

МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ

Федеральное государственное автономное образовательное учреждение

высшего образования

«КРЫМСКИЙ ФЕДЕРАЛЬНЫЙ УНИВЕРСИТЕТ им. В. И. ВЕРНАДСКОГО»

ФИЗИКО-ТЕХНИЧЕСКИЙ ИНСТИТУТ

Кафедра компьютерной инженерии и моделирования

Инсталляция и конфигурация ОС Linux

Отчет по лабораторной работе 1

по дисциплине «**Системное администрирование**»

студента 3 курса группы ИВТ-б-о-202

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Симферополь, 2023

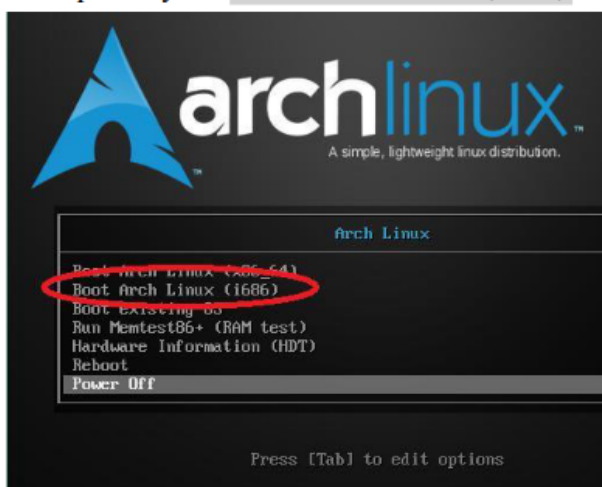
Ход работы

Цель работы:

Познакомиться с основами установки ОС Linux, а также подготовить базу для выполнения следующих лабораторных и практических занятий

Порядок выполнения работы:

1. Подготовьте среду для выполнения дальнейших лабораторных работ, установив **GNU Linux Arch** в запущенную виртуальную машину
 - (a) Выберите пункт **Boot Arch Linux (i686)**



```
(aqua@kali)-[~]
$ cd Qemu

(aqua@kali)-[~/Qemu]
$ cd ISO

(aqua@kali)-[~/Qemu/ISO]
$ ls
archlinux-2023.02.01-x86_64.iso

(aqua@kali)-[~/Qemu/ISO]
$ cd ..

(aqua@kali)-[~/Qemu]
$ cd Arch

(aqua@kali)-[~/Qemu/Arch]
$ ls
script.sh  VM_base.qcow2  VM.qcow2

(aqua@kali)-[~/Qemu/Arch]
$
```

```
kvm -smp 4 -m 3000 -vga std -hdd /home/aqua/Qemu/Arch/VM.qcow2 -cdrom  
/home/aqua/Qemu/ISO/archlinux-2023.02.01-x86_64.iso -boot menu=on,splash-time=10000 -netdev  
user,id=net1 -nic user,hostfwd=tcp::2222-:22 -serial none -monitor telnet:127.0.0.1:10023,server,nowait
```

Разметка диска



форматирование

```
root@archiso ~ # lsblk
NAME        MAJ:MIN RM   SIZE RO TYPE MOUNTPOINTS
fd0          2:0    1     4K  0 disk
loop0        7:0    0 710.1M  1 loop /run/archiso/airootfs
sda          8:0    0    20G  0 disk
├─sda1       8:1    0    16G  0 part
└─sda2       8:2    0     4G  0 part
sr0          11:0   1 824.3M  0 rom  /run/archiso/bootmnt
root@archiso ~ # mkfs.ext4 /dev/sda1
mke2fs 1.46.5 (30-Dec-2021)
Discarding device blocks: done
Creating filesystem with 4194304 4k blocks and 1048576 inodes
Filesystem UUID: 3f715447-67e5-4350-81a2-c76eac6f93c7
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
    4096000

Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done

root@archiso ~ # mkswap /dev/sda2
Setting up swapspace version 1, size = 4 GiB (4293914624 bytes)
no label, UUID=c17515ca-6e7e-4447-a665-093d54afe0c3
root@archiso ~ #
```

Монтирование

```
root@archiso ~ # lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
fd0          2:0    1    4K  0 disk
loop0       7:0    0 710.1M  1 loop /run/archiso/airootfs
sda          8:0    0   20G  0 disk
├─sda1       8:1    0   16G  0 part
└─sda2       8:2    0    4G  0 part
sr0         11:0    1 824.3M  0 rom  /run/archiso/bootmnt
root@archiso ~ # mount /dev/sda1 /mnt
root@archiso ~ # swapon /dev/sda2
root@archiso ~ # lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
fd0          2:0    1    4K  0 disk
loop0       7:0    0 710.1M  1 loop /run/archiso/airootfs
sda          8:0    0   20G  0 disk
├─sda1       8:1    0   16G  0 part /mnt
└─sda2       8:2    0    4G  0 part [SWAP]
sr0         11:0    1 824.3M  0 rom  /run/archiso/bootmnt
root@archiso ~ # _
```

