

Лабораторная работа №1

Основы информационной безопасности

Сабралиева Марворид Нуралиевна

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1 Цель работы

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

2 Задание

Получите следующую информацию. 1. Версия ядра Linux (Linux version). 2. Частота процессора (Detected Mhz processor). 3. Модель процессора (CPU0). 4. Объем доступной оперативной памяти (Memory available). 5. Тип обнаруженного гипервизора (Hypervisor detected). 6. Тип файловой системы корневого раздела.

3 Выполнение лабораторной работы

1. Создаю виртуальную машину и задаю конфигурацию жесткого диска (рис. 3.1).

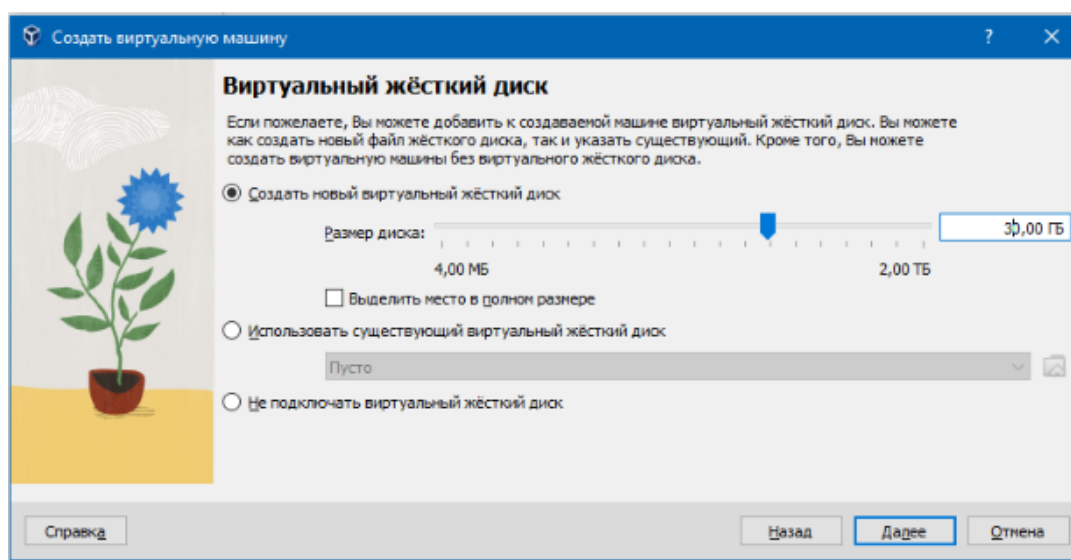


Рис. 3.1: Конфигурация жесткого диска

2. Добавляю новый привод оптического диска и выбираю образ. Запускаю виртуальную машину и начинаю ее настройку с языка для интерфейса (рис. 3.2).

