Raspberry PI Surveilliance with motion

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# Purpose of Solution

The main purpose of a surveillance camera is it to keep people safe from various criminal activities and record all the information that can be used as an evidence to catch criminal. In addition, some of the objective of having a surveillance camera are given below:

* 24 hours public security.
* Can be monitor from anywhere
* Can be used from any devices
* Protects property from the thief, robbery or those who tries to harm us.
* Helps to collect evidence and quickly solve the problem
* Improves business sense
* Reduce crime rate
* Useful for home, bank, hospital.
* People can feel secure in public areas

# Target Audience

The main target audience are public or business/company. Also, some target audience are:

* Public areas like parking, events hall
* All businesses required a surveillance camera either security or multiple purposes like monitor employees, prevent products being stolen
* Health care industry
* Office buildings, supermarket
* Bank
* Airport

# Requirement

Requirements to build this project

* Should have knowledge about raspberry pi
* Raspberry pi with Raspbian OS on the SD card, power supply are needed for the project.
* Should connect to via SSH
* Assembling all the hardware components together
* One of the software called motion detection software should be installed
* Videos should be saved on windows shared folder
* Camera should be mounted

Note: camera should be kept in safe and dry place to avoid damage and we should look after Wi-Fi signal as it will not work when it’s beyond the range of Wi-Fi.

* Able to access live stream using any devices like mobile phone, pc, laptops from the same network

# Equipment requirement

List of equipment used for our project:

* Raspberry pi
* Raspberry Pi camera
* HDMI cable
* HDMI Female to HDMI Micro Male Adapter
* SD card
* Suitable power supply
* Camera

# Step by step Process

## Installing Motion

1. Go to this [website](https://github.com/Motion-Project/motion/releases) and download “[buster\_motion\_4.3.2-1\_armhf.deb](https://github.com/Motion-Project/motion/releases/download/release-4.3.2/buster_motion_4.3.2-1_armhf.deb)” from the list.

## Extract the file from the file explorer.

## Configuring the motion.conf file from motion

1. Type the command below to go to motion directory.

|  |
| --- |
| Cd /etc/motion |

1. Open the motion.conf file from the editor by the command below.

|  |
| --- |
| Sudo nano motion.conf |

1. Now select the appropriate directory to save your picture.

“Note: You will have different layout then this picture.”

Graphical user interface, text, application

Description automatically generated

The above command will take a picture folder in that directory and saves pictures and videos there.

1. Uncomment “mmalcam\_name” and add vc.rill.camera just like in the above picture. This will record the video of any motion captured.
2. Now change the value for picture output to “on”. This will save capture the motion and save in the target\_dir.
3. Now turn off the web control localhost and stream localhost like in the picture below.

Graphical user interface, application

Description automatically generated

1. Save the file by pressing ctrl+s and exit by pressing ctrl+x.
2. Reboot the raspberry.

|  |
| --- |
| Sudo reboot |

## Mail Buster

1. Install mail client server.

|  |
| --- |
| Sudo apt-get install msmtp msmtp-mta |

1. Create a file called “msmtprc” in etc directory.

|  |
| --- |
| Cd /etc |

|  |
| --- |
| Sudo nano msmtprc |

1. Now configure your email server as in the picture below.

Graphical user interface, text, application

Description automatically generated“Note you have to turn on the less secure apps access from the security by going to your Gmail account”.

1. Now reboot your raspberry.

|  |
| --- |
| Sudo reboot |

1. Type in this command to see if your mail buster is working.

|  |
| --- |
| echo 'your message' | msmtp destination-email-address@gmail.com |

1. If you receive the mail, you ready to go.
2. Now start the motion and you have your surveillance ready.

# How to use solution including troubleshooting

After you set up all the file, you just must start the motion by typing motion on the terminal.

|  |
| --- |
| motion |

There might be times when the motion might not work, or you change the conf file you can use the following command.

|  |
| --- |
| Sudo service motion restart |

This does not seem to work sometimes. In that case you can stop the motion by following command.

|  |
| --- |
| Ps -A | grep motion |

This will display the process number of motions on left hand side so now you have to type the command below.

|  |
| --- |
| Sudo kill <that particular process number of motions> |

This will stop the motion from process, and you can start the motion again from the terminal.

# Issues and the solution of problem

During the project we had to jump through different hurdles which wasn’t easy task. However, we were able to solve those problems and built the successful project.

## Issues encountered when doing project

There were several issues we encountered while we did this project some of them are listed below:

1. Live streaming wasn’t working.
2. The mail buster was all outdated
3. The SD card got corrupted.
4. The motion wasn’t installing.
5. The mail buster wasn’t attaching the picture.
6. The photo and the video started taking a lot of space.
7. The graphics in the live streaming video was all black.

## Solutions taken to solve the problem

1. We had the motion running but the live streaming was not running so we found out that the live stream port was off so turned it on in the motion.conf file.
2. We tried using postfix mail client, hiromloox those were either deleted or outdated so we found a mail buster which is “msmtpc”. Likewise, this mail buster is UpToDate and support motion
3. As weren’t able to figure out what was the problem with the mail buster before finding out msmtpc we tried changing the SD card with other raspberry pi and then it got corrupted for no reason, at the end it wasn’t even read by the computer so we had to use a new SD card.
4. After we used the new SD card, we searched the latest version of motion and tried installing them but could not do it because we hadn’t updated the raspberry pi.

|  |
| --- |
| Sudo apt-get update |

1. As we got the mail working, but it was not attaching the picture, so we had to install mutt. This helps to extract our file and attach it

|  |
| --- |
| sudo apt-get -y install mutt |

1. As the motion kept capturing a lot of images and videos, I had to free up the space manually. So, we set up an automatic deleting file. We used crontab for delineating the file automatically.

|  |
| --- |
| Crontab -e |

|  |
| --- |
| 0 0 \* \* \* /usr/bin/find /videos/ -type f -name '\*.avi' -mtime +30 -exec rm {} \; |

This deletes the files from videos which are older than 30 days.

1. As we had set up everything, we wanted to see everything is working we found out that the live streaming did not have graphics in it. After looking into the conf file we found out that we had to turn off the demon. So, we turned it off and restarted the motion the live streaming had decent graphics.