Проверка ISO

```
root@archiso ~ # pacman -Sy archlinux-keyring
:: Synchronizing package databases...
core                               155.6 KiB   270 KiB/s 00:01 [#####] 100%
extra                             1742.1 KiB  3.89 MiB/s 00:00 [#####] 100%
community                         7.3 MiB   6.48 MiB/s 00:01 [#####] 100%
resolving dependencies...
looking for conflicting packages...

Packages (1) archlinux-keyring-20230225-1

Total Download Size:   1.13 MiB
Total Installed Size:  1.60 MiB
Net Upgrade Size:      0.01 MiB

:: Proceed with installation? [Y/n] y
:: Retrieving packages...
archlinux-keyring-20230225-1-any 1156.3 KiB  6.38 MiB/s 00:00 [#####] 100%
(1/1) checking keys in keyring [#####] 100%
(1/1) checking package integrity [#####] 100%
(1/1) loading package files [#####] 100%
(1/1) checking for file conflicts [#####] 100%
(1/1) checking available disk space [#####] 100%
:: Processing package changes...
(1/1) upgrading archlinux-keyring [#####] 100%
=> Appending keys from archlinux.gpg...
=> Updating trust database...
gpg: next trustdb check due at 2023-07-12
=> Updating trust database...
gpg: next trustdb check due at 2023-07-12
:: Running post-transaction hooks...
(1/2) Reloading system manager configuration...
(2/2) Arming ConditionNeedsUpdate...
root@archiso ~ #
```

