

README – 4273 π

Daniel Barker and Heleen Plaisier, Institute of Evolutionary Biology, University of Edinburgh
Email 4273_pi@ed.ac.uk

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4273 π , Version 1.4. <http://4273pi.org>

Introduction

4273 π is a customised distribution of GNU/Linux for the Raspberry Pi, particularly intended for education, training and research in bioinformatics. 4273 π is a customised version of Raspbian, a version of Debian GNU/Linux for the Raspberry Pi.

Compared to Raspbian, 4273 π includes additional software and data, useful for bioinformatics, and some changes to the system configuration to better suit the intended use (see ‘Network’ and ‘Printing’, below). 4273 π also includes an Open Access course in bioinformatics, *4273 π Bioinformatics for Biologists*, in the ~/4273pi directory.

For an overview of *4273 π Bioinformatics for Biologists* and a key to its contents see the handbook, ~/4273pi/README_handbook.pdf. Other material is arranged into ‘components’, each in its own directory (~/4273pi/INTRO, ~/4273pi/BLAST, and so on).

4273 π Bioinformatics for Biologists is based on the module BL4273 Bioinformatics for Biologists at the University of St Andrews, an optional module of 15 SCOTCAT credits for final-year undergraduate students on BSc(Hons) Biology, BSc(Hons) Biochemistry and other BSc(Hons) courses taught by the School of Biology. BL4273 is taught on Raspberry Pi hardware (starting in academic year 2012-2013).

4273 π is intended for a single user. If the same Raspberry Pi is to be used by multiple users, they can either use the same login (if they can trust each other); or, each have their own SD card to plug into the Raspberry Pi.

Files

`4273pi.tar.gz` contains a directory, `4273pi/`, with the following contents.

README_4273pi.pdf. This file.

2016-03-08-4273pi.img. SD card image of `4273π`.

scripts/. Directory containing shell scripts used in the preparation of `4273π`. For details, see `scripts/work_instruction.pdf`.

Installation

Hardware

`4273π` requires a Raspberry Pi and associated peripherals, including a 32 GB SD card. Other sizes of SD card are not supported. Smaller SD cards have insufficient capacity for some releases of `4273π`. For simplicity, we require a 32 GB card for all releases. Larger sizes (e.g. 64 GB) may work, but can be expensive and have not been tested with `4273π`.

A brief guide to hardware is on the `4273π` Web site:

<http://4273pi.org>

Software

The SD card image file is `2016-03-08-4273pi.img`.

You have to transfer the SD card image to an SD card (whichever is appropriate for your model of Raspberry Pi). You can do this from another computer, which could be running Windows, OS X or Linux. It might even be a Raspberry Pi.

Follow the instructions to here:

http://elinux.org/RPi_Easy_SD_Card_Setup

The relevant instructions are in the ‘Create your own’ section: ‘Flashing the SD card using Windows’, ‘Flashing the SD card using Mac OSX’ or ‘Flashing the SD card using Linux (including on a Pi!)’, as appropriate.

Note that some `dd` software for Windows will not work. But, if you follow the instructions the above Web site and use the software recommended there, you should have no problem.

Password

The user name is: **pi**

The password is: **4273pi**

Getting started

With the Raspberry Pi switched off and everything unplugged from the mains, insert the 4273 π SD card and connect all peripherals. Check that the monitor is switched on. Then connect the power to the Pi, at about the same time as you connect power to the USB hub if you are using one. The Pi will start up.

You can now launch the file manager and use it to browse the bioinformatics course in the 4273pi directory. `README_handbook.pdf` is a sensible place to begin.

Configuration

To run commands as administrator (super-user), precede them with `sudo`. You will not be prompted for another password.

To change details such as the time-zone, or the amount of RAM used for the graphics system, run

```
sudo raspi-config
```

With some older monitors, things may vanish off the edge of the screen. But you can still supply your username and password to log in (even if you can't see what you're doing), launch `raspi-config` as above, choose `Change overscan`, `Enable`, `Finish` and `reboot`. This should bring everything within the visible area.

Updates and packages are available via the usual Debian mechanism, APT. By default this will connect to a mirror of the Raspbian repository.

Network

4273 π is configured to access the network with a dynamic IP (as found on many networks). A static IP can be configured via the graphical user interface.

4273 π has a software firewall, which will allow outgoing traffic, but blocks most kinds of incoming traffic – broadly similar to a typical firewall on a desktop computer. Still, 4273 π

is not intended for use in situations with a high security risk. It should be used behind a router or hardware firewall configured to block the most potentially damaging kinds of incoming traffic. For many home and university networks, such a router or hardware firewall will already be in place.

Printing

By default, there is one ‘printer’ – a PDF writer. This will print to a PDF file in the `~/PDF` directory. You can, for example, transfer this to a different computer via a USB stick.

4273 π uses the CUPS printing system. Any time you want to add a printer or change settings, open a Web browser on the Raspberry Pi and go to the following URL:

`http://localhost:631`

If prompted for authentication, enter your Raspberry Pi username and password.