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Raspberry Pi 3

The **Raspberry Pi 3** was released in early March 2016, shortly before the release of Ubuntu 16.04 (Xenial) LTS, but too short to have proper support. It is possible to run Xenial's kernel and a full Ubuntu installation, but it requires replacing the firmware, bootloader and some other hacks.

While the BCM2710 is a 64-bit CPU, as of this writing there is no firmware or kernel support for it arm64 mode yet. As such, you will be left with a 32-bit installation.

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Fresh installation

One-off raspi3 images are available which include the ppa-rpi3 PPA pre-installed. For installation details, see [ARM/RaspberryPi](#).

Cross-hardware upgrade

This procedure assumes a working Ubuntu Xenial Raspberry Pi **2** installation. You will be converting a few things over to work on the RPi3, then doing a hardware swap from an RPi2 to an RPi3.

Be sure you have proper backups! This is not a foolproof or well-tested procedure; if it breaks, you get to keep both pieces.

Install a PPA which contains updated u-boot-rpi, flash-kernel and linux-firmware-raspi2 packages, and upgrade.

```
add-apt-repository ppa:ubuntu-raspi2/ppa-rpi3
apt-get update
apt-get -u dist-upgrade
```

Install the RPi3 u-boot loader.

```
apt-get install binutils # Required by mkknlimg, may not be installed
wget -O /tmp/mkknlimg https://raw.githubusercontent.com/raspberrypi/tools/master/mkimage/mkknlimg
chmod 0755 /tmp/mkknlimg
/tmp/mkknlimg --dtok /usr/lib/u-boot/rpi_3_32b/u-boot.bin /boot/firmware/uboot.bin
```

Remove uboot.env, as the updated flash-kernel package switches to using boot.scr on the RPi3. Run flash-kernel to install the new components.

```
rm -f /boot/firmware/uboot.env
flash-kernel
```

Check that bcm2710-rpi-3-b.dtb and boot.scr have been created in /boot/firmware by flash-kernel.

Modify /boot/firmware/config.txt with at least the following configs:

```
enable_uart=1
device_tree_address=0x100
device_tree_end=0x8000
kernel=uboot.bin
dtparam=i2c_arm=on
dtparam=spi=on
```

enable_uart is needed by u-boot for all RPi3 modes, even if you have no intention of using a serial console. The device_tree options are needed to explicitly declare the DTB area, as the DTB is slightly larger than 16,128 bytes, and the bootloader otherwise assumes an address space of 0x100 through 0x4000.

Shut down the system.

```
poweroff
```

Swap out the hardware from the RPi2 to the RPi3 and boot.

64-bit kernel/userland

64-bit Raspberry Pi 3 kernel status is in its early days as of this writing (May 2016). The only known general-purpose working kernel is a 4.5.0 kernel from user "[Electron752](#)". Raspberry Pi firmware is working in 64-bit mode as of late April (with `arm_control=0x200`), and u-boot's 64-bit rpi_3 target is working

as of version 2016.05.

Some forum posts describe building a "stubbed" u-boot which tells the RPi3 to switch to 64-bit mode, but this is no longer required with latest firmware and u-boot.

You may use [20160517-raspi3-arm64-firmware-kernel.tar.xz](#) and manually integrate it into an Ubuntu arm64 userland installation. It's a tree consisting (only) of:

- 4.5.0+ kernel and modules from <https://github.com/Electron752/boot64-rpi3> (stripped)
- u-boot binary from u-boot 2016.05~rc3+dfsg1-1rpi3.2 ([lp:ubuntu-raspi2/ppa-rpi3](#))
- Firmware from linux-firmware-raspi2 1.20160503+6832d9a-0ubuntu1~rpi3 ([lp:ubuntu-raspi2/ppa-rpi3](#))

Known issues:

- brcmfmac does not seem to recognize the 43430 wifi/bluetooth controller, even with firmware present.
- The kernel requires a custom DTB. Therefore u-boot loads and uses the standard bcm2710-rpi-3-b.dtb (same one compiled from the Ubuntu 4.4.0 kernels), then loads the custom DTB, overwriting 0x100 before handing off to Linux.
 - Make sure flash-kernel (even the version from [ppa:ubuntu-raspi2/ppa-rpi3](#)) is not installed, as it will replace boot.scr with one which doesn't have the DTB loading hack.
- VideoCore userland utilities are **not yet available** for arm64.

Bugs filed

- [LP: #1578505](#) - flash-kernel: Raspberry Pi 3 support
- [LP: #1580323](#) - u-boot: Pull/merge 2016.05~rc3+dfsg1-1 from Debian experimental
 - Upstream Debian: [Debian: #823524](#) - u-boot: Add rpi_3_32b target to u-boot-rpi
- [LP: #1578745](#) - linux-firmware-raspi2: Update firmware for Raspberry Pi 3 support
- [LP: #1580326](#) - livecd-rootfs: Add raspi3 subarch
 - [MP: #293959](#) - livecd-rootfs: Add raspi3 subarch

ARM/RaspberryPi/RaspberryPi3 (last edited 2016-05-17 04:52:28 by fo0bar)