

Arch Linux LVM Installation Guide

Overview

Here is a clean, parameterized, automation-ready Arch Linux LVM installation flow with:

- Parametrized superuser name ('SUPERUSER')
- LVM-based swap LV (no plain swap partition)
- Automated password assignment
- Wheel = passworded sudo, SUPERUSER = passwordless sudo

Everything is deterministic and safe for Packer shell provisioners.

❖ Parameter block (live ISO)

```
# --- PARAMETERS ---
DISK=/dev/sda
VGNAME=vg0
LVROOT=root
LVSWAP=swap

SUPERUSER="hammad"          # parametrized superuser name
SUPERPASS="YourPasswordHere" # automated password
SSH_PUBKEY="YOUR_SSH_PUBKEY_HERE"

HOSTNAME="archlvm"
TIMEZONE="Canada/Eastern"
LOCALE="en_CA.UTF-8"
KEYMAP="us"

SWAPSIZE="1G"    # LVM swap size (adjust as needed)
```

1. Disk partitioning (EFI + LVM PV only)

Layout:

1. EFI – 512 MiB
2. LVM PV – rest of disk

```
sgdisk --zap-all "$DISK"
parted -s "$DISK" mklabel gpt

# EFI partition
parted -s "$DISK" mkpart ESP fat32 1MiB 513MiB
parted -s "$DISK" set 1 esp on

# LVM PV partition
parted -s "$DISK" mkpart primary 513MiB 100%
```

```
parted -s "$DISK" set 2 lvm on  
  
mkfs.fat -F32 "${DISK}1"  
  
2. LVM setup (root + swap LVs)  
pvcreate "${DISK}2"  
vgcreate "$VGNAME" "${DISK}2"  
  
# Swap LV  
lvcreate -L "$SWAPSIZE" -n "$LVSWAP" "$VGNAME"  
  
# Root LV (remaining space)  
lvcreate -l 100%FREE -n "$LVROOT" "$VGNAME"  
  
mkfs.ext4 "/dev/$VGNAME/$LVROOT"  
mkswap "/dev/$VGNAME/$LVSWAP"
```

3. Mount target

```
mount "/dev/$VGNAME/$LVROOT" /mnt  
mkdir -p /mnt/boot  
mount "${DISK}1" /mnt/boot  
swapon "/dev/$VGNAME/$LVSWAP"
```

4. Install base system + required packages

```
pacstrap -K /mnt \  
base linux linux-firmware \  
lvm2 python git nano bash sudo openssh
```

5. Generate fstab

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

6. Chroot

```
arch-chroot /mnt /bin/bash
```

7. System configuration

```
ln -sf "/usr/share/zoneinfo/$TIMEZONE" /etc/localtime  
hwclock --systohc  
  
echo "$LOCALE UTF-8" >> /etc/locale.gen  
locale-gen  
echo "LANG=$LOCALE" > /etc/locale.conf  
  
echo "KEYMAP=$KEYMAP" > /etc/vconsole.conf  
  
echo "$HOSTNAME" > /etc/hostname  
cat > /etc/hosts <<EOF  
127.0.0.1 localhost  
::1 localhost
```

```
127.0.1.1      $HOSTNAME.localdomain $HOSTNAME
EOF
```

8. Enable LVM in initramfs

```
sed -i 's/^HOOKS=(\(.*\)\) filesystems/HOOKS=(\1 lvm2 filesystems/' \
/etc/mkinitcpio.conf
mkinitcpio -P
```

9. Bootloader (systemd-boot)

```
bootctl install
```

```
cat > /boot/loader/loader.conf <<EOF
default arch
timeout 3
editor no
EOF

cat > /boot/loader/entries/arch.conf <<EOF
title Arch Linux
linux /vmlinuz-linux
initrd /initramfs-linux.img
options root=/dev/$VGNAME/$LVROOT rw
EOF
```

10. Create parametrized superuser with automated password

```
useradd -m -G wheel -s /bin/bash "$SUPERUSER"
echo "${SUPERUSER}:$SUPERPASS" | chpasswd
```

11. Sudo configuration

```
# wheel group: password required
cat > /etc/sudoers.d/10-wheel <<'EOF'
%wheel ALL=(ALL:ALL) ALL
EOF
chmod 440 /etc/sudoers.d/10-wheel

# SUPERUSER: passwordless sudo
cat > /etc/sudoers.d/11-superuser-nopasswd <<EOF
$SUPERUSER ALL=(ALL:ALL) NOPASSWD: ALL
EOF
chmod 440 /etc/sudoers.d/11-superuser-nopasswd
```

12. SSH key for SUPERUSER

```
install -d -m 700 -o "$SUPERUSER" -g "$SUPERUSER"
/home/"$SUPERUSER"/.ssh
echo "$SSH_PUBKEY" > /home/"$SUPERUSER"/.ssh/authorized_keys
chown "$SUPERUSER":$SUPERUSER /home/"$SUPERUSER"/.ssh/authorized_keys
chmod 600 /home/"$SUPERUSER"/.ssh/authorized_keys

systemctl enable sshd
```

13. Finalize

```
exit  
swapoff "/dev/$VGNAME/$LVSWAP"  
umount -R /mnt  
reboot
```