



instructables

How to Make Raspberry Pi Webcam Server and Stream Live Video || Motion + Webcam + Raspberry Pi

 by Being Engineers

Hello and welcome to **Being Engineers**.

If you are watching this, then you might know how to work with **Raspberry Pi** and you may want to make a **Webcam server** that can stream live video over the internet.

This is what we will be doing today. The process will be very simple but the result is pretty impressive and useful. Before starting you have to know 2 things:

1. How to install OS in a Raspberry pi. (link - <https://www.instructables.com/id/HOW-TO-INSTALL-RA...> (<https://www.instructables.com/id/HOW-TO-INSTALL-RASPBIAN-OS-IN-YOUR-RASPBERRY-PI/>))
2. How to use your **Laptop Screen** a monitor for Raspberry pi. (link - <https://www.instructables.com/id/How-to-Use-Window...> (<https://www.instructables.com/id/How-to-Use-Windows-Laptop-As-Monitor-for-Raspberry/>))

So before we get started, we want to clarify that the process is not the only process to achieve this result. I am showing this to you because I found this most convenient to the user.

You can check out our YouTube channel - www.youtube.com/c/being_engineers1
(http://www.youtube.com/c/being_engineers1)

Our Website - www.being-engineers.com (<http://www.being-engineers.com>)

We have made a video tutorial on it.**So do have a look. :)**

[//www.youtube.com/embed/3m29S2rbqBw](https://www.youtube.com/embed/3m29S2rbqBw)

Now let's begin.

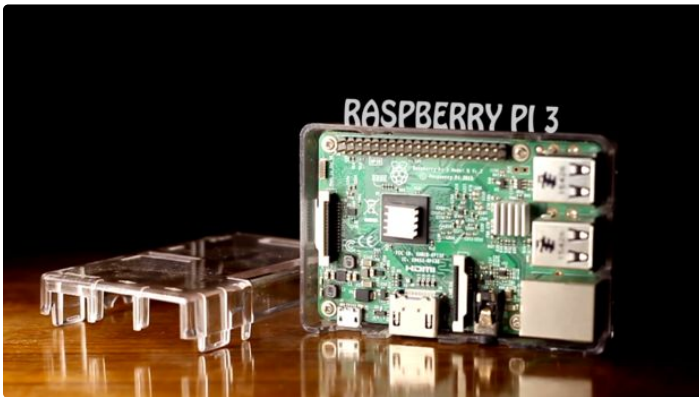


Step 1: Gather the Components

In this project, you will need the following:

- **Raspberry Pi 3 Model B** (Any version will work, but in PI 3 we have the provision for **WiFi** that can make this server wireless)
- **USB Webcam** (I will use my old **Logitech** Webcam. Use a better camera for better results.)
- **5V 2A Power Source** (I will use my **Honor** 13000mah Power Bank)
- **Lan Cable** (RJ - 45 Cable)
- **Minimum 8 GB Class 10 SD Card** (I will use **Sandisk** 32GB class 10 SD Card)

If you haven't install the **Raspbian OS** on the SD card, then you will need a memory card reader and checkout our tutorial on how to install the OS in Raspberry Pi.



Step 2: Set up Your Raspberry Pi

We assume you have the SD Card with the **raspbian** OS installed.

Then **insert the SD Card** in the Pi.

Connect the USB camera to any one of the four available USB port.

Connect the ethernet cable aka LAN cable to your Pi and connect the other end to your router.

Then **Power Up** the Raspberry Pi.

The next step is only for Raspberry Pi 3 users. Others. go to step 4.



Step 3: Connect your Pi to Internet through WiFi (only for Raspberry Pi 3 users)

Open the desktop of Raspbian and connect to WiFi by putting the correct password.

When the raspbian is connected to the network by WiFi, then shut down the system.

Now detach the LAN cable and restart. Then you must be connected to the Internet via WiFi only.

This will help to move your webcam and the pi anywhere without the RJ-45 cable.

Step 4: Know your Raspberry Pi IP Address

Do the following steps to view Pi IP address.

1. **Open your browser** on laptop or mobile.
2. Go to your **Router settings** by typing in the default IP address of your router. (written somewhere on your router.)
3. Find the **list of connected devices**.
4. Find the **corresponding IP address** of the device named **rasberry**.

