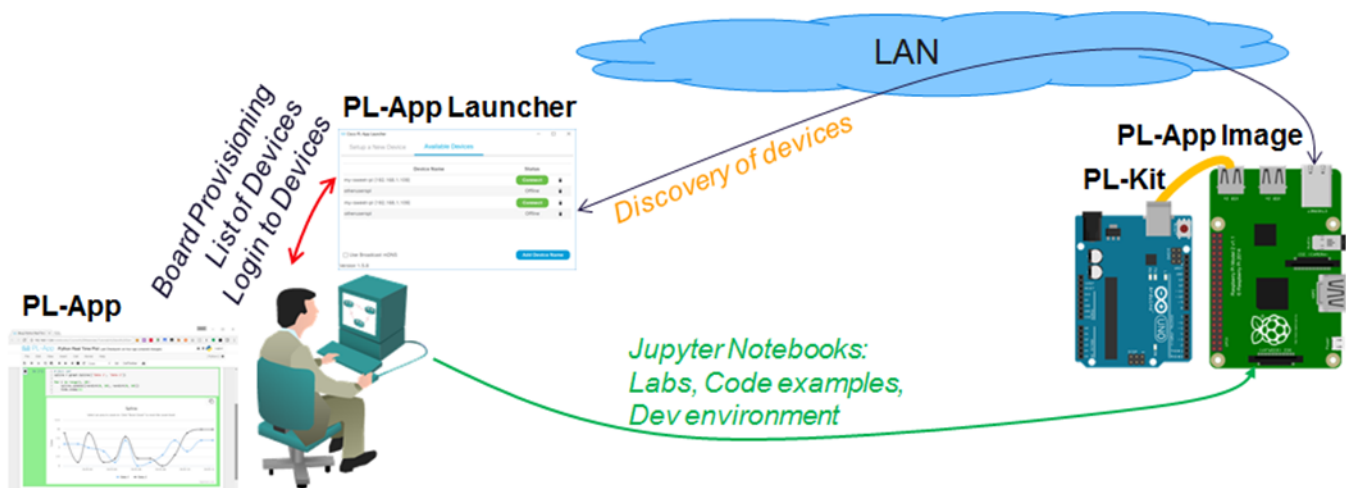


## Lab no 02 Part01 – Setting up PL-App & Raspberry Pi

This lab provides a basic guideline to set up the initial configuration of the Raspberry Pi board along with a PL-App environment.

### Parts: -

1. Download and Install the PL-App Launcher
2. Download and Install the PL-App Image.
3. Set up a micro-SD card with PL-App.
4. Access PL-App on a Raspberry Pi.



## Required Resources

- Prototyping Lab App (PL-App) Launcher application
- Prototyping Lab App (PL-App) Image file
- Wired Ethernet or Wi-Fi connection to the local-area network with DHCP
- Raspberry Pi with a power adapter
- Google Chrome.

## Part 1: Download and Install the PL-App Launcher

- a. Navigate to [www.netacad.com](http://www.netacad.com) in your web browser and enter your IoT Fundamentals class.
- b. From the course page, download the PL-App Launcher application installer for your operating system.
- c. After a successful download, install the PL-App Launcher application. NOTE: Windows 7+ and Mac OS are supported.
- d. After a successful installation, start the PL-App Launcher application. You should see the following screen with the Setup a New Device tab:

The screenshot shows the Cisco PL-App Launcher application window. The title bar reads "Cisco PL-App Launcher". There are two tabs: "Setup a New Device" (active) and "Available Devices".

**Setup a New Device**

1. Insert the SD card reader into the USB port and select it from the dropdown menu:  
[Dropdown menu] [Refresh]
2. Select the PL-App image file that you have downloaded from NetAcad.com:  
Find Image: [Browse]
3. Create a unique Device Name and Password for the PL-App device:  
Device Name: [Include your name or initials (e.g. jj-pi1984)]  
Device Password: [Password to access PL-App on your device]
4. Optional settings (connecting the device to an existing Wireless LAN):  
WiFi SSID: [ ]  
WiFi Password: [ ]
5. [Update Config Only] [Write Disk Image]

Version 1.5.8

## **Part 2: Download and Install the PL-App Image.**

- a) Navigate to [www.netacad.com](http://www.netacad.com) in your web browser and enter your IoT Fundamentals class.
- b) From the course page, download the PL-App image file. Although the PL-App image is a file with .zip extension, there is no need to unpack the ZIP file.  
*Note: the PL-App image file is about 900 MB, and the download speed might vary based your Internet connection and its current use.*

