200.fc39.x86_64
kernel-modules-core-6.7.4-200.fc39.x86_64
libdovi-3.2.0-2.fc39.x86_64
llvm-libs-17.0.6-3.fc39.x86_64
qt5-qtranslations-5.15.12-1.fc39.noarch
wlroots-0.16.0-16.2-1.fc39.x86_64
gstamr1-plugins-bad-free-libs-1.22.9-1.fc39.x86_64
kernel-core-6.7.4-200.fc39.x86_64
kernel-modules-extra-6.7.4-200.fc39.x86_64
libc3-1.0.4-2.fc39.x86_64
npxwireless-firmware-20240115-2.fc39.noarch
tiwilink-firmware-20240115-2.fc39.noarch
xcb-util-errors-1.0.1-1.fc39.x86_64
```

Выполнено!  
[root@fedora ~]#

# Настройка виртуальной машины

Установим программы для удобства работы в консоли. Автоматическое обновление я не установила, так как не вижу в нем необходимости

```
root
Проверка      : perl-File-Basename-2.86-502.fc39.noarch 42/60
Проверка      : perl-File-stat-1.13-502.fc39.noarch 43/60
Проверка      : perl-FileHandle-2.05-502.fc39.noarch 44/60
Проверка      : perl-Getopt-Std-1.13-502.fc39.noarch 45/60
Проверка      : perl-IO-1.52-502.fc39.x86_64 46/60
Проверка      : perl-IPC-Open3-1.22-502.fc39.noarch 47/60
Проверка      : perl-NDBM_File-1.16-502.fc39.x86_64 48/60
Проверка      : perl-POSIX-2.13-502.fc39.x86_64 49/60
Проверка      : perl-SelectSaver-1.02-502.fc39.noarch 50/60
Проверка      : perl-Symbol-1.09-502.fc39.noarch 51/60
Проверка      : perl-base-2.27-502.fc39.noarch 52/60
Проверка      : perl-if-0.61.000-502.fc39.noarch 53/60
Проверка      : perl-integer-4:5.38.2-502.fc39.x86_64 54/60
Проверка      : perl-libs-4:5.38.2-502.fc39.x86_64 55/60
Проверка      : perl-locale-1.10-502.fc39.noarch 56/60
Проверка      : perl-mro-1.28-502.fc39.x86_64 57/60
Проверка      : perl-overload-1.37-502.fc39.noarch 58/60
Проверка      : perl-overloading-0.02-502.fc39.noarch 59/60
Проверка      : perl-vars-1.05-502.fc39.noarch 60/60