Установка базовых пакетов

```
# pacstrap -K /mnt base linux linux-firmware
```

```
gpg: Generating pacman keyring master key...
gpg: directory '/mnt/etc/pacman.d/gnupg/openpgp-revocs.d' created
gpg: revocation certificate stored as '/mnt/etc/pacman.d/gnupg/openpgp-revocs.d/57514DFF57D38784E7D52A1A2E2B9624C209B8EA.reu'
gpg: Done
==> Updating trust database...
gpg: marginals needed: 3 completes needed: 1 trust model: pgp
gpg: depth: 0 valid: 1 signed: 0 trust: 0-, 0g, 0n, 0m, 0f, 1u
==> Installing packages to /mnt
:: Synchronizing package databases...
core                                     155.6 KiB   317 KiB/s   00:00 [#####] 100%
extra                                  1742.4 KiB   3.21 MiB/s   00:01 [#####] 100%
community                             7.3 MiB     6.84 MiB/s   00:01 [#####] 100%
resolving dependencies...
:: There are 3 providers available for initramfs:
:: Repository core
1) mkinitcpio
:: Repository extra
2) booster 3) dracut

Enter a number (default=1):
looking for conflicting packages...

Packages (121) acl-2.3.1-3 archlinux-keyring-20230225-1 argon2-20190702-4 attr-2.5.1-2 audit-3.0.9-2 bash-5.1.016-3 binutils-2.40-4 brotli-1.0.9-10
bzlib2-1.0.8-5 ca-certificates-20220905-1 ca-certificates-mozilla-3.88.1-1 ca-certificates-utils-20220905-1 coreutils-9.1-3
cryptsetup-2.6.1-1 curl-7.88.1-3 dbus-1.14.6-1 device-mapper-2.03.19-1 diffutils-3.9-1 e2fsprogs-1.47.0-1 expat-2.5.0-1 file-5.44-3
filesystem-2023.01.31-1 findutils-4.9.0-2 gawk-5.2.1-1 gcc-libs-12.2.1-2 gdbm-1.23-1 gettext-0.21.1-2 glib2-2.74.5-1 glibc-2.37-2
gmp-6.2.1-2 gnupg-2.2.40-1 gnutls-3.8.0-1 gpgme-1.18.0-2 grep-3.8-3 gzip-1.12-2 hwdetect-0.367-1 iana-etc-20230105-1 icu-72.1-2
iproute2-6.2.0-2 iptables-1.8.9-1 iputils-20221126-1 jansson-2.14-2 json-c-0.16-1 kbd-2.5.1-1 keyutils-1.6.3-1 kmod-30-3 krb5-1.20.1-1
less-1.608-2 libarchive-3.6.2-2 libassuan-2.5.5-1 libbpf-1.0.1-1 libcap-2.67-1 libcap-ng-0.8.3-1 libelf-0.188-3 libevent-2.1.12-4
libffi-3.4.4-1 libgcrypt-1.10.1-2 libgpg-error-1.46-2 libidn2-2.3.4-3 libksba-1.6.3-1 libldap-2.6.4-1 libmnl-1.0.5-1
libnetfilter_conntrack-1.0.9-1 libnftnl-1.0.2-1 libnftnl-1.2.4-1 libnftnl-1.2.4-1 libnftnl-1.2.4-1 libnftnl-1.2.4-1 libnftnl-1.2.4-1
libnetfilter_conntrack-1.0.9-1 libnftnl-1.0.2-1 libnftnl-1.2.4-1 libnftnl-1.2.4-1 libnftnl-1.2.4-1 libnftnl-1.2.4-1
libpcap-1.10.3-1 libpsl-0.21.2-1 libsasl-2.1.28-4 libseccomp-2.5.4-1 libsecret-0.20.5-2 libssh2-1.10.0-3 libsysprof-capture-3.46.0-4
libtasn1-4.19.0-1 libtirpc-1.3.3-2 libunistring-1.1-2 libuio-0.3.2-4 libxcrypt-4.4.33-1 libxml2-2.10.3-2 licenses-20220125-1
linux-api-headers-6.1.9-1 linux-firmware-whence-20230210.bf4115c-1 lz4-1.1.9.4-1 mkinitcpio-34-2 mkinitcpio-busybox-1.35.0-1 mpfr-4.2.0-3
ncurses-6.4-1 nettle-3.8.1-1 nft-1.6-3 openssl-3.0.8-1 p11-kit-0.24.1-1 pacman-6.0.2-5 pacman-mirrorlist-20230226-1 pam-1.5.2-1
pambase-20221020-1 pciutils-3.9.0-2 pcre2-10.42-2 pinentry-1.2.1-1 popt-1.19-1 procs-ng-3.3.17-1 psmisc-23.6-1 readline-8.2.001-2
sed-4.9-2 shadow-4.13-2 sqlite-3.41.0-1 systemd-253-1 systemd-libs-253-1 systemd-sysucompat-253-1 tar-1.34-1 tpm2-tss-3.2.0-3
tzdata-2022g-2 util-linux-2.38.1-1 util-linux-libs-2.38.1-1 xz-5.4.1-1 zlib-1.1.2.13-2 zstd-1.5.4-1 base-3-1 linux-6.1.12.arch1-1
linux-firmware-20230210.bf4115c-1

Total Download Size: 432.47 MiB
Total Installed Size: 849.84 MiB

:: Proceed with installation? [Y/n]
:: Retrieving packages...
linux-6.1.12.arch1-1-x86_64                164.0 MiB   8.19 MiB/s   00:20 [#####] 100%
linux-firmware-20230210.bf4115c-1-any      137.1 MiB   6.50 MiB/s   00:21 [#####] 100%
gcc-libs-12.2.1-2-x86_64                  25.7 MiB   8.66 MiB/s   00:00 [#####] 100%
Total ( 2/121)                             326.8 MiB   8.69 MiB/s   00:12 [#####] 100%
```

Генерируем fstab

```
root@archiso ~ # genfstab -U /mnt >> /mnt/etc/fstab
root@archiso ~ # arch-chroot /mnt
[root@archiso /]# lsblk
NAME        MAJ:MIN RM   SIZE RO TYPE MOUNTPOINTS
fd0          2:0    1     4K  0 disk
loop0        7:0    0 710.1M  1 loop
sda          8:0    0    20G  0 disk
├─sda1       8:1    0    16G  0 part /
└─sda2       8:2    0     4G  0 part [SWAP]
sr0         11:0    1 824.3M  0 rom
[root@archiso /]#
```

Настройка времени

```
# ln -sf /usr/share/zoneinfo/Region/City /etc/localtime
```

```
[root@archiso /]# ln -sf /usr/share/zoneinfo/Europe/Simferopol /etc/localtime
[root@archiso /]# hwclock --systohc
[root@archiso /]# _
```

