Linux Academy

Update the Red Hat 7 Kernel Package to Ensure a Bootable System

Rob Marti

rob@linuxacademy.com

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Updating the Kernel

While in most instances, you can update your Red Hat system's kernel with `yum`, downloading and installing the latest kernel using RPM is an alternative method for keeping your kernel up-to-date.

> This process can also be used to install a custom kernel on the system. Red Hat does not consider any "Red Hat" systems running a custom kernel a Red Hat system.

Getting Started

Start the Live! Lab, and then SSH into your server with the given credentials. We need to work as `root` to update the kernel. You can also prepend `sudo` to any commands if working as a superuser.

Determining the Kernel

Use the `uname` command to view information regarding your system. In particular, we want to use the `uname -r` command, which outputs the kernel release number.

For example:

```
[root@linuxacademy1 ~]# uname -r
3.10.0-327.18.2.el7
```

Your results should be similar, if not identical. The kernel *3.10.0-327.18.2.el7.x86_64* is currently the default kernel in this lab. If running on an outside server, your results may differ.

Obtaining the New Kernel

Now that you are aware of the kernel version run `yum list kernel` to see if there are any available kernel updates. When run, you may receive a notification stating that the repodata is out-of-date. To solve this, run `yum clean all` and then re-run the previous command:

```
yum clean all
yum list kernel
```

The output now lists a newer, updated kernel, currently *3.10.0-957.5.1.el7*, although yours may be newer.

Downloading the Kernel

We can download the RPM of the new kernel through the use of `yumdownloader`. Run:

```
yumdownloader kernel
```

And install:

```
rpm -ivh kernel-3.10.0-957.5.1.el7.x86_64.rpm
```

The name of your kernel package may vary. At this point you may realize, upon running the above command, you receive an error relating to failed dependencies. To resolve this, we need to update our `linux-firmware` and `dracut` packages:

```
yum install linux-firmware dracut
```

With the dependencies resolved, rerun the installation command.

If you now navigate to the `/boot` directory, you can view the newest kernel installed under *vmlinuz-3.10.0-957.5.1.el7.x86_64*. You can also see the older kernel located alongside it.

If *vmlinuz-3.10.0-957.5.1.el7.x86_64* is not located in the `/boot` directory, run `dracut` to regenerate it for the latest kernel.

Ensure the new kernel is installed by `reboot`ing the system and once more running the `uname -r` command. It should output the version number of the newly-downloaded kernel.

Booting Different Kernels

Through the use of the GRUB bootloader, we can designate from which kernel we want to boot. Those of you who use Linux in a desktop environment may already be familiar with the GRUB boot menu, and may be wondering how we can use GRUB when our Linux Academy lab servers do not bring up boot menu upon login. To do this by altering which kernel we use through the command line.

Run `yum list kernel` to view a list of available kernels. Both our old and new kernels are available.

To change the default kernel, we use the `grub2-set-default` command followed by a number, `0` denotes newer kernel, `1` the older.

Run:

```
grub2-set-default 1
```

Then reboot. Should you run `uname -r` once more, you should see that we are using the older kernel. To change back replace the `1` in the above code with a `0`, rerun the command, and reboot the system.