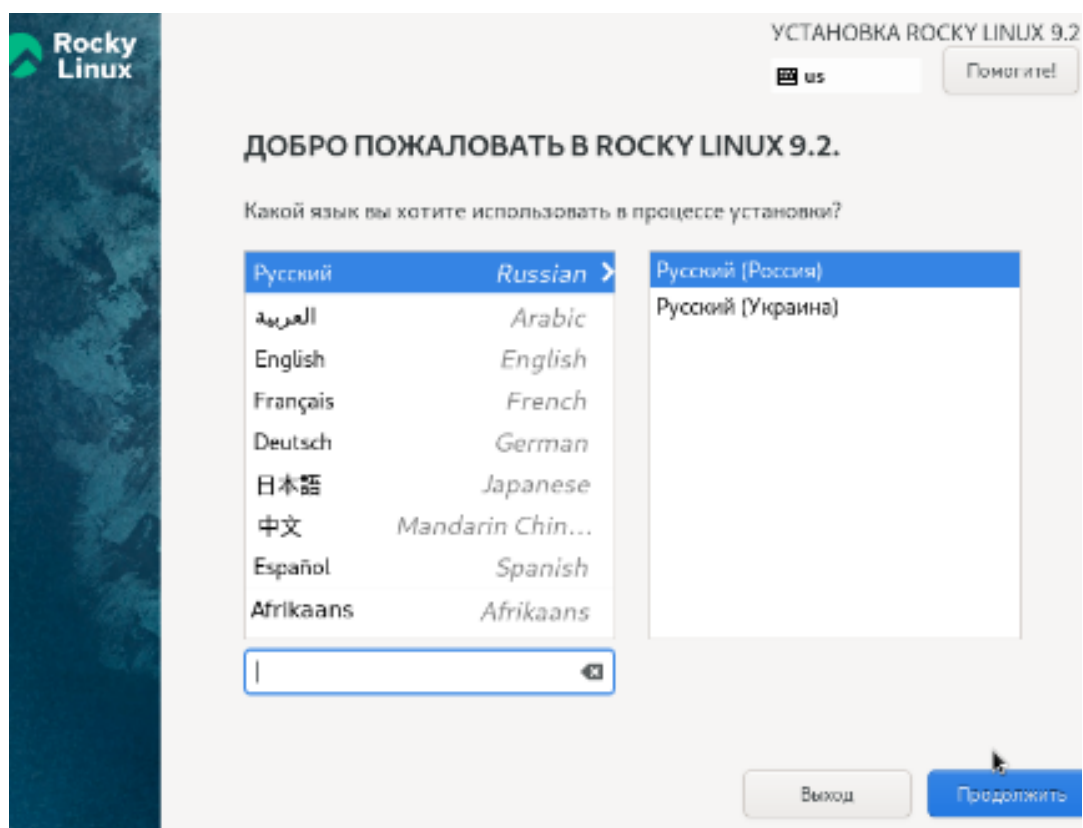


Рис. 3.2: Приветственный экран

3. Указываю параметры установки (рис. 3.3).