In our case, it is **192.168.0.107**



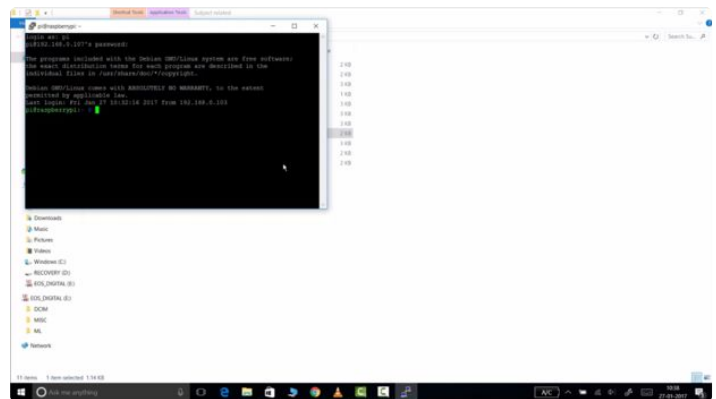
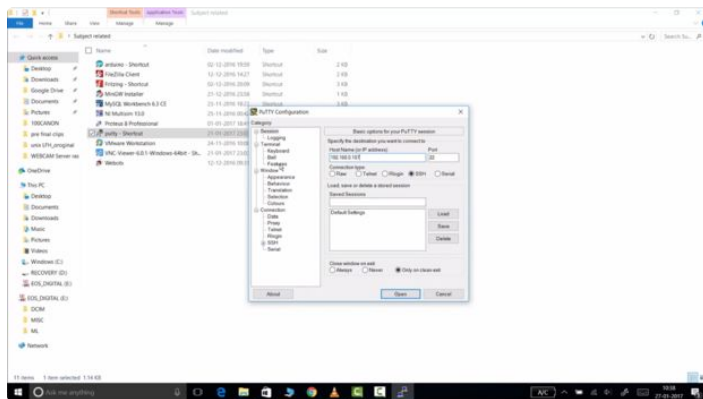
Step 5: Connect to your Pi by SSH connection (PUTTY)

Open up **Putty** and type in the IP address of your Pi and connect.

'pi' & 'rasberry' is the default **'login as'** and **'password'** in Raspbian.

It is always a good practice to **Update** and **Upgrade** the system as soon as you log in.

To do it, type in the command **'sudo apt-get update'** and **'sudo apt-get upgrade'** one at a time.



Step 6: Install the Software and Do the Necessary Settings

Type in the command '**sudo apt-get install motion**' to start the installation.

Now to make sure that the camera is correctly detected.

Type in the command '**lsusb**' and enter. You should see the name of your camera. If it is NOT there, then there is **some problem** in your camera or the camera is **not supported in 'motion'**.

After the installation is complete, type in the command '**sudo nano /etc/motion/motion.conf**' and press enter.

Then you have to change some settings in the .conf file. It might be difficult sometimes to find the settings but use '**ctrl + w**' to find it. So follow the steps:

1. Make sure '**daemon**' is **ON**.
2. Set '**framerate**' anywhere in between **1000 to 1500**.
3. Keep '**Stream_port**' to **8081**.
4. '**Stream_quality**' should be **100**.
5. Change '**Stream_localhost**' to **OFF**.
6. Change '**webcontrol_localhost**' to **OFF**.
7. Set '**quality**' to **100**.
8. Set '**width**' & '**height**' to **640 & 480**.
9. Set '**post_capture**' to **5**.
10. Press **ctrl + x** to exit. Type **y** to save and **enter** to conform.

Again type in the command '**sudo nano /etc/default/motion**' and press **enter**.