Настройка локалий

установка редактора

```
Machine View
[root@archiso /]# pacman -S nano
resolving dependencies...
looking for conflicting packages...

Packages (1) nano-7.2-1

Total Download Size: 0.58 MiB
Total Installed Size: 2.51 MiB

:: Proceed with installation? [Y/n] y
:: Retrieving packages...
   nano-7.2-1-x86_64                    598.6 KiB   767 KiB/s 00:01 [#####] 100%
(1/1) checking keys in keyring [#####] 100%
(1/1) checking package integrity [#####] 100%
(1/1) loading package files [#####] 100%
(1/1) checking for file conflicts [#####] 100%
(1/1) checking available disk space [#####] 100%
:: Processing package changes...
(1/1) installing nano [#####] 100%
:: Running post-transaction hooks...
(1/1) Arming ConditionNeedsUpdate...
[root@archiso /]#
```

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

```
393 #ra_J.UTF-8
394 #rif_MA.UTF-8
395 #ro_RO.UTF-8 UTF-8
396 #ro_RO.ISO-8859-2
397 ru_RU.KOI8-R KOI8-R
398 #ru_RU.UTF-8 UTF-8
399 #ru_RU.ISO-8859-5
400 #ru_UA.UTF-8 UTF-8
/etc/locale.gen (397,1) | ft:
Saved /etc/locale.gen
```

```
Machine View
[root@archiso /]# locale-gen
Generating locales...
  en_US.UTF-8... done
  ru_RU.KOI8-R... done
Generation complete.
[root@archiso /]#
```


Настройка root

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

arch

настройка sudo

```
created symlink /etc/systemd/system/network-online.target.wants/networkmanager-wait-online.service + /usr/lib/systemd/system/networkmanager-wait-online.service.  
[root@archiso /]# pacman -S sudo  
resolving dependencies...  
looking for conflicting packages...  
  
Packages (1) sudo-1.9.13-1  
  
Total Download Size: 1.75 MiB  
Total Installed Size: 7.20 MiB  
  
:: Proceed with installation? [Y/n] y  
:: Retrieving packages...  
sudo-1.9.13-1-x86_64 1793.1 KiB 676 KiB/s 00:03 [#####] 100%  
(1/1) checking keys in keyring [#####] 100%  
(1/1) checking package integrity [#####] 100%  
(1/1) loading package files [#####] 100%  
(1/1) checking for file conflicts [#####] 100%  
(1/1) checking available disk space [#####] 100%  
:: Processing package changes...  
(1/1) installing sudo [#####] 100%  
:: Running post-transaction hooks...  
(1/3) Reloading system manager configuration...  
Skipped: Running in chroot.  
(2/3) Creating temporary files...
```

```
[root@archiso /]# nano /etc/sudoers_  
_
```

```
82 root ALL=(ALL:ALL) ALL  
83  
84 ## Uncomment to allow members of group wheel to execute any command  
85 %wheel ALL=(ALL:ALL) ALL  
86  
87 ## Same thing without a password  
88 # %wheel ALL=(ALL:ALL) NOPASSWD: ALL
```

Настройка пользователя

```
[root@archiso /]# useradd -m user1
[root@archiso /]# passwd user1
New password:
Retype new password:
passwd: password updated successfully
[root@archiso /]# usermod -aG wheel,audio,video,storage,floppy user1
[root@archiso /]# _
```

Настройка сети

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

```
GNU nano 2.2
```

```
# Static table lookup for hostnames.
# See hosts(5) for details.

127.0.0.1    localhost
::1         localhost
127.0.1.1    aqua_
```

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

Packages (19) bluez-libs-5.66-1  gpm-1.20.7.r38.ge82d1a6-4  libdaemon-0.14-5  libnm-glib-1.20.4-1  libndp-1.8-1  libnewt-0.52.23-1  libnm-1.42.2-1
             libpgm-5.3.128-2  libsodium-1.0.18-2  libteam-1.31-7  mobile-broadband-provider-info-20221107-2  nspr-4.35-1  nss-3.88.1-1  pcre-8.45-3
             pcsclite-1.9.9-2  slang-2.3.3-2  wpa_supplicant-2:2.10-8  zeromq-4.3.4-2  networkmanager-1.42.2-1

Total Download Size: 12.29 MiB
Total Installed Size: 66.52 MiB

:: Proceed with installation? [Y/n] y
:: Retrieving packages...
networkmanager-1.42.2-1-x86_64           3.6 MiB   3.32 MiB/s   00:01 [#####] 100%
wpa_supplicant-2:2.10-8-x86_64          1659.8 KiB  4.87 MiB/s   00:00 [#####] 100%
nss-3.88.1-1-x86_64                     1583.4 KiB  6.64 MiB/s   00:00 [#####] 100%
Total ( 2/19)                           5.2 MiB   2.06 MiB/s   00:03 [#####] 42%

