

# ARCH LINUX “FROM SCRATCH” + GNOME + INTEL CHIPSET + UEFI + SECURE BOOT

## 1. UEFI & KEYBOARD & LOCALE

IMPORTANT: ENABLE SECURE BOOT WITH NO KEYS ENROLLED

- a. ls /sys/firmware/efi/efivars ... if there's an error ... it's not UEFI
- b. efibootmgr ... should list "Linux Boot Manager"

```
loadkeys br-abnt2
nano /etc/locale.gen ... unmark LANG=pt_BR.UTF-8
locale-gen
nano /etc/locale.conf ... set LANG=pt_BR.UTF-8
```

## 2. NETWORK & CONNECTIVITY BY WI-FI

```
ip link
iwctl
device list
station wlan0 scan
station wlan0 get-networks
station wlan0 connect
exit
ping 1.1.1.3
```

```
timedatectl
```

```
ls /usr/share/kbd/consolefonts/ | grep ter-122b
if yes: setfont ter-122b
if not: pacman -Sy terminus-font
then : setfont ter-122b
```

## 3. PARTITIONING & FORMATTING NVME

```
parted /dev/nvme0n1 mklabel gpt
parted /dev/nvme0n1 mkpart ESP fat32 1MiB 1025MiB
parted /dev/nvme0n1 set 1 esp on
parted /dev/nvme0n1 mkpart primary ext4 1025MiB 4097MiB
parted /dev/nvme0n1 mkpart primary btrfs 4097MiB 100%
```

```
mkfs.fat -F32 /dev/nvme0n1p1
mkfs.ext4 -L B00T /dev/nvme0n1p2
mkfs.btrfs -L R00T /dev/nvme0n1p3
```

## 4. MOUNTING BTRFS SUBVOLUMES

```
mount /dev/nvme0n1p3 /mnt
btrfs subvolume create /mnt/@
btrfs subvolume create /mnt/@home
btrfs subvolume create /mnt/@log
```

```
btrfs subvolume create /mnt/@pkg
btrfs subvolume create /mnt/@snapshots
umount /mnt

mount -o subvol=@ /dev/nvme0n1p3 /mnt
mkdir -p /mnt/{home,var/log,var/cache/pacman/pkg,var/snapshots}
mount -o subvol=@home /dev/nvme0n1p3 /mnt/home
mount -o subvol=@log /dev/nvme0n1p3 /mnt/var/log
mount -o subvol=@pkg /dev/nvme0n1p3 /mnt/var/cache/pacman/pkg
mount -o subvol=@snapshots /dev/nvme0n1p3 /mnt/var/snapshots
mkdir -p /mnt/boot
mount /dev/nvme0n1p2 /mnt/boot
mkdir -p /mnt/boot/efi
mount /dev/nvme0n1p1 /mnt/boot/efi
```

## 5. BASE SYSTEM INSTALLATION FOR INTEL CHIPSET

```
reflector --latest 20 --sort rate --save /etc/pacman.d/mirrorlist

pacstrap -K /mnt base linux-firmware linux-lts linux-lts-headers linux-zen
linux-zen-headers dkms dracut intel-ucode vulkan-intel vulkan-mesa-device-select
vulkan-tools apparmor btrfs-progs efibootmgr iwd nano networkmanager sbctl sudo

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

## 6. CHROOT CONFIGURATION

```
arch-chroot /mnt

ln -sf /usr/share/zoneinfo/America/Araguaina /etc/localtime
hwclock --systohc
nano /etc/locale.gen ... check if LANG=pt_BR.UTF-8 is enabled
locale-gen
nano /etc/locale.conf ... set LANG=pt_BR.UTF-8
nano /etc/vconsole.conf ... set KEYMAP=br-abnt2
nano /etc/hostname ... set book (choose a personal name)

passwd ... setting "root" admin password
useradd -m -g users -G wheel -s /bin/bash arch (choose a personal name)
passwd arch ... setting arch sudo password
EDITOR=nano visudo
%wheel ALL=(ALL:ALL) ALL ... uncomment for enabling sudo for arch user
```

## 7. BOOTLOADER (SYSTEMD-BOOT)

### a. bootctl config

```
blkid /dev/nvme0n1p3 ... catch the UUID in PARTUUID field
nano /boot/loader/entries/arch-zen.conf
```