Установлен:
gpm-libs-1.20.7-44.fc39.x86_64      mc-1:4.8.30-1.fc39.x86_64
perl-B-1.88-502.fc39.x86_64         perl-Carp-1.54-500.fc39.noarch
perl-Data-Dumper-2.188-501.fc39.x86_64 perl-Digest-1.20-500.fc39.noarch
perl-Dynaloader-1.54-502.fc39.x86_64 perl-Encode-4:3.19-500.fc39.x86_64
perl-Exporter-5.77-500.fc39.noarch  perl-Fcntl-1.15-502.fc39.x86_64
perl-File-Path-2.18-500.fc39.noarch  perl-File-Temp-1:0.231.100-500.fc39.noarch
perl-FileHandle-2.05-502.fc39.noarch perl-Getopt-Long-1:2.54-500.fc39.noarch
perl-HTTP-Tiny-0.088-3.fc39.noarch   perl-IO-1.52-502.fc39.x86_64
perl-IO-Socket-SSL-2.083-3.fc39.noarch perl-IPC-Open3-1.22-502.fc39.noarch
perl-Mozilla-CA-20230801-1.fc39.noarch perl-NDBM_File-1.16-502.fc39.x86_64
perl-POSIX-2.13-502.fc39.x86_64     perl-PathTools-3.89-500.fc39.x86_64
perl-Pod-PerlDoc-3.28.01-501.fc39.noarch perl-Pod-Simple-1:3.45-4.fc39.noarch
perl-Scalar-List-Utils-5:1.63-500.fc39.x86_64 perl-SelectSaver-1.02-502.fc39.noarch
perl-Storable-1:3.32-500.fc39.x86_64 perl-Symbol-1.09-502.fc39.noarch
perl-Term-Cap-1.18-500.fc39.noarch   perl-Text-ParseWords-3.31-500.fc39.noarch
perl-Time-Local-2:1.350-3.fc39.noarch perl-URI-5.21-1.fc39.noarch
perl-constant-1.33-501.fc39.noarch   perl-if-0.61.000-502.fc39.noarch
perl-libnet-3.15-501.fc39.noarch     perl-libs-4:5.38.2-502.fc39.x86_64
perl-mro-1.28-502.fc39.x86_64       perl-overload-1.37-502.fc39.noarch
perl-parent-1:0.241-500.fc39.noarch  perl-overloading-0.02-502.fc39.noarch
perl-PerlIO-1.10-502.fc39.noarch     perl-podlators-1:1.01-500.fc39.noarch
perl-AutoLoader-5.74-502.fc39.noarch perl-Class-Struct-0.68-502.fc39.noarch
perl-Digest-MD5-2.58-500.fc39.x86_64 perl-Errno-1.37-502.fc39.x86_64
perl-File-Basename-2.86-502.fc39.noarch perl-File-stat-1.13-502.fc39.noarch
perl-Getopt-Std-1.13-502.fc39.noarch perl-IO-Socket-IP-0.42-1.fc39.noarch
perl-MIME-Base64-3.16-500.fc39.x86_64 perl-Net-SSLeay-1.92-10.fc39.x86_64
perl-Pod-Escapes-1:1.07-500.fc39.noarch perl-Pod-Usage-4:2.03-500.fc39.noarch
perl-Socket-4:2.037-3.fc39.x86_64   perl-Term-ANSIColor-5.01-501.fc39.noarch
perl-Text-Tabs-Wrap-2023.0511-3.fc39.noarch perl-base-2.27-502.fc39.noarch
perl-integer-4:5.38.2-502.fc39.x86_64 perl-locale-1.10-502.fc39.noarch
perl-overloading-0.02-502.fc39.noarch perl-vars-1.05-502.fc39.noarch
```

# Настройка виртуальной машины

Отключаем SELinux. Меняем значения в файле /etc/selinux/config. Перезагружаем виртуальную машину.

```
root@ ~
GNU nano 7.2 /etc/selinux/config Изменен

# This file controls the state of SELinux on the system.
# SELINUX= can take one of these three values:
#   enforcing - SELinux security policy is enforced.
#   permissive - SELinux prints warnings instead of enforcing.
#   disabled - No SELinux policy is loaded.
# See also:
# https://docs.fedoraproject.org/en-US/quick-docs/getting-started-with-selinux/#getting-started-with-selinux-selinux-states-and-modes
#
# NOTE: In earlier Fedora kernel builds, SELINUX=disabled would also
# fully disable SELinux during boot. If you need a system with SELinux
# fully disabled instead of SELinux running with no policy loaded, you
# need to pass selinux=0 to the kernel command line. You can use grubby
# to persistently set the bootloader to boot with selinux=0:
#
#   grubby --update-kernel ALL --args selinux=0
#
# To revert back to SELinux enabled:
#
#   grubby --update-kernel ALL --remove-args selinux
#
SELINUX=permissive
# SELINUXTYPE= can take one of these three values:
#   targeted - Targeted processes are protected,
#   minimum - Modification of targeted policy. Only selected processes are protected.
#   mls - Multi Level Security protection.
SELINUXTYPE=targeted
```

# Настройка виртуальной машины

Установим драйвера для VirtualBox. Устанавливаем средства разработки. Установим пакет DKMS. В меню виртуальной машины подключим образ диска дополнений гостевой ОС. Подмонтируем диск. Установим драйвера и перезагрузим машину.

```
root@fedora:~# mount /dev/sr0 /media
mount: /media: WARNING: source write-protected, mounted read-only.
root@fedora:~# /media/VBoxLinuxAdditions.run
Verifying archive integrity... 100% MD5 checksums are OK. All good.
Uncompressing VirtualBox 7.0.10 Guest Additions for Linux 100%
VirtualBox Guest Additions installer
This system appears to have a version of the VirtualBox Guest Additions
already installed. If it is part of the operating system and kept up-to-date,
there is most likely no need to replace it. If it is not up-to-date, you
should get a notification when you start the system. If you wish to replace
it with this version, please do not continue with this installation now, but
instead remove the current version first, following the instructions for the
operating system.

