

PiMask

Backup

Functional Specification

Version 0.1

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Version History

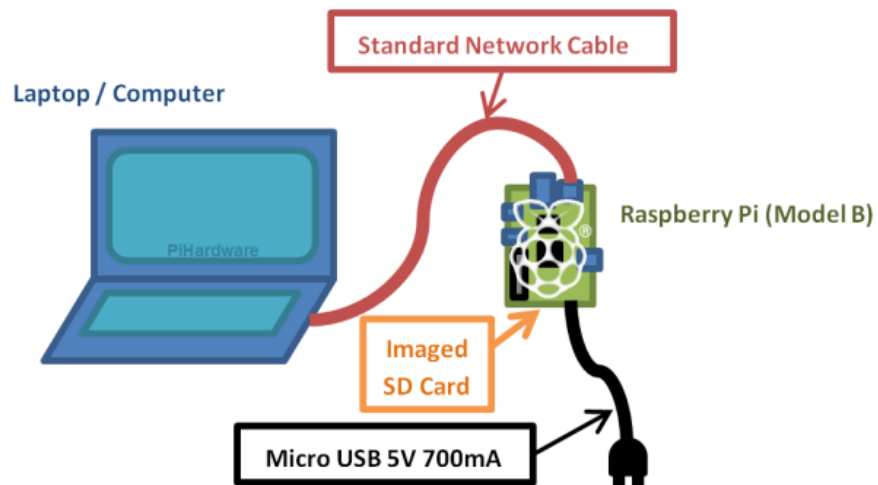
Version	Changes
0.1	Enlisting the ways to achieve Backup mechanism

Introduction

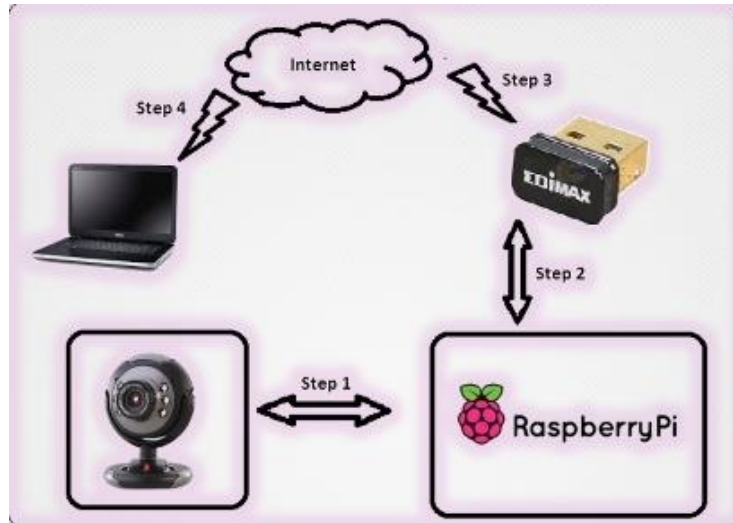
The functionality described in this document is a part of the “back up” feature that we plan to implement in our mobile application/web application. It refers to the ability of a user’s phone to communicate with the Raspberry Pi which acts as a controller.

The aim is to be able to wirelessly communicate with the controller (Raspberry Pi) using one of the possible methods. There are various methods to do. Our goal is to research about each method and implement the best one.

References



The above diagram shows a typical way to transfer data to or from raspberry pi into another client machine. The raspberry pi can be connected to another laptop using a wire/cable and copy data onto each other.



For our project, we need to access the data wirelessly. To achieve that we can connect the devices wirelessly in the above shown way.

1. Kumar, K. (Mar 05, 2015). Smart wireless surveillance monitoring using RASPBERRY PI. Retrieved from <http://www.slideshare.net/KrishnaKumar272/smart-wireless-surveillance-monitoring-using-raspberry-pi>
2. Raspberry Pi Foundation.Remote access. Retrieved from <https://www.raspberrypi.org/documentation/remote-access/>

Requirements

For this feature, the requirements are:

1. A laptop with wifi feature
2. A smartphone with wifi feature
3. A raspberry pi with one of the compatible OS
4. A wifi module for the raspberry pi

Functional Overview

Our project requires data to be transferred to our controller (Raspberry Pi). Thus we need to pair the devices with the Raspberry Pi wirelessly. The following are the ways in which we can gain remote access to it:

ACCESS OVER THE INTERNET

Raspberry Pi can be accessed by any other device through the Internet. There are two ways in which we can do this.

1. The first method is port forwarding. In this method, the router is configured to direct the traffic from the public ip on the TCP port to the local network IP address of the Raspberry Pi.
2. The second method is Weaved services. Weaved is a software that needs to be downloaded on Raspberry Pi. This enables the Pi to be connected from anywhere over the internet.

VIRTUAL NETWORK COMPUTING

VNC allows the user to access the graphical interface of the Raspberry Pi on some other machine. Through this way, you can directly work on Raspberry Pi itself.

You need to install TightVNC package and run it on the Raspberry Pi:

```
sudo apt-get install tightvncserver
```

```
tightvncserver
```

Now, start VNC server from terminal:

```
vncserver :0 -geometry 1920x1080 -depth 24
```

On your machine, install and run VNC client:

On your Linux machine, install package `xtightvncviewer`:

```
sudo apt-get install xtightvncviewer
```

SSH:

Using SSH will let you access the commandline of Raspberry Pi from other devices on the same network.

You can enable the SSH server using `raspi-config`:

1. Enter `sudo raspi-config` in the terminal
2. Navigate to `ssh`
3. hit `Enter` and select `Enable or disable ssh server`

SSH FILE TRANSFER PROTOCOL:

SSH File Transfer Protocol gives you the ability to access and manage files from Raspberry Pi over SSH. It is very easy to implement this method because SSH is already available on Raspbian OS.

Filezilla client is used to implement this method.

Ubuntu using nautilus:

Open Nautilus on client machine.

Select File > Connect to Server

```
Type: SSH
Server: <The Pi's IP address>
Port: 22 (default)
User name: pi (default)
Password: raspberry (default)
```

RSYNC:

rsync is a tool which can be used to sync folders from the Raspberry Pi to your device like laptop. It uses SSH to do so. It is more secure than FTP method. Using this tool enables automatic syncing of folders between the two devices.

The command to implement rsync:

```
rsync -avz -e ssh pi@192.168.1.10:camera/ camera/
```

WEBSERVER:

One more way to access data on Raspberry Pi is to setup a webserver on it and accessing it through other devices on the same network.

The following webservers can be setup on PI:

1. Apache
2. NGINX

Configuration/External Interfaces

N/A

Implementation

The functionality can be effectively implemented in the following two ways:

1. Using rsync:
This method will require for the Raspberry Pi to be setup with the Raspbian OS and using rsync with SSH.
The setup needs to be done for a particular folder which will be automatically synced with the other device.
2. Webserver:

Setting up a webserver will be the major part of the functionality. The webserver needs to be compatible with Raspberry Pi.

The other part of the functionality will include creating a web application through which other devices can access the data from the Raspberry Pi.

Testing

If we implement the webserver, the following testing procedures will be carried out:

1. Server-side Testing
2. Stress Testing
3. UI testing for the Web Application