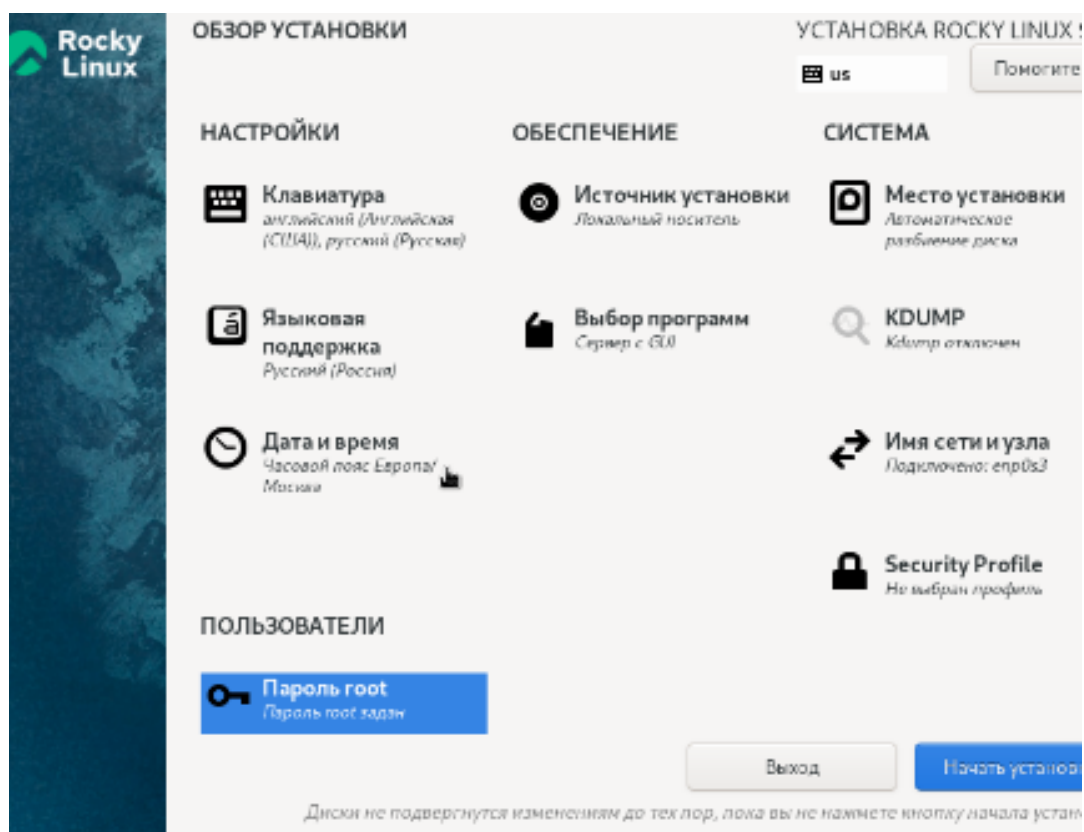


Рис. 3.3: Параметры установки

4. Перехожу к этапу установки и дожидаюсь его завершения (рис. 3.4).