## **Part 3: Setup a micro SD card with PL-App**

- a) Start the PL-App Launcher application. You should see the following screen with the Setup a New Device tab:

The screenshot shows the Cisco PL-App Launcher application window. The title bar reads "Cisco PL-App Launcher". There are two tabs: "Setup a New Device" (active) and "Available Devices". The "Setup a New Device" tab contains a numbered list of steps:

- 1 Insert the SD card reader into the USB port and select it from the dropdown menu:  
A dropdown menu is shown with a downward arrow. A "Refresh" button is to the right.
- 2 Select the PL-App image file that you have downloaded from NetAcad.com:  
Find Image:
- 3 Create a unique Device Name and Password for the PL-App device:  
Device Name:   
Device Password:
- 4 Optional settings (connecting the device to an existing Wireless LAN):  
WiFi SSID:   
WiFi Password:
- 5

Version 1.5.8

- b) Locate a micro-SD ( $\mu$ SD) card inside the PL-Kit that is at least 8 GB in size.
- c) Insert the  $\mu$ SD card into your SD card reader or USB reader and insert it into your computer.

- d) Determine the drive letter of the  $\mu$ SD card using the File Explorer.
- e) In the PL-App Launcher, select the  $\mu$ SD Card Removable Drive, in this example select the [D:\] drive. If not present in the menu, click the Refresh button.

**Be careful to select the correct drive; if you select the wrong drive, you can destroy your data on the selected disk drive.**

Cisco PL-App Launcher

Setup a New Device Available Devices

1 Insert the SD card reader into the USB port and select it from the dropdown menu:

[D:\] Refresh

2 Select the PL-App image file that you have downloaded from NetAcad.com:

Find Image: Browse

3 Create a unique Device Name and Password for the PL-App device:

Device Name: Include your name or initials (e.g. jj-pi1984)

Device Password: Password to access PL-App on your device

4 Optional settings (connecting the device to an existing Wireless LAN):

WiFi SSID:

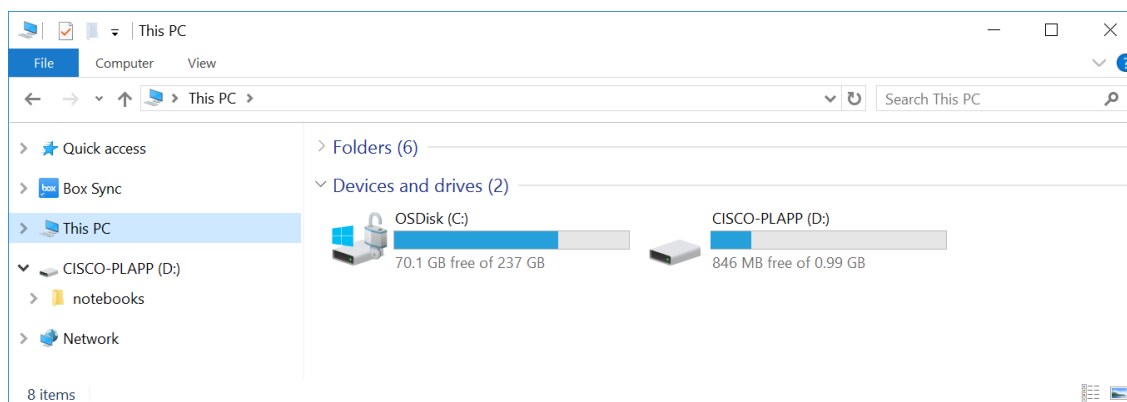
WiFi Password:

