

Лабораторная работа №1

Основы Информационной безопасности

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17 февраля 2024

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Информация

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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

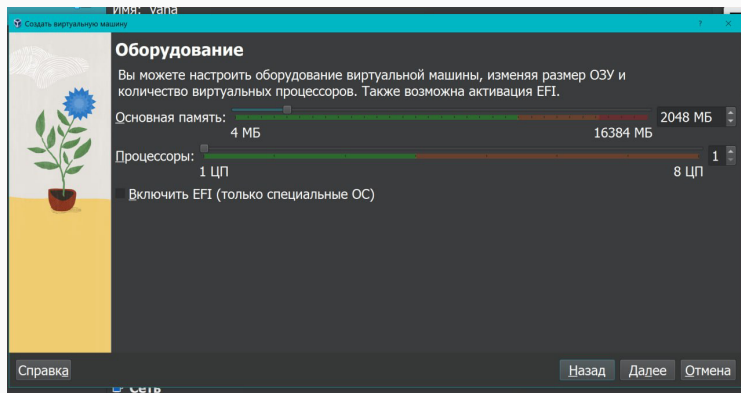


Рис. 1: Оборудование

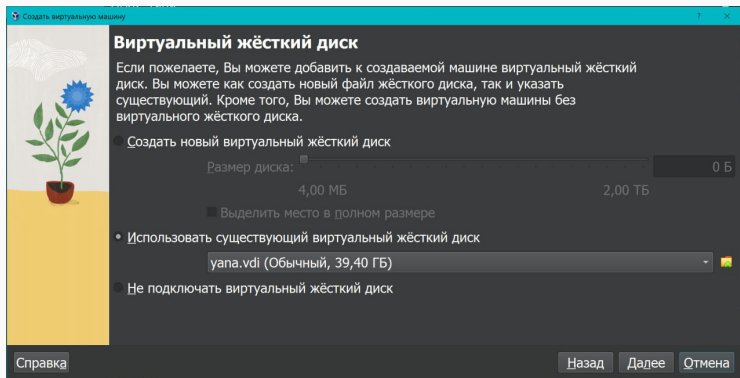
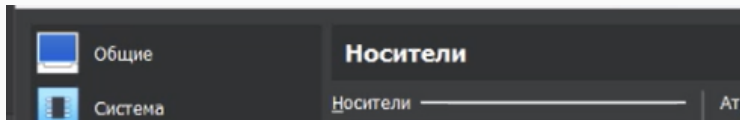


Рис. 2: Виртуальный жесткий диск



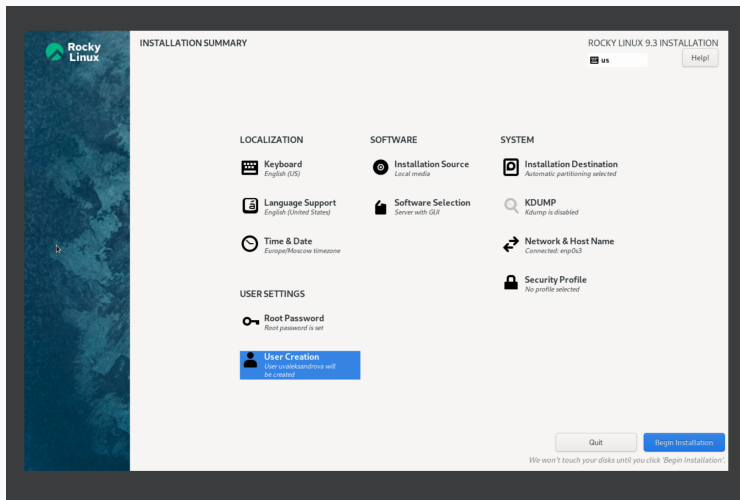


Рис. 4: Сводка установки

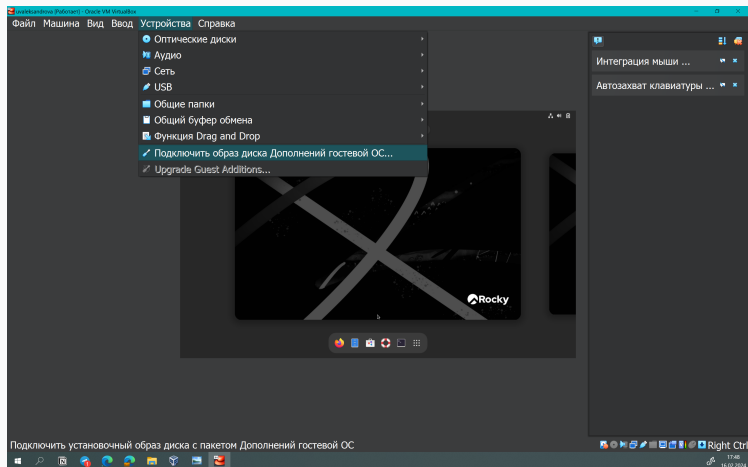
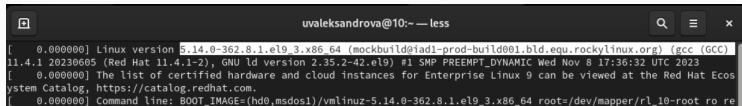


