



Build your own mini “Pelican Pi”

The Pelican Pi (<http://hackersforcharity.org/education>) is a ruggedized Raspberry Pi unit designed for education in rough environments. It requires a decent amount of hardware and software.

You can, however, build a bare-bones version of the Pelican Pi without all the cool ruggedized additions, but containing all the same great educational software. The stripped-down Pi will contain the following software, ready to serve via wifi or ethernet to any client with a modern browser:

- Khan Academy with exercises, tracking and MUCH more thanks to the Learning Equality Ka-Lite team.
- Wikipedia for Schools (included with RACHEL)
- Technology training, English as a Second Language, Life skills training and more (GCFLearnFree.org)
- An e-book library from Project Gutenberg (included with RACHEL)
- Textbooks from CK-12 (included with RACHEL)
- Village health guides from Hesperian (included with RACHEL)

Pi Server Installation

Hardware notes

- RACHEL requires a Ralink wi-fi adapter (like this one from [Amazon](#) for \$7 or this one from [dx.com](#) for \$6). You can use others, but you’ll need to install drivers.
 - This server setup requires at least a 64gb SD card.
1. First, follow the instructions at <http://pi.worldpossible.org/howto.html>. This will allow you to install RACHEL to an SD Card. For this version of the server (with RACHEL, GCFLearnFree and Ka-Lite) we require a 64GB SD Card. Follow all the steps, all the way through to step 7 (“Use your RACHEL-Pi as a Wi-Fi hotspot”).

RACHEL install notes:

- The SD card can be “formatted” on any number of platforms. See http://elinux.org/RPi_SD_cards for more information.

- Rachel recommends the use of the Ralink adapters mentioned above. IF you don't get the RPI SSID, you've likely got a different card, and the drivers aren't working. Other popular types of nano wifi cards are based on the Realtek chipset. Connect to the PI via Ethernet and try the steps outlined here (<http://jenssegers.be/blog/43/Realtek-RTL8188-based-access-point-on-Raspberry-Pi>) to get those cards up and running. Here is a sample script summarizing that install:

```

sudo apt-get autoremove hostapd
wget https://github.com/jenssegers/RTL8188-hostapd/archive/v1.1.tar.gz
tar -zxvf v1.1.tar.gz
cd RTL8188-hostapd-1.1/hostapd
sudo make
sudo make install
sudo su
cat > /etc/hostapd/hostapd.conf << EOF
# Open network setup
interface=wlan0
driver=rtl871xdrv
ssid=RPI
#sets the mode of wifi, Setting to g ensures backward compatibility.
hw_mode=g
# Set the wi-fi channel:
channel=6
#Sets authentication algorithm
#1 - only open system authentication
auth_algs=1
wmm_enabled=0
EOF
exit
sudo service hostapd restart

```

2. SSH into the Pi, either through wifi (192.168.10.1) or via Ethernet with a login of pi/rachel.
3. Run `sudo raspi-config` to expand the root filesystem to take advantage of the full 64gb available on the SD card. You'll need the space.
4. Run `sudo apt-get update`
5. Run `sudo apt-get upgrade`
6. Install Ka-Lite. The full instructions are here (<http://goo.gl/s7rHXy> on the <http://kalitewiki.learningequality.org> website). Following is a scripted version dated Oct 2013:

```

sudo su
apt-get install python python-m2crypto git-core
git clone https://github.com/learningequality/ka-lite.git
cd ka-lite
./install_linux.sh
cat > kalite/local_settings.py << EOF
CONFIG_PACKAGE = "Rpi"
EOF

```

7. Continue the KA-Lite installation by installing the raspberry Pi optimization steps outlined here (<http://kalitewiki.learningequality.org/using-ka-lite/deployment/raspberry-pi-deployment/raspberry-pi-optimization>). This link also provides troubleshooting steps. Following is a scripted version dated Oct 2013:

```
apt-get install nginx
rm /etc/nginx/sites-enabled/default
touch /etc/nginx/sites-enabled/kalite
sh -c 'kalite/manage.py nginxconfig > /etc/nginx/sites-enabled/kalite'
rm /etc/nginx/nginx.conf
touch /etc/nginx/nginx.conf
cat > /etc/nginx/nginx.conf << EOF
# Open network setup
user www-data;
pid /var/run/nginx.pid;

###
# we have 1 cpu so only need 1 worker process
worker_processes 1;

events {
    ###
    # good overall speed on RPi with this setting
    worker_connections 1536;

    ###
    # Activate the optimised polling for linux
    use epoll;

    ###
    # Keep multi_accept off - RPi+KA Lite is slowed if "on"
    multi_accept off;
}

http {
    ###
    # RPi+KA Lite is faster with sendfile "off"
    sendfile off;
    tcp_nopush off;

    tcp_nodelay on;
    keepalive_timeout 65;
    types_hash_max_size 2048;

    include /etc/nginx/mime.types;
    default_type application/octet-stream;

    ###
    # Speed up landing page by caching open file descriptors
    open_file_cache max=2048;

    ##
    # Logging Settings
    # don't log, we don't need to know normally
    access_log off;
    error_log off;
```

```

##
# Gzip Settings
gzip on;
gzip_disable "msie6";

##
# Virtual Host Configs
include /etc/nginx/conf.d/*.conf;
include /etc/nginx/sites-enabled/*;
}
EOF
service kalite stop
service kalite start
service nginx stop
service nginx start

cd /opt
git clone https://github.com/learningequality/ka-lite-pi-scripts.git
cd /opt/ka-lite-pi-scripts
./configure.sh