```
title Arch Linux ZEN
linux /vmlinuz-linux-zen
initrd /intel-ucode.img
initrd /initramfs-linux-zen.img
options root=PARTUUID=<UUID catched> zswap.enabled=0 rootfstype=btrfs
rootflags=subvol=@ rw apparmor=1 security=apparmor loglevel=3
```

```
nano /boot/loader/entries/arch-lts.conf
```

```
title Arch Linux LTS
linux /vmlinuz-linux-lts
initrd /intel-ucode.img
initrd /initramfs-linux-lts.img
options root=PARTUUID=<UUID catched> zswap.enabled=0 rootfstype=btrfs
rootflags=subvol=@ rw apparmor=1 security=apparmor loglevel=3
```

IMPORTANT: Dracut does not create or manage initramfs fallback

```
nano /boot/loader/loader.conf
```

```
default arch-zen.conf
timeout 2
console-mode max
editor no
```

b. sbctl config

```
sbctl verify
sbctl create-keys
sbctl verify
sbctl sign -s ... (sign each entry listed by verify command)
sbctl enroll-keys
sbctl list-enrolled-keys
sbctl status
```

```
nano /etc/sysctl.d/99-sysctl.conf
```

```
kernel.kptr_restrict = 2
kernel.dmesg_restrict = 1
kernel.randomize_va_space = 2
fs.protected_hardlinks = 1
fs.protected_symlinks = 1
```

```
sysctl --system
```

c. hooks config

```
mkdir -p /etc/pacman.d/hooks (necessary)
```

```
nano /etc/pacman.d/hooks/99-secureboot.hook

[Trigger]
Operation = Upgrade
Type = Package
Target = linux-zen
Target = linux-lts
Target = systemd

[Action]
Description = Signing linux-zen linux-lts kernels initramfs systemd-boot with
sbctl
When = PostTransaction
Exec = /bin/sh -c 'sbctl sign -s /boot/vmlinuz-linux-zen 2>/dev/null || true &&
sbctl sign -s /boot/vmlinuz-linux-lts 2>/dev/null || true && sbctl sign -s
/boot/initramfs-linux-zen*.img 2>/dev/null || true && sbctl sign -s
/boot/initramfs-linux-lts*.img 2>/dev/null || true && sbctl sign -s
/boot/EFI/BOOT/BOOTX64.EFI 2>/dev/null || true && sbctl sign -s
/boot/EFI/systemd/systemd-bootx64.efi 2>/dev/null || true'
```

d. generate initramfs

- a. ls /sys/firmware/efi/efivars ... check if UEFI remain active
- b. efibootmgr ... should list "Linux Boot Manager"

```
systemctl enable apparmor.service
systemctl enable NetworkManager.service
```

dracut --force --verbose

exit ... exiting from chroot environment

```
umount -R /mnt
swapoff -a
```

reboot + F2 + Secure Boot + Key Management + Verify Keys or Import Keys if you did not has used sbctl enroll-keys + F10

## 8. POST-INSTALLATION NETWORK CONFIGURATION

Login: root

```
systemctl start NetworkManager.service
```

```
nmcli general status
nmcli device status
nmcli device wifi list
nmcli device wifi connect "SSID" --ask (or -a)
```

```
pacman -Sy terminus-font
setfont ter-122b
```

```
bootctl status
```

```
Secure Boot: enabled (user keys)
```

```
sbctl status
```

```
Secure Boot: enabled  
Setup Mode: disabled  
Vendor keys: disabled  
User keys: enrolled
```

## 9. INSTALLING GNOME DESKTOP

```
[ Gnome Desktop – 68 ] pacman -S adwaita-icon-theme colord eog extension-manager  
file-roller fwupd gdm gedit gedit-plugins gnome gnome-backgrounds gnome-  
bluetooth gnome-boxes gnome-browser-connector gnome-calculator gnome-calendar  
gnome-characters gnome-clocks gnome-color-manager gnome-control-center gnome-  
disk-utility gnome-firmware gnome-info-collect gnome-keyring gnome-logs gnome-  
menus gnome-music gnome-online-accounts gnome-power-manager gnome-session gnome-  
settings-daemon gnome-shell-extensions gnome-terminal gnome-text-editor gnome-  
themes-extra gnome-tweaks gnome-usage gnome-user-docs gnome-weather grilo-  
plugins gst-plugins-base gst-plugins-base-libs gthumb gvfs gvfs-afc gvfs-dnssd  
gvfs-goa gvfs-gphoto2 gvfs-mtp gvfs-nfs gvfs-smb gvfs-wsdd localsearch loupe  
mesa-utils mutter nautilus rygel seahorse simple-scan system-config-printer  
tinysparql xdg-desktop-portal-gnome xdg-user-dirs-gtk xkeyboard-config yelp  
yelp-tools yelp-xsl
```

