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ФАКУЛЬТЕТ	Информатика и системы управления
КАФЕДРА	Информационная безопасность (ИУ8)

Отчёт
по лабораторной работе № 1
по дисциплине «Безопасность систем баз данных»

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ВСТУПЛЕНИЕ

Цель работы: установить и настроить дистрибутив Linux на виртуальную машину VirtualBox, рабочее окружение, сервер SSH и среду разработки.

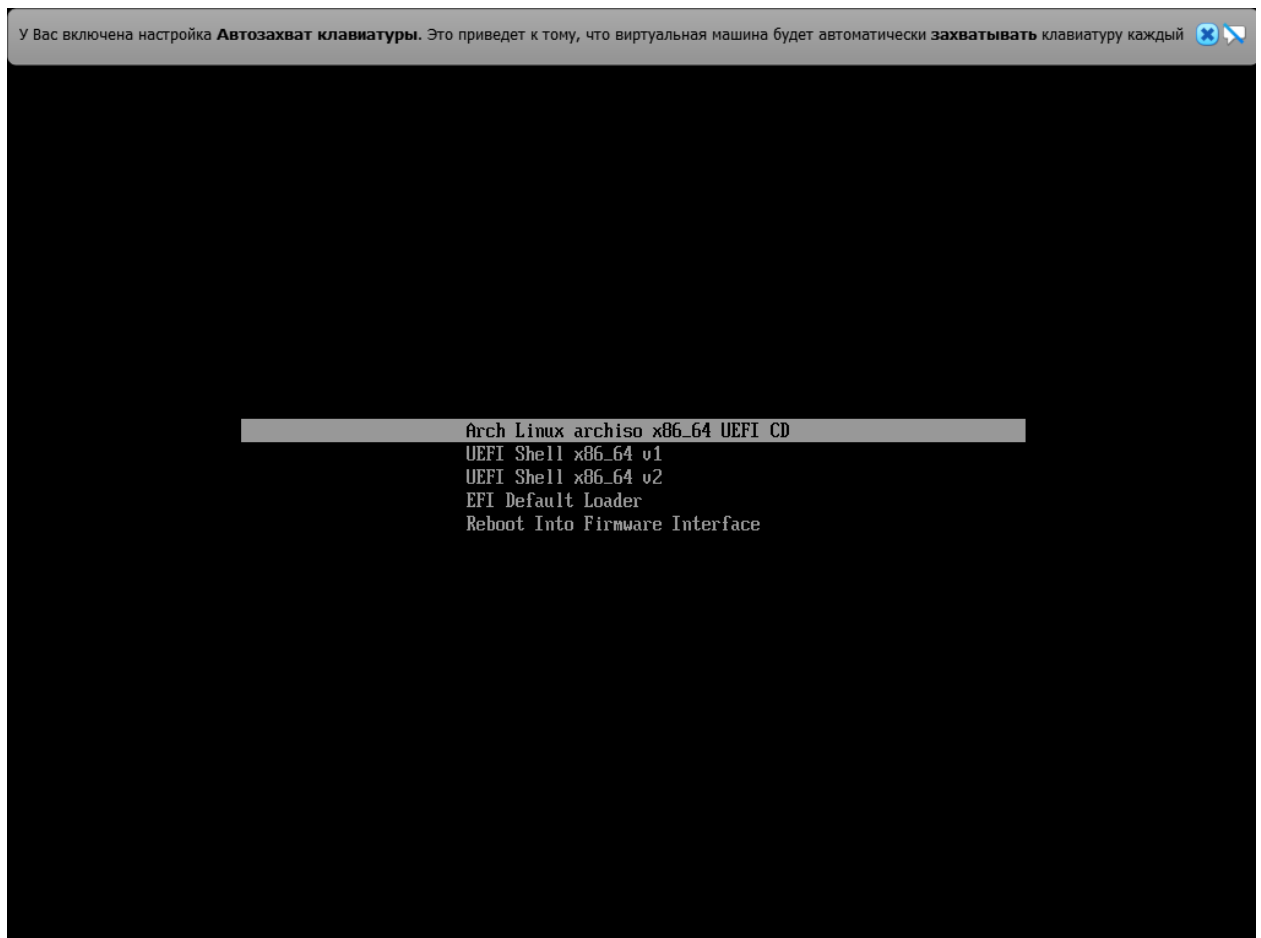
В качестве дистрибутива был выбран Arch Linux, в качестве рабочего окружения – XFCE.

1. ПОДГОТОВКА К УСТАНОВКЕ

1.1 Создание новой виртуальной машины в VirtualBox

Загружаем образ `archlinux-2020.02.01-x86_64.iso` и создаем новую виртуальную машину с динамическим виртуальным жёстким диском, тип VDI, объём 20 Гб.

Запускаем виртуальную машину и выбираем *Arch Linux archiso x86_64 UEFI CD*.

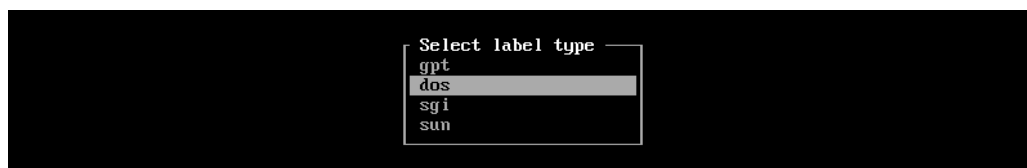


1.2 Разбиение диска

Для разметки диска выполним команду `cfdisk /dev/sda`.

```
root@archiso ~ # cfdisk /dev/sda
```

В появившемся меню *Select label type* выберем «gpt».



Разметим диск так:

```

Disk: /dev/sda
Size: 20 GiB, 21474836480 bytes, 41943040 sectors
Label: gpt, identifier: B94A4A26-CB9A-D242-AFFB-B6924CE66F79

Device            Start      End      Sectors  Size Type
/dev/sda1         2048      1050623  1048576  512M Linux filesystem
/dev/sda2        1050624   22022143 20971520  10G Linux filesystem
/dev/sda3        22022144  26216447  4194304   2G Linux filesystem
/dev/sda4        26216448  30410751  4194304   2G Linux filesystem
/dev/sda5        30410752  34605055  4194304   2G Linux filesystem
>> /dev/sda6      34605056  39847935  5242880   2.5G Linux filesystem
Free space       39847936  41943006  2095071  1023M

Partition UUID: BF731E33-40E9-EB41-8023-0F195501A61B
Partition type: Linux filesystem (0FC63DAF-8483-4772-8E79-3D69D8477DE4)

[ Delete ] [ Resize ] [ Quit ] [ Type ] [ Help ] [ Write ] [ Dump ]
```

Командой `lsblk` посмотрим диск:

```

root@archiso ~ # lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
loop0  7:0    0  535M  1 loop /run/archiso/sfs/airootfs
sda     8:0    0   20G  0 disk
├─sda1   8:1    0  512M  0 part
├─sda2   8:2    0   10G  0 part
├─sda3   8:3    0    2G  0 part
├─sda4   8:4    0    2G  0 part
├─sda5   8:5    0    2G  0 part
└─sda6   8:6    0   2.5G  0 part
sr0     11:0   1  652M  0 rom
sr1     11:1   1  652M  0 rom /run/archiso/bootmnt
root@archiso ~ #
```

1.3 Форматирование разделов

Отформатируем sda1 как загрузочный командой *mkfs.fat -F32 /dev/sda1*.

