

Core partners, Part 4: Managing the PlayStation 3 Wi-Fi network

Terra Soft shows you how to configure, encrypt, and maintain the built-in PS3 Wi-Fi network

Skill Level: Introductory

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Terra Soft Solutions IT Manager Aaron Johnson shows you, step-by-step, how to configure and encrypt the built-in Wi-Fi network that comes with the Cell Broadband Engine™-based Sony PlayStation 3. And, as a little bonus, get 16 quick steps that explain how to switch from a wireless network back to a wired network on the PS3.

Introduction

In this article, you will learn:

- The four major steps to configuring the built-in PS3 Wi-Fi network, including the Wi-Fi encryption options that are available to you, the two quick steps to enable encryption, and how to upgrade your Linux kernel.
- The 16 steps needed to make the complex task of switching between wired and wireless networks less arduous.

Configuring the PS3 Wi-Fi

There are four major steps to configuring the Wi-Fi that is built into the PlayStation 3:

- [Update the GameOS firmware](#)
- [Upgrade the Linux kernel](#)
- [Activate the Wi-Fi on PS3 under Linux®](#)
- [Set up or change your wireless connection](#)

Update the GameOS firmware

Before the Wi-Fi can work under Linux, you need to run GameOS firmware version 1.6 or later. Complete these steps in GameOS to ensure you are running the latest firmware.

1. Reboot into GameOS by doing the following:
 1. Log out of Linux (Yellow Dog symbol on the task bar).
 2. Select **Applications > Boot Game OS**.
 3. Click **Shutdown** from the login menu.
 4. Once the PS3 is off, push and hold the power button until you hear the second beep (about five seconds).
2. Go to **System > System update**.
3. Select **Update Via Internet**.
4. Follow the prompts to complete the update.
5. Reset the default OS by going to **Settings > System Settings > Default System**.
6. Select **OtherOS**.
7. Click **X**.
8. When prompted with **Start the other system now?**, select **Yes**.

If your kernel is upgraded, skip to [Activate the Wi-Fi on the PS3 under Linux](#). Otherwise, upgrade your kernel by continuing to the next section.

Upgrade the Linux kernel

This kernel upgrade information applies only if you are using YDL 5.0.x; YDL 6 doesn't need a kernel upgrade. If you don't need a kernel upgrade, skip to [Activate](#)

[the Wi-Fi on the PS3 under Linux.](#)

This article describes three methods to upgrade your Linux kernel:

- A semi-automated kernel upgrade that assumes your PS3 has a LAN (Ethernet) connection to the Internet under YDL
- The use of an additional personal computer and USB key or CD-R because your PS3 under Linux does *not* have an Internet connection
- A manual upgrade option for the Linux savvy with adequate Linux command-line experience.

Semi-automated method with LAN connection

Two cautions before you attempt this:

- This kernel upgrade is beta software and is not recommended in a production environment.
- This script rewrites your `kboot.conf`, which could render your system useless.

Do the following to upgrade the kernel using the semi-automated method:

1. Open a terminal window by clicking on the Yellow Dog icon on the task bar.
2. Select **Applications > Accessories > Gnome Terminal**.
3. To gain root access, type `su - [ENTER]`.
4. When prompted, enter the root password.
5. Download the auto updater script by entering:

```
wget
http://www.terrasoftsolutions.com/support/solutions/ydl_5.0/ConfigWifiKernel.sh
```

You see a progress bar and confirmation of download with
'ConfigWifiKernel.sh' saved [1089/1089]

6. Enter `chmod 700 ConfigWifiKernel.sh`
7. Run the script by entering `./ConfigWifiKernel.sh`
8. Reboot the computer by entering `reboot`

Additional computer method without LAN connection

Now go through the manual process of upgrading the YDL kernel and kboot bootloader without an Internet connection to your PS3. You'll need some Linux command-line experience to complete this.

- An Internet connection is required on an assisting computer.
- This kernel upgrade is beta software, and it is not recommended in a production environment.

This method is broken into three subtasks: download, transfer, and activate.

Download

Download the new kernel, and transfer it to a USB key. The kernel that supports Wi-Fi on the PS3 under YDL is currently beta code, so it must be downloaded outside of regular yum updates. Because your PS3 does not have an Internet connection, you are going to use a USB key or CD to transfer the new kernel from your personal computer to the PS3. Do the following:

1. Download the following items (right-click **Save Target As** or **Save Link As**):
 - [kernel-2.6.23-9.ydl5.1.ppc64.rpm](#)
 - [buildkboot.sh](#)
2. Move these items onto a USB key or burn them to CD.
3. Insert the USB key or CD into the PS3.

