Installation guide

This document is a guide for installing **Arch Linux** from the live system booted with the official installation image. Before installing, it would be advised to view the **FAQ**. For conventions used in this document, see **Help:Reading**. In particular, code examples may contain placeholders (formatted in *italics*) that must be replaced manually.

For more detailed instructions, see the respective **ArchWiki** articles or the various programs' **man pages**, both linked from this guide. For interactive help, the **IRC channel** and the **forums (https://bbs.archlinux.org/)** are also available.

Arch Linux should run on any **x86_64**-compatible machine with a minimum of 512 MB RAM. A basic installation with all packages from the `base (https://www.archlinux.org/groups/x86_64/base/)` group should take less than 800 MB of disk space. As the installation process needs to retrieve packages from a remote repository, this guide assumes a working internet connection is available.

Contents

Pre-installation

Download and boot the installation medium as explained in **Category:Getting and installing Arch**. You will be logged in on the first **virtual console** as the root user, and presented with a **Zsh** shell prompt; common commands such as `systemctl(1) (https://jlk.f jfi.cvut.cz/arch/manpages/man/systemctl.1)` can be **tab-completed**.

To switch to a different console—for example, to view this guide with **ELinks** alongside the installation—use the `Alt+arrow` **shortcut**. To **edit** configuration files, **nano**, **vi** and **vim** are available.

Set the keyboard layout

The default **console keymap** is **US**. Available layouts can be listed with:

```
# ls /usr/share/kbd/keymaps/**/*.map.gz
```

To modify the layout, append a corresponding file name to `loadkeys(1) (https://jlk.fjfi.cvu t.cz/arch/manpages/man/loadkeys.1)`, omitting path and file extension. For example, to set a **German** keyboard layout:

```
# loadkeys de-latin1
```

Console fonts are located in `/usr/share/kbd/consolefonts/` and can likewise be set with `setfont(8) (https://jlk.fjfi.cvut.cz/arch/manpages/man/setfont.8)`.

Verify the boot mode

If UEFI mode is enabled on an **UEFI** motherboard, **Archiso** will **boot** Arch Linux accordingly via **systemd-boot**. To verify this, list the **efivars** directory:

```
# ls /sys/firmware/efi/efivars
```

If the directory does not exist, the system may be booted in **BIOS** or CSM mode. Refer to your motherboard's manual for details.

Connect to the Internet

The installation image enables the **dhcpcd** daemon on boot for **wired (https://git.archlin ux.org/archiso.git/tree/configs/releng/airootfs/etc/udev/rules.d/81-dhcpcd.rules)** network devices. The connection may be **checked** with:

```
# ping archlinux.org
```

If no connection is available, **stop** the *dhcpcd* service with `systemctl stop dhcpcd@` and pressing `Tab`. Proceed with **Network configuration** for **wired** devices or **Wireless network configuration** for **wireless** devices.

Update the system clock

Use **timedatectl(1) (https://jlk.fjfi.cvut.cz/arch/manpages/man/timedatectl.1)** to ensure the system clock is accurate:

```
# timedatectl set-ntp true
```

To check the service status, use `timedatectl status`.

Partition the disks

When recognized by the live system, disks are assigned to a **block device** such as `/dev/sda` or `/dev/nvme0n1`. To identify these devices, use **lsblk** or *fdisk*.

```
# fdisk -l
```

Results ending in `rom`, `loop` or `airoot` may be ignored.

The following *partitions* are **required** for a chosen device:

- One partition for the root directory `/`.
- If **UEFI** is enabled, an **EFI System Partition**.

> **Note:** **Swap** space can be set on a separate partition or a **swap file**.

To modify *partition tables*, use **fdisk** or **parted**.

```
# fdisk /dev/sda
```

See **Partitioning** for more information.

> **Note:** If you want to create any stacked block devices for **LVM**, **disk encryption** or **RAID**, do it now.

Format the partitions

Once the partitions have been created, each must be formatted with an appropriate **file system**. For example, to format the root partition on `/dev/sda1` with `ext4`, run:

```
# mkfs.ext4 /dev/sda1
```

If you created a partition for swap (for example `/dev/sda3`), initialize it with *mkswap*:

```
# mkswap /dev/sda3
# swapon /dev/sda3
```

See **File systems#Create a file system** for details.

Mount the file systems

Mount the file system on the root partition to `/mnt`, for example:

```
# mount /dev/sda1 /mnt
```

Create mount points for any remaining partitions and mount them accordingly:

```
# mkdir /mnt/boot
# mount /dev/sda2 /mnt/boot
```

genfstab (https://git.archlinux.org/arch-install-scripts.git/tree/genfstab.in) will later detect mounted file systems and swap space.

Installation

Select the mirrors

Packages to be installed must be downloaded from **mirror servers**, which are defined in `/etc/pacman.d/mirrorlist`. On the live system, all mirrors are enabled, and sorted by their synchronization status and speed at the time the installation image was created.