Отформатируем в файловую систему *ext4* командой *kfs.ext4 /dev/sda2*. (каждую sda от 2 до 6)

```
root@archiso ~ # mkfs.fat -F32 /dev/sda1
```

Дальше отформатируем в файловую систему *ext4* командой *kfs.ext4 /dev/sda2*. (каждую sda от 2 до 6)

```
root@archiso ~ # mkfs.ext4 /dev/sda2
mke2fs 1.45.6 (20-Mar-2020)
Creating filesystem with 2621440 4k blocks and 655360 inodes
Filesystem UUID: 7faf2290-3648-4301-b3f6-3f32474f774c
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632

Allocating group tables: done
Writing inode tables: done
Creating journal (16384 blocks): done
Writing superblocks and filesystem accounting information: done

root@archiso ~ # mkfs.ext4 /dev/sda3
mke2fs 1.45.6 (20-Mar-2020)
Creating filesystem with 524288 4k blocks and 131072 inodes
Filesystem UUID: d584c84a-1ea5-43c6-8d84-eb779d6acbe4
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912

Allocating group tables: done
Writing inode tables: done
Creating journal (16384 blocks): done
Writing superblocks and filesystem accounting information: done

root@archiso ~ # mkfs.ext4 /dev/sda4
mke2fs 1.45.6 (20-Mar-2020)
Creating filesystem with 524288 4k blocks and 131072 inodes
Filesystem UUID: 094288e5-825c-4a3c-9fb4-25e505076738
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912

Allocating group tables: done
Writing inode tables: done
Creating journal (16384 blocks): done
Writing superblocks and filesystem accounting information: done
```

1.4 Монтирование разделов

Монтируем корневой раздел в каталог */mnt*, затем создаем точки монтирования для всех остальных разделов.

```

root@archiso ~ # mount /dev/sda2 /mnt
root@archiso ~ # mount /dev/sda1 /mnt/boot
mount: /mnt/boot: mount point does not exist.
32 root@archiso ~ # mkdir /mnt/home
root@archiso ~ # mkdir /mnt/boot
root@archiso ~ # mkdir /mnt/var
root@archiso ~ # mkdir /mnt/opt
root@archiso ~ # mkdir /mnt/tmp
root@archiso ~ # mount /dev/sda1 /mnt/boot
root@archiso ~ # mount /dev/sda3 /mnt/var
root@archiso ~ # mount /dev/sda4 /mnt/opt
root@archiso ~ # mount /dev/sda5 /mnt/tmp
root@archiso ~ # mount /dev/sda6 /mnt/home

```

Далее командой `lsblk` проверяем всё ли так

```

root@archiso ~ # lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
loop0       7:0    0   535M  1 loop /run/archiso/sfs/airootfs
sda         8:0    0    20G  0 disk
├─sda1      8:1    0   512M  0 part /mnt/boot
├─sda2      8:2    0    10G  0 part /mnt
├─sda3      8:3    0     2G  0 part /mnt/var
├─sda4      8:4    0     2G  0 part /mnt/opt
├─sda5      8:5    0     2G  0 part /mnt/tmp
└─sda6      8:6    0    2.5G  0 part /mnt/home
sr0         11:0    1    652M  0 rom
sr1         11:1    1    652M  0 rom /run/archiso/bootmnt

```

2. УСТАНОВКА

2.1 Установка основных пакетов

Используем скрипт *pacstrap*, чтобы установить пакет `base`, ядро `Linux` и прошивки часто встречающихся устройств.

```

root@archiso ~ # pacstrap -i /mnt base linux linux-firmware sudo nano

```

```

-> Running build hook: [filesystems]
-> Running build hook: [keyboard]
-> Running build hook: [fsck]
==> Generating module dependencies
==> Creating gzip-compressed initcpio image: /boot/initramfs-linux.img
==> Image generation successful
==> Building image from preset: /etc/mkinitcpio.d/linux.preset: 'fallback'
-> -k /boot/vmlinuz-linux -c /etc/mkinitcpio.conf -g /boot/initramfs-linux-fallback.img -S autodetect
==> Starting build: 5.6.14-arch1-1
-> Running build hook: [base]
-> Running build hook: [udev]
-> Running build hook: [modconf]
-> Running build hook: [block]
==> WARNING: Possibly missing firmware for module: wd719x
==> WARNING: Possibly missing firmware for module: aic94xx
-> Running build hook: [filesystems]
-> Running build hook: [keyboard]
-> Running build hook: [fsck]
==> Generating module dependencies
==> Creating gzip-compressed initcpio image: /boot/initramfs-linux-fallback.img
==> Image generation successful
(11/13) Reloading system bus configuration...
Running in chroot, ignoring request: try-reload-or-restart
(12/13) Warn about old perl modules
perl: warning: Setting locale failed.
perl: warning: Please check that your locale settings:
    LANGUAGE = (unset),
    LC_ALL = (unset),
    LC_MESSAGES = "",
    LANG = "en_US.UTF-8"
are supported and installed on your system.
perl: warning: Falling back to the standard locale ("C").
(13/13) Rebuilding certificate stores...
pacstrap -i /mnt base linux linux-firmware sudo nano 33.35s user 12.78s system 11% cpu 6:29.29 total
root@archiso ~ # _

```

3. НАСТРОЙКА СИСТЕМЫ

3.1 Fstab

Сгенерируем файл *fstab*.

```
root@archiso ~ # genfstab -U -p /mnt >> /mnt/etc/fstab
```

3.2 Chroot

Перейдём к корневому каталогу новой системы.

```
root@archiso ~ # arch-chroot /mnt /bin/bash
```

3.3 Локализация

Включим *en_US.UTF8 UTF8*

```
[root@archiso /]# nano /etc/locale.gen
```


Расскомментируем строку ru_RU.UTF-8 UTF-8 и en_US.UTF-8 UTF-8

```
#om_ET UTF-8
#om_KE.UTF-8 UTF-8
#om_KE ISO-8859-1
#or_IN UTF-8
#os_RU UTF-8
#pa_IN UTF-8
#pa_PK UTF-8
#pap_AW UTF-8
#pap_CW UTF-8
#pl_PL.UTF-8 UTF-8
#pl_PL ISO-8859-2
#ps_AF UTF-8
#pt_BR.UTF-8 UTF-8
#pt_BR ISO-8859-1
#pt_PT.UTF-8 UTF-8
#pt_PT ISO-8859-1
#pt_PT@euro ISO-8859-15
#quz_PE UTF-8
#raj_IN UTF-8
#ro_RO.UTF-8 UTF-8
#ro_RO ISO-8859-2
#ru_RU.KOI8-R KOI8-R
ru_RU.UTF-8 UTF-8
#ru_RU ISO-8859-5
#ru_UA.UTF-8 UTF-8
#ru_UA KOI8-U
#rw_RW UTF-8
#sa_IN UTF-8
#sah_RU UTF-8
#sat_IN UTF-8
#sc_IT UTF-8
#sd_IN UTF-8
#sd_IN@devanagari UTF-8
#se_NO UTF-8
#sgs_LT UTF-8
#shn_MM UTF-8
#shs_CA UTF-8
#si_LK UTF-8
#sid_ET UTF-8
#sk_SK.UTF-8 UTF-8
#sk_SK ISO-8859-2
#sl_SI.UTF-8 UTF-8
#sl_SI ISO-8859-2
```

Командой locale-gen генерируем

```
[root@archiso /]# locale-gen
Generating locales...
  en_US.UTF-8... done
  ru_RU.UTF-8... done
Generation complete.
```

И пропишем:

```
[root@archiso /]# echo "LANG=en_US.UTF-8" > /etc/locale.conf
```

3.4 Часовой пояс

Выберем часовой пояс.

```
[root@archiso /]# ln -sf /usr/share/zoneinfo/Europe/Moscow /etc/localtime
```

Проверим часовой пояс:

```
[root@archiso /]# hwclock --systohc --utc  
[root@archiso /]# date  
Thu 28 May 2020 04:29:43 PM MSK  
[root@archiso /]#
```

3.5 Настройка сети

Установим имя хоста.

```
[root@archiso /]# nano /etc/hostname
```

```
spaton
```

```
[root@archiso /]# nano /etc/hosts
```

```
# Static table lookup for hostnames.  
# See hosts(5) for details.  
127.0.1.1 localhost.localdomain spaton
```

3.6 Сетевой менеджер

Установим сетевой менеджер.

```
[root@archiso /]# pacman -S networkmanager
```

```
(20/20) checking keys in keyring [#####]
(20/20) checking package integrity [#####]
(20/20) loading package files [#####]
(20/20) checking for file conflicts [#####]
(20/20) checking available disk space [#####]
:: Processing package changes...
( 1/20) installing nspr [#####]
( 2/20) installing nss [#####]
( 3/20) installing jansson [#####]
( 4/20) installing libnm [#####]
( 5/20) installing js60 [#####]
( 6/20) installing polkit [#####]
( 7/20) installing wpa_supplicant [#####]
( 8/20) installing libnm-glib [#####]
( 9/20) installing slang [#####]
(10/20) installing gpm [#####]
(11/20) installing libnewt [#####]
Optional dependencies for libnewt
    tcl: whiptcl support
    python: libnewt support with the _snack module
    python2: libnewt support with the _snack module
(12/20) installing libndp [#####]
(13/20) installing libdaemon [#####]
(14/20) installing libsodium [#####]
(15/20) installing libpgm [#####]
(16/20) installing zeromq [#####]
(17/20) installing libteam [#####]
(18/20) installing bluez-libs [#####]
(19/20) installing mobile-broadband-provider-info [#####]
(20/20) installing networkmanager [#####]
Optional dependencies for networkmanager
    dnsmasq: connection sharing
    bluez: Bluetooth support
    ppp: dialup connection support
    modemmanager: cellular network support
    iwd: wpa_supplicant alternative
    dhclient: alternative DHCP client
    openresolv: alternative resolv.conf manager
:: Running post-transaction hooks...
(1/5) Creating system user accounts...
(2/5) Reloading system manager configuration...
Running in chroot, ignoring request: daemon-reload
(3/5) Reloading device manager configuration...
Running in chroot, ignoring request.
(4/5) Arming ConditionNeedsUpdate...
(5/5) Reloading system bus configuration...
Running in chroot, ignoring request: try-reload-or-restart
```