Transfer

Now transfer the new kernel from the USB key to the PS3. Do the following:

1. Select **YDL Menu > Applications > Accessories > Gnome Terminal**.
2. At the command prompt, enter the following commands:

```
su - [ENTER]
cd /path/to/CDorUSBkey/ [ENTER]
rpm -ivh kernel-2.6.23-9.ydl5.1.ppc64.rpm [ENTER]
```

The path to the CD is usually /media/cdrom, and the USB key /media/{Name of your usb key}.

3. Remain in the terminal as root for the Activate instructions.

Activate

To activate the new kernel, you must modify a file called `kboot`, which is located at `/etc/kboot.conf`. The following script automates this process for you. *Warning:* Use this script with caution, because it does completely rewrite your `kboot.conf`.

1. Make a backup copy of your current `kboot.conf` by entering `cp /etc/kboot.conf /etc/kboot.conf.org`
2. Run the script to build a new `kboot.conf` by entering

```
chmod 700 buildkboot.sh [ENTER]
./buildkboot.sh [ENTER]
```

3. Exit the terminal.
4. Reboot the PS3, and you should be good to go.

Manual upgrade method

Now go through the manual process of upgrading the YDL kernel and `kboot` bootloader. Again, this instruction is intended for intermediate-to-advanced users with solid Linux command-line experience. This kernel upgrade is beta software, and it is not recommended in a production environment.

This method is broken into three subtasks: update, install, and activate.

Update

Update the YDL system. The following process should be done regularly in order to maintain the YDL system:

1. Select **YDL Menu > Applications > System Tools > Software Management > Software Updater**.
2. All updates should already be selected. If not, select all updates.
3. Click **Apply Updates**.
4. After all updates are installed, select **Reboot Later** from Software Updater.

Install

Install the new kernel. The kernel that supports Wi-Fi on the PS3 under YDL is currently in beta status, so it must be downloaded separately from regular updates.

1. Select **YDL Menu > Applications > Accessories > Gnome Terminal**.

2. At the command prompt run the following commands:

```
su - [ENTER]
wget
ftp://ftp.yellowdoglinux.com/pub/yellowdog/betas/kernel/kernel-
2.6.23-9.ydl5.1.ppc64.rpm [ENTER]
rpm -ivh kernel-2.6.23-9.ydl5.1.ppc64.rpm [ENTER]
```

3. Remain in the terminal as root for the Activate instructions.

Activate

To activate the new kernel, you must modify a file called `kboot`, which is located at `/etc/kboot.conf`. You can activate manually using a command-line editor (such as `vi` or `nano`), or you can use this script to build a new `kboot.conf`. This script is built based on existing installed kernels. *Warning:* Use this script with caution, because it does completely rewrite your `kboot.conf`.

1. Make a backup copy of your current `kboot.conf` by entering `cp /etc/kboot.conf /etc/kboot.conf.org`
2. Edit `kboot.conf` using your favorite editor. For example, you can use `nano /etc/kboot.conf` [ENTER]
3. Exit the terminal.
4. Reboot the PS3, and you're ready to go.

Activate the Wi-Fi on the PS3 under Linux

For the Wi-Fi on the PS3 in Linux, it takes a little bit of work to activate wireless networking to use `eth0` (the Linux ID for the networking device). Unfortunately, the PS3 allows for either a wired or a wireless connection, but not both. This is because of Hypervisor limitations that all other operating systems (in this case Yellow Dog Linux) have to go through to get to the hardware.

To activate the Wi-Fi, do the following:

1. Log into YDL as a user.
2. Unplug the wired network cable.
3. Open the Network configuration menu by clicking on the Yellow Dog logo (**Menu Button**) from the main shelf, and then select **Applications > Applications > System Tools > System Config > Network**.

4. Enter the root password when prompted (for security purposes).
5. Click on the **Hardware** tab.
6. Select **Sony PS3 Ethernet Dev.**
7. Click **Delete**.
8. Confirm deletion by clicking **Yes**.
9. Confirm again by clicking **Yes**.

Set up or change your wireless connection

To change your wireless settings, you should have already configured wireless using the following steps or have installed a version of YDL 5 that already supports wireless. To set up or change your wireless connection, do the following:

1. Click on the **Devices** tab.
2. Click **Deactivate**.
3. Click **New**.
4. Select **Wireless Connection** and click **Forward**.
5. Select **Sony PS3 Ethernet Device (eth0)** and click **Forward**.
6. Set the mode to **Auto**.
7. Select **Specified:** for Network name: (SSID).
8. In the box provided, enter the SSID of your access point. You can find this SSID in the management settings for your access point.
9. Select the channel that your access point is using. You can find this in the management settings for your access point. *Note:* Only channels 1-11 are legal for use in the United States. Check local laws for other restrictions.
10. Set the Transmit Rate to **Auto**.
11. If your access point does not use encryption, make sure the box labeled Key is empty and skip to Step 15. If your access point does use encryption, continue with the next steps to see the available encryption options and the simple steps to enable encryption.