If your system simply has the remains of a version of the Additions you could
not remove you should probably continue now, and these will be removed during
installation.

Do you wish to continue? [yes or no]
```

# Настройка виртуальной машины

Настроим раскладки клавиатуры.

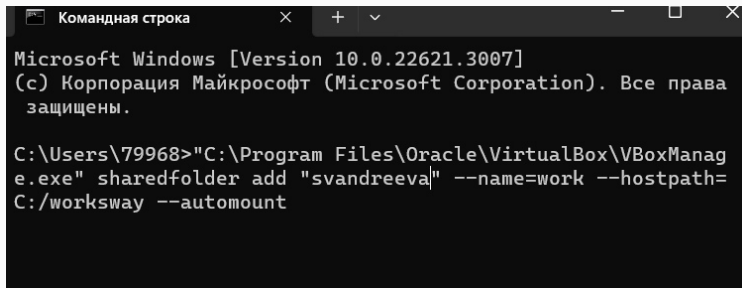
```
foot
GNU nano 7.2 /etc/X11/xorg.conf.d/00-keyboard.conf
# Written by systemd-localed(8), read by systemd-localed and Xorg. It's
# probably wise not to edit this file manually. Use localectl(1) to
# instruct systemd-localed to update it.
Section "InputClass"
    Identifier "system-keyboard"
    MatchIsKeyboard "on"
    Option "XkbLayout" "us,ru"
    Option "XkbVariant" ",winkeys"
    Option "XkbOptions" "grp:rctrl_toggle,compose:ralt,terminate:ctrl_alt_bksp"
EndSection
```

Рис. 10: Настроим раскладки клавиатуры



## Подключение общей папки

Подключение общей папки. Внутри виртуальной машины добавим своего пользователя в группу vboxsf, а затем в хостовой системе подключим разделяемую папку. Перезагрузим машину.



```
Командная строка
Microsoft Windows [Version 10.0.22621.3007]
(c) Корпорация Майкрософт (Microsoft Corporation). Все права защищены.

C:\Users\79968>"C:\Program Files\Oracle\VirtualBox\VBoxManage.exe" sharedfolder add "svandreeva" --name=work --hostpath=C:/worksway --automount
```

Рис. 11: Подключение общей папки

# Установка программного обеспечения для создания документации

Установим pandoc с помощью менеджера пакетов, а затем установим пакет pandoc-crossref той же версии. Распакуем загрузки и поместим их в каталог /usr/local/bin. Установим дистрибутив TeXlive.

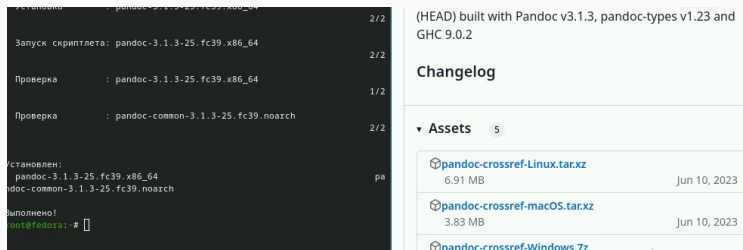


Рис. 12: Установим pandoc

# Домашнее задание

```
[svandreeva@fedora ~]$ sudo -i
[sudo] пароль для svandreeva:
[root@fedora ~]# dmesg | grep -i "Linux version"
[    0.000000] Linux version 6.7.4-200.fc39.x86_64 (mockbuild@de0c58eb5f524c20963d3b29334043cc) (gcc (GCC) 13.2.1 20231205 (Red Hat
U ld version 2.40-14.fc39) #1 SMP PREEMPT_DYNAMIC Mon Feb  5 22:21:14 UTC 2024
[root@fedora ~]# dmesg | grep -i "Mhz processor"
[    0.000011] tsc: Detected 2995.210 MHz processor
[root@fedora ~]# dmesg | grep -i "CPU0"
[    0.454251] smpboot: CPU0: 11th Gen Intel(R) Core(TM) i3-1115G4 @ 3.00GHz (family: 0x6, model: 0x8c, stepping: 0x1)
[root@fedora ~]#
```

Рис. 13: версия ядра Linux, частота процессора, модель процессора

# Домашнее задание

svandreeva [Работает] - Oracle VM VirtualBox

Найти Машина Вид Ввод Устройства Справка