Затем включим его.

```
[root@archiso /]# systemctl enable NetworkManager
```

3.7 Пароль пользователя

Установим пароль пользователя.

```
[root@archiso /]# passwd
New password:
Retype new password:
passwd: password updated successfully
[root@archiso /]#
```

3.8 GRUB и пакет загрузки EFI

Установим GRUB и пакет загрузки EFI

```

[root@archiso /]# pacman -S grub efibootmgr
resolving dependencies...
looking for conflicting packages...

Packages (3) efivar-37-4  efibootmgr-17-1  grub-2:2.04-7

Total Download Size:    6.85 MiB
Total Installed Size:  33.25 MiB

:: Proceed with installation? [Y/n] y
:: Retrieving packages...
grub-2:2.04-7-x86_64                6.7 MiB   1220 KiB/s  00:06 [#####]
efivar-37-4-x86_64                110.5 KiB  84.3 KiB/s  00:01 [#####]
efibootmgr-17-1-x86_64             27.4 KiB   456 KiB/s  00:00 [#####]
(3/3) checking keys in keyring [#####]
(3/3) checking package integrity [#####]
(3/3) loading package files [#####]
(3/3) checking for file conflicts [#####]
(3/3) checking available disk space [#####]
:: Processing package changes...
(1/3) installing grub [#####]
Generate your bootloader configuration with:
  grub-mkconfig -o /boot/grub/grub.cfg
Optional dependencies for grub
  freetype2: For grub-mkfont usage
  fuse2: For grub-mount usage
  dosfstools: For grub-mkrescue FAT FS and EFI support
  efibootmgr: For grub-install EFI support [pending]
  libisoburn: Provides xorriso for generating grub rescue iso using grub-mkrescue
  os-prober: To detect other OSes when generating grub.cfg in BIOS systems
  nttools: For grub-mkrescue FAT FS support
(2/3) installing efivar [#####]
(3/3) installing efibootmgr [#####]
:: Running post-transaction hooks...
(1/1) Arming ConditionNeedsUpdate...

```

Дальше установим загрузчик в систему и сгенерируем файлы

```

[root@archiso /]# mkdir /boot/efi
[root@archiso /]# mount /dev/sda1 /boot/efi
[root@archiso /]# lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
loop0 7:0 0 535M 1 loop
sda 8:0 0 20G 0 disk
├─sda1 8:1 0 512M 0 part /boot/efi
├─sda2 8:2 0 10G 0 part /
├─sda3 8:3 0 2G 0 part /var
├─sda4 8:4 0 2G 0 part /opt
├─sda5 8:5 0 2G 0 part /tmp
├─sda6 8:6 0 2.5G 0 part /home
sr0 11:0 1 652M 0 rom

```

```

[root@archiso /]# grub-install --target=x86_64-efi --bootloader-id=GRUB --efi-directory=/boot/efi --removable
Installing for x86_64-efi platform.
Installation finished. No error reported.
[root@archiso /]# grub-mkconfig -o /boot/grub/grub.cfg
Generating grub configuration file ...
Found linux image: /boot/vmlinuz-linux
Found initrd image: /boot/initramfs-linux.img
Found fallback initrd image(s) in /boot: initramfs-linux-fallback.img
done

```

Установим GRUB

```

[root@archiso /]# pacman -S grub
warning: grub-2:2.04-7 is up to date -- reinstalling
resolving dependencies...
looking for conflicting packages...

Packages (1) grub-2:2.04-7

Total Installed Size: 32.82 MiB
Net Upgrade Size: 0.00 MiB

:: Proceed with installation? [Y/n] y
(1/1) checking keys in keyring
(1/1) checking package integrity
(1/1) loading package files
(1/1) checking for file conflicts
(1/1) checking available disk space
:: Processing package changes...
(1/1) reinstalling grub
:: Running post-transaction hooks...
(1/1) Arming ConditionNeedsUpdate...
[root@archiso /]# grub-install /dev/sda
Installing for x86_64-efi platform.
Installation finished. No error reported.
[root@archiso /]# grub-mkconfig -o /boot/grub/grub.cfg
Generating grub configuration file ...
Found linux image: /boot/vmlinuz-linux
Found initrd image: /boot/initramfs-linux.img
Found fallback initrd image(s) in /boot: initramfs-linux-fallback.img
done

```

Выйдем из корневого каталога и перезапустим систему, прописав: exit;
umount -R/mnt и reboot.

Система установлена. Пропишем логин с паролем.

```

Arch Linux 5.6.14-arch1-1 (tty1)

spaton login: root
Password:
[root@spaton ~]# _

```

Создадим файл прокачки (1 Гб). Изменим его правила доступа,
отформатируем, включим и добавим в /etc/fstab.

```

spaton login: root
Password:
[root@spaton ~]# fallocaate -l 1G /swapfile
[root@spaton ~]# chmod 600 /swapfile
[root@spaton ~]# mkswap /swapfile
Setting up swspace version 1, size = 1024 MiB (1073737728 bytes)
no label, UUID=ee1f72bd-fc67-48cb-8145-cd9c4d5975ef
[root@spaton ~]# swapon /swapfile
[root@spaton ~]# echo '/swapfile none swap sw 0 0' >> /etc/fstab
[root@spaton ~]# free -m

```

	total	used	free	shared	buff/cache	available
Mem:	970	57	831	0	81	802
Swap:	1023	0	1023			

```

[root@spaton ~]#

```

3.9 Добавление пользователя

Создадим пользователя, добавим его в группу и наделим правам

Дальше дадим привилегия новому созданному пользователю

```
[root@spaton ~]# EDITOR=nano visudo
```

Раскомментируем строку *%wheel ALL(ALL) ALL*

```
## Desktop path settings
# Defaults env_keep += "QTDIR KDEDIR"
##
## Allow sudo-run commands to inherit the callers' ConsoleKit session
# Defaults env_keep += "XDG_SESSION_COOKIE"
##
## Uncomment to enable special input methods. Care should be taken as
## this may allow users to subvert the command being run via sudo.
# Defaults env_keep += "XMODIFIERS GTK_IM_MODULE QT_IM_MODULE QT_IM_SWITCHER"
##
## Uncomment to use a hard-coded PATH instead of the user's to find commands
# Defaults secure_path="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin"
##
## Uncomment to send mail if the user does not enter the correct password.
# Defaults mail_badpass
##
## Uncomment to enable logging of a command's output, except for
## sudoreplay and reboot. Use sudoreplay to play back logged sessions.
# Defaults log_output
# Defaults! /usr/bin/sudoreplay !log_output
# Defaults! /usr/local/bin/sudoreplay !log_output
# Defaults! REBOOT !log_output
##
## Runas alias specification
##
##
## User privilege specification
##
root ALL=(ALL) ALL

## Uncomment to allow members of group wheel to execute any command
%wheel ALL=(ALL) ALL

## Same thing without a password
# %wheel ALL=(ALL) NOPASSWD: ALL

## Uncomment to allow members of group sudo to execute any command
# %sudo ALL=(ALL) ALL

## Uncomment to allow any user to run sudo if they know the password
## of the user they are running the command as (root by default).
# Defaults targetpw # Ask for the password of the target user

^G Get Help      ^O Write Out    ^W Where Is     ^K Cut Text     ^J Justify      ^C Cur Pos      ^U Undo         ^M Mark
^X Exit          ^R Read File    ^_ Replace      ^U Paste Text   ^T To Spell     ^_ Go To Line    ^E Redo         ^F Copy
```

Перезагрузим систему

4. РАБОЧЕЕ ОКРУЖЕНИЕ

Установим рабочее окружение XFCE.