12. To allow access to an access point that has encryption enabled (such as WEP or WPA), get the encryption key from the management settings of your access point.
 - A WEP 64-bit key looks like this: 4a 9f 1f 98 f3.
 - A WEP 128-bit key looks like this: 4b bc 8e 20 e7 1d 24 e4 7f 5d 88 d0 2e.
 - The user selects a WPA-PSK and WPA2, and they vary depending on model.

At the time this article was published, WPA-PSK and WPA2 were not supported on the PS3, but it should have been in the works.
13. For Key, enter 0x and your hex key.
 - For 64-bit, it looks like 0x4a9f1f98f3.
 - For 128-bit, it looks like 0x4bbc8e20e71d24e47f5d88d02e.
 - For 256-bit, it's as yet unknown.
14. Click **OK**.
15. Click **Forward**.
16. If your network is using DHCP to hand out IP addresses or if you are unsure, select **Automatically obtain IP address settings with DHCP**.
17. Click **Forward > Forward > Apply > Activate > Yes > OK**.
18. Test that your connection is active.

Switching between wired and wireless

Considering the Hypervisor limitations and the challenge of controlling which network connection is active, it is not easy to switch between wireless and wired connections. And it's impossible to have both online at the same time. This procedure is more technical than configuring wireless settings. It requires some technical knowledge of how Linux works and how to use the command line. If you are unsure of any steps, get help from an experienced Linux user. (*Editor: Or you can explore the [developerWorks Linux zone's](#) articles and [expert forums](#).)*

To switch from the wireless to the wired connection, do the following:

1. Open the Network configuration menu by clicking on the Yellow Dog logo

(**Menu Button**) from the main shelf, and then select **Applications > Applications > System Tools > System Config > Network**.

2. Delete **Sony PS3 Ethernet Dev** under the Hardware tab.
3. Close the network configuration manager. Confirm with **Yes** and **OK**.
4. Open a terminal window.
5. Type `su - [ENTER]`.
6. Enter the root password when prompted.
7. Enter `rm /etc/sysconfig/network-scripts/ifcfg-eth0`
8. Enter `rm /etc/sysconfig/networking/devices/ifcfg-eth0`
9. Restart networking by entering `service network restart`
10. Enter `killall dhclient`
11. Rebuild `/etc/sysconfig/network-scripts/ifcfg-eth0` from scratch. If in doubt, enter `nano /etc/sysconfig/network-scripts/ifcfg-eth0` to edit the file, and use these defaults:

```
DEVICE=eth0
BOOTPROTO=dhcp
ONBOOT=yes
```

12. Press and hold the Ctrl key, then press the X key.
13. Press the Y key to save changes to the file.
14. Press the Enter key to confirm to save to that filename.
15. Enter `cp /etc/sysconfig/network-scripts/ifcfg-eth0 /etc/sysconfig/networking/devices/ifcfg-eth0`
16. Enter `service network restart`

Yellow Dog Linux should now be running on the wired network once again.

Conclusion

This article described how to configure and encrypt the built-in Wi-Fi network that comes with the Cell Broadband Engine(TM)-based Sony PlayStation 3. It also

described 16 quick steps for how to switch between wired and wireless networks on the PS3.

Resources

Learn

- Use an [RSS feed](#) to request notification for the upcoming articles in this series. (Find out more about [RSS feeds of developerWorks content](#).)
- Find the original documentation this article was taken from at Terra Soft Solutions:
 - [Configure the built-in Sony PS3 Wi-Fi.](#)
 - [Encrypt the built-in Sony PS3 Wi-Fi.](#)
 - [Switch back to a wired network connection.](#)
 - [Upgrading your Linux kernel: Automated, LAN connection.](#)
 - [Upgrading your Linux kernel: Without LAN connection.](#)
 - [Upgrading your Linux kernel: Manual upgrade.](#)
- Check out [Terra Soft Solutions](#) to see the depth of experience around its renowned Yellow Dog Linux operating system, a CentOS/RPM-based operating system that supports the IBM Cell/B.E. SDK.
- This article is a part of our unofficial "partners" series:
 - The first article in this series is "[Core partners, Part 1: Build high-performance apps for multicore processors](#)" (developerWorks, May 2007) about the RapidMind Development Platform, which provides a simple single-source mechanism to develop portable high-performance applications for multicore processors.
 - The second article in this series is "[Using DDT to clean up Cell/B.E. app bugs](#)" (developerWorks, February 2008), which describes how to use Allinea Software's Distributed Debugging Tool (DDT) to debug complete Cell/B.E. applications, including multiple threads within a single Cell/B.E. processor and among clusters of Cell/B.E. processors.
 - The third article in this series is "[Transforming Gedae-built portable apps](#)" (developerWorks, April 2008), which was a study that examined the portability of applications developed in Gedae by analyzing the work required to move an example application from a simulation on a PC to actually running on a DSP board (the Mercury Computer System AdapDev system) to running on a multicore Cell/B.E. system.
- Find "[PS3 fab-to-lab, Part 1: Build Linux lab equipment from a Sony PlayStation 3](#)" (developerWorks, May 2007) to see just how flexible the Cell/B.E.-based PS3 system can be.