Skipped: Running in chroot.
[root@archiso /]# systemctl enable NetworkManager
Created symlink /etc/systemd/system/multi-user.target.wants/NetworkManager.service → /usr/lib/systemd/system/NetworkManager.service.
Created symlink /etc/systemd/system/dbus-org.freedesktop.nm-dispatcher.service → /usr/lib/systemd/system/NetworkManager-dispatcher.service.
Created symlink /etc/systemd/system/network-online.target.wants/NetworkManager-wait-online.service → /usr/lib/systemd/system/NetworkManager-wait-online.service.
[root@archiso /]# _
```

Настройка загрузчика

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

Packages (1) grub-2:2.06.r456.g65bc45963-1

Total Download Size:   6.83 MiB
Total Installed Size: 33.25 MiB

:: Proceed with installation? [Y/n] y
:: Retrieving packages...
grub-2:2.06.r456.g65bc45963-1-x86_64           6.8 MiB  4.31 MiB/s 00:02 [#####] 100%
(1/1) checking keys in keyring [#####] 100%
(1/1) checking package integrity [#####] 100%
(1/1) loading package files [#####] 100%
(1/1) checking for file conflicts [#####] 100%
(1/1) checking available disk space [#####] 100%
:: Processing package changes...
(1/1) installing grub [#####] 100%
:: Install your bootloader and generate configuration with:
   $ grub-install ...
   $ 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
 lzop: For grub-mkrescue LZ2 support
 efibootmgr: For grub-install EFI support
 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
:: Running post-transaction hooks...
(1/1) Arming ConditionNeedsUpdate...
[root@archiso /]# grub-install /dev/sda
Installing for i386-pc 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
Warning: os-prober will not be executed to detect other bootable partitions.
Systems on them will not be added to the GRUB boot configuration.
Check GRUB_DISABLE_OS_PROBER documentation entry.
Adding boot menu entry for UEFI Firmware Settings ...
done
[root@archiso /]# _
```

Если нужен дуалбут

```
[root@archiso /]# nano /etc/default/grub
```

```
# Probing for other operating systems is disabled for security reasons. Read
# documentation on GRUB_DISABLE_OS_PROBER, if still want to enable this
# functionality install os-prober and uncomment to detect and include other
# operating systems.
GRUB_DISABLE_OS_PROBER=false
```

```
[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
Adding boot menu entry for UEFI Firmware Settings ...
done
[root@archiso /]#
```

Размонтирование

```
[root@archiso /]#  
exit  
arch-chroot /mnt 4.95s user 2.66s system 0% cpu 20:12.88 total  
root@archiso ~ # umount /dev/sda  
umount: /dev/sda: not mounted.  
32 root@archiso ~ # lsblk  
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS  
fd0          2:0    1    4K  0 disk  
loop0        7:0    0 710.1M  1 loop /run/archiso/airootfs  
sda          8:0    0   20G  0 disk  
├─sda1       8:1    0   16G  0 part /mnt  
└─sda2       8:2    0    4G  0 part [SWAP]  
sr0         11:0    1 824.3M  0 rom  /run/archiso/bootmnt  
root@archiso ~ # umount /dev/sda1  
root@archiso ~ # lsblk  
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS  
fd0          2:0    1    4K  0 disk  
loop0        7:0    0 710.1M  1 loop /run/archiso/airootfs  
sda          8:0    0   20G  0 disk  
├─sda1       8:1    0   16G  0 part  
└─sda2       8:2    0    4G  0 part [SWAP]  
sr0         11:0    1 824.3M  0 rom  /run/archiso/bootmnt  
root@archiso ~ # reboot_
```

Вход в систему с рута

```
Arch Linux 6.2.1-arch1-1 (tty1)  
  
aqua login: root  
Password:  
[root@aqua ~]# _
```