Установим X Window System и аудио

```
spaton login: elshan
Password:
[elshan@spaton ~]$ pacman -S pulseaudio pulseaudio-alsa xorg xorg-xinit xorg-server
error: you cannot perform this operation unless you are root.
[elshan@spaton ~]$ sudo pacman -S pulseaudio pulseaudio-alsa xorg xorg-xinit xorg-server
```

```
Enter a selection (default=all):
resolving dependencies...
looking for conflicting packages...
warning: dependency cycle detected:
warning: harfbuzz will be installed before its freetype2 dependency
warning: dependency cycle detected:
warning: mesa will be installed before its libglvnd dependency

Packages (134) alsa-lib-1.2.2-1 alsa-plugins-1:1.2.2-2 alsa-topology-conf-1.2.2-2 alsa-ucm-conf-1.2.2-1 flac-1.3.3-2
fontconfig-2:2.13.91+24+g75eadca-2 freetype2-2.10.2-1 graphite-1:1.3.14-1 groff-1.22.4-3 harfbuzz-2.6
inetutils-1.9.4-8 libasyncns-0.8+3+g68cd5af-3 libdrm-2.4.102-1 libedit-20191231_3.1-1 libepoxy-1.5.4-
libevdev-1.9.0-1 libfontenc-1.1.4-2 libglvnd-1.3.1-1 libgudev-233-2 libice-1.0.10-3 libinput-1.15.5-
libogg-1.3.4-2 libomxil-bellagio-0.9.3-3 libpciaccess-0.16-2 libpipeline-1.5.2-1 libpng-1.6.37-2
libpulse-13.0-3 libsm-1.2.3-2 libsndfile-1.0.28-3 libsoxr-0.1.3-2 libtool-2.4.6+42+gb88ceb5-13
libunwind-1.3.1-2 libvorbis-1.3.6-2 libwacom-1.3-1 libx11-1.6.9-7 libxau-1.0.9-3 libxaw-1.0.13-3
libxcb-1.14-1 libxcomposite-0.4.5-3 libxcursor-1.2.0-2 libxdamage-1.1.5-3 libxdmcp-1.1.3-3 libxext-1
libxf86-5.0.3-4 libxfont2-2.0.4-3 libxft-2.3.3-2 libxi-1.7.10-3 libxinerama-1.1.4-3 libxkbfile-1.1
libxmu-1.1.3-2 libxpm-3.5.13-2 libxrandr-1.5.2-3 libxrender-0.9.10-4 libxshmfence-1.3-2 libxt-1.2.0-
libxtst-1.2.3-4 libxv-1.0.11-4 libxxf86vm-1.1.4-4 llvmlibs-10.0.0-2 lm_sensors-3.6.0-2 man-db-2.9.1
mesa-20.0.7-3 mtdev-1.1.6-1 orc-0.4.31-2 pixman-0.40.0-1 rtkit-0.13-1 speexdsp-1.2.0-2 tdb-1.4.3-2
wayland-1.18.0-2 webrtc-audio-processing-0.3.1-2 xcb-proto-1.14-1 xcb-util-0.4.0-3 xcb-util-image-0.4
xcb-util-keysyms-0.4.0-3 xcb-util-renderutil-0.3.9-3 xcb-util-wm-0.4.1-3 xf86-input-libinput-0.30.0-1
xkeyboard-config-2.29-1 xorg-font-utils-7.6-6 xorg-fonts-alias-1.0.3-3 xorg-util-macros-1.19.2-2
xorgproto-2020.1-1 pulseaudio-13.0-3 pulseaudio-alsa-1:1.2.2-2 xf86-video-vesa-2.4.0-3 xorg-bdftopcf-
xorg-docs-1.7.1-3 xorg-font-util-1.3.2-2 xorg-fonts-100dpi-1.0.3-5 xorg-fonts-75dpi-1.0.3-5
xorg-fonts-encodings-1.0.5-2 xorg-iceauth-1.0.8-2 xorg-luit-1.1.1-4 xorg-mkfontscale-1.2.1-2
xorg-server-1.20.8-2 xorg-server-common-1.20.8-2 xorg-server-devel-1.20.8-2 xorg-server-xephyr-1.20.8-
xorg-server-xnest-1.20.8-2 xorg-server-xvfb-1.20.8-2 xorg-server-xwayland-1.20.8-2 xorg-sessreg-1.1.2-
xorg-setxkbmap-1.3.2-2 xorg-smproxy-1.0.6-3 xorg-x11perf-1.6.1-2 xorg-xauth-1.1-2 xorg-xbacklight-1.2
xorg-xcmsdb-1.0.5-3 xorg-xcursorgen-1.0.7-2 xorg-xdpyinfo-1.3.2-4 xorg-xdriinfo-1.0.6-2 xorg-xev-1.2
xorg-xgamma-1.0.6-3 xorg-xhost-1.0.8-2 xorg-xinit-1.4.1-2 xorg-xinput-1.6.3-2 xorg-xkbcomp-1.4.3-1
xorg-xkbvd-1.1.4-3 xorg-xkbutils-1.0.4-4 xorg-xkill-1.0.5-2 xorg-xlsatoms-1.1.3-2 xorg-xlscitizens-1
xorg-xmodmap-1.0.10-2 xorg-xpr-1.0.5-2 xorg-xprop-1.2.4-2 xorg-xrandr-1.5.1-2 xorg-xrdb-1.2.0-2
xorg-xrefresh-1.0.6-2 xorg-xset-1.2.4-2 xorg-xsetroot-1.1.2-2 xorg-xvinfo-1.1.4-2 xorg-xwd-1.0.7-2
xorg-xwininfo-1.1.5-2 xorg-xwud-1.0.5-2

Total Download Size: 81.87 MiB
Total Installed Size: 285.94 MiB

:: Proceed with installation? [Y/n] y
:: Retrieving packages...
libtool-2.4.6+42+gb88ceb5-13-x86_64 407.4 KiB 306 KiB/s 00:01 [#####]
groff-1.22.4-3-x86_64 2044.3 KiB 906 KiB/s 00:02 [#####]
libpipeline-1.5.2-1-x86_64 40.0 KiB 3.90 MiB/s 00:00 [#####]
man-db-2.9.1-2-x86_64 1017.9 KiB 691 KiB/s 00:01 [#####]
libedit-20191231_3.1-1-x86_64 0.0 B 0.00 B/s 00:00 [-----]
```

Также установим гостевое дополнение

```
elshan@spaton ~]$ sudo pacman -S virtualbox-guest-utils
[sudo] password for elshan:
resolving dependencies...
looking for conflicting packages...

Packages (1) virtualbox-guest-utils-6.1.8-2

Total Download Size: 1.12 MiB
Total Installed Size: 7.26 MiB

:: Proceed with installation? [Y/n] y
:: Retrieving packages...
  virtualbox-guest-utils-6.1.8-2-x86_64 1149.0 KiB 509 KiB/s 00:02 [#####]
(1/1) checking keys in keyring [#####]
(1/1) checking package integrity [#####]
(1/1) loading package files [#####]
(1/1) checking for file conflicts [#####]
(1/1) checking available disk space [#####]
:: Processing package changes...
(1/1) installing virtualbox-guest-utils [#####]
:: Running post-transaction hooks...
(1/4) Creating system user accounts...
(2/4) Reloading system manager configuration...
(3/4) Reloading device manager configuration...
(4/4) Arming ConditionNeedsUpdate...
```