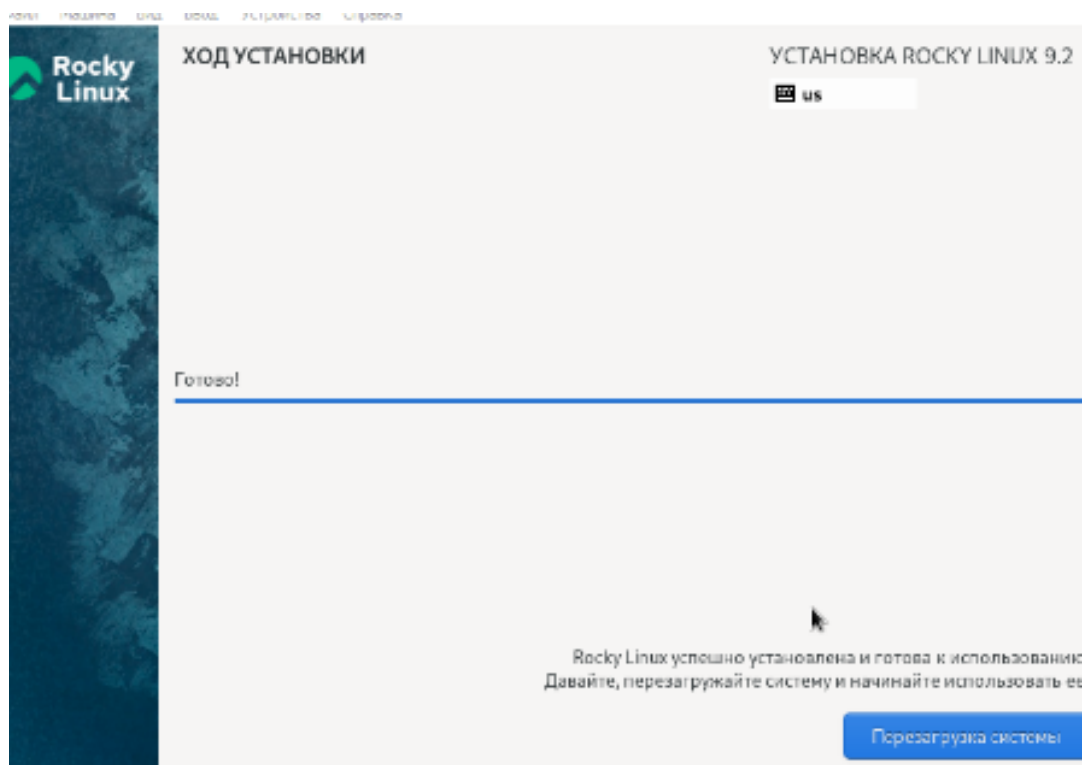


Рис. 3.4: Установка

5. Загружаю с жесткого диска установленную систему и перехожу к выполнению задания. Ввожу команду `dmesg` (рис. 3.5).

```
marvorid@localhost:~$ dmesg
[0.000000] Linux version 5.14.0-362.8.1.el9_3.x86_64 (mockbuild@iad1-prod-build001.bld.equ.rockylinux.org) (gcc (GCC) 11.4.1 2
0230605 (Red Hat 11.4.1-2), GNU ld version 2.35.2-42.el9) #1 SMP PREEMPT_DYNAMIC Wed Nov 8 17:36:32 UTC 2023
[0.000000] The list of certified hardware and cloud instances for Enterprise Linux 9 can be viewed at the Red Hat Ecosystem Ca
talog, https://catalog.redhat.com.
[0.000000] Command line: BOOT_IMAGE=(hd0,msdos1)/vmlinuz-5.14.0-362.8.1.el9_3.x86_64 root=/dev/mapper/rl-root ro crashkernel=1
G-4G:192M,4G-64G:256M,64G-:512M 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' format.
[0.000000] signal: max sigframe size: 1776
[0.000000] BIOS-provided physical RAM map:
[0.000000] BIOS-e820: [mem 0x0000000000000000-0x0000000000009fbfff] usable
[0.000000] BIOS-e820: [mem 0x0000000000009fc00-0x0000000000009ffff] reserved
[0.000000] BIOS-e820: [mem 0x000000000000f0000-0x000000000000ffffff] reserved
[0.000000] BIOS-e820: [mem 0x00000000000100000-0x0000000000003ffff] usable
[0.000000] BIOS-e820: [mem 0x000000000003ffff000-0x0000000000003ffff] ACPI data
[0.000000] BIOS-e820: [mem 0x000000000fec00000-0x000000000fec00fff] reserved
[0.000000] BIOS-e820: [mem 0x000000000fee00000-0x000000000fee00fff] reserved
[0.000000] BIOS-e820: [mem 0x000000000fff00000-0x000000000ffff] reserved
[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
```

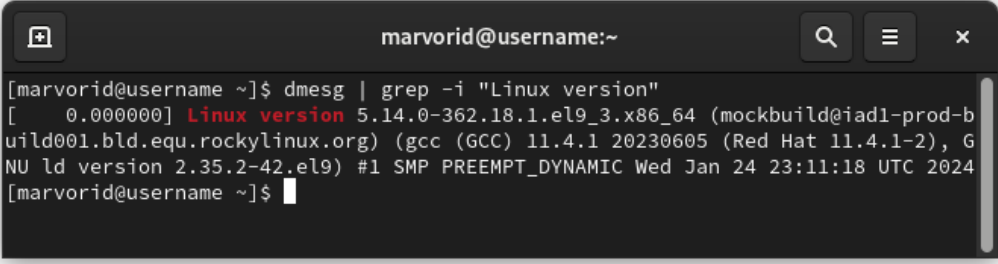
Рис. 3.5: команда dmesg

6. Вводим команду dmesg | less (рис. 3.6).

```
marvorid@username:~ — less
[0.000000] Linux version 5.14.0-362.18.1.el9_3.x86_64 (mockbuild@iad1-prod-b
uild001.bld.equ.rockylinux.org) (gcc (GCC) 11.4.1 20230605 (Red Hat 11.4.1-2), G
NU ld version 2.35.2-42.el9) #1 SMP PREEMPT_DYNAMIC Wed Jan 24 23:11:18 UTC 2024
[0.000000] The list of certified hardware and cloud instances for Enterprise
Linux 9 can be viewed at the Red Hat Ecosystem Catalog, https://catalog.redhat.
com.
[0.000000] Command line: BOOT_IMAGE=(hd0,msdos1)/vmlinuz-5.14.0-362.18.1.el9
_3.x86_64 root=/dev/mapper/rl-root ro crashkernel=1G-4G:192M,4G-64G:256M,64G-:51
2M 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 regi
sters'
[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' format.
[0.000000] signal: max sigframe size: 1776
[0.000000] BIOS-provided physical RAM map:
[0.000000] BIOS-e820: [mem 0x0000000000000000-0x0000000000009fbfff] usable
[0.000000] BIOS-e820: [mem 0x0000000000009fc00-0x0000000000009ffff] reserved
[0.000000] BIOS-e820: [mem 0x000000000000f0000-0x000000000000ffffff] reserved
[0.000000] BIOS-e820: [mem 0x00000000000100000-0x0000000000003ffff] usable
[0.000000] BIOS-e820: [mem 0x000000000003ffff000-0x0000000000003ffff] ACPI data
:
```

