

Лабораторная работа №1

Установка и конфигурация операционной системы на виртуальную машину

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RUDN

Приобрести практические навыки установки операционной системы на виртуальную машину и настройки минимально необходимых для дальнейшей работы сервисов.

Информационная безопасность представляет собой защиту данных и поддерживающей инфраструктуры от случайных или преднамеренных воздействий природного или искусственного характера, которые могут нанести ущерб владельцам или пользователям этой информации и инфраструктуры.

Выполнение лабораторной работы

Выбрала каталог для виртуальных машин и создала новую VB. Установила параметры: имя, тип ОС, объем памяти, динамический диск на 20 ГБ. Добавила оптический привод и указала образ ОС.

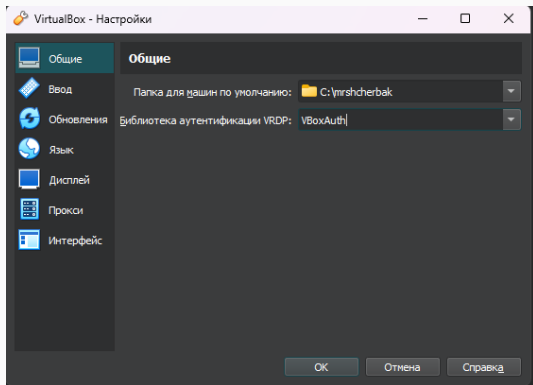


Рис. 1: Расположение каталога виртуальных машин

Настройка виртуальной машины

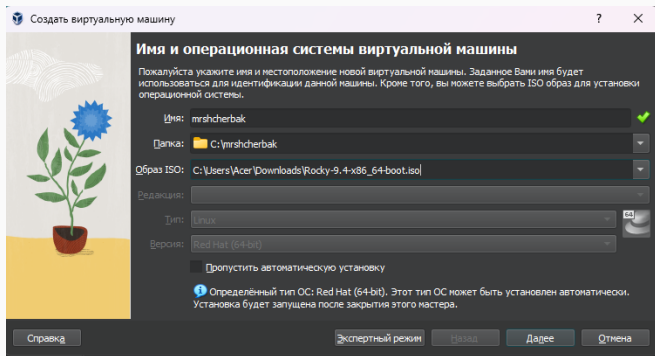


Рис. 2: Установка параметров

Настройка виртуальной машины

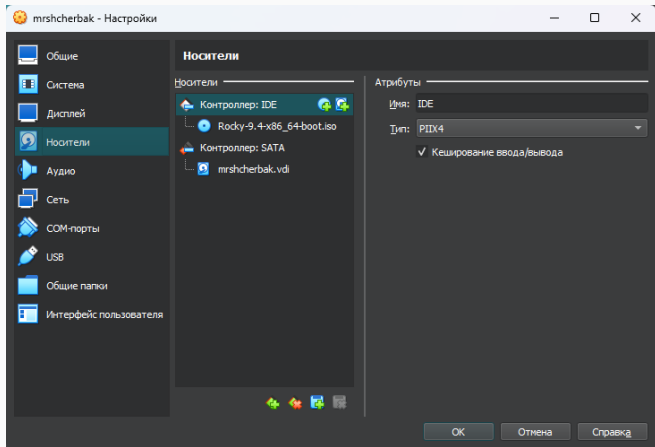


Рис. 3: Подключение образа оптического диска

Созданная виртуальная машина

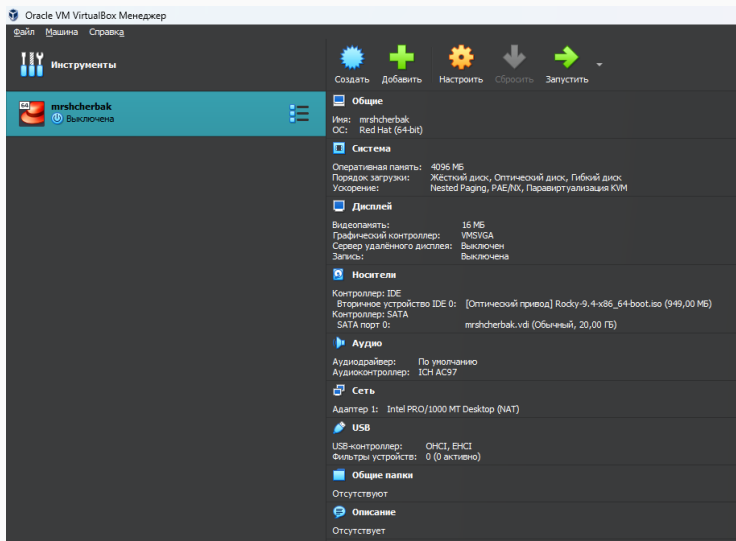


Рис. 4: Виртуальная машина mrshcherbak

Процесс настройки виртуальной машины

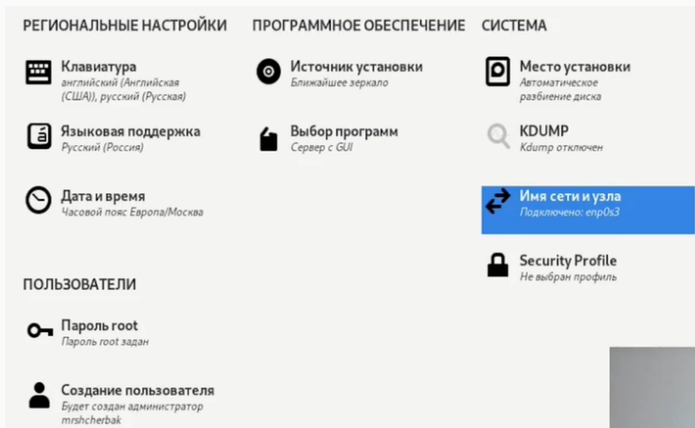


Рис. 5: Окно настройки установки образа ОС

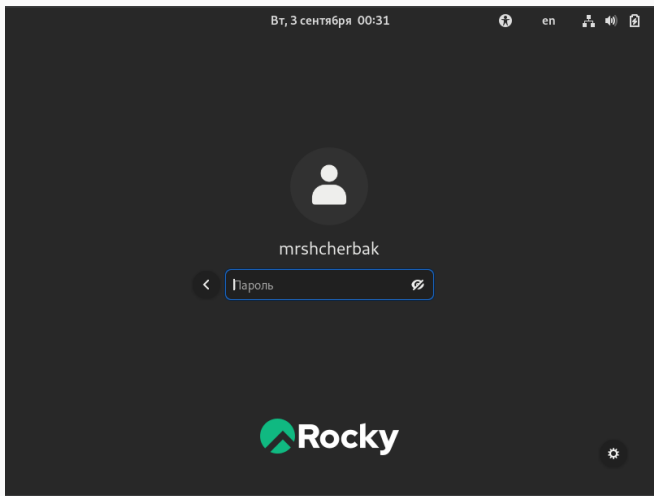
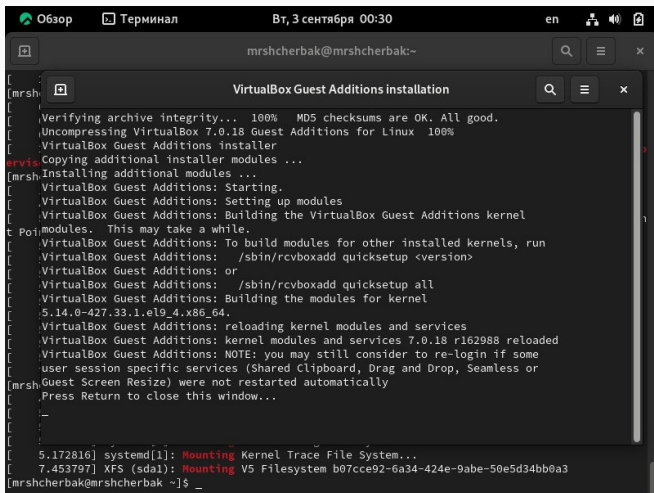