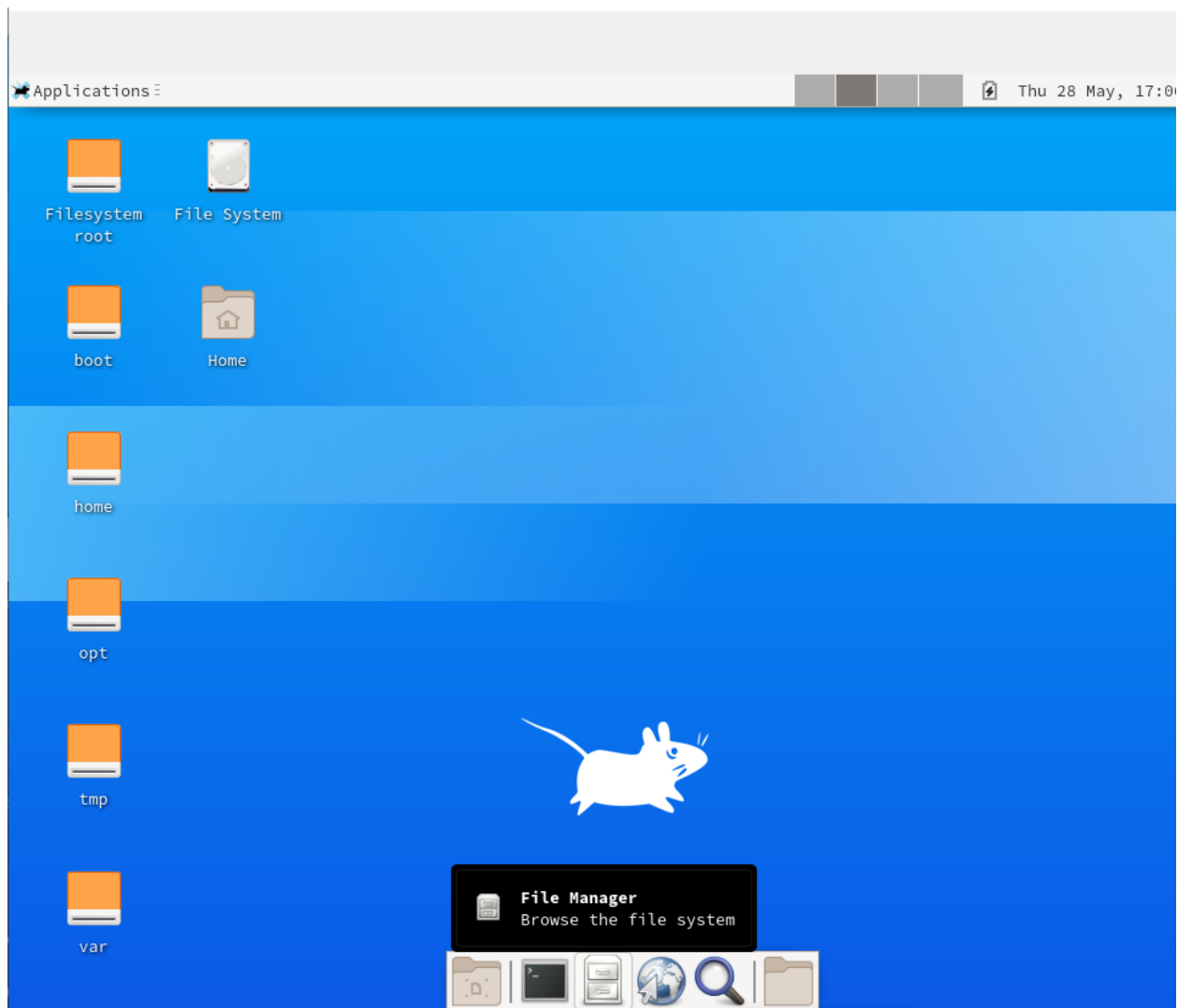
Установим XFCE

```
elshan@spaton ~]$ sudo pacman -S xfce4 lightdm lightdm-gtk-greeter

elshan@spaton ~]$ echo "exec startxfce4" > ~/.xinitrc
elshan@spaton ~]$ systemctl enable lightdm
==== AUTHENTICATING FOR org.freedesktop.systemd1.manage-unit-files ====
Authentication is required to manage system service or unit files.
Authenticating as: elshan
Password:
==== AUTHENTICATION COMPLETE ====
Created symlink /etc/systemd/system/display-manager.service → /usr/lib/systemd/system/lightdm.service.
```

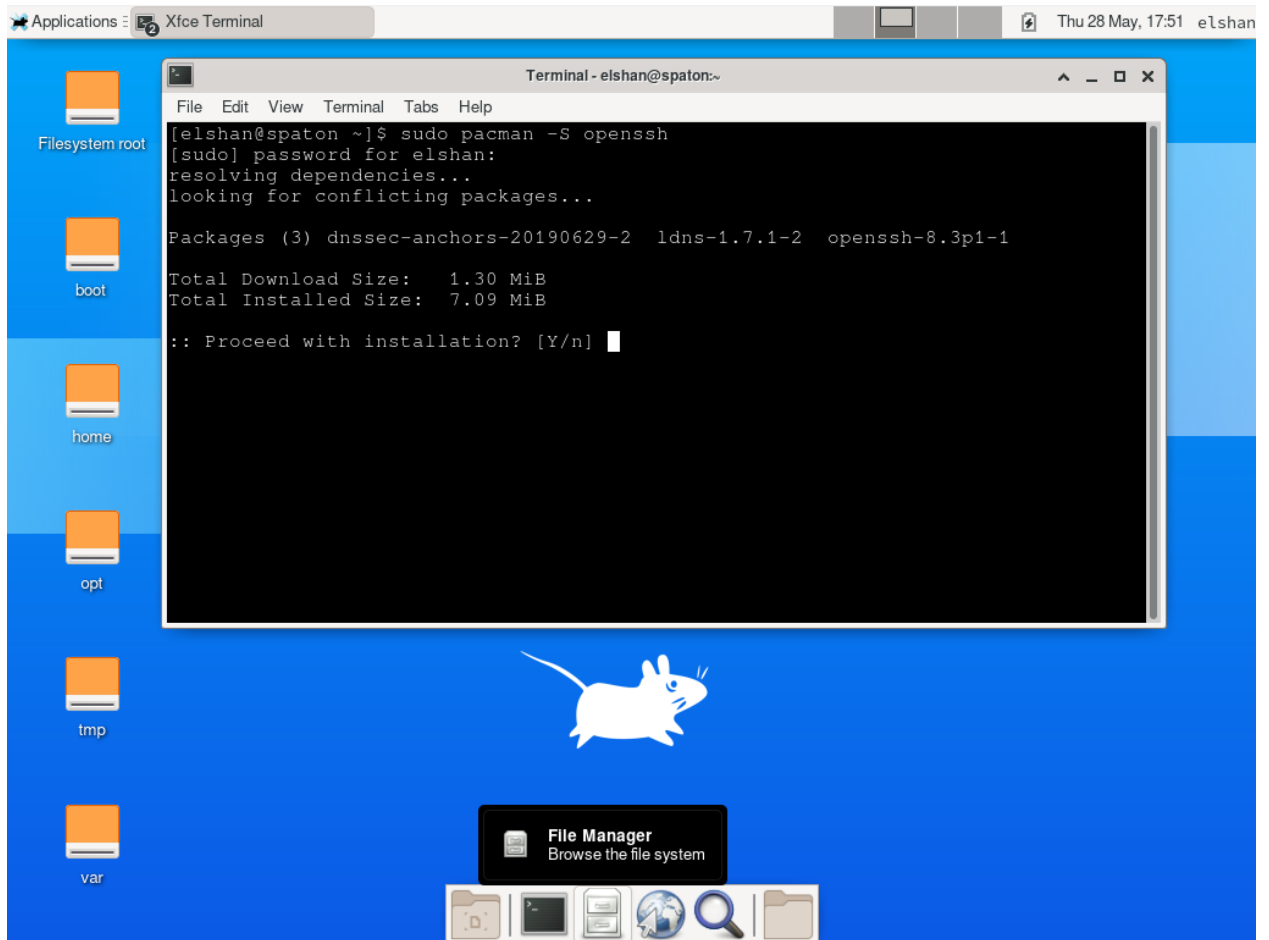
Запускаем

```
elshan@spaton ~]$ startx
```

