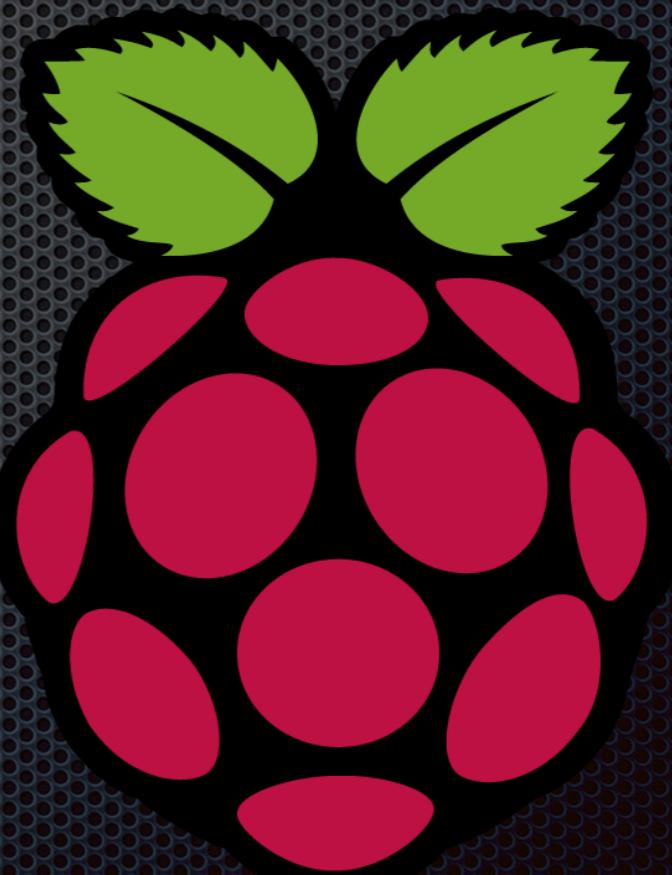


# Getting Started with the Raspberry Pi

Bryan Prather-Huff

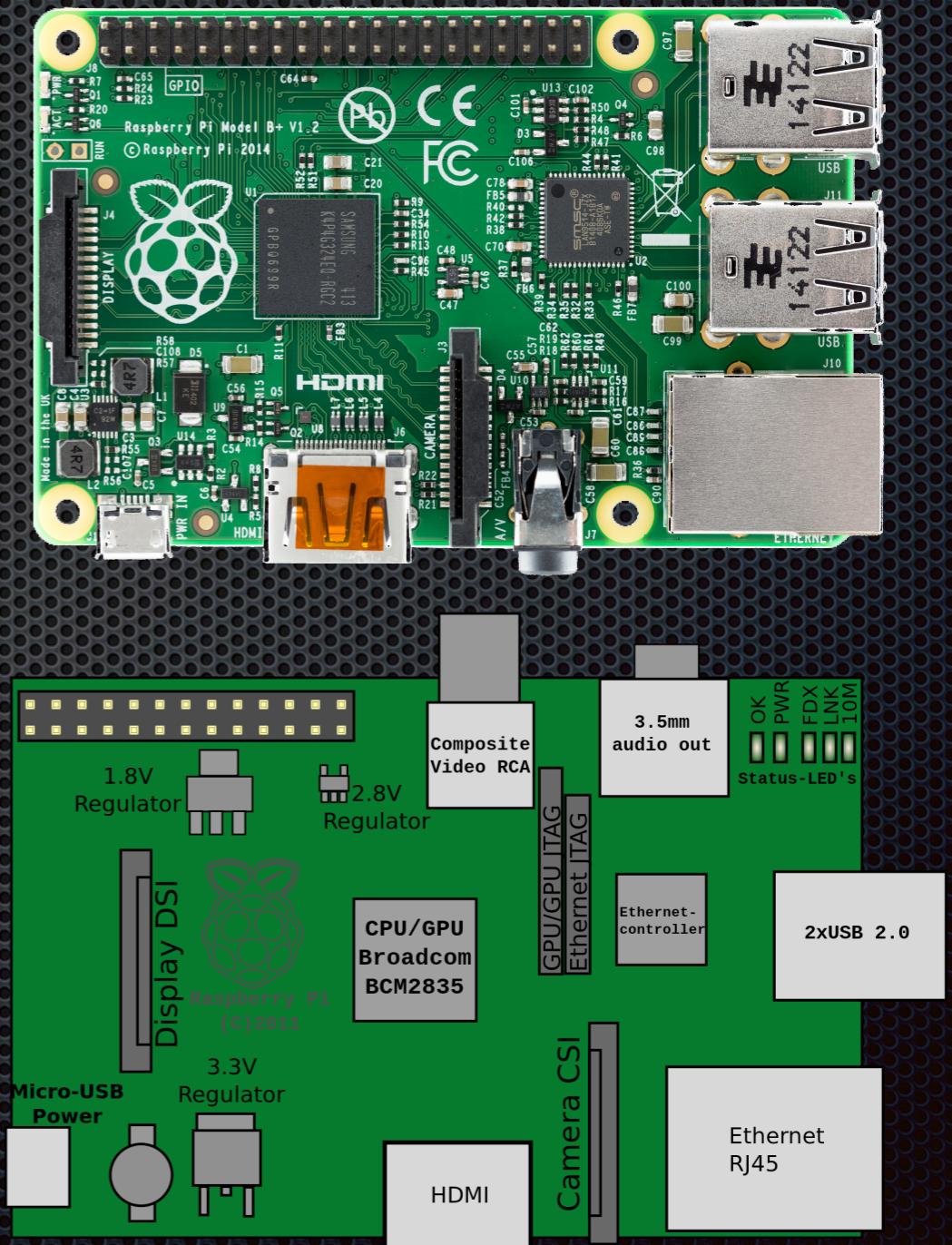
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Intro. to Networks and Their Applications