Рис. 5: Подключение гостевой ОС

```
uvaleksandrova@10:~$ 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 20230605 (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 Ecos
ystem Catalog, 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_10-root ro re
sume=/dev/mapper/rl_10-swap rd.lvm.lv=rl_10/root rd.lvm.lv=rl_10/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 0x0000000000000000-0x000000000009fbff] usable
[ 0.000000] BIOS-e820: [mem 0x000000000009fc00-0x000000000009ffff] reserved
[ 0.000000] BIOS-e820: [mem 0x00000000000f0000-0x00000000000fffff] reserved
[ 0.000000] BIOS-e820: [mem 0x0000000000100000-0x00000000007fffff] usable
[ 0.000000] BIOS-e820: [mem 0x00000000007fff0000-0x0000000000fffff] ACPI data
[ 0.000000] BIOS-e820: [mem 0x00000000fec00000-0x00000000fec00fff] reserved
[ 0.000000] BIOS-e820: [mem 0x00000000fee00000-0x00000000fee00fff] reserved
[ 0.000000] BIOS-e820: [mem 0x00000000ffffc0000-0x00000000ffffffffff] 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
[ 0.000002] kvm-clock: using sched offset of 4652120879 cycles
[ 0.000004] clocksource: kvm-clock: mask: 0xffffffffffffffff max_cycles: 0x1cd42e4dffb, max_idle_ns: 881590591483 ns
[ 0.000006] tsc: Detected 3110.406 MHz processor
[ 0.000696] e820: update [mem 0x00000000-0x00000fff] usable ==> reserved
[ 0.000698] e820: remove [mem 0x000a0000-0x000fffff] usable
[ 0.000702] last_pfn = 0x7fff0 max_arch_pfn = 0x400000000
[ 0.000710] Disabled
[ 0.000711] x86/PAT: MTRRs disabled, skipping PAT initialization too.
[ 0.000712] CPU MTRRs all blank - virtualized system.
[ 0.000714] x86/PAT: Configuration [0-7]: WB WT UC- UC WB WT UC- UC
[ 0.000765] found SMP MP-table at [mem 0x0009fff0-0x0009ffff]
```

Рис. 6: dmesg

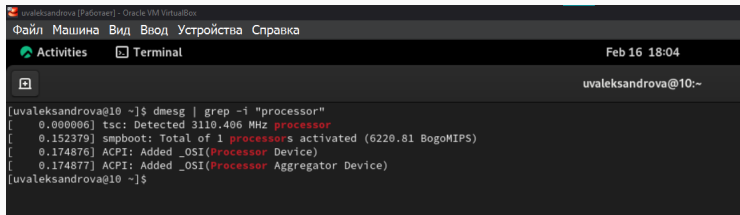
Домашнее задание

A terminal window with a dark background. The title bar shows 'uvaleksandrova@10:~ — less'. The terminal output shows the 'cat /etc/os-release' command and its output, which includes the Linux version '5.14.0-362.8.1.el9_3.x86_64'.

```
uvaleksandrova@10:~ — less
[ 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 20230605 (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 Ecos
ystem Catalog, 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_10-root ro re
```

Рис. 7: Версия ядра Linux

Частота процессора



```
uvaleksandrova [Работа] - Oracle VM VirtualBox
Файл  Машина  Вид  Ввод  Устройства  Справка
Activities  Terminal
Feb 16 18:04
uvaleksandrova@10:~
[uvaleksandrova@10 ~]$ dmesg | grep -i "processor"
[ 0.000006] tsc: Detected 3110.406 MHz processor
[ 0.152379] smpboot: Total of 1 processors activated (6220.81 BogoMIPS)
[ 0.174876] ACPI: Added _OSI(Processor Device)
[ 0.174877] ACPI: Added _OSI(Processor Aggregator Device)
[uvaleksandrova@10 ~]$
```