Рис. 3.6: команда dmesg

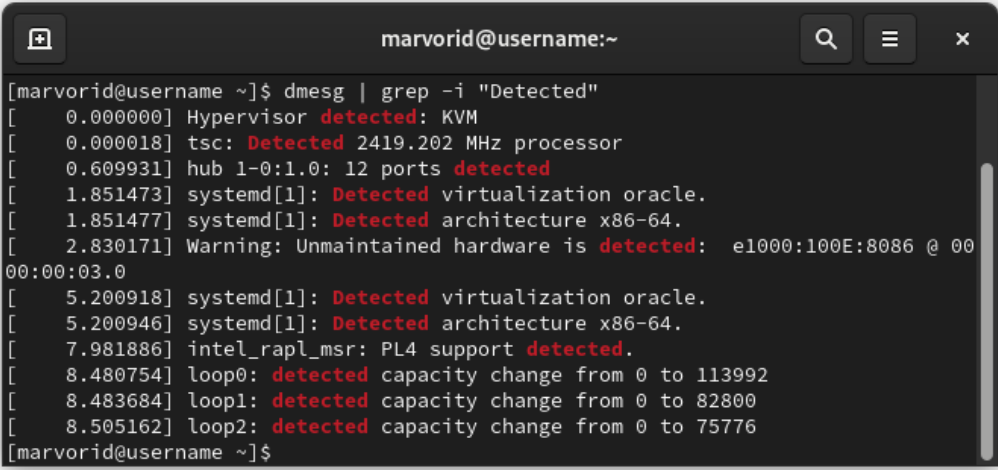
7. Узнаем версию ядра Linux (Linux version). (рис. 3.7).



```
marvoriid@username:~  
[marvoriid@username ~]$ dmesg | grep -i "Linux version"  
[ 0.000000] Linux version 5.14.0-362.18.1.el9_3.x86_64 (mockbuild@iad1-prod-b  
uild001.bld.equ.rockylinux.org) (gcc (GCC) 11.4.1 20230605 (Red Hat 11.4.1-2), G  
NU ld version 2.35.2-42.el9) #1 SMP PREEMPT_DYNAMIC Wed Jan 24 23:11:18 UTC 2024  
[marvoriid@username ~]$
```

