README – 4273π

Stevie A Bain and Daniel Barker
Institute of Evolutionary Biology, School of Biological Sciences, University of Edinburgh

4273π, Version 1.6. https://4273pi.org

Introduction

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

Compared to the standard release of Raspbian, 4273π 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). 4273π also includes Open Educational Resources for bioinformatics, in the `~/4273pi` directory. These include the `~/4273pi/GULO` directory required for our Higher Biology, Higher Human Biology and Advanced Higher Biology workshop (https://4273pi.org/schools).

4273π 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.

`2020-06-24-4273pi.img`. Raspberry Pi SD card image.

`scripts/`. Directory containing shell scripts used in the preparation of the SD card image. For details, see `scripts/work_instruction.pdf`.

Installation

Hardware

4273π requires any model of Raspberry Pi plus associated peripherals, including a 32 GB SD or microSD card. Smaller sizes of card are not supported. Larger sizes (e.g. 64 GB) are also expected to work but can be expensive and have not been tested with 4273π.

Software

The SD card image file is `2020-06-24-4273pi.img`.

You have to transfer the SD card image to an SD card or microSD 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 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 OS X' or 'Flashing the SD card using Linux (including on a Raspberry 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 4273π SD card and connect all peripherals. Switch the monitor on, then within a few seconds power on the Pi. The Pi will start up.

You can now launch the file manager and use it browse the bioinformatics materials in the `4273pi` directory, and/or launch a Terminal.

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, the amount of RAM used for the graphics system or the monitor overscan, run

```
sudo raspi-config
```

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

Network

4273π 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.

4273π 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, 4273π 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.

If you intend to remove the software firewall or reconfigure it to allow incoming connections, make sure to change the user's password first. The command to do this is:

```
passwd
```

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.

4273π 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.