

Universal Linux Boot Troubleshooting Guide

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This guide provides recovery procedures for common Linux boot issues applicable to both RHEL/CentOS and Debian/Ubuntu systems. Commands are provided for each family where they differ.

1. Recovering from Kernel Panic (Missing or Corrupted initramfs)

A kernel panic can occur if the '/boot/initramfs' or '/boot/initrd.img' file is missing or corrupted.

RHEL / CentOS:

```
dracut -v /boot/initramfs-$(uname -r).img $(uname -r)
# To force regeneration:
dracut -v -f /boot/initramfs-$(uname -r).img $(uname -r)
```

Debian / Ubuntu:

```
update-initramfs -c -k $(uname -r)
# To update existing:
update-initramfs -u -k $(uname -r)
```

2. Restoring Deleted vmlinuz Files

If both 'vmlinuz' and 'vmlinuz.rescue' files are deleted, reinstall the kernel package.

RHEL / CentOS:

```
yum reinstall kernel # or dnf reinstall kernel
```

Debian / Ubuntu:

```
apt install --reinstall linux-image-$(uname -r)
```

3. Repairing a Corrupted grub.cfg

If the GRUB configuration file is missing or corrupted, regenerate it using the following commands:

RHEL / CentOS:

```
grub2-mkconfig -o /boot/grub2/grub.cfg
```

Debian / Ubuntu:

```
grub-mkconfig -o /boot/grub/grub.cfg
```

Optional for both:

```
touch /.autorelabel # fix SELinux contexts if applicable
```

4. Rebuilding the /boot/grub Directory

If the entire GRUB directory is deleted, reinstall GRUB from rescue mode.

RHEL / CentOS:

```
grub2-install /dev/sda
grub2-mkconfig -o /boot/grub2/grub.cfg
```

Debian / Ubuntu:

```
grub-install /dev/sda
grub-mkconfig -o /boot/grub/grub.cfg
```

Note: On UEFI systems, GRUB files may reside in `/boot/efi/EFI//`.

5. Resetting Forgotten Root Password

If you forgot the root password, boot into single-user mode or modify the GRUB boot entry.

1. Reboot and interrupt the boot process.
2. Highlight the boot entry and press 'e'.
3. Replace 'ro' with 'rw init=/bin/bash' (Debian) or 'rw init=/sysroot/bin/sh' (RHEL).
4. Press Ctrl + X to boot.
5. Change password:

```
chroot /sysroot # RHEL only
passwd root
touch /.autorelabel
exit
reboot
```

■ This guide covers common Linux boot recovery scenarios for both RHEL-based and Debian-based distributions.