Рис. 6: Вход под своим пользователем

Установка образа дополнений для гостевой ОС

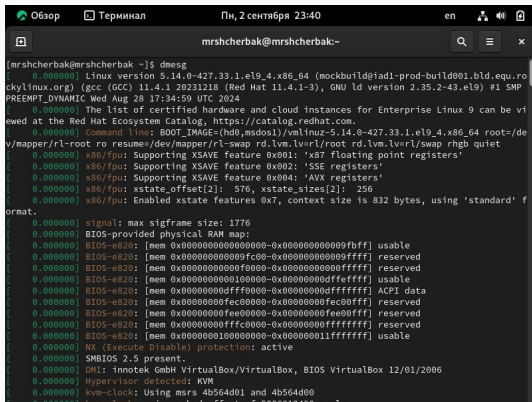


```
[mrshcherbak@mrshcherbak:~]$ sudo ./VBoxLinuxAdditions.sh
[Verifying archive integrity... 100% MD5 checksums are OK. All good.]
[Uncompressing VirtualBox 7.0.18 Guest Additions for Linux 100%]
[VirtualBox Guest Additions installer]
[Copying additional installer modules ...]
[Installing additional modules ...]
[VirtualBox Guest Additions: Starting.]
[VirtualBox Guest Additions: Setting up modules]
[VirtualBox Guest Additions: Building the VirtualBox Guest Additions kernel
modules. This may take a while.]
[VirtualBox Guest Additions: To build modules for other installed kernels, run
VirtualBox Guest Additions: /sbin/rcvboxadd quicksetup <version>
VirtualBox Guest Additions: or
VirtualBox Guest Additions: /sbin/rcvboxadd quicksetup all
VirtualBox Guest Additions: Building the modules for kernel
5.14.0-427.33.1.el9_4.x86_64.
[VirtualBox Guest Additions: reloading kernel modules and services]
[VirtualBox Guest Additions: kernel modules and services 7.0.18 r162988 reloaded]
[VirtualBox Guest Additions: NOTE: you may still consider to re-login if some
user session specific services (Shared Clipboard, Drag and Drop, Seamless or
Guest Screen Resize) were not restarted automatically]
[Press Return to close this window...]
[5.172816] systemd[1]: Mounting Kernel Trace File System...
[7.453797] XFS (sda1): Mounting V5 Filesystem b07cce92-6a34-424e-9abe-50e5d34bb0a3
[mrshcherbak@mrshcherbak ~]$
```

Рис. 7: Подключение образа диска дополнений гостевой ОС

Домашнее задание

Команда `dmesg` выводит системные сообщения ядра Linux, связанные с загрузкой, оборудованием и ошибками.