Настройка системы

```
[root@aqua ~]# pacman -S openssh
resolving dependencies...
looking for conflicting packages...

Packages (4) dnsssec-anchors-20190629-3  ldns-1.8.3-2  libedit-20210910_3.1-2  openssh-9.2p1-1

Total Download Size:  1.67 MiB
Total Installed Size: 6.97 MiB

:: Proceed with installation? [Y/n] y
:: Retrieving packages...
openssh-9.2p1-1-x86_64             1124.6 KiB  1345 KiB/s  00:01 [#####] 100%
ldns-1.8.3-2-x86_64               472.9 KiB   4.09 MiB/s  00:00 [#####] 100%
libedit-20210910_3.1-2-x86_64    110.8 KiB   1385 KiB/s  00:00 [#####] 100%
dnsssec-anchors-20190629-3-any     3.0 KiB    41.0 KiB/s  00:00 [#####] 100%
Total (4/4)                      1711.3 KiB  1229 KiB/s  00:01 [#####] 100%
(4/4) checking keys in keyring
(4/4) checking package integrity
(4/4) loading package files
(4/4) checking for file conflicts
(4/4) checking available disk space
:: Processing package changes...
(1/4) installing dnsssec-anchors [#####] 100%
(2/4) installing ldns [#####] 100%
Optional dependencies for ldns
  libpcap: ldns-dpa tool [installed]
(3/4) installing libedit [#####] 100%
(4/4) installing openssh [#####] 100%
Optional dependencies for openssh
  libfido2: FIDO/U2F support
  x11-ssh-askpass: input passphrase in X
  xorg-xauth: X11 forwarding
:: Running post-transaction hooks...
(1/3) Reloading system manager configuration...
(2/3) Creating temporary files...
(3/3) Arming ConditionNeedsUpdate...
[root@aqua ~]#
```

```
[root@aqua ~]# pacman -S mc
resolving dependencies...
looking for conflicting packages...

Packages (2) which-2.21-6  mc-4.8.29-2

Total Download Size:  1.82 MiB
Total Installed Size: 6.99 MiB

:: Proceed with installation? [Y/n] y
:: Retrieving packages...
mc-4.8.29-2-x86_64             1849.3 KiB   2.09 MiB/s  00:01 [#####] 100%
which-2.21-6-x86_64           15.8 KiB    225 KiB/s  00:00 [#####] 100%
Total (2/2)                   1865.1 KiB   1738 KiB/s  00:01 [#####] 100%
(2/2) checking keys in keyring
(2/2) checking package integrity
(2/2) loading package files
(2/2) checking for file conflicts
(2/2) checking available disk space
:: Processing package changes...
(1/2) installing which [#####] 100%
(2/2) installing mc [#####] 100%
Optional dependencies for mc
  aspell: spelling corrections
  cabextract: ucab extfs
  cdparanoia: audio extfs
  cdrkit: iso9660 extfs
  cvs: CVS support
  gawk: hp48+ extfs [installed]
  mtools: a+ extfs
  p7zip: support for 7zip archives
  perl: needed by several extfs scripts
  python: to access uc1541 or s3 storage
  python-boto: s3+ extfs
  python-pytz: s3+ extfs
  unace: uace extfs
  unrar: unrar extfs
  unzip: open zip archives
  zip: uzip extfs
:: Running post-transaction hooks...
(1/1) Arming ConditionNeedsUpdate...
[root@aqua ~]#
```

```

[root@aqua ~]# pacman -S vim
resolving dependencies...
looking for conflicting packages...

Packages (4) db5.3-5.3.28-2 perl-5.36.0-3 vim-runtime-9.0.1337-1 vim-9.0.1337-1

Total Download Size: 25.95 MiB
Total Installed Size: 106.30 MiB

:: Proceed with installation? [Y/n] y
:: Retrieving packages...
perl-5.36.0-3-x86_64 15.6 MiB 5.97 MiB/s 00:03 [#####] 100%
vim-runtime-9.0.1337-1-x86_64 7.0 MiB 2.03 MiB/s 00:03 [#####] 100%
vim-9.0.1337-1-x86_64 2.1 MiB 6.37 MiB/s 00:00 [#####] 100%
db5.3-5.3.28-2-x86_64 1229.3 KiB 1714 KiB/s 00:01 [#####] 100%
Total (4/4) 25.9 MiB 3.51 MiB/s 00:07 [#####] 100%
(4/4) checking keys in keyring [#####] 100%
(4/4) checking package integrity [#####] 100%
(4/4) loading package files [#####] 100%
(4/4) checking for file conflicts [#####] 100%
(4/4) checking available disk space [#####] 100%
:: Processing package changes...
(1/4) installing vim-runtime [#####] 100%
Optional dependencies for vim-runtime
sh: support for some tools and macros [installed]
python: demoser server example tool
gawk: mve tools upport [installed]
(2/4) installing db5.3 [#####] 100%
(3/4) installing perl [#####] 100%
(4/4) installing vim [#####] 100%
Optional dependencies for vim
python: Python language support
ruby: Ruby language support
lua: Lua language support
tcl: Tcl language support
:: Running post-transaction hooks...
(1/2) Arming ConditionNeedsUpdate...
(2/2) Warn about old perl modules
[root@aqua ~]# _