Рис. 3.7: команда dmesg

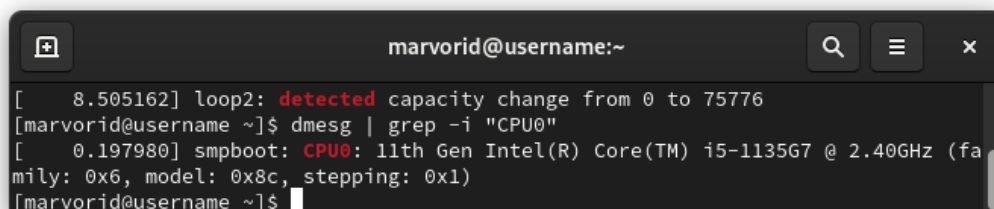
8. Узнаем частоту процессора (Detected Mhz processor) (рис. 3.8).



```
marvoriid@username:~  
[marvoriid@username ~]$ dmesg | grep -i "Detected"  
[ 0.000000] Hypervisor detected: KVM  
[ 0.000018] tsc: Detected 2419.202 MHz processor  
[ 0.609931] hub 1-0:1.0: 12 ports detected  
[ 1.851473] systemd[1]: Detected virtualization oracle.  
[ 1.851477] systemd[1]: Detected architecture x86-64.  
[ 2.830171] Warning: Unmaintained hardware is detected: e1000:100E:8086 @ 00  
00:00:03.0  
[ 5.200918] systemd[1]: Detected virtualization oracle.  
[ 5.200946] systemd[1]: Detected architecture x86-64.  
[ 7.981886] intel_rapl_msr: PL4 support detected.  
[ 8.480754] loop0: detected capacity change from 0 to 113992  
[ 8.483684] loop1: detected capacity change from 0 to 82800  
[ 8.505162] loop2: detected capacity change from 0 to 75776  
[marvoriid@username ~]$
```

Рис. 3.8: команда dmesg

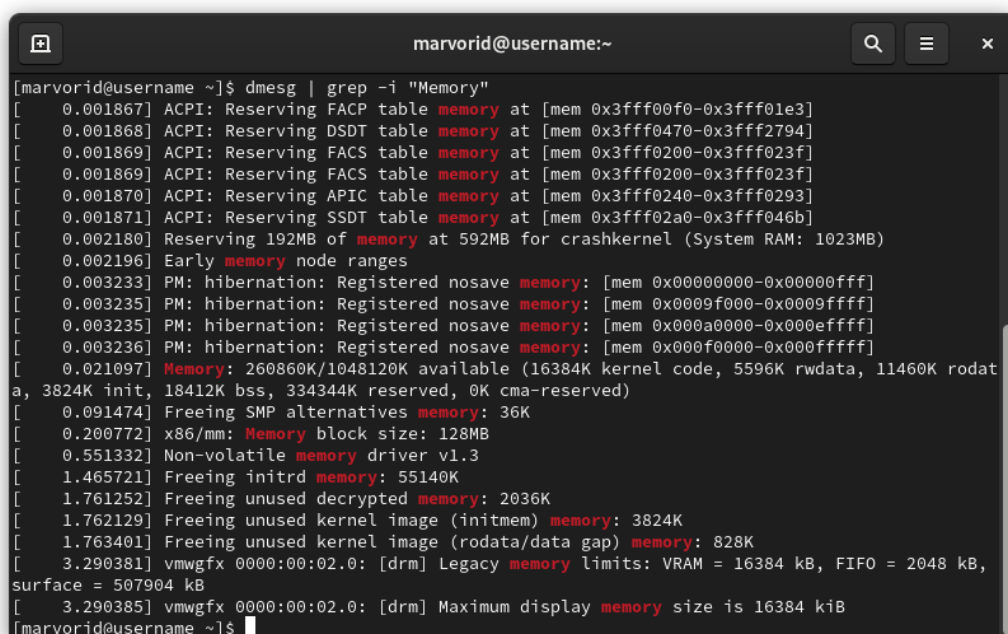
9. Модель процессора (CPU0) (рис. 3.9).



```
marvorid@username:~  
[ 8.505162] loop2: detected capacity change from 0 to 75776  
[marvorid@username ~]$ dmesg | grep -i "CPU0"  
[ 0.197980] smpboot: CPU0: 11th Gen Intel(R) Core(TM) i5-1135G7 @ 2.40GHz (family: 0x6, model: 0x8c, stepping: 0x1)  
[marvorid@username ~]$
```