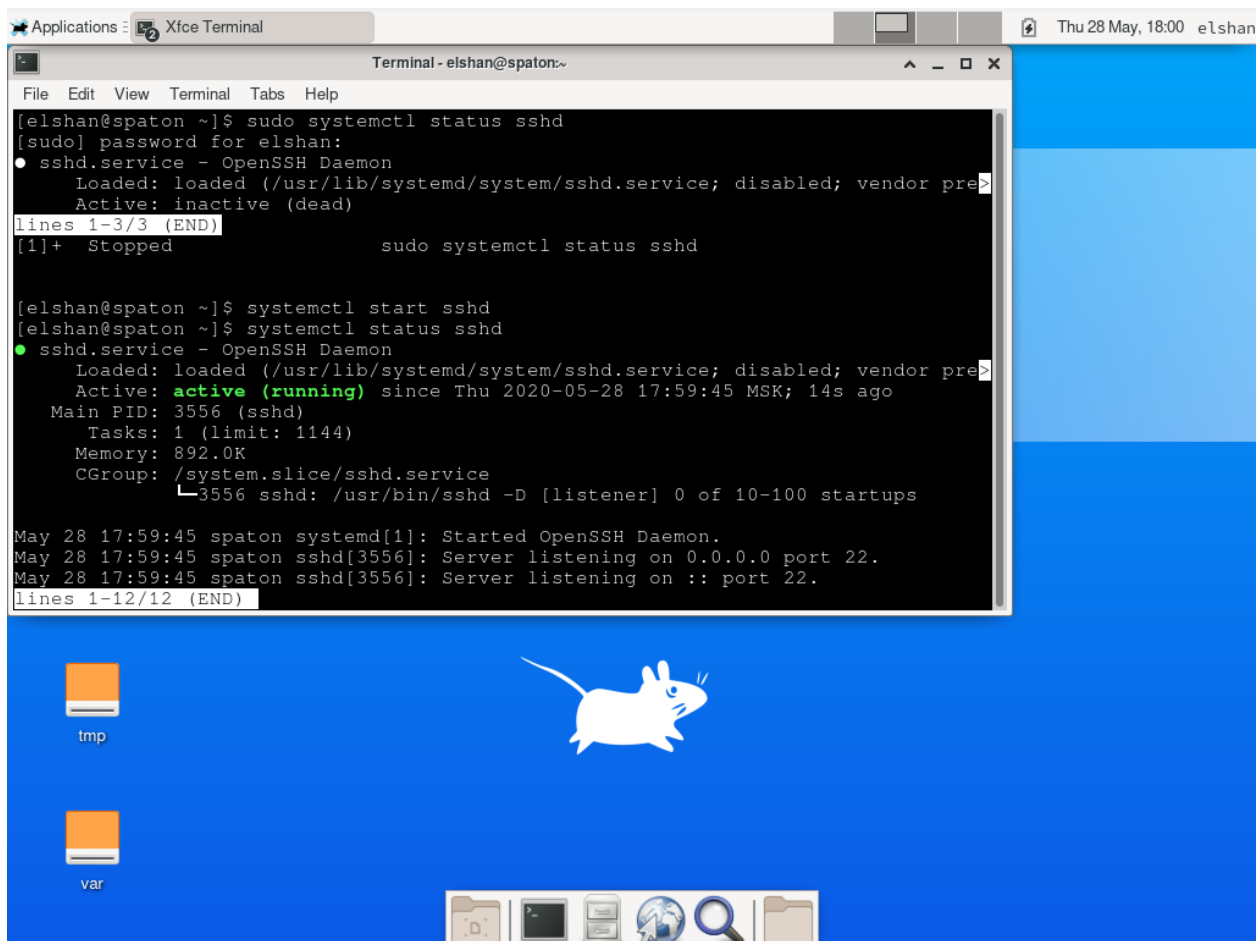



5. SSH СЕРВЕР

Установим и настроим ssh сервер. В настройках виртуальной машины во вкладке «Сеть» устанавливаем тип подключения «Сетевой мост», потом запускаем систему.



Проверка статуса работы сервера:



```
[elshan@spaton ~]$ sudo systemctl status sshd
[sudo] password for elshan:
● sshd.service - OpenSSH Daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; disabled; vendor pre>
   Active: inactive (dead)
lines 1-3/3 (END)
[1]+  Stopped                  sudo systemctl status sshd

[elshan@spaton ~]$ systemctl start sshd
[elshan@spaton ~]$ systemctl status sshd
● sshd.service - OpenSSH Daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; disabled; vendor pre>
   Active: active (running) since Thu 2020-05-28 17:59:45 MSK; 14s ago
   Main PID: 3556 (sshd)
   Tasks: 1 (limit: 1144)
   Memory: 892.0K
   CGroup: /system.slice/sshd.service
           └─3556 sshd: /usr/bin/sshd -D [listener] 0 of 10-100 startups

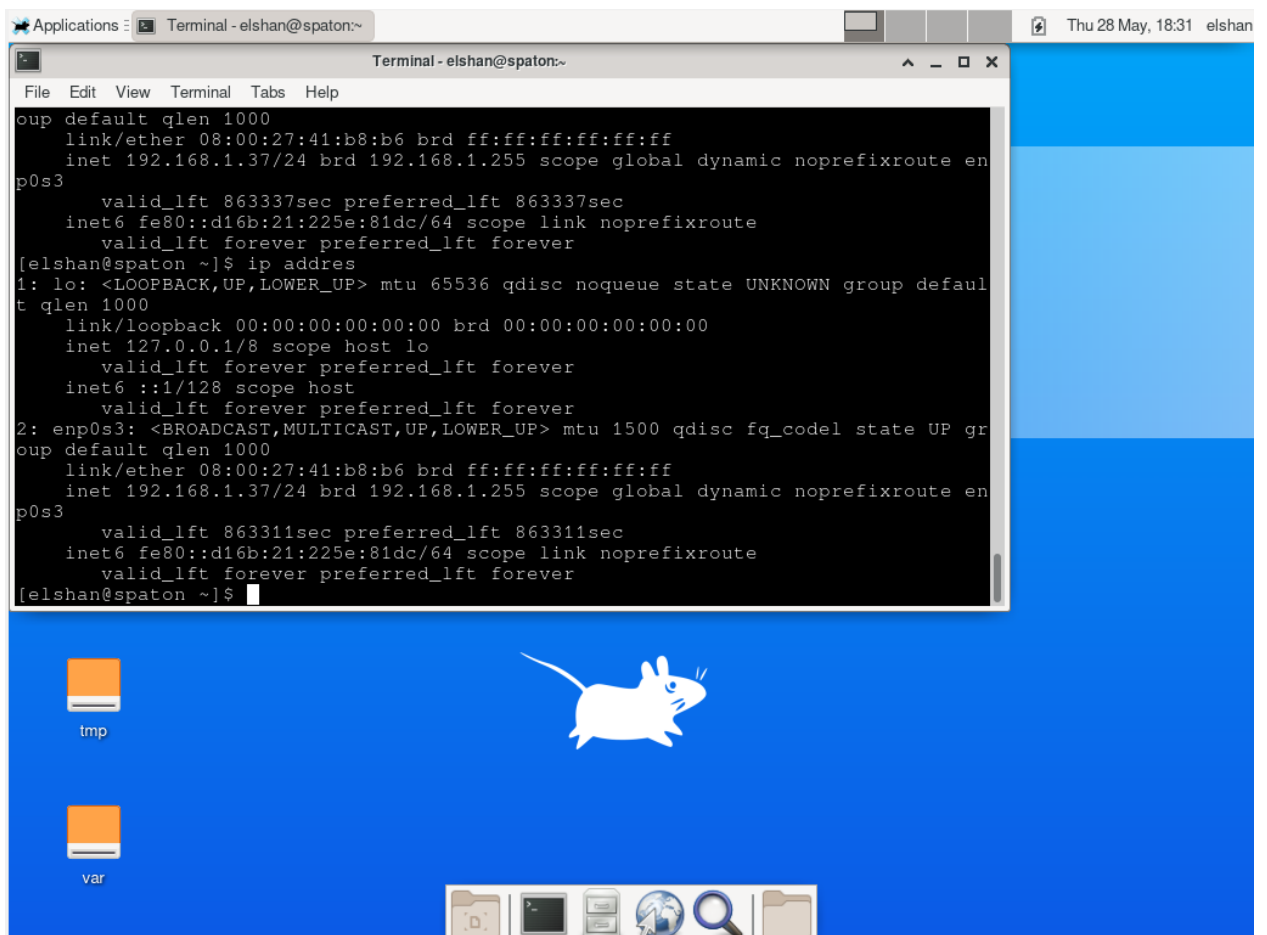
May 28 17:59:45 spaton systemd[1]: Started OpenSSH Daemon.
May 28 17:59:45 spaton sshd[3556]: Server listening on 0.0.0.0 port 22.
May 28 17:59:45 spaton sshd[3556]: Server listening on :: port 22.
lines 1-12/12 (END)
```

Добавим ssh в автозагрузку системы:

```
[elshan@spaton ~]$ sudo systemctl enable sshd
[sudo] password for elshan:
Created symlink /etc/systemd/system/multi-user.target.wants/sshd.service → /usr/
lib/systemd/system/sshd.service.
```