# What is a Raspberry Pi?

- A tiny general purpose computer (credit card sized)
- Comes in Models A, B, B+, 2
- Runs Linux and Windows IoT Core
- Comes with a bunch of IO
  - 26 GPIO; 4 USB; 1 Ethernet
  - A/V (HDMI, 3.5mm, Composite)
- ARM Processor (1 - 4 core dep. model)
- 256 MB - 1 GB RAM
- Storage provided by MicroSD Flash



# Getting Started

- What you need:
  - Raspberry Pi
  - MicroSD w/ >=4GB (Class 10 pref.)
  - A PC with SD card slot to configure and connect with
  - Various cables (HDMI, microUSB)
  - Ethernet or WIFI dongle
  - Keyboard, Mouse, Monitor (Optional)

# Flashing Raspbian to the MicroSD

- Download Raspbian from The Raspberry Pi Foundation ([raspberrypi.org](http://raspberrypi.org))
  - Also find tutorials and guides here
- Put your MicroSD into the SD adapter and plug into your computer
- Write to SD (\*nix terminal; no GUI)
  - Format SD to FAT using system disk manager (diskutil on OS X and I like fdisk on Linux)
  - Use disk manager to unmount the SD card, but DON'T EJECT
  - Use terminal to figure out what disk your SD card is listed as (/dev/disk\*), on my laptop this is 'disk1' because I have one other hard drive
  - Run 'pv /path/to/raspbian.img | sudo dd of=/dev/rdisk1 bs=1m' (or bs=1M on GNU dd)
- For Windows: Download Win32 Disk Imager from SourceForge, install and follow prompts; select Raspbian image when the required step is reached

# Running the Raspberry Pi

## With a Monitor and Keyboard

- Plug the MicroSD card into the Raspberry Pi
- Plug all the peripherals into the device
- Plug in the MicroUSB to power-on the device
- Wait for boot sequence to be finished and the login prompt to appear (use ‘pi:raspberry’ as credentials)

# Running the Raspberry Pi Headless

- Plug the MicroSD card into the Raspberry Pi
- Plug in the MicroUSB to power-on the device
- Connect the Pi and your computer to a wired network with DHCP
  - If you are feeling adventurous, try hooking the RPi directly to your computer and running your own DHCP server
  - Scan the network for the Raspberry Pi ('sudo nmap -sS 192.168.xxx.1/24', nmap can be installed on both \*nix and Windows platforms; 'arp -a' on all platforms to look at MAC-to-IP table)
  - Find the most likely candidate from the output of the scan (it should only have one port open: '22/tcp open ssh' and the MAC address should be from Cisco)
  - Use Putty on Windows and 'ssh' on \*nix to ssh into the device ('ssh pi@192.168.xxx.xxx')

# What Next?

- Configure a WIFI dongle
  - Use **WPA-Supplicant**
- Know your text editor
  - Nano, Emacs, Vi
- Learn about network interfaces
  - ifconfig, host, tcpdump, arp, iptables, nmap
- Update packages
  - Debian uses the **apt** package manager
- Configure SSH Keys to log in without a password (more secure)
  - Generate and place your ssh keys on the RPi ('ssh-keygen')

**“Get comfortable with the terminal.”**

*—Every developer and sysadmin, ever. Of all time.*

# Lets Dive Right In!