5 Update Config Only Write Disk Image

Version 1.5.8

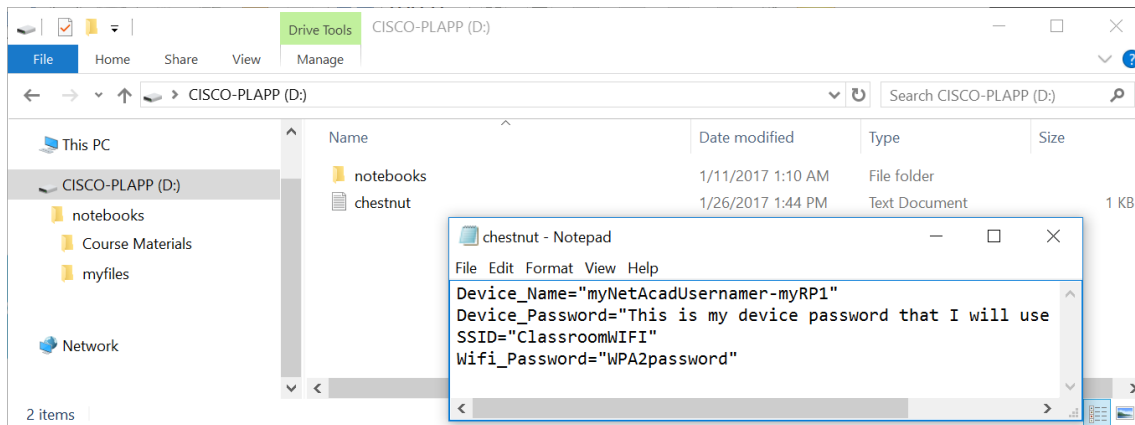
- f) Click the Find Image: Browse button in the application and select the PL-App image zip file that you downloaded in the previous step.
- g) To personalize the PL-App installation on the  $\mu$ SD card, enter the configurations section of the PL-App Launcher application and configure:
- **Device Name** - This is the name of the PL-App Raspberry Pi instance in your local-area network (LAN). Make sure the selected Device Name is unique on the LAN, otherwise naming problems might occur. For example, you can use your name followed by a number, or your username, or initials (e.g. myname-myRPi1). The Device Name can contain letters (a-z), numbers (0-9) and dashes (-). The first character must be a letter.

- **Device Password** - This is a password that you will need to enter when accessing PL-App on the Raspberry Pi. The password is stored in its clear-text form on the  $\mu$ SD card. For security reasons, always use a unique password (i.e. never use the same password as your email, social media, netacad.com, etc.).
- h) If your Raspberry Pi is to be connected to the network over Wi-Fi, enter the optional settings section and configure the following:
- **WiFi SSID** - The name of the Wi-Fi network to which to connect (e.g. Classroom WIFI).
  - **WiFi Password** - The WPA2 Pre-Shared Key (Wi-Fi password).
- i) When your settings are correct, click the Write Disk Image button to overwrite all the data on the selected SD card removable drive and flash it with the PL-App image. This process will also write your configuration settings to the SD card in a file called chestnut.txt. Depending on the speed of your  $\mu$ SD card, this process might take 5-10 minutes to complete.
- NOTE: If the  $\mu$ SD card has already been flashed with the PL-App image, and you only want to change the existing settings (e.g. Device Name, Wireless Settings, etc.), then click the Update Config Only button to update only the setup settings.**
- j) When the  $\mu$ SD card setup is complete, use the File Explorer to verify the contents of the  $\mu$ SD card. You should see the  $\mu$ SD card drive name has changed to CISCO-PLAPP:

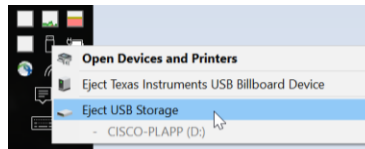


- k) Explore the  $\mu$ SD card drive letter. You should see the notebooks folder and the chestnut.txt setup file:

## Lab no 02 part 1 – Setting up PL-App with a Raspberry Pi



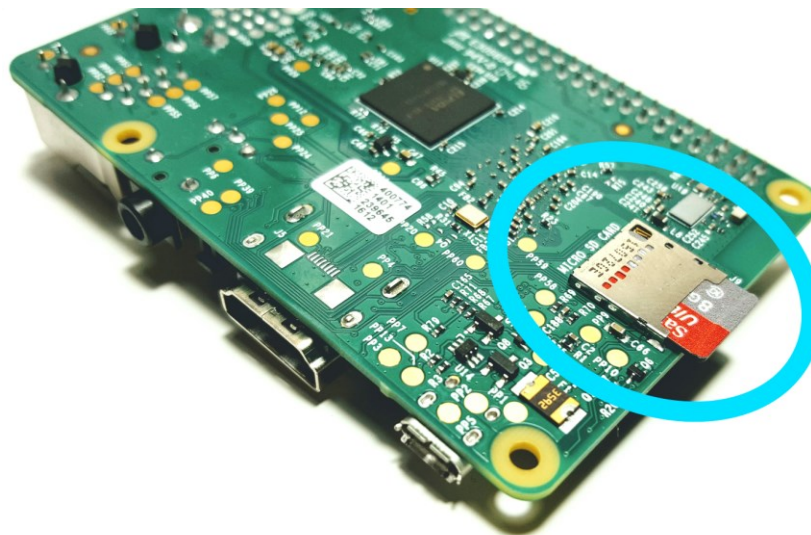
- l) Before removing the  $\mu$ SD card from your computer, make sure to safely unmount it.



