

# How to Harden Your cPanel System's Kernel

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## Overview

This document describes how to install the cPanel hardened kernel update for the Linux® kernel on CentOS 6 servers.

If you enable both of the `SymLinksIfOwnerMatch` and `FollowSymLinks` configuration settings, Apache becomes vulnerable to a race condition through symlinks. This symlink vulnerability allows a malicious user to serve files from anywhere on a server that strict OS-level permissions do not protect. The cPanel Hardened Kernel update provides Symlink Race Condition Protection.

If you need assistance, contact [cPanel Technical Support](#).

### Warnings:

- We **deprecated** the cPanel-provided hardened kernel update in cPanel & WHM version 68. We **strongly** recommend that you **remove the hardened kernel** and consider KernelCare's symlink protection options. For more information about KernelCare, read the [KernelCare](#) documentation.
- The cPanel-provided kernel update will **not** work for OpenVZ®, Virtuozzo®, LXC, or other container-based systems.
- This document **only** applies to systems installed with CentOS 6 64-bit systems.
- cPanel & WHM does **not** automatically update the operating system kernel. Unattended system kernel updates may cause unplanned reboots or system failures.
- We **strongly** suggest that **only** experienced System Administrators perform this process.
- Do **not** perform these steps if you use KernelCare™, KernelSplice, or similar technologies.

## Harden your system's kernel

To harden your cPanel system's kernel, log in to your server as the `root` user via SSH and perform the following steps:

### Retrieve the repository from cPanel

After you log in to your server, run the following commands to download the signed kernel repository from the `securedownloads.cpanel.net` site. To do this, run the following command:

```
cd /etc/yum.repos.d/  
wget https://securedownloads.cpanel.net/cPkernel/cPkernel.repo
```

This command returns output that resembles the following example:

```
2016-04-22 12:59:10
https://securedownloads.cpanel.net/cPkernel/cPkernel.repo
Resolving securedownloads.cpanel.net... 1.2.3.4
Connecting to securedownloads.cpanel.net|1.2.3.4|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 221 [text/plain]
Saving to: "cPkernel.repo"
100%[=====>] 1,235 --.-K/s in 0s
2016-04-22 12:59:10 (28.8 MB/s) - "cPkernel.repo" saved [1235]
```

## Update the kernel

After you download the signed kernel repository, update the kernel on your system. To do this, run the following command:

```
yum -y update kernel
```

This command returns output that resembles the following example:

```
Loaded plugins: fastestmirror
Setting up Update Process
Determining fastest mirrors
epel/metalink | 10 kB 00:00
* base: repos.mia.quadranet.com
* epel: reflector.westga.edu
* extras: mirror.5ninesolutions.com
* updates: mirror.us.oneandone.net
base | 3.7 kB 00:00
cPkernel | 2.9 kB
00:00 ...
cPkernel/primary_db | 1.5 MB 00:01
epel | 4.3 kB 00:00
http://reflector.westga.edu/repos/Fedora-EPEL/6/x86_64/repodata/repomd.xml:
[Errno -1] repomd.xml does not match metalink for epel
Trying other mirror.
epel | 4.3 kB 00:00
epel/primary_db | 5.9 MB 00:00
extras | 3.4 kB 00:00
updates | 3.4 kB 00:00
updates/primary_db | 2.0 MB 00:00
Resolving Dependencies
--> Running transaction check
---> Package kernel.x86_64 0:2.6.32-642.4.199.cpanel6 will be installed
--> Processing Dependency: kernel-firmware >= 2.6.32-642.4.199.cpanel6 for
package: kernel-2.6.32-642.4.199.cpanel6.x86_64
--> Running transaction check
---> Package kernel-firmware.noarch 0:2.6.32-642.4.2.el6 will be updated
```

---> Package kernel-firmware.x86\_64 0:2.6.32-642.4.199.cpanel6 will be an update

--> Finished Dependency Resolution

#### Dependencies Resolved

```
=====
=====
Package                Arch      Version                Repository
Size
=====
Installing:
kernel                 x86_64    2.6.32-642.4.199.cpanel6  cPkernel
32 M
Updating for dependencies:
kernel-firmware       x86_64    2.6.32-642.4.199.cpanel6  cPkernel
28 M
```

#### Transaction Summary

```
=====
=====
Install      1 Package(s)
Upgrade      1 Package(s)
```

Total download size: 60 M

Downloading Packages:

```
(1/2): kernel-2.6.32-642.4.199.cpanel6.x86_64.rpm | 32 MB 00:06
...
(2/2): kernel-firmware-2.6.32-642.4.199.cpanel6.x86_64.r | 28 MB 00:06
...
-----
```

```
-----
Total                                     4.8 MB/s | 60 MB 00:12
```

warning: rpmts\_HdrFromFdno: Header V4 RSA/SHA512 Signature, key ID 7e931c7c: NOKEY

Retrieving key from

<https://securedownloads.cpanel.net/cPanelPublicRPMKey.asc>

Importing GPG key 0c4F842D6D:

  Userid: "user@example.com"

  From : <https://securedownloads.cpanel.net/cPanelPublicRPMKey.asc>

Running rpm\_check\_debug

Running Transaction Test

Transaction Test Succeeded

Running Transaction

  Updating : kernel-firmware-2.6.32-642.4.199.cpanel6.x86\_64

1/3

  Installing : kernel-2.6.32-642.4.199.cpanel6.x86\_64

2/3

adding symlink protection for user: nobody

Please reboot to enable symlink protection for user: nobody

  Cleanup : kernel-firmware-2.6.32-642.4.2.el6.noarch

3/3

Verifying : kernel-2.6.32-642.4.199.cpanel6.x86\_64

1/3

Verifying : kernel-firmware-2.6.32-642.4.199.cpanel6.x86\_64

2/3

Verifying : kernel-firmware-2.6.32-642.4.2.el6.noarch

3/3

Installed:

kernel.x86\_64 0:2.6.32-642.4.199.cpanel6

Dependency Updated:

```
kernel-firmware.x86_64 0:2.6.32-642.4.199.cpanel6
```

```
Complete!
```

---

## Restart the server

After you update the kernel, you **must** restart the system to complete the kernel update. To reboot the server, run the `reboot` command.

This command returns output that resembles the following example:

```
Broadcast message from user@example.com
(/dev/pts/0) at 13:02 ...
The system is going down for reboot NOW!
bash-4.1# Connection to example.com closed by remote host.
```

---

## Verify the kernel update

After you reboot your server, verify that the cPanel Hardened Kernel update succeeded. To verify that your update was successful, log in to the server as the `root` user via SSH and run the `uname` command.

This command returns output that resembles the following example:

```
[user@example.com ~]$ uname -r
*2.6.32-573.22.199.cpanel6.x86_64
```

If the command's output includes `cpanel` in the returned value, you successfully updated the kernel.

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## Additional documentation

[Suggested documentation](#) [For cPanel users](#) [For WHM users](#) [For developers](#)

- [How to Harden Your cPanel System's Kernel](#)
- [How to Manage Your php.ini Directives with PHP-FPM](#)
- [How to Set Up \(PHP\) Composer](#)
- [PHP Security Concepts](#)
- [How to Harden PHP](#)
  
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- [WHM API 1 Functions - php\\_set\\_vhost\\_versions](#)
- [Guide to the LiveAPI System - LiveAPI Methods](#)
- [Tutorial - Call UAPI's SSL::install\\_ssl Function in Custom Code](#)
- [UAPI Functions - LangPHP::php\\_get\\_impacted\\_domains](#)
- [WHM API 1 Functions - php\\_fpm\\_config\\_set](#)