



BeagleBone Essentials

By Rodolfo Giometti

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BeagleBone Essentials By Rodolfo Giometti

Harness the power of the BeagleBone Black to manage external environments using C, Bash, and Python/PHP programming

About This Book

- Learn the fundamentals of Beaglebone Black via a detailed tutorial that provides practical examples, from initial board setup to device driver management
- Access external peripherals to monitor and control an electronic device
- Monitor and control several electronic devices with one of the best embedded computers

Who This Book Is For

If you are a developer with some hardware or electrical engineering experience who wants to learn how to use embedded machine-learning capabilities and get access to a GNU/Linux device driver to collect data from a peripheral or to control a device, this is the book for you.

What You Will Learn

- Set up and install a Debian operating system for your BeagleBone Black
- Get access to the serial console to manage the BeagleBone Black's bootloader and kernel
- Discover the pros and cons of native versus cross-compiling C applications
- Compile the Linux kernel from scratch and add custom device drivers
- Ascertain how a system daemon works and how high-level languages can interact with it
- Work with electronic components to build a small circuit
- Develop applications that interact with your circuits connected with the system's GPIOs, serial/USB ports, and I²C/SPI/1-Wire busses
- Use RFID LF readers, temperature sensors, barcode readers, ADC/DAC, and other peripherals to monitor and control your surroundings

In Detail

The BeagleBone Black is an embedded system that is able to run complete GNU/Linux distributions such as Debian or Ubuntu. Having powerful distribution capabilities, and packed with an easily expandable embedded board, the BeagleBone Black is a device that will allow users to build powerful and versatile monitoring and controlling systems.

You start off by learning how to set up the board from scratch; you will be introduced to the concepts of compilation and cross-compilation of user-space and kernel-space applications with some basic debugging techniques. Next, you will move on to high-level programming by using scripting languages; you'll then learn how to get access to different kinds of peripherals such as serial ports, USB devices, I2C/SPI, and 1-Wire. Finally, you will discover how to use or develop system daemons in several programming languages, collect peripheral data, and control a device. Accessing all peripherals and writing good monitoring and controlling programs can be a complex task; it's all too easy to make mistakes early in development that lead to serious problems in production. This guide is an invaluable tutorial if you are planning to use a BeagleBone Black to control or monitor projects.

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Editorial Review

About the Author

Rodolfo Giometti

Rodolfo Giometti is an engineer, IT specialist, GNU/Linux expert, and software libre evangelist. He is the maintainer of LinuxPPS projects (Linux's Pulse Per Second subsystem). He also actively contributes to the Linux source code community with several patches and new device drivers for industrial application devices. He has over 20 years of experience working with x86, ARM, MIPS, and PowerPC-based platforms. Now, he is the co-chief at HCE Engineering S.r.l. and a cofounder of the Cosino Project, which involves new hardware and software systems that are used for quick prototyping in the industry environment, control automation, and remote monitoring.

Users Review

From reader reviews:

Kyle Raya:

BeagleBone Essentials can be one of your basic books that are good idea. We all recommend that straight away because this guide has good vocabulary that can increase your knowledge in terminology, easy to understand, bit entertaining but nonetheless delivering the information. The author giving his/her effort to put every word into enjoyment arrangement in writing BeagleBone Essentials however doesn't forget the main stage, giving the reader the hottest as well as based confirm resource information that maybe you can be among it. This great information can draw you into fresh stage of crucial contemplating.

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