```

```

[root@aqua ~]# pacman -S htop
resolving dependencies...
looking for conflicting packages...

Packages (1) htop-3.2.2-1

Total Download Size: 0.14 MiB
Total Installed Size: 0.36 MiB

:: Proceed with installation? [Y/n] y
:: Retrieving packages...
htop-3.2.2-1-x86_64 147.3 KiB 285 KiB/s 00:01 [#####] 100%
(1/1) checking keys in keyring [#####] 100%
(1/1) checking package integrity [#####] 100%
(1/1) loading package files [#####] 100%
(1/1) checking for file conflicts [#####] 100%
(1/1) checking available disk space [#####] 100%
:: Processing package changes...
(1/1) installing htop [#####] 100%
Optional dependencies for htop
lm_sensors: show cpu temperatures
lsuf: show files opened by a process
strace: attach to a running process
:: Running post-transaction hooks...
(1/1) Arming ConditionNeedsUpdate...
[root@aqua ~]# _

```

Добавление пользователей

```
[root@aqua ~]# useradd -m user2 -g users -G audio,video,wheel
[root@aqua ~]# passwd user2
New password:
Retype new password:
passwd: password updated successfully
[root@aqua ~]# useradd -m user3 -g users -G audio,video,wheel
[root@aqua ~]# passwd user3
New password:
Retype new password:
passwd: password updated successfully
[root@aqua ~]#
```

Подключение по ssh

```
(aqua@kali)-[~]
$ sudo su
[sudo] password for aqua:
(root@kali)-[/home/aqua]
# systemctl status ssh
o ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/lib/systemd/system/ssh.service; disabled; preset: disabled)
   Active: inactive (dead)
   Docs: man:sshd(8)
        man:sshd_config(5)

(root@kali)-[/home/aqua]
# systemctl enable ssh
Synchronizing state of ssh.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable ssh
Created symlink /etc/systemd/system/ssh.service → /lib/systemd/system/ssh.service.
Created symlink /etc/systemd/system/multi-user.target.wants/ssh.service → /lib/systemd/system/ssh.service.

(root@kali)-[/home/aqua]
# systemctl status ssh
o ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/lib/systemd/system/ssh.service; enabled; preset: disabled)
   Active: inactive (dead)
   Docs: man:sshd(8)
        man:sshd_config(5)

(root@kali)-[/home/aqua]
#
```

```
root@aqua ~]# pacman -S openssh
warning: openssh-9.2p1-1 is up to date -- reinstalling
resolving dependencies...
looking for conflicting packages...

Packages (1) openssh-9.2p1-1

Total Installed Size: 4.81 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 openssh
:: Running post-transaction hooks...
(1/3) Reloading system manager configuration...
(2/3) Creating temporary files...
(3/3) Arming ConditionNeedsUpdate...
root@aqua ~]# systemctl status openssh
Unit openssh.service could not be found.
root@aqua ~]# sshd -t
sshd: no hostkeys available -- exiting.
root@aqua ~]# systemctl start sshd
root@aqua ~]# sshd -t
root@aqua ~]# systemctl status sshd
■ sshd.service - OpenSSH Daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; disabled; preset: disabled)
   Active: active (running) since Tue 2023-02-28 17:38:08 MSK; 2min 7s ago
 Main PID: 649 (sshd)
   Tasks: 1 (limit: 3466)
  Memory: 1.1M
     CPU: 6ms
  CGroup: /system.slice/sshd.service
          └─649 "sshd: /usr/bin/sshd -D [listener] 0 of 10-100 startups"

Feb 28 17:38:08 aqua systemd[1]: Started OpenSSH Daemon.
Feb 28 17:38:08 aqua sshd[649]: Server listening on 0.0.0.0 port 22.
Feb 28 17:38:08 aqua sshd[649]: Server listening on :: port 22.
root@aqua ~]#
```



```
user1@aqua:/home/user1
File Actions Edit View Help
(root@kali)-[/home/aqua]
# ssh -p 2222 user1@localhost
user1@localhost's password:
Last login: Tue Feb 28 17:59:02 2023 from 10.0.2.2
[user1@aqua ~]$ su
Password:
[root@aqua user1]#
```

Сброс пароля пользователя при входе

```
[root@aqua user1]# passwd -e user1
passwd: password changed.
[root@aqua user1]# chage -l user1
Last password change
Password expires
Password inactive
Account expires
Minimum number of days between password change
Maximum number of days between password change
Number of days of warning before password expires
[root@aqua user1]#
```