Рис. 3.9: команда dmesg

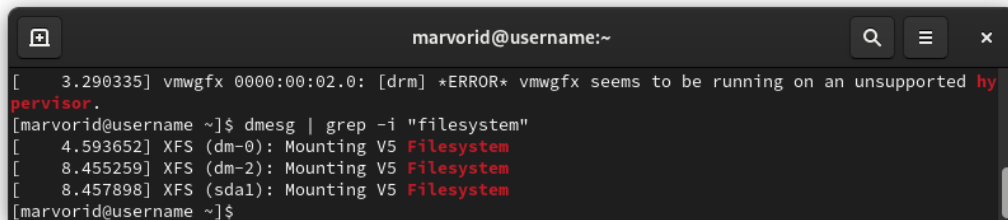
10. Объем доступной оперативной памяти (Memory available).(рис. 3.10).



```
marvorid@username:~  
[marvorid@username ~]$ dmesg | grep -i "Memory"  
[ 0.001867] ACPI: Reserving FACP table memory at [mem 0x3fff00f0-0x3fff01e3]  
[ 0.001868] ACPI: Reserving DSDT table memory at [mem 0x3fff0470-0x3fff2794]  
[ 0.001869] ACPI: Reserving FACS table memory at [mem 0x3fff0200-0x3fff023f]  
[ 0.001869] ACPI: Reserving FACS table memory at [mem 0x3fff0200-0x3fff023f]  
[ 0.001870] ACPI: Reserving APIC table memory at [mem 0x3fff0240-0x3fff0293]  
[ 0.001871] ACPI: Reserving SSDT table memory at [mem 0x3fff02a0-0x3fff046b]  
[ 0.002180] Reserving 192MB of memory at 592MB for crashkernel (System RAM: 1023MB)  
[ 0.002196] Early memory node ranges  
[ 0.003233] PM: hibernation: Registered nosave memory: [mem 0x00000000-0x00000fff]  
[ 0.003235] PM: hibernation: Registered nosave memory: [mem 0x0009f000-0x0009ffff]  
[ 0.003235] PM: hibernation: Registered nosave memory: [mem 0x000a0000-0x000effff]  
[ 0.003236] PM: hibernation: Registered nosave memory: [mem 0x000f0000-0x000fffff]  
[ 0.021097] Memory: 260860K/1048120K available (16384K kernel code, 5596K rdata, 11460K rodata, 3824K init, 18412K bss, 334344K reserved, 0K cma-reserved)  
[ 0.091474] Freeing SMP alternatives memory: 36K  
[ 0.200772] x86/mm: Memory block size: 128MB  
[ 0.551332] Non-volatile memory driver v1.3  
[ 1.465721] Freeing initrd memory: 55140K  
[ 1.761252] Freeing unused decrypted memory: 2036K  
[ 1.762129] Freeing unused kernel image (initmem) memory: 3824K  
[ 1.763401] Freeing unused kernel image (rodata/data gap) memory: 828K  
[ 3.290381] vmwgfx 0000:00:02.0: [drm] Legacy memory limits: VRAM = 16384 kB, FIFO = 2048 kB, surface = 507904 kB  
[ 3.290385] vmwgfx 0000:00:02.0: [drm] Maximum display memory size is 16384 kiB  
[marvorid@username ~]$
```

Рис. 3.10: команда dmesg

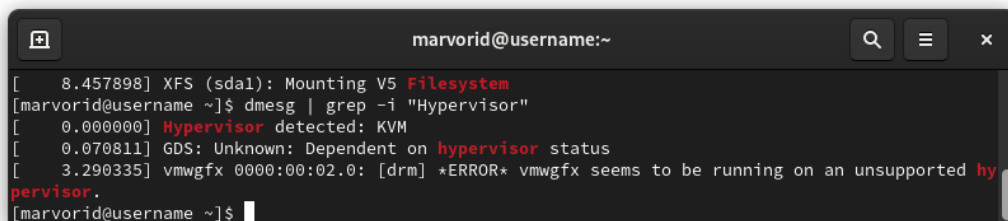
11. Тип обнаруженного гипервизора (Hypervisor detected). (рис. 3.11).



```
marvolid@username:~  
[ 3.290335] vmwgfx 0000:00:02.0: [drm] *ERROR* vmwgfx seems to be running on an unsupported hy  
pervisor.  
[marvolid@username ~]$ dmesg | grep -i "filesystem"  
[ 4.593652] XFS (dm-0): Mounting V5 Filesystem  
[ 8.455259] XFS (dm-2): Mounting V5 Filesystem  
[ 8.457898] XFS (sda1): Mounting V5 Filesystem  
[marvolid@username ~]$
```