Set '**start_motion_daemon**' to **yes**. Save and exit.

```
pi@raspberrypi: ~  
pi@raspberrypi:~$ lsusb  
Bus 001 Device 004: ID 046d:082b Logitech, Inc.  
Bus 001 Device 003: ID 0424:ec00 Standard Microsystems Corp. SMSC95C96 Ethernet Adapter  
Bus 001 Device 002: ID 0424:9514 Standard Microsystems Corp.  
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub  
pi@raspberrypi:~$
```

```
pi@raspberrypi:~  
File: /etc/motion/motion.conf  
#####  
# Image width (pixels). Valid range: Camera dependent, default: 352  
width 352  
# Image height (pixels). Valid range: Camera dependent, default: 288  
height 288  
# Maximum number of frames to be captured per second.  
# Valid range: 2-100. Default: 100 (almost no limit).  
# Generate 1000  
framerate 1000  
# Minimum time in seconds between capturing picture frames from the camera.  
# Default: 0 = disabled - the capture rate is given by the camera framerate.  
# This option is used when you want to capture images at a rate lower than 2 per  
minimum_frame_time 0  
#####  
DO NOT CHANGE FRAMERATE TO 1000 - 1500  
Get Help  WriteOut  Read File  Prev Page  Cut Text  Our For  
Exit      Justify   Where is  Next Page  UnCut Text  To Spell
```

```
pi@raspberrypi:~  
GNU nano 2.2.6 File: /etc/motion/motion.conf  
#####  
timelapse_filename %Y%m%d-timelapse  
#####  
# Global Network Options  
#####  
# Enable or disable IPV6 for http control and stream (default: off )  
ipv6_enabled off  
#####  
# Live Stream Server  
#####  
# The mini-http server listens to this port for requests (default: 0 = disabled)  
stream_port 8081  
#####  
# Quality of the jpeg (in percent) images produced (default: 50)  
stream_quality 50  
#####  
# Output frames at 1 fps when no motion is detected and increase to the  
#####  
DO NOT CHANGE THE STREAM PORT  
Get Help  WriteOut  Read File  Prev Page  Cut Text  Our For  
Exit      Justify   Where is  Next Page  UnCut Text  To Spell
```

```
pi@raspberrypi:~  
GNU nano 2.2.6 File: /etc/motion/motion.conf Modified  
#####  
timelapse_filename %Y%m%d-timelapse  
#####  
# Global Network Options  
#####  
# Enable or disable IPV6 for http control and stream (default: off )  
ipv6_enabled off  
#####  
# Live Stream Server  
#####  
# The mini-http server listens to this port for requests (default: 0 = disabled)  
stream_port 8081  
#####  
# Quality of the jpeg (in percent) images produced (default: 50)  
stream_quality 50  
#####  
# Output frames at 1 fps when no motion is detected and increase to the  
File to insert in config file  
# Set HTTP  
# Cancel  
SET STREAM QUALITY = 100
```

```
pi@raspberrypi:~$ nano /etc/motion/motion.conf
GNU nano 2.2.6 File: /etc/motion/motion.conf Modified
#####
# The mini-http server listens to this port for requests (default: 0 = disabled)
stream_port 8081

# Quality of the jpeg (in percent) images produced (default: 50)
stream_quality 100

# Output frames at 1 fps when no motion is detected and increase to the
# rate given by stream_maxrate when motion is detected (default: off)
stream_motion off

# Maximum framerate for stream streams (default: 1)
stream_maxrate 100

# Restrict stream connections to localhost only (default: on)
stream_localhost off

# Limits the number of images per connection (default: 0 = unlimited)
#####
SET STREAM LOCALHOST TO OFF
```

```
pi@raspberrypi:~$ nano /etc/motion/motion.conf
GNU nano 2.2.6 File: /etc/motion/motion.conf Modified
#####
# When set to 'first', only the first picture of an event is saved.
# Picture with most motion of an event is saved when set to 'best'.
# Picture with motion nearest center of picture is saved when set to 'center'.
# Can be used as preview shot for the corresponding movie.
output_pictures on

# Output pictures with only the pixels moving object (ghost images) (default: on)
output_debug_pictures off

# The quality (in percent) to be used by the jpeg compression (default: 75)
quality 100

# Type of output images
# Valid values: jpeg, ppm (default: jpeg)
picture_type jpeg

#####
SET QUALITY = 100
```

```
pi@raspberrypi:~$ nano /etc/motion/motion.conf
GNU nano 2.2.6 File: /etc/motion/motion.conf Modified
#####
# Default: not defined (Disabled)
# stream_authentication username:password

#####
# TCP/IP port for the http server to listen on (default: 0 = disabled)
webcontrol_port 8080

# Restrict control connections to localhost only (default: on)
webcontrol_localhost off

# Output for http server, select off to choose raw text plain (default: on)
webcontrol_html_output on

# Authentication for the http based control. Syntax username:password
# Default: not defined (Disabled)
#####
SET WEBCONTROL_LOCALHOST TO OFF
```

```
pi@raspberrypi:~$ nano /etc/motion/motion.conf
GNU nano 2.2.6 File: /etc/motion/motion.conf Modified
#####
# Image height (pixels). Valid range: Camera dependent, default: 288
height 720

# Maximum number of frames to be captured per second.
# Valid range: 2-100. Default: 100 (almost no limit).
framerate 1000

# Minimum time in seconds between capturing picture frames from the camera.
# Default: 0 = disabled - the capture rate is given by the camera framerate.
# This option is used when you want to capture images at a rate lower than 2 per
# second.
minimum_frame_time 0

# URL to use if you are using a network camera, size will be autodetected (includes
# Must be a URL that returns single jpeg pictures or a raw mjpeg stream. Defaults
# to camera url value
#####
SET WIDTH = 640 & HEIGHT = 480
```

```
pi@raspberrypi:~$ nano /etc/motion/motion.conf
GNU nano 2.2.6 File: /etc/motion/motion.conf Modified
#####
# Picture frames must contain motion at least the specified number of frames
# in a row before they are detected as true motion. At the default of 1, all
# motion is detected. Valid range: 1 to thousands, recommended 1-5
minimum_motion_frames 1

# Specifies the number of pre-captured (buffered) pictures from before motion
# was detected that will be output at motion detection.
# Recommended range: 0 to 5 (default: 0)
# Do not use large values! Large values will cause Motion to skip video frames &
# cause unsmooth movies. To smooth movies use larger values of post_capture instead
# of pre_capture
pre_capture 0

# Number of frames to capture after motion is no longer detected (default: 0)
post_capture 5

# Event Gap is the seconds of no motion detection that triggers the end of an event
# An event is a series of pictures of a single object within a short timeframe
# Recommended range: 0 to 10 (default: 10)
# Events are disabled and disabled
# events causing all Motion to be written to one single movie file and no pre_capture
#####
SET POST CAPTURE = 5
```

```
pi@raspberrypi:~$ nano /etc/default/motion
GNU nano 2.2.6 File: /etc/default/motion
#####
# set to 'yes' to enable the motion daemon
start_motion yes

#####
Read 3 lines
```