- Learn more about Cell/B.E. programming from the developerWorks series:
 - ["Programming high-performance applications on the Cell/B.E. processor"](#)
 - ["PS3 fab-to-lab"](#)
 - ["The little broadband engine that could"](#)
- Refer to the [Cell Broadband Engine documentation](#) section of the IBM Semiconductor Solutions Technical Library for a wealth of downloadable manuals, specifications, and more.
- Sign up for the [developerWorks newsletter](#) and get the latest developer news and Cell/B.E. happenings delivered to your inbox each week. Check *Power Architecture*® when you sign up to receive Cell/B.E. news in your newsletter.
- In the [Linux zone on developerWorks](#), find more resources for Linux developers.
- With the ["Windows-to-Linux roadmap"](#) (developerWorks, November 2003), start moving your operational skills from a Windows to a Linux environment. This nine-part series shows you how to "think in Linux" and covers common commands, point-and-click configuration, working with filesystems and logs, using networking and recovery tools, and compiling packages from available source code.
- Our [Linux fundamentals and certification-prep tutorials](#) run the gamut of Linux administration tasks. Take over 25 tutorials in sequence to build fundamental Linux skills from the ground up, or zero in on the exam topics you need to study in order to attain Linux system administrator certification from the Linux Professional Institute.
- In ["Anatomy of the Linux file system"](#) (developerWorks, October 2007), learn why Linux is the Swiss Army knife of operating systems. Linux supports a large number of file systems, from journaling to clustering to cryptographic. Linux is a wonderful platform for using standard and more exotic file systems and also for developing file systems. This article explores the virtual file system (VFS) in the Linux kernel.
- In ["Anatomy of the Linux kernel"](#) (developerWorks, June 2007), delve into the Linux kernel, the core of a large and complex operating system. While huge, the kernel is well organized in terms of subsystems and layers. This article walks you through the general structure of the Linux kernel and points out major subsystems, core interfaces, and related resources to help you dig deeper.
- Take the ["Hacking the Linux 2.6 kernel, Part 1: Getting ready"](#) tutorial (developerWorks, July 2005) to learn about system and environment requirements, the best ways to acquire Linux source code, how to configure and boot your new kernel, and how to print messages during bootup.

Get products and technologies

- Get your copy of the [IBM SDK for Multicore Acceleration 3.0](#) or browse through the [library of Cell/B.E. documentation](#).
- Find all Cell/B.E.-related articles, discussion forums, downloads, and more at the IBM developerWorks [Cell Broadband Engine resource center](#): your definitive resource for all things Cell/B.E.
- Contact IBM about [custom Cell/B.E.-based or custom-processor based solutions](#).

Discuss

- Check out the [Cell Broadband Engine Architecture forum](#) to get your technical questions about the processor answered. Juicy problems and answers from the forums are rounded up periodically and highlighted in the ["Forum watch" blog series](#).
- Go to the [Cell Broadband Engine/Power Architecture blog](#) for [news](#), downloads, instructional resources, and event notifications for Cell/B.E. and other Power Architecture-related technologies. You can find the popular ["Forum watch"](#) blog series (Q&A roundup), the ["FixIt"](#) technology updates, and the [Infobomb](#) quick-read technology introductions.
- Check the [Linux tech support forum](#), for help with IBM trial products for Linux on x86 systems. Your host, Ian Shields, a Senior Programmer on the developerWorks staff, will also help you find other resources.

About the author

Aaron Johnson

Aaron Johnson is the IT Manager of Terra Soft Solutions where he manages internal systems for the engineers, performs quality assurance testing, end-user support, and does the occasional programming. Aaron lives in Fort Collins, Colorado with his wife, Nicole, and their pets. He enjoys hiking, rock climbing, and camping in the mountains of Colorado.

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