1. Hardware
   1. Raspberry Pi Zero W
      1. <https://www.raspberrypi.org/products/raspberry-pi-zero-w/>
   2. USB to Micro USB cord
   3. USB Charger
   4. USB Micro SD reader for your pc
2. Create Raspberry Pi Zero W SD Card
   1. Download RASPBIAN STRETCH LITE OS
      1. <https://www.raspberrypi.org/downloads/raspbian/>
   2. Install RASPBIAN STRETCH LITE OS
      1. <https://www.raspberrypi.org/documentation/installation/installing-images/README.md>
   3. Add SSH and Wifi configuration files to the Micro SD card
      1. https://howchoo.com/g/ndy1zte2yjn/how-to-set-up-wifi-on-your-raspberry-pi-without-ethernet#add-your-wpa\_supplicantconf-file
         1. Reinsert SD Card into your computer
         2. Create an empty file “**ssh**” on the micro sd card
         3. Create “**wpa\_supplicant.conf**” on the micro sd card:

country=US

ctrl\_interface=DIR=/var/run/wpa\_supplicant GROUP=netdev

update\_config=1

network={

ssid="HIVEPIWIFI"

scan\_ssid=1

psk="HIVEPIWIFIPASSWORD"

key\_mgmt=WPA-PSK

}

1. Add USB Ethernet to your Rapberry PI
   1. <https://gist.github.com/gbaman/975e2db164b3ca2b51ae11e45e8fd40a>
   2. vi **config.txt**
      1. dtoverlay=dwc2 on a new line, then save the file.
      2. open up the cmdline.txt. Be careful with this file, it is very picky with its formatting! Each parameter is seperated by a single space (it does not use newlines). Insert modules-load=dwc2,g\_ether after rootwait.
2. Power on the Raspberry Pi
   1. Put the micro SD card into the PI zero
   2. Put the Pi Zero into the its case
   3. Connect the Micro USB cable and power block
   4. Plug the raspberry pi into the wall outlet
3. Log into your Raspberry Pi
   1. Connect your laptop to the wifi network
   2. Log into your raspberry pi via “ssh pi@raspberrypi” from your favorite terminal such as Putty
      1. Username: pi
      2. Hostname: raspberrypi
   3. Let’s confirm the Raspberry Pi is online
      1. ping –c 4 www.google.com
4. Let’s add software to the Raspberry Pi Zero W
   1. Switch user to root for software installation

sudo -i

* 1. Update the aptitude software repository

apt-get update

* 1. Upgrade Raspbian OS

apt-get upgrade

* 1. install vim

apt-get install vim

* 1. Install the Python package manager

apt-get install python-pip

* 1. Install Docker

curl -fsSL get.docker.com -o get-docker.sh

sudo sh get-docker.sh

sudo usermod -aG docker pi

* 1. Install docker-compose

pip install docker-compose

* 1. install git

apt-get install git

* 1. Reboot the Raspberry Pi (90 seconds)

reboot

* 1. Confirm docker version

docker –-version

* 1. Confirm docker-compose version

docker-compose --version

1. Update the hostname and loopback adapter so your pi is unique on the network
   1. Switch user to root for software installation

sudo -i

* 1. Edit Hostname

vi /etc/hostname

* 1. Edit Hosts

vi /etc/hosts

* 1. Reboot the Raspberry Pi (90 seconds)

reboot

1. Initialize Docker SWARM

docker swarm init

1. Deploy Helloworldarm Load Balanced Cluster
   1. git clone <https://github.com/bignay2000/helloworldarm.git>
   2. cd helloworldarm
   3. docker stack deploy -c docker-compose.yml helloworld