Step 7: Start The Server

First of all you have to **restart** the motion software. To do it type in the command **'sudo service motion restart'** and press **enter**.

Again type in the command **'sudo motion'** and press **enter**. Now your server is ready.

```
pi@raspberrypi:~$ sudo service motion restart
pi@raspberrypi:~$ sudo motion
[0] [NTC] [ALL] conf_load: Processing thread 0 - config file /etc/motion/motion.conf
[0] [ALR] [ALL] conf_cmpparse: Unknown config option "adl_threadnr"
[0] [NTC] [ALL] motion_startup: Motion 3.2.12+git20140228 Started
[0] [NTC] [ALL] motion_startup: Logging to syslog
[0] [NTC] [ALL] motion_startup: Using log type (ALL) log level (NTC)
[0] [NTC] [ALL] become_daemon: Motion going to daemon mode
pi@raspberrypi:~$
```

Step 8: It's DONE!!

Now open up your browser. Type in the IP address of your raspberry Pi and the port number in this way:

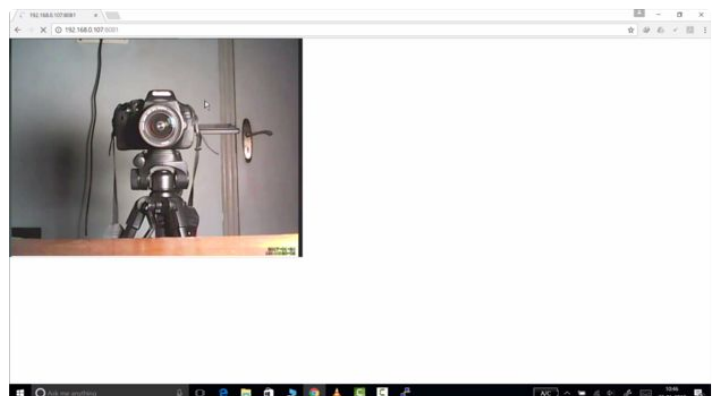
192.168.0.107:8081 (First there is the IP address, then a ':', then the port number). Press **Enter**.

Now **you can see the Live feed coming from your webcam** directly on your laptop or mobile or both at the same time.

Hope you have enjoyed this tutorial. If yes then please do **SUBSCRIBE** to our channel **Being Engineers**. It really helps us a lot on seeing your support and interest towards our channel and don't forget to share :)

Channel link - https://www.youtube.com/c/being_engineers1 (https://www.youtube.com/c/being_engineers1)

Peace.



1.
mounted
on
a

remote
controlled
car