```

8. If you have a fancy Install ATXRasPi power button, run this section (from <http://lowpowerlab.com/atxraspi/#installation>) to allow graceful shutdowns on button press. For a plain old Pi with no fancy power button, skip to the next section.

```

sudo apt-get install git-core
git clone git://git.drogon.net/wiringPi
cd wiringPi
./build
cd ~
wget https://raw.githubusercontent.com/LowPowerLab/ATX-Raspi/master/shutdowncheck
sudo chmod 755 shutdowncheck
sudo su
cat > /etc/rc.local << EOF
#!/bin/sh -e
#
# rc.local
#
# This script is executed at the end of each multiuser runlevel.
# Make sure that the script will "exit 0" on success or any other
# value on error.
#
# In order to enable or disable this script just change the execution
# bits.
#
# By default this script does nothing.

# Print the IP address
_IP=$(hostname -I) || true
if [ "$_IP" ]; then
    printf "My IP address is %s\n" "$_IP"
fi
(cd /home/pi && exec ./shutdowncheck) &
exit 0
EOF

```

9. If you have no ATXRasPi board / power button, but wish to do graceful shutdowns with a drive jumper between GPIO2 and GPIO3 (as shown here: <http://>)

www.raspberrypi.org/phpBB3/viewtopic.php?f=37&t=42449) run this to allow a graceful shutdown when you jumper GPIO2 and GPIO3.

```
sudo su
cat > /home/pi/gpio_actions.sh << EOF
#!/bin/bash
# Written by g0t0
# See http://www.raspberrypi.org/phpBB3/viewtopic.php?f=37&t=42449
if [[ $EUID -ne 0 ]]; then
    echo "Error: This script must be run as root" >&2
    exit 1
fi

SHUTDOWN_PIN="3"
#DHCP_ON_PIN="2"

echo "$SHUTDOWN_PIN" > /sys/class/gpio/export
echo "in" > /sys/class/gpio/gpio"$SHUTDOWN_PIN"/direction
#echo "$DHCP_ON_PIN" > /sys/class/gpio/export
#echo "in" > /sys/class/gpio/gpio"$DHCP_ON_PIN"/direction

while ( true )
do
    # check if the pin is connected to GND and, if so, halt the system
    if [ $(/sys/class/gpio/gpio"$SHUTDOWN_PIN"/value) == 0 ]
    then
        echo "$SHUTDOWN_PIN" > /sys/class/gpio/unexport
        shutdown -h now "System halted by a GPIO action"
    # elif [ $(/sys/class/gpio/gpio"$DHCP_ON_PIN"/value) == 0 ]
    # then
    #     dhclient eth0
    fi

    sleep 60
done
EOF
#cron entry for the watchdog script
echo "@reboot      root      /home/pi/gpio_actions.sh" >> /etc/crontab
reboot
```

10. Contact the folks at GCF (GSFLearnfree.org) and ask for a cop of their offline content. Copy it alongside the RACHEL content in `/var/www`. The GCF content directory should be in `/var/www/content`.

11. Update the `/var/www/index.html` file to include the GCF and Ka-Lite content. Find the “search form” and add these lines afterwards:

```
<input type="submit" value="Search"><input type="hidden" name="search"
value="1">
</td></tr></table>
</form>
<br />
<ul>
  <li><b>Ka-Lite (Khan Academy w/Exercises and Reporting)</b>: (Provided By
<a href="http://http://kalite.learningequality.org">Learning Equality.org</
a>) </li>
  <li><a href="http://1.1.1.1:8008" target="GCF">Ka-Lite Landing Page</a></li>
</ul>
```


Goodwill Community Foundation (GCF) Offline: (GCF Web Page)

GCF LearnFree Offline Main Index Page

Apple

Career

Computers

Digital Lifestyle

Everyday Life

Google

Information Savvy

Internet Basics

Job Development

Job Development

Math Basics

Office 2000

Office 2003

Office 2007

Office 2010

Office XP

OpenOffice

Reading (English)

Social Media

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