The higher a mirror is placed in the list, the more priority it is given when downloading a package. You may want to edit the file accordingly, and move the geographically closest mirrors to the top of the list, although other criteria should be taken into account.

This file will later be copied to the new system by *pacstrap*, so it is worth getting right.

Install the base packages

Use the **pacstrap (https://projects.archlinux.org/arch-install-scripts.git/tree/pacstrap.in)** script to install the **base (https://www.archlinux.org/groups/x86_64/base/)** package group:

```
# pacstrap /mnt base
```

This group does not include all tools from the live installation, such as **btrfs-progs (https://www.archlinux.org/packages/?name=btrfs-progs)** or specific wireless firmware; see **packages.both (https://projects.archlinux.org/archiso.git/tree/configs/releng/packages.both)** for comparison.

To **install** packages and other groups such as **base-devel (https://www.archlinux.org/groups/x86_64/base-devel/)**, append the names to *pacstrap* (space separated) or to individual **pacman** commands after the **#Chroot** step.

Configure the system

Fstab

Generate an **fstab** file (use `-U` or `-L` to define by **UUID** or labels, respectively):

```
# genfstab -U /mnt >> /mnt/etc/fstab
```

Check the resulting file in `/mnt/etc/fstab` afterwards, and edit it in case of errors.

Chroot

Change root into the new system:

```
# arch-chroot /mnt
```

Time zone

Set the **time zone**:

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

Run **hwclock(8) (https://jlk.fjfi.cvut.cz/arch/manpages/man/hwclock.8)** to generate `/etc/adjtime`:

```
# hwclock --systohc
```

This command assumes the hardware clock is set to **UTC**. See **Time#Time standard** for details.

Locale

Uncomment `en_US.UTF-8 UTF-8` and other needed **localizations** in `/etc/locale.gen`, and generate them with:

```
# locale-gen
```

Set the `LANG` **variable** in **locale.conf(5) (https://jlk.fjfi.cvut.cz/arch/manpages/man/locale.conf.5)** accordingly, for example:

```
/etc/locale.conf
```
```
LANG=en_US.UTF-8
```

If you **set the keyboard layout**, make the changes persistent in **vconsole.conf(5) (https://jlk.fjfi.cvut.cz/arch/manpages/man/vconsole.conf.5)**:

```
/etc/vconsole.conf
```
```
KEYMAP=de-latin1
```

Hostname

Create the **hostname** file:

```
/etc/hostname
```
```
myhostname
```

Add matching entries to **hosts(5) (https://jlk.fjfi.cvut.cz/arch/manpages/man/hosts.5)**:

```
/etc/hosts

127.0.0.1        localhost
::1              localhost
127.0.1.1        myhostname.localdomain   myhostname
```

If the system has a permanent IP address, it should be used instead of `127.0.1.1`.

Network configuration

The newly installed environment has no network connection activated by default. See
Network configuration#Network managers.

For **Wireless configuration**, **install** the `iw (https://www.archlinux.org/packages/?name=iw)`
and `wpa_supplicant (https://www.archlinux.org/packages/?name=wpa_supplicant)` packages, as
well as needed **firmware packages**. Optionally install `dialog (https://www.archlinux.org/pac`
`kages/?name=dialog)` for usage of *wifi-menu*.

Initramfs

Creating a new *initramfs* is usually not required, because **mkinitcpio** was run on
installation of the `linux (https://www.archlinux.org/packages/?name=linux)` package with
pacstrap.

For special configurations, modify the `mkinitcpio.conf(5) (https://jlk.fjfi.cvut.cz/arch/manpa`
`ges/man/mkinitcpio.conf.5)` file and recreate the initramfs image:

```
# mkinitcpio -p linux
```

Root password

Set the root **password**:

```
# passwd
```

Boot loader

A Linux-capable boot loader must be installed in order to boot Arch Linux. See **Category:Boot loaders** for available choices.

If you have an Intel CPU, install the `intel-ucode (https://www.archlinux.org/packages/?name=intel-ucode)` package in addition, and **enable microcode updates**.

Reboot

Exit the chroot environment by typing `exit` or pressing `Ctrl+D`.

Optionally manually unmount all the partitions with `umount -R /mnt`: this allows noticing any "busy" partitions, and finding the cause with `fuser(1) (https://jlk.fjfi.cvut.cz/arch/manpages/man/fuser.1)`.

Finally, restart the machine by typing `reboot`: any partitions still mounted will be automatically unmounted by *systemd*. Remember to remove the installation media and then login into the new system with the root account.

Post-installation

See **General recommendations** for system management directions and post-installation tutorials (like setting up a graphical user interface, sound or a touchpad).

For a list of applications that may be of interest, see **List of applications**.

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