Посмотрим информацию об ip адресе, запустим ssh сервер командой *sudo systemctl start sshd* и выполним подключение к виртуальной машине:

```
elshan@spaton:~  
Маска подсети . . . . . : 255.255.255.0  
Основной шлюз. . . . . : 192.168.1.1  
  
Адаптер Ethernet Сетевое подключение Bluetooth:  
  
Состояние среды. . . . . : Среда передачи недоступна.  
DNS-суффикс подключения . . . . . :  
  
C:\Users\Xiaomi>ssh elshan@192.168.1.37  
The authenticity of host '192.168.1.37 (192.168.1.37)' can't be established.  
ECDSA key fingerprint is SHA256:RJajc8If7ygt4sxx5qdB/h+g5KYxQBgVz9QU8dCcm0.  
Are you sure you want to continue connecting (yes/no)? yes  
Warning: Permanently added '192.168.1.37' (ECDSA) to the list of known hosts.  
elshan@192.168.1.37's password:  
Last login: Thu May 28 16:52:38 2020  
[elshan@spaton ~]$
```



Сделаем запрет авторизации с использованием пароля.

```
Terminal - elshan@spaton:~
File Edit View Terminal Tabs Help
[elshan@spaton ~]$ nano /etc/ssh/sshd_config
```

```
GNU nano 4.9.3 /etc/ssh/sshd_config
# $OpenBSD: sshd_config,v 1.103 2018/04/09 20:41:22 tj Exp $

# This is the sshd server system-wide configuration file.  See
# sshd_config(5) for more information.

# This sshd was compiled with PATH=/usr/local/sbin:/usr/local/bin:/usr/bin

# The strategy used for options in the default sshd_config shipped with
# OpenSSH is to specify options with their default value where
# possible, but leave them commented.  Uncommented options override the
# default value.

#Port 22
#AddressFamily any
#ListenAddress 0.0.0.0
#ListenAddress ::

#HostKey /etc/ssh/ssh_host_rsa_key
#HostKey /etc/ssh/ssh_host_ecdsa_key
#HostKey /etc/ssh/ssh_host_ed25519_key
[ File '/etc/ssh/sshd_config' is unwritable ]
^G Get Help  ^O Write Out ^W Where Is  ^K Cut Text  ^J Justify   ^C Cur Pos
^X Exit      ^R Read File ^\ Replace  ^U Paste Text ^T To Spell  ^_ Go To Line
```

Изменяем параметры:

