

CentOS Kernel Upgrade

RedHat KB: [CHAPTER 5. MANUALLY UPGRADING THE KERNEL](#)

Kernel Packages

CentOS/RedHat Linux ? kernel ??????????

- kernel — Contains the kernel for single-core, multi-core, and multi-processor systems.
- kernel-debug — Contains a kernel with numerous debugging options enabled for kernel diagnosis, at the expense of reduced performance.
- kernel-devel — Contains the kernel headers and makefiles sufficient to build modules against the kernel package.
- kernel-debug-devel — Contains the development version of the kernel with numerous debugging options enabled for kernel diagnosis, at the expense of reduced performance.
- kernel-doc — Documentation files from the kernel source. Various portions of the Linux kernel and the device drivers shipped with it are documented in these files. Installation of this package provides a reference to the options that can be passed to Linux kernel modules at load time.
By default, these files are placed in the `/usr/share/doc/kernel-doc-kernel_version/` directory.
- kernel-headers — Includes the C header files that specify the interface between the Linux kernel and user-space libraries and programs. The header files define structures and constants that are needed for building most standard programs.
- linux-firmware — Contains all of the firmware files that are required by various devices to operate.
- perf — This package contains the perf tool, which enables performance monitoring of the Linux kernel.
- kernel-abi-whitelists — Contains information pertaining to the Red Hat Enterprise Linux kernel ABI, including a lists of kernel symbols that are needed by external Linux kernel modules and a yum plug-in to aid enforcement.
- kernel-tools — Contains tools for manipulating the Linux kernel and supporting documentation.

Preparing to upgrade

```
# Current kernel running
uname -a
# Grub2 Info for syatem booting
```

```
awk -F\ ' '$1=="menuentry " {print $2}' /boot/grub2/grub.cfg
```

```
grub2-editenv list
```

```
# Current kernel packages installed
```

```
rpm -qa | grep kernel
```

```
# Or
```

```
yum list installed "kernel-*
```

Downloading the upgraded kernel

? [RedHat Custom Portal](#) ??????? kernel ??

1. `kernel-3.10.0-1062.el7.x86_64.rpm?`
2. `linux-firmware-20190429-72.gitddde598.el7.noarch.rpm` (?????????????????)

Performing the upgrade

?? kernel ?????????? Dracut ????????? initialRAM file system ?????????? Dracut ???????

?? kernel

```
# ███ linux-firmware
# NOTE: ██████████ -ivh
rpm -Uvh linux-firmware-20190429-72.gitddde598.el7.noarch.rpm

# ███ kernel
# NOTE: ██████████ -Uvh
rpm -ivh kernel-3.10.0-1062.el7.x86_64.rpm
```

????

??? kernel ?????????????????????? `/etc/sysconfig/kernel?`

```
# UPDATEDEFAULT specifies if new-kernel-pkg should make
# new kernels the default
UPDATEDEFAULT=yes

# DEFAULTKERNEL specifies the default kernel package type
DEFAULTKERNEL=kernel
```

Listing the contents of the initial RAM file system image

```
# To list the files that are included in the initramfs, run the following command as root:
lsinitrd

# To only list files in the /etc directory, use the following command:
lsinitrd | grep etc/

# To output the contents of a specific file stored in the initramfs for the current kernel,
use the -f option:
lsinitrd -f filename

# For example, to output the contents of sysctl.conf, use the following command:
lsinitrd -f /etc/sysctl.conf

# To specify a kernel version, use the --kver option:
lsinitrd --kver kernel_version -f /etc/sysctl.conf

# For example, to list the information about kernel version 3.10.0-327.10.1.el7.x86_64, use
the following command:
lsinitrd --kver 3.10.0-327.10.1.el7.x86_64 -f /etc/sysctl.conf
```

Reversing Changes Made to the Initial RAM File System Image

????????? initialramfs file ??

1. Reboot the system choosing the rescue kernel in the GRUB menu.
2. Change the incorrect setting that caused the initramfs to malfunction.
3. Recreate the initramfs with the correct settings by running the following command as root:

```
dracut --kver <kernel_version> --force
```

FAQ

linux-firmware package files conflicts

Solution:

```
# Install kernel
rpm -ivh kernel-3.10.0-1062.el7.x86_64.rpm
```

```
warning: kernel-3.10.0-1062.el7.x86_64.rpm: Header V3 RSA/SHA256 Signature, key ID fd431d51:
NOKEY
error: Failed dependencies:
    linux-firmware >= 20190429-72 is needed by kernel-3.10.0-1062.el7.x86_64

# Install linux-firmware
rpm -ivh linux-firmware-20190429-72.gitddde598.el7.noarch.rpm kernel-3.10.0-
1062.el7.x86_64.rpm

warning: linux-firmware-20190429-72.gitddde598.el7.noarch.rpm: Header V3 RSA/SHA256 Signature,
key ID f4a80eb5: NOKEY
warning: kernel-3.10.0-1062.el7.x86_64.rpm: Header V3 RSA/SHA256 Signature, key ID fd431d51:
NOKEY
Preparing...                               ##### [100%]
    file /usr/lib/firmware/amd-ucode/microcode_amd_fam17h.bin from install of linux-
firmware-20190429-72.gitddde598.el7.noarch conflicts with file from package linux-firmware-
20180911-69.git85c5d90.el7.noarch
    file /usr/lib/firmware/amd-ucode/microcode_amd_fam17h.bin.asc from install of linux-
firmware-20190429-72.gitddde598.el7.noarch conflicts with file from package linux-firmware-
20180911-69.git85c5d90.el7.noarch

# Solution: using -Uvh to upgrade the linux-firmware
rpm -Uvh linux-firmware-20190429-72.gitddde598.el7.noarch.rpm
rpm -ivh kernel-3.10.0-1062.el7.x86_64.rpm
```

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