- m) Remove the  $\mu$ SD card from your computer.

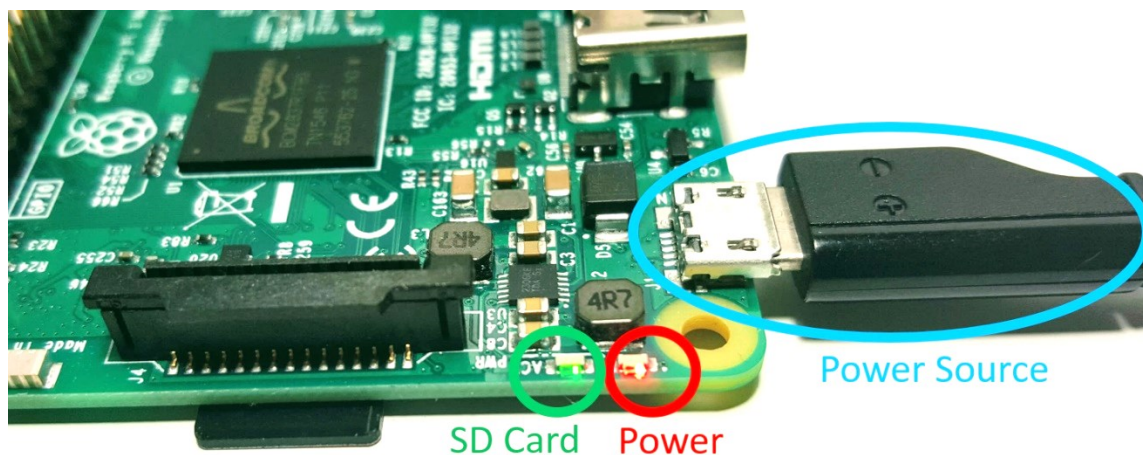
## Part 4: Access PL-App on a Raspberry Pi

- a) Enter the  $\mu$ SD card into your Raspberry Pi. The  $\mu$ SD card slot is on the back side of the board. Before entering or removing the  $\mu$ SD card into your Raspberry Pi, make sure it is not powered on.
- b) Connect the Raspberry Pi to the LAN. If you are using an Ethernet cable, connect the cable to the Raspberry Pi. If you are using Wi-Fi, make sure the signal from the access point is strong enough. Your computer and the Raspberry Pi must be in the same subnetwork for the PL-App Launcher discovery to work.



**Note:** For security reasons, it is recommended that PL-App devices be on a separate network, preferably wired that has no connection to the rest of the school network or has its own internet access (to complete the labs that require internet connectivity).

- c) Power on your Raspberry Pi by connecting the  $\mu$ USB cable with a proper power supply that provides enough current to the Raspberry Pi board. The recommended PSU provides 2.5A to power the Raspberry Pi 3 Model B.



**NOTE:** The red Power LED must be always on. If the Power LED is blinking, or is off, the power source from the PSU is not providing enough power to the board.

- d) Start the PL-App Launcher application. You should see the following screen with the Available Devices tab.

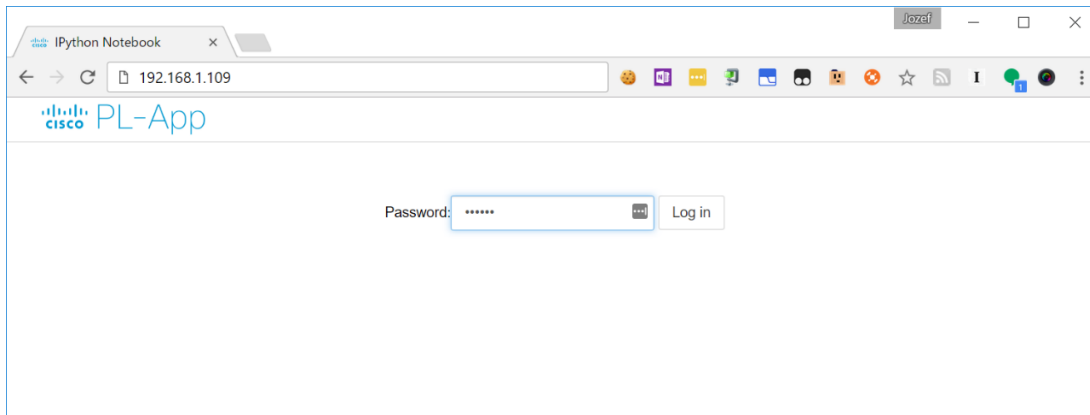
The Available Devices tab lists all the PL-App devices that have been set up on this computer with PL-App Launcher or were manually added to the list using the Add Device Name button. PL-App Launcher is continuously trying to discover the listed PL-App Raspberry Pi devices that are connected to the network. Once a device is discovered, its current IP address is shown in the list and a green Connect button becomes active. Clicking the green Connect button opens a new web browser connection for the selected PL-App device.