Статьи	
	: password must be changed
DevO	: password must be changed
	: password must be changed
	: never
FreeB	: 0
	: 99999
	: 7
Сети	

```
(root@kali)-[/home/aqua]
# ssh -p 2222 user1@localhost
user1@localhost's password:
You are required to change your password immediately (administrator enforced).
You are required to change your password immediately (administrator enforced).
Last login: Tue Feb 28 18:09:28 2023 from 10.0.2.2
WARNING: Your password has expired.
You must change your password now and login again!
Changing password for user1.
Current password:
New password:
Retype new password:
passwd: password updated successfully
Connection to localhost closed.
```

Назначение устаривания учётной записи пользователя

```
(root@kali)-[/home/aqua]
# ssh -p 2222 user1@localhost
user1@localhost's password:
Last login: Tue Feb 28 18:10:03 2023 from 10.0.2.2
[user1@aqua ~]$ su
Password:
[root@aqua user1]# usermod -e 2023-03-01 user2
[root@aqua user1]# chage -l user2
Last password change           : Feb 28, 2023
Password expires                : never
Password inactive               : never
Account expires                 : Mar 01, 2023
Minimum number of days between password change : 0
Maximum number of days between password change : 99999
Number of days of warning before password expires : 7
[root@aqua user1]#
```

Блокировка и разблокировка пользователя

```
[root@aqua user1]# chage -E 1 user3
[root@aqua user1]# chage -l user3
Last password change           : Feb 28, 2023
Password expires                : never
Password inactive               : never
Account expires                 : Jan 02, 1970
Minimum number of days between password change : 0
Maximum number of days between password change : 99999
Number of days of warning before password expires : 7
[root@aqua user1]# chage -E -1 user3
[root@aqua user1]# chage -l user3
Last password change           : Feb 28, 2023
Password expires                : never
Password inactive               : never
Account expires                 : never
Minimum number of days between password change : 0
Maximum number of days between password change : 99999
Number of days of warning before password expires : 7
[root@aqua user1]#
```

Настройка синхронизации времени

```
[root@aquana user1]# nano /etc/systemd/timesyncd.conf
```

```
File Actions Edit View Help
GNU nano 7.2 /etc/systemd/timesyncd.conf Modified
# This file is part of systemd.
#
# systemd is free software; you can redistribute it and/or modify it under the
# terms of the GNU Lesser General Public License as published by the Free
# Software Foundation; either version 2.1 of the License, or (at your option)
# any later version.
#
# Entries in this file show the compile time defaults. Local configuration
# should be created by either modifying this file, or by creating "drop-ins" in
# the timesyncd.conf.d/ subdirectory. The latter is generally recommended.
# Defaults can be restored by simply deleting this file and all drop-ins.
# See timesyncd.conf(5) for details.

[Time]
NTP=
FallbackNTP=192.168.100.101
RootDistanceMaxSec=5
PollIntervalMinSec=32
PollIntervalMaxSec=2048
ConnectionRetrySec=30
SaveIntervalSec=60

[root@aqua user1]# nano /etc/systemd/timesyncd.conf
[root@aqua user1]# systemctl restart systemd-timesyncd.service
[root@aqua user1]# systemctl status systemd-timesyncd.service
● systemd-timesyncd.service - Network Time Synchronization
   Loaded: loaded (/usr/lib/systemd/system/systemd-timesyncd.service; disabled; preset: enabled)
   Active: active (running) since Tue 2023-02-28 18:29:50 MSK; 17s ago
     Docs: man:systemd-timesyncd.service(8)
    Main PID: 471 (systemd-timesyn)
      Status: "Contacted time server 192.168.100.101:123 (192.168.100.101)."
```

```
[root@aquar user1]# timedatectl
                Local time: Tue 2023-02-28 18:31:21 MSK
                Universal time: Tue 2023-02-28 15:31:21 UTC
                RTC time: Tue 2023-02-28 15:31:21
                Time zone: Europe/Simferopol (MSK, +0300)
System clock synchronized: yes
                NTP service: active
                RTC in local TZ: no
```

Отключение

```
[root@aqua user1]# poweroff
[root@aqua user1]# Connection to localhost closed by remote host.
Connection to localhost closed.

(root@kali)-[/home/aqua]
#
```

Контрольные вопросы

1. Rolling release – постоянно обновляемый дистрибутив.

2. grub – загрузчик операционной системы

3. pacman

4. apt install, разархивирование deb пакетов

5. passwd

6.

pacstrap – для установки базовых пакетов

arch-chroot – изменение корневого каталога диска для запущенного процесса и его дочерних процессов

locale-gen – генерирование локалиев, которые указаны в /etc/locale.gen

mkinitcpio – bash-скрипт, который создаёт начальный загрузочный диск системы