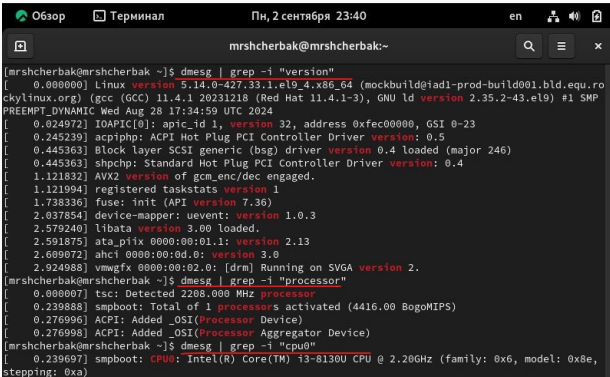


```
Обзор Терминал Пн, 2 сентября 23:40 en
mrshcherbak@mrshcherbak:~

[mrshcherbak@mrshcherbak ~]$ dmesg
0.000000 Linux version 5.14.0-427.33.1.el9_4.x86_64 (mockbuild@ad1-prod-build001.bld.equ.ro
cklinux.org) (gcc (GCC) 11.4.1 20231218 (Red Hat 11.4.1-3), GNU ld version 2.35.2-43.el9) #1 SMP
PREEMPT_DYNAMIC Wed Aug 28 17:34:59 UTC 2024
0.000000 The list of certified hardware and cloud instances for Enterprise Linux 9 can be vi
ewed at the Red Hat Ecosystem Catalog, https://catalog.redhat.com.
0.000000 Command line: BOOT_IMAGE=(hd0,msdos1)/vmlinuz-5.14.0-427.33.1.el9_4.x86_64 root=/de
v/mapper/rl-root ro resume=/dev/mapper/rl-swap rd.lvm.lv=rl/root rd.lvm.lv=rl/swap rhgb quiet
0.000000 x86/fpu: Supporting XSAVE feature 0x001: 'x87 floating point registers'
0.000000 x86/fpu: Supporting XSAVE feature 0x002: 'SSE registers'
0.000000 x86/fpu: Supporting XSAVE feature 0x004: 'AVX registers'
0.000000 x86/fpu: xstate_offset[2]: 576, xstate_sizes[2]: 256
0.000000 x86/fpu: Enabled xstate features 0x7, context size is 832 bytes, using 'standard' f
ormat.
0.000000 signal: max sigframe size: 1776
0.000000 BIOS-provided physical RAM map:
0.000000 BIOS-e820: [mem 0x0000000000000000-0x000000000009fbff] usable
0.000000 BIOS-e820: [mem 0x000000000009fc00-0x00000000000fffff] reserved
0.000000 BIOS-e820: [mem 0x00000000000ffff000-0x00000000000fffff] reserved
0.000000 BIOS-e820: [mem 0x0000000000100000-0x00000000000dffff] usable
0.000000 BIOS-e820: [mem 0x0000000000dffff000-0x0000000000dfffff] ACPI data
0.000000 BIOS-e820: [mem 0x000000000fec00000-0x000000000fec00fff] reserved
0.000000 BIOS-e820: [mem 0x000000000fee00000-0x000000000fee00fff] reserved
0.000000 BIOS-e820: [mem 0x000000000ffff0000-0x000000000ffff0fff] reserved
0.000000 BIOS-e820: [mem 0x00000000010000000-0x00000000010000fff] usable
0.000000 NX (Execute Disable) protection: active
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 msrs 4b564d01 and 4b564d00
0.000000
```

Рис. 8: Вывод команды “`dmesg`”