PermitRootLogin no

PubkeyAuthentication yes

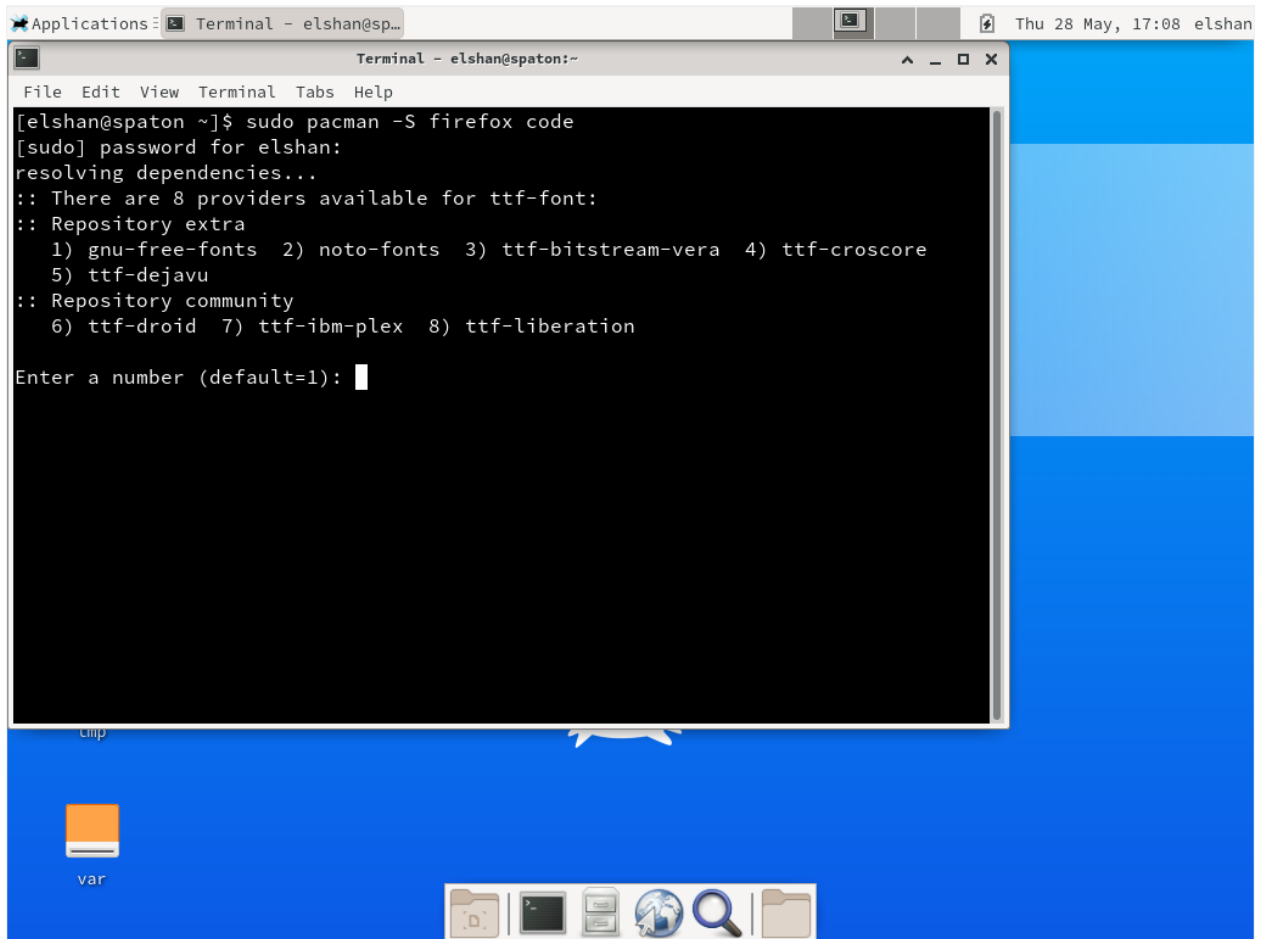
PasswordAuthentication no

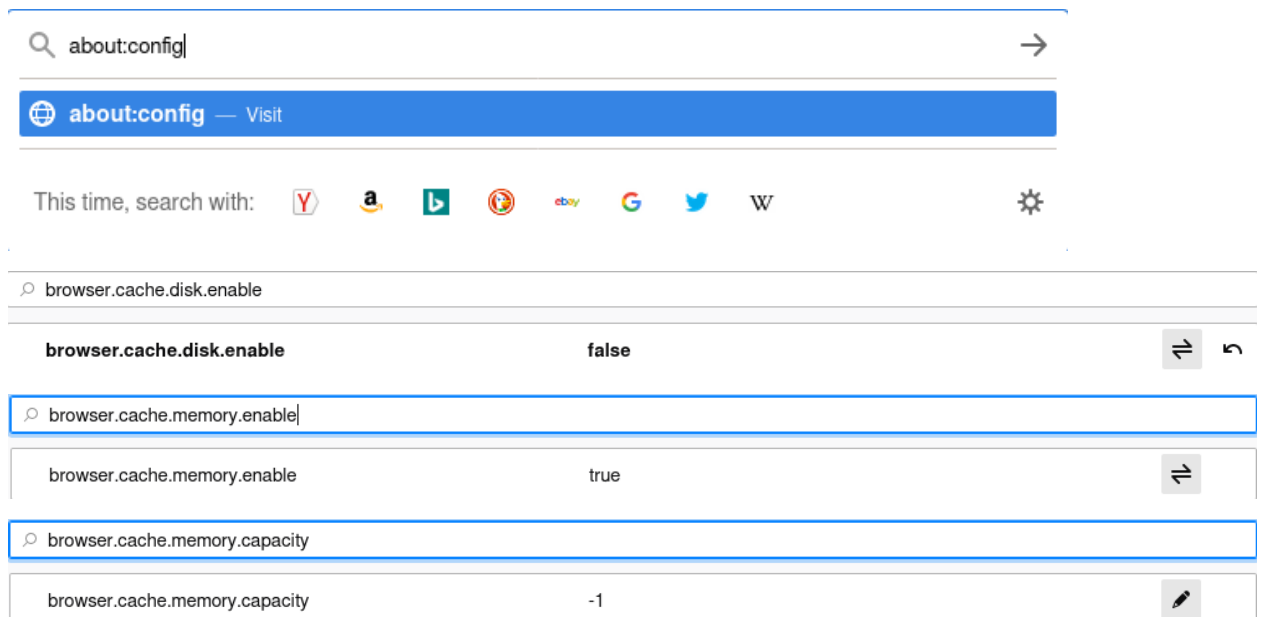
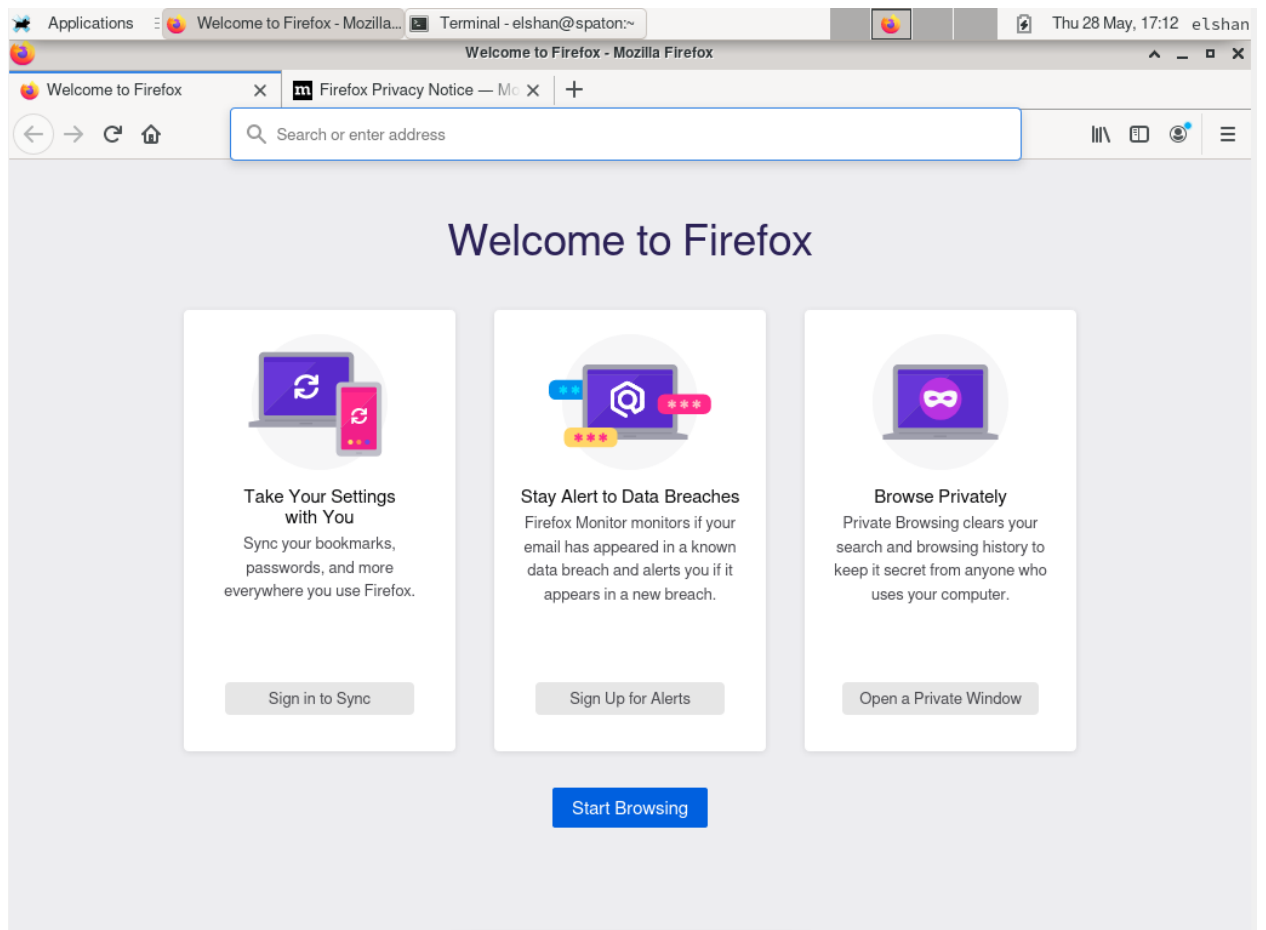
AllowUsers elshan

Перезапускаем сервер командой: systemctl restart sshd

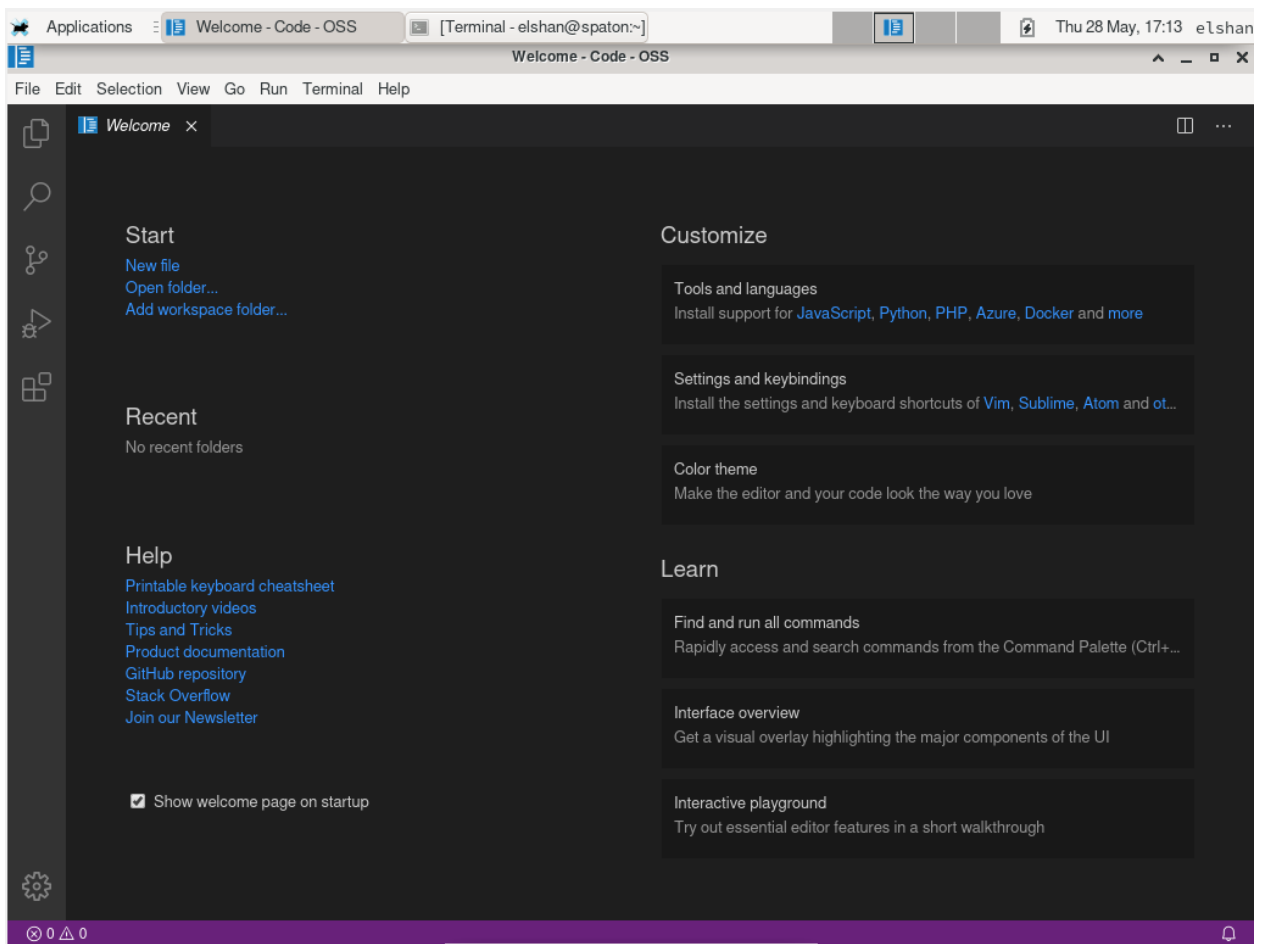
6. УСТАНОВКА БРАУЗЕРА И СРЕДЫ РАЗРАБОТКИ

Установим браузер Visual Code, FireFox и сделаем так, чтобы его кэш располагался в оперативной памяти.





Среда разработки VS Code.



ЗАКЛЮЧЕНИЕ

Вывод: в результате выполнения работы был установлен и настроен дистрибутив Linux на виртуальную машину VirtualBox, установлено рабочее окружение, сервер SSH и среда разработки.