Рис. 8: Частота процессора

Модель процессора и объем доступной оперативной памяти

```
[uvaleksandrova@10 ~]$ dmesg | grep -i "CPU"
[ 0.151861] smpboot: CPU0: 11th Gen Intel(R) Core(TM) i5-11300H @ 3.10GHz (family: 0x6, model: 0x8c, stepping: 0x1)
[uvaleksandrova@10 ~]$ dmesg | grep -i "Memory"
[ 0.000919] ACPI: Reserving FACP table memory at [mem 0x7ffff0f0-0x7ffff0e3]
[ 0.000920] ACPI: Reserving DSDT table memory at [mem 0x7ffff0610-0x7ffff2962]
[ 0.000922] ACPI: Reserving FACS table memory at [mem 0x7ffff0200-0x7ffff023f]
[ 0.000922] ACPI: Reserving FACS table memory at [mem 0x7ffff0200-0x7ffff023f]
[ 0.000923] ACPI: Reserving APIC table memory at [mem 0x7ffff0240-0x7ffff0293]
[ 0.000923] ACPI: Reserving SSDT table memory at [mem 0x7ffff02a0-0x7ffff060b]
[ 0.001181] Early memory node ranges
[ 0.001877] PM: hibernation: Registered nosave memory: [mem 0x00000000-0x00000fff]
[ 0.001878] PM: hibernation: Registered nosave memory: [mem 0x0000f000-0x0000ffff]
[ 0.001879] PM: hibernation: Registered nosave memory: [mem 0x000a0000-0x000aefff]
[ 0.001879] PM: hibernation: Registered nosave memory: [mem 0x000f0000-0x000fffff]
[ 0.008477] Memory: 268860K/2696696K available (16384K kernel code, 5596K rwdata, 11444K rodata, 3824K init, 18424K bss, 157768K reserved, 0K cma-reserved)
[ 0.049325] Freeing SMP alternatives memory: 36K
[ 0.156293] x86/mm: Memory block size: 128MB
[ 0.331230] Non-volatile memory driver v1.3
[ 0.760130] Freeing initrd memory: 57252K
[ 0.975092] Freeing unused decrypted memory: 2036K
[ 0.975456] Freeing unused kernel image (initmem) memory: 3824K
[ 0.976819] Freeing unused kernel image (rodata/data gap) memory: 844K
[ 1.749928] vmwgfx 0000:00:02.0: [drm] Legacy memory limits: VRAM = 16384 kB, FIFO = 2048 kB, surface = 507904 kB
[ 1.749932] vmwgfx 0000:00:02.0: [drm] Maximum display memory size is 16384 kiB
```

Рис. 9: Модель процессора

```
[ 1.749932] vmwgfx 0000:00:02:0: [drm] Maximum display memory size is 1024 MiB
[uvaleksandrova@10 ~]$ dmesg | grep -i "Memory available"
[uvaleksandrova@10 ~]$ dmesg | grep -i "Hypervisor detected"
[    0.000000] Hypervisor detected: KVM
[uvaleksandrova@10 ~]$
```

Рис. 10: Тип обнаруженного гипервизора

Тип файловой системы корневого раздела

```
uvaleksandrova@10 ~$ dmesg | grep -i hypervisor detected
[ 0.000000] Hypervisor detected: KVM
[uvaleksandrova@10 ~]$ df -T
Filesystem                Type      1K-blocks    Used Available Use% Mounted on
devtmpfs                   devtmpfs    4096          0      4096   0% /dev
tmpfs                      tmpfs      1001460        0   1001460   0% /dev/shm
tmpfs                      tmpfs      400584    8360   392224   3% /run
/dev/mapper/rl_10-root    xfs      38916096 5695980 33220116  15% /
/dev/sdal                  xfs       983040   273032   710008  28% /boot
tmpfs                     tmpfs       200292     128    200164   1% /run/user/1000
/dev/sr0                   iso9660     52272    52272         0 100% /run/media/uvaleksandrova/VBox_GAs_7.0.14
[uvaleksandrova@10 ~]$
```