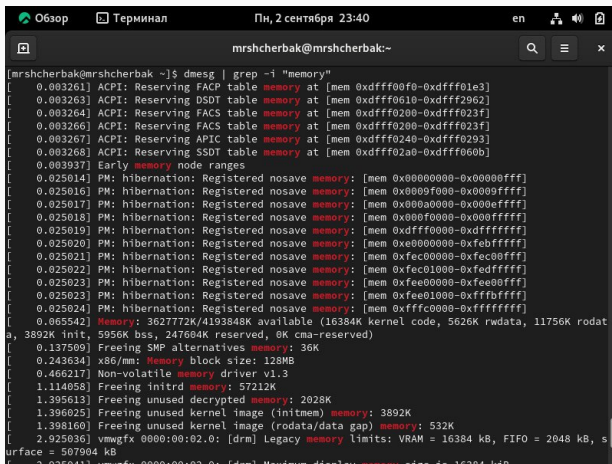
Версия ядра Linux, частота процессора и модель процессора



```
Обзор Терминал Пн, 2 сентября 23:40 en
mrshcherbak@mrshcherbak:~
[mrshcherbak@mrshcherbak ~]$ dmesg | grep -i "version"
[ 0.000000] Linux version 5.14.0-427.33.1.el9_4.x86_64 (mockbuild@iad1-prod-build001.bld.equ.ro
ckylinux.org) (gcc (GCC) 11.4.1 20231218 (Red Hat 11.4.1-3), GNU ld version 2.35.2-43.el9) #1 SMP
PREEMPT_DYNAMIC Wed Aug 28 17:34:59 UTC 2024
[ 0.024972] IOAPIC[0]: apic_id 1, version 32, address 0xfec00000, GSI 0-23
[ 0.245239] acpiphp: ACPI Hot Plug PCI Controller Driver version: 0.5
[ 0.445363] Block layer SCSI generic (bsg) driver version 0.4 loaded (major 246)
[ 0.445363] shpchp: Standard Hot Plug PCI Controller Driver version: 0.4
[ 1.121832] AVX2 version of gcm_enc/dec engaged.
[ 1.121994] registered taskstats version 1
[ 1.738336] fuse: init (API version 7.36)
[ 2.037854] device-mapper: uevent: version 1.0.3
[ 2.579240] libata version 3.00 loaded.
[ 2.591875] ata_piix 0000:00:01.1: version 2.13
[ 2.609072] ahci 0000:00:0d.0: version 3.0
[ 2.924988] vmwgfx 0000:00:02.0: [drm] Running on SVGA version 2.
[mrshcherbak@mrshcherbak ~]$ dmesg | grep -i "processor"
[ 0.000007] tsc: Detected 2208.000 MHz processor
[ 0.239888] smpboot: Total of 1 processors activated (4416.00 BogoMIPS)
[ 0.276996] ACPI: Added _OSI(Processor Device)
[ 0.276998] ACPI: Added _OSI(Processor Aggregator Device)
[mrshcherbak@mrshcherbak ~]$ dmesg | grep -i "cpu0"
[ 0.239697] smpboot: CPU0: Intel(R) Core(TM) i3-8130U CPU @ 2.20GHz (family: 0x6, model: 0x8e,
stepping: 0xa)
```

Рис. 9: Просмотр версии Linux, частоты и модели процессора

Объем доступной оперативной памяти



```
Обзор Терминал Пн, 2 сентября 23:40 en
mrshcherbak@mrshcherbak:~$ dmesg | grep -i "memory"
[ 0.003261] ACPI: Reserving FACP table memory at [mem 0xdfff00f0-0xdfff01e3]
[ 0.003263] ACPI: Reserving DSDT table memory at [mem 0xdfff0610-0xdfff2962]
[ 0.003264] ACPI: Reserving FACS table memory at [mem 0xdfff0200-0xdfff023f]
[ 0.003266] ACPI: Reserving FACS table memory at [mem 0xdfff0200-0xdfff023f]
[ 0.003267] ACPI: Reserving APIC table memory at [mem 0xdfff0240-0xdfff0293]
[ 0.003268] ACPI: Reserving SSDT table memory at [mem 0xdfff02a0-0xdfff060b]
[ 0.003937] Early memory node ranges
[ 0.025014] PM: hibernation: Registered nosave memory: [mem 0x00000000-0x00000fff]
[ 0.025016] PM: hibernation: Registered nosave memory: [mem 0x0009f000-0x0009ffff]
[ 0.025017] PM: hibernation: Registered nosave memory: [mem 0x000a0000-0x000aefff]
[ 0.025018] PM: hibernation: Registered nosave memory: [mem 0x000f0000-0x000fffff]
[ 0.025019] PM: hibernation: Registered nosave memory: [mem 0xdfff0000-0xdfffffff]
[ 0.025020] PM: hibernation: Registered nosave memory: [mem 0xe0000000-0xfefbffff]
[ 0.025021] PM: hibernation: Registered nosave memory: [mem 0xfec00000-0xfec0ffff]
[ 0.025022] PM: hibernation: Registered nosave memory: [mem 0xfec01000-0xfedfffff]
[ 0.025023] PM: hibernation: Registered nosave memory: [mem 0xfef00000-0xfef0ffff]
[ 0.025023] PM: hibernation: Registered nosave memory: [mem 0xfef01000-0xffffbfff]
[ 0.025024] PM: hibernation: Registered nosave memory: [mem 0xffffc000-0xffffffff]
[ 0.065542] Memory: 3627772K/4193848K available (16384K kernel code, 5626K rwd data, 11756K ro data)
[ 0.137509] Freeing SMP alternatives memory: 36K
[ 0.243634] x86/mm: Memory block size: 128MB
[ 0.466217] Non-volatile memory driver v1.3
[ 1.114058] Freeing initrd memory: 57212K
[ 1.395613] Freeing unused decrypted memory: 2028K
[ 1.396025] Freeing unused kernel image (initmem) memory: 3892K
[ 1.398160] Freeing unused kernel image (rodata/data gap) memory: 532K
[ 2.925036] vmwgfx 0000:00:02.0: [drm] Legacy memory limits: VRAM = 16384 kB, FIFO = 2048 kB, surface = 507904 kB
[ 2.925041] vmwgfx 0000:00:02.0: [drm] Maximum display memory size is 16384 kB
```