Рис. 3.11: команда dmesg

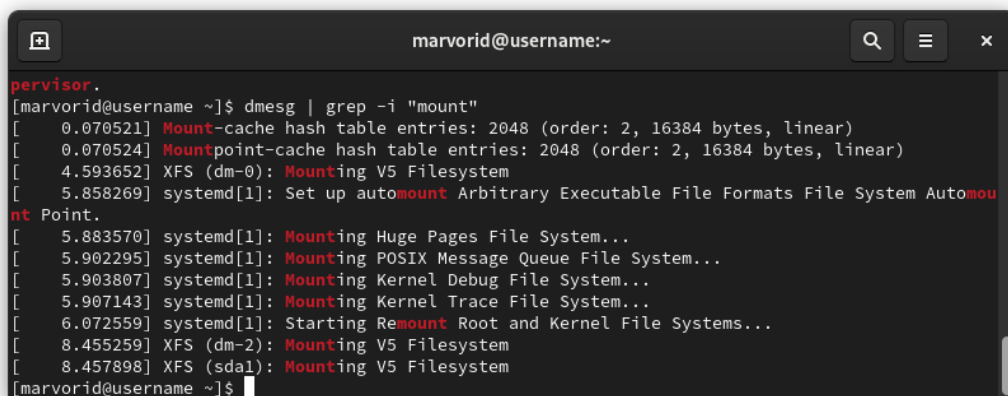
12. Тип файловой системы корневого раздела (рис. 3.12).



```
marvolid@username:~  
[ 8.457898] XFS (sda1): Mounting V5 Filesystem  
[marvolid@username ~]$ dmesg | grep -i "Hypervisor"  
[ 0.000000] Hypervisor detected: KVM  
[ 0.070811] GDS: Unknown: Dependent on hypervisor status  
[ 3.290335] vmwgfx 0000:00:02.0: [drm] *ERROR* vmwgfx seems to be running on an unsupported hy  
pervisor.  
[marvolid@username ~]$
```

Рис. 3.12: команда dmesg

13. Последовательность монтирования файловых систем.(рис. 3.13).



```
marvolid@username:~  
pervisor.  
[marvolid@username ~]$ dmesg | grep -i "mount"  
[ 0.070521] Mount-cache hash table entries: 2048 (order: 2, 16384 bytes, linear)  
[ 0.070524] Mountpoint-cache hash table entries: 2048 (order: 2, 16384 bytes, linear)  
[ 4.593652] XFS (dm-0): Mounting V5 Filesystem  
[ 5.858269] systemd[1]: Set up automount Arbitrary Executable File Formats File System Auto  
mount Point.  
[ 5.883570] systemd[1]: Mounting Huge Pages File System...  
[ 5.902295] systemd[1]: Mounting POSIX Message Queue File System...  
[ 5.903807] systemd[1]: Mounting Kernel Debug File System...  
[ 5.907143] systemd[1]: Mounting Kernel Trace File System...  
[ 6.072559] systemd[1]: Starting Remount Root and Kernel File Systems...  
[ 8.455259] XFS (dm-2): Mounting V5 Filesystem  
[ 8.457898] XFS (sda1): Mounting V5 Filesystem  
[marvolid@username ~]$
```

Рис. 3.13: команда dmesg

4 Выводы

Мы приобрели практические навыки установки операционной системы на виртуальную машину.

Список литературы