```
0.000000] Command line: BOOT_IMAGE=(hd0,gpt2)/vmlinuz-6.7.4-200.fc39.x86_64 root=UUID=b5d597a1-1071
=root nomodeset vga=791 rhgb quiet
0.000000] BIOS-provided physical RAM map:
0.000000] BIOS-e820: [mem 0x0000000000000000-0x000000000009fbff] usable
0.000000] BIOS-e820: [mem 0x000000000009fc00-0x000000000009ffff] reserved
0.000000] BIOS-e820: [mem 0x00000000000f0000-0x00000000000fffff] reserved
0.000000] BIOS-e820: [mem 0x0000000000100000-0x0000000000dfffff] usable
0.000000] BIOS-e820: [mem 0x00000000dfff0000-0x00000000dfffffff] ACPI data
0.000000] BIOS-e820: [mem 0x00000000fec00000-0x00000000fec00fff] reserved
0.000000] BIOS-e820: [mem 0x00000000fee00000-0x00000000fee00fff] reserved
0.000000] BIOS-e820: [mem 0x00000000fffc0000-0x00000000ffffffff] reserved
0.000000] BIOS-e820: [mem 0x0000000100000000-0x000000011fffffff] usable
0.000000] NX (Execute Disable) protection: active
0.000000] APIC: Static calls initialized
0.000000] SMBIOS 2.5 present.
0.000000] DMI: innotek GmbH VirtualBox/VirtualBox, BIOS VirtualBox 12/01/2006
0.000000] Hypervisor detected: KVM
0.000000] kvm-clock: Using msrc 4b564d01 and 4b564d00
0.000002] kvm-clock: using sched offset of 9208749579 cycles
0.000005] clocksource: kvm-clock: mask: 0xffffffffffffff max_cycles: 0x1cd42e4dffb, max_idle_ns:
0.000008] tsc: Detected 2995.210 MHz processor
0.001048] e820: update [mem 0x00000000-0x00000fff] usable ==> reserved
0.001052] e820: remove [mem 0x000a0000-0x000fffff] usable
0.001058] last_pfn = 0x120000 max_arch_pfn = 0x40000000
0.001064] MTRRs disabled by BIOS
0.001067] x86/PAT: Configuration [0-7]: WB WC UC- UC WB WP UC- WT
0.001087] last_pfn = 0xdfff0 max_arch_pfn = 0x40000000
0.001147] found SMP MP-table at [mem 0x0009ffff-0x0009ffff]
0.005433] RAMDISK: [mem 0x33ea6000-0x35f4afff]
0.005441] ACPI: Early table checksum verification disabled
0.005444] ACPI: RSDP 0x00000000000E0000 000024 (v02 VBOX )
0.005449] ACPI: XSDT 0x0000000000FF0030 00003C (v01 VBOX VBOXXSDT 00000001 ASL 00000061)
0.005456] ACPI: FACP 0x0000000000FF00F0 0000F4 (v04 VBOX VBOXFACP 00000001 ASL 00000061)
0.005462] ACPI: DSDT 0x0000000000FF0610 002353 (v02 VBOX VBOXBIOS 00000002 INTL 20100528)
0.005466] ACPI: FACS 0x0000000000FF0200 000040
0.005469] ACPI: FACS 0x0000000000FF0200 000040
0.005472] ACPI: APIC 0x0000000000FF0240 00005C (v02 VBOX VBOXAPIC 00000001 ASL 00000061)
0.005475] ACPI: SSDT 0x0000000000FF02A0 00036C (v01 VBOX VBOXCPU 00000002 INTL 20100528)
0.005478] ACPI: Reserving FACP table memory at [mem 0xdfff00f0-0xdfff01e3]
0.005479] ACPI: Reserving DSDT table memory at [mem 0xdfff0610-0xdfff2962]
0.005480] ACPI: Reserving FACS table memory at [mem 0xdfff0200-0xdfff023f]
```

Я приобрела практические навыки установки операционной системы на виртуальную машину, настройки минимально необходимых для дальнейшей работы сервисов.