Рис. 10: Объем доступной оперативной памяти

Домашнее задание

```
[mrshcherbak@mrshcherbak ~]$ dmesg | grep -i "hypervisor"
[ 0.000000] Hypervisor detected: KVM
[ 0.115910] SRBDS: Unknown: Dependent on hypervisor status
[ 0.115911] GDS: Unknown: Dependent on hypervisor status
[ 2.924995] vmwgfx 0000:00:02.0: [drm] *ERROR* vmwgfx seems to be running on an unsupported hypervisor.
[mrshcherbak@mrshcherbak ~]$ dmesg | grep -i "file"
[ 1.634016] systemd[1]: Reached target Initrd /usr File System.
[ 4.089137] XFS (dm-0): Mounting V5 Filesystem 87b576d6-b267-4802-8f38-165115287878
[ 5.133111] systemd[1]: Set up automount Arbitrary Executable File Formats File System Automount Point.
[ 5.133367] systemd[1]: Stopped target Initrd File Systems.
[ 5.133410] systemd[1]: Stopped target Initrd Root File System.
[ 5.133554] systemd[1]: Reached target Remote File Systems.
[ 5.156504] systemd[1]: Mounting Huge Pages File System...
[ 5.159776] systemd[1]: Mounting POSIX Message Queue File System...
[ 5.162786] systemd[1]: Mounting Kernel Debug File System...
[ 5.172816] systemd[1]: Mounting Kernel Trace File System...
[ 5.233405] systemd[1]: Stopped File System Check on Root Device.
[ 5.285770] systemd[1]: Starting Remount Root and Kernel File Systems...
[ 7.453797] XFS (sdal): Mounting V5 Filesystem b07cce92-6a34-424e-9abe-50e5d34bb0a3
[mrshcherbak@mrshcherbak ~]$ dmesg | grep -i "mounting"
[ 4.089137] XFS (dm-0): Mounting V5 Filesystem 87b576d6-b267-4802-8f38-165115287878
[ 5.156504] systemd[1]: Mounting Huge Pages File System...
[ 5.159776] systemd[1]: Mounting POSIX Message Queue File System...
[ 5.162786] systemd[1]: Mounting Kernel Debug File System...
[ 5.172816] systemd[1]: Mounting Kernel Trace File System...
[ 7.453797] XFS (sdal): Mounting V5 Filesystem b07cce92-6a34-424e-9abe-50e5d34bb0a3
[mrshcherbak@mrshcherbak ~]$ _
```

Рис. 11: Тип обнаруженного гипервизора, файловой системы корневого раздела, последовательность монтирования файловых систем

Таким образом, в ходе ЛР№1 я приобрела практические навыки установки операционной системы на виртуальную машину и настройки минимально необходимых для дальнейшей работы сервисов.

- Методические материалы курса.
- Rocky Linux Documentation. [Электронный ресурс]. М. URL: Rocky Linux Documentation (Дата обращения: 03.09.2024).
- Файловая система. [Электронный ресурс]. М. URL: Файловая система (Дата обращения: 03.09.2024).