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

1. UEFI & KEYBOARD & LOCALE

IMPORTANT: ENABLE SECURE BOOT WITH NO KEYS ENROLLED

ls /sys/firmware/efi/efivars ... if there’s an error ... it’s not UEFI

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
if ok: 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 BOOT /dev/nvme0n1p2
mkfs.btrfs -L ROOT /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/@cache
btrfs subvolume create /mnt/@snapshots

umount /mnt

mount -o subvol=@ /dev/nvme0n1p3 /mnt

```
mkdir -p /mnt/{home,var/log,var/cache,var/snapshots}

mount -o subvol=@home /dev/nvme0n1p3 /mnt/home
mount -o subvol=@log /dev/nvme0n1p3 /mnt/var/log
mount -o subvol=@cache /dev/nvme0n1p3 /mnt/var/cache
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-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)

bootctl install

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 rootflags=subvol=@ rw
rootfstype=btrfs apparmor=1 security=apparmor loglevel=3
```

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

timeout 3
console-mode max
editor no

sbctl verify
sbctl create-keys
sbctl verify
sbctl sign -s (sign each entrie listed above)
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

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

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

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

[Action]
Description = Signing linux-zen kernel & 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/initramfs-*.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'

ls /sys/firmware/efi/efivars ... check if UEFI remain active

efibootmgr ... should list "Linux Boot Manager"

systemctl enable NetworkManager.service ... enable network connection

dracut --force --verbose

exit ... exiting from chroot environment

umount -R /mnt
swapoff -a

reboot + F2 + Secure Boot + Custom Mode + Import Keys [ only if you did not
has used sbctl enroll-keys ]
```

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
```

9. INSTALLING GNOME AND ESSENTIAL PACKAGES

[Gnome System] pacman -S **gdm** adwaita-icon-theme 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 xdg-desktop-portal-gnome xdg-user-dirs-gtk xkeyboard-config **mutter**

[Applications] pacman -S collision decibels eog extension-manager eyedropper file-roller firefox firefox-i18n-pt-br firewalld foliate font-manager fragments gedit gparted gthumb gvfs gvfs-afc gvfs-dnssd gvfs-goa gvfs-gphoto2 gvfs-mtp gvfs-nfs gvfs-smb gvfs-wsdd libreoffice-still libreoffice-still-pt-br loupe mission-center mpv nautilus network-manager-applet papers pavucontrol qalculate-gtk seahorse shotwell showtime simple-scan snapshot system-config-printer timeshift

[CLI-I] pacman -S alsa-utils aspell aspell-en aspell-pt at-spi2-core avahi bashtop bat bind-tools bluez bluez-utils colord cronie cups cups-browsed cups-filters cups-pdf curl ethtool fail2ban fastfetch fd ffmpeg foomatic-db foomatic-db-engine foomatic-db-ppds fwupd fzf gedit-plugins git glances grc grilo-plugins gst-plugins-base gst-plugins-base-libs gutenprint hspell htop hunspell hwinfo imagemagick inxi iproute2 less libssh libssh2 libvncserver libvoikko libwireplumber localsearch lsd lsof

[CLI-II] pacman -S man-db man-pages mesa-utils meson ninja nmap nss-mdns ntfs-3g nuspell p7zip pacman-contrib parted pipewire pipewire-pulse powertop ptyxis pwgen qt5-wayland qt6-wayland reflector ripgrep rpcbind rygel smartmontools speech-dispatcher speedtest-cli tecla tinysparql 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 yelp yelp-tools yelp-xsl zed

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

systemctl enable apparmor.service
systemctl enable avahi-daemon.service
systemctl enable bluetooth.service
systemctl enable cronie.service
systemctl enable cups.service
```

```
systemctl enable cups-browsed.service
systemctl enable firewalld.service
systemctl enable tlp.service

reboot

Login: “user” & “password” ... if fail --> make login by CLI

CLI command: sudo systemctl start gdm.service

sbctl status

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

bootctl status

    Secure Boot: enabled (user keys)

10. CONFIGURATIONS AND OPTIMIZATIONS

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
8. install 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-monaspace-frozen
ttf-monaspace-variable ttf-monofur ttf-monoid ttf-montserrat ttf-nunito ttf-
opensans ttf-overpass ttf-roboto ttf-roboto-mono
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