**NOTE:** The very first startup of a freshly written  $\mu$ SD card might take longer to become connected due to the initial setup at the boot-up process (expanding the file system of the  $\mu$ SD card, etc.).

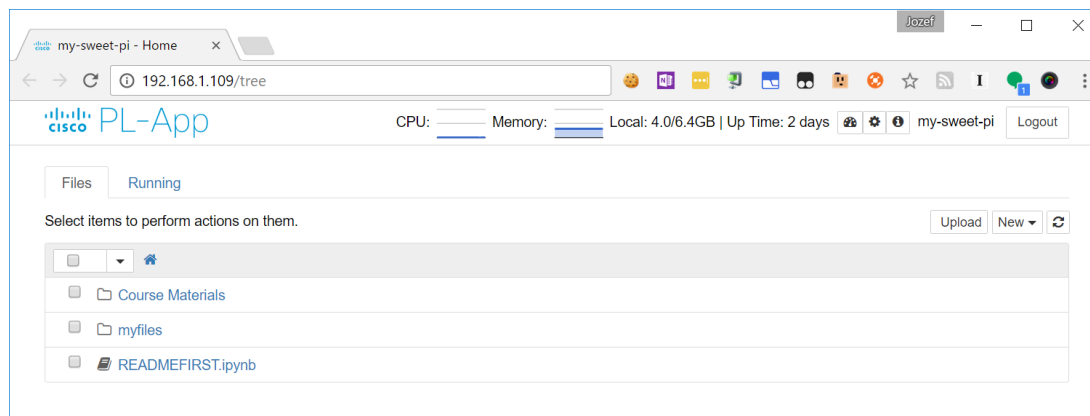
- e) Click the green Connect button of your device in PL-App Launcher to directly connect to the local PL-App web interface running on your Raspberry Pi device. You can use the PL-App based web interface to access existing labs and to write and install new applications, access the Linux shell interface, etc.



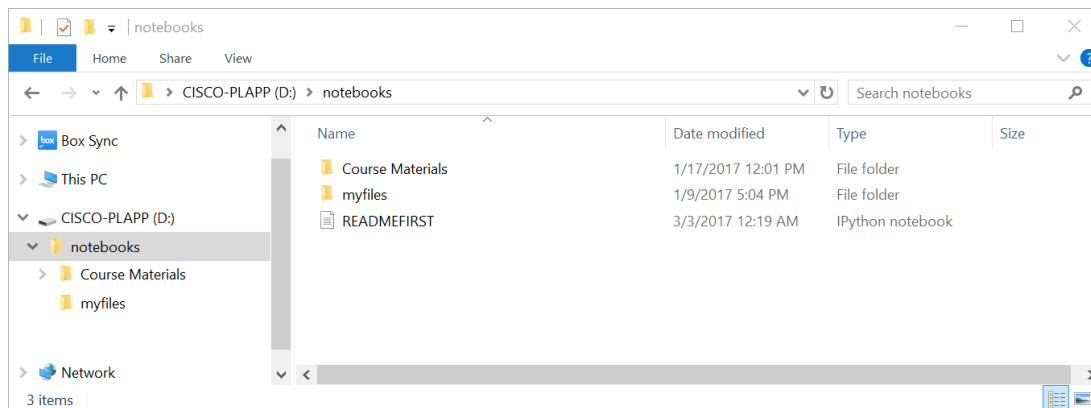
- f) First, log in to the web interface of PL-App. Use the password you specified in PL-App Launcher in the setup process of the  $\mu$ SD card.



- g) After a successful login, the PL-App directory browser opens the root directory of the notebooks:



This is the PL-App's representation of the notebooks folder that was created on the  $\mu$ SD card:



- h) The basic structure of the folders in the root notebooks directory is as follows:

- **Course Materials:** this folder contains Cisco authored labs in the form of Jupyter Notebooks.
- **My files:** this folder is your space to create your own Jupyter Notebooks and other files.