Рис. 11: Тип файловой системы

Последовательность монтирования файловых систем

```
uualeksandrova@10:~  
[ 1.749932] vmwgfx 0000:00:02.0: [drm] Maximum display memory size is 16384 kiB  
[uualeksandrova@10 ~]$ dmesg | grep -i "Memory available"  
[uualeksandrova@10 ~]$ dmesg | grep -i "Hypervisor detected"  
[ 0.000000] Hypervisor detected: KVM  
[uualeksandrova@10 ~]$ df -T  
Filesystem Type 1K-blocks Used Available Use% Mounted on  
devtmpfs devtmpfs 4096 0 4096 0% /dev  
tmpfs tmpfs 1001460 0 1001460 0% /dev/shm  
tmpfs tmpfs 400584 8360 392224 3% /run  
/dev/mapper/rl_10-root xfs 38916096 5695980 33220116 15% /  
/dev/sdal xfs 983040 273032 710008 28% /boot  
tmpfs tmpfs 200292 128 200164 1% /run/user/1000  
/dev/sr0 iso9660 52272 52272 0 100% /run/media/uualeksandrova/VBox_GAs_7.0.14  
[uualeksandrova@10 ~]$ mount  
proc on /proc type proc (rw,nosuid,nodev,noexec,relatime)  
sysfs on /sys type sysfs (rw,nosuid,nodev,noexec,relatime,seclabel)  
devtmpfs on /dev type devtmpfs (rw,nosuid,seclabel,size=4096k,nr_inodes=242370,mode=755,inode64)  
securityfs on /sys/kernel/security type securityfs (rw,nosuid,nodev,noexec,relatime)  
tmpfs on /dev/shm type tmpfs (rw,nosuid,nodev,seclabel,inode64)  
devpts on /dev/pts type devpts (rw,nosuid,noexec,relatime,seclabel,gid=5,mode=620,ptmxmode=000)  
tmpfs on /run type tmpfs (rw,nosuid,nodev,seclabel,size=400584k,nr_inodes=819200,mode=755,inode64)  
cgroup2 on /sys/fs/cgroup type cgroup2 (rw,nosuid,nodev,noexec,relatime,seclabel,nsdelegate,memory_recursiveprot)  
pstore on /sys/fs/pstore type pstore (rw,nosuid,nodev,noexec,relatime,seclabel)  
bpf on /sys/fs/bpf type bpf (rw,nosuid,nodev,noexec,relatime,mode=700)  
/dev/mapper/rl_10-root on / type xfs (rw,relatime,seclabel,attr2,inode64,logbufs=8,logbsize=32k,noquota)  
selinuxfs on /sys/fs/selinux type selinuxfs (rw,nosuid,noexec,relatime)  
systemd-1 on /proc/sys/fs/binfmt_misc type autofs (rw,relatime,fd=29,pgrp=1,timeout=0,minproto=5,maxproto=5,direct,pipe_ino=18494)  
mqueue on /dev/mqueue type mqueue (rw,nosuid,nodev,noexec,relatime,seclabel)  
hugetlbfs on /dev/hugepages type hugetlbfs (rw,relatime,seclabel,pagesize=2M)  
debugfs on /sys/kernel/debug type debugfs (rw,nosuid,nodev,noexec,relatime,seclabel)  
tracefs on /sys/kernel/tracing type tracefs (rw,nosuid,nodev,noexec,relatime,seclabel)  
configfs on /sys/kernel/config type configfs (rw,nosuid,nodev,noexec,relatime)  
fusectl on /sys/fs/fuse/connections type fusectl (rw,nosuid,nodev,noexec,relatime)  
none on /run/credentials/systemd-sysctl.service type ramfs (ro,nosuid,nodev,noexec,relatime,seclabel,mode=700)  
none on /run/credentials/systemd-sysusers.service type ramfs (ro,nosuid,nodev,noexec,relatime,seclabel,mode=700)  
none on /run/credentials/systemd-tmpfiles-setup-dev.service type ramfs (ro,nosuid,nodev,noexec,relatime,seclabel,mode=700)  
/dev/sdal on /boot type xfs (rw,relatime,seclabel,attr2,inode64,logbufs=8,logbsize=32k,noquota)  
none on /run/credentials/systemd-tmpfiles-setup.service type ramfs (ro,nosuid,nodev,noexec,relatime,seclabel,mode=700)  
tmpfs on /run/user/1000 type tmpfs (rw,nosuid,nodev,relatime,seclabel,size=200292k,nr_inodes=50073,mode=700,uid=1000,gid=1000,inode64)  
gvfsd-fuse on /run/user/1000/gvfs type fuse.gvfsd-fuse (rw,nosuid,nodev,relatime,user_id=1000,group_id=1000)  
/dev/sr0 on /run/media/uualeksandrova/VBox_GAs_7.0.14 type iso9660 (ro,nosuid,nodev,relatime,nojoliet,check=s,map=n,blocksize=2048,uid=1000,gid=1000)
```

Рис. 12: Последовательность монтирования файловых систем

Вывод

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

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