```
systemctl enable gdm.service  
systemctl status gdm.service
```

```
reboot
```

```
Login: "user" & "password"
```

```
sudo systemctl start gdm.service (if necessary)
```

## 10. ESSENTIALS PACKAGES AND CONFIGURATIONS

Installation of applications and services complementary to Gnome Desktop

```
[ GUI ] sudo pacman -S collision decibels firefox firefox-i18n-pt-br firewalld  
foliate font-manager fragments gparted eyedropper libreoffice-still libreoffice-  
still-pt-br mission-center mpv network-manager-applet papers pavucontrol ptyxis  
qalculate-gtk shotwell showtime snapshot timeshift zed
```

```
[ CLI ] sudo pacman -S alsa-utils aspell aspell-en aspell-pt at-spi2-core avahi  
bashtop bat bind-tools bluez bluez-utils cronie cups cups-browsed cups-filters  
cups-pdf curl ethtool fail2ban fastfetch fd ffmpeg foomatic-db foomatic-db-  
engine foomatic-db-ppds fzf git glances grc gutenprint hspell htop hunspell  
hwinfo imagemagick inxi iproute2 less libssh libssh2 libvncserver libvoikko  
libwireplumber lsd lsof man-db man-pages meson ninja nmap nss-mdns ntfs-3g  
nuspell p7zip pacman pacman-contrib parted pipewire pipewire-pulse powertop  
pwgen qt5-wayland qt6-wayland reflector ripgrep rpcbind smartmontools speech-
```

```
dispatcher speedtest-cli tecla tlp tree unzip upower v4l-utils v4l2loopback-
utils wget wireless_tools wireplumber yt-dlp zip zram-generator zsh zsh-
autocomplete zsh-autosuggestions zsh-completions zsh-history-substring-search
zsh-lovers zsh-syntax-highlighting
```

```
[ Sistem Fonts ] sudo pacman -S gnu-free-fonts ttf-anonymous-pro ttf-atkinson-
hyperlegible ttf-bitstream-vera ttf-caladea ttf-carlito ttf-cascadia-code ttf-
crimson-pro ttf-crimson-pro-variable ttf-croscore ttf-dejavu ttf-doulos-sil ttf-
droid ttf-eurof ttf-fantasque-sans-mono ttf-fira-code ttf-fira-mono ttf-fira-
sans ttf-hack ttf-ibm-plex ttf-inconsolata ttf-input ttf-jetbrains-mono ttf-
junicode ttf-junicode-variable ttf-khmer ttf-lato ttf-liberation ttf-libertinus
ttf-linux-libertine ttf-linux-libertine-g ttf-material-icons ttf-material-
symbols-variable ttf-meslo-nerd ttf-mona-sans ttf-monospace-frozen ttf-
monospace-variable ttf-monofur ttf-monoid ttf-montserrat ttf-nunito ttf-opensans
ttf-overpass ttf-roboto ttf-roboto-mono
```

```
sudo systemctl enable avahi-daemon.service
sudo systemctl start avahi-daemon.service
```

```
sudo systemctl enable bluetooth.service
sudo systemctl start bluetooth.service
```

```
sudo systemctl enable cronie.service
sudo systemctl start cronie.service
```

```
sudo systemctl enable cups.service
sudo systemctl start cups.service
```

```
sudo systemctl enable cups-browsed.service
sudo systemctl start cups-browsed.service
```

```
sudo systemctl enable firewalld.service
sudo systemctl start firewalld.service
```

```
sudo systemctl enable tlp.service
sudo systemctl start tlp.service
```

1. setup gnome-control-center
2. setup gnome-tweaker
3. setup extension-manager
4. setup fstab: sudo nano /etc/fstab
5. setup timeshift
6. setup zram-generator
7. setup zsh: chsh -s /bin/zsh \$USER ... then logout / login

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