

Low Cost Offline Data Streamer Using Raspberry Pi Zero W Model

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Abstract: In this paper the low-cost offline data streamer that is based on the raspberry pi zero w model. In this paper the data synchronization has been done by using the WIFI technology which is inbuilt on the raspberry pi. The offline data streamer is used to stream the data which is stored in micro SD card which is of 32GB memory and expandable up to 128GB memory to the multiple users in the WIFI range. The main thing of this system is to connect the multiple users and enjoy the multimedia in offline mode such as movies, videos, songs while travelling in the bus. It can be connected to a maximum of 50 users through mobile phone or on laptop. All this work is done on Raspbian OS (operating system). There are a variety of facts such as Etcher tool, VNC viewer, Raspbian OS and Flow chart are given in this paper.

Keywords — *Low-cost computing, own-clouding, offline data streamer, Raspberry pi.*

I. INTRODUCTION

There are lots of entertaining devices available, some of them are recordable player or broadcast media receiver player. But all devices have some problems, if there are 5 person or more crowds are there, they all will have to enjoy the same track. Another problem of broadcast player is the range issue and much more problems are there to enjoy the entertainment to everyone [1].

In 21st generation everyone using the smart phone which is having the Wi-Fi function. Every Wi-Fi device has the smart browser function. By taking this in mind we are going to use offline data streamer which will be used by every user as well as that every user can enjoy the different media which is stored on the raspberry pi with no buffering at anytime and anywhere, where the device is present [2].

We are going to use the raspberry pi zero w which has the inbuilt hotspot function to broadcast the media. In the raspberry pi there is one static IP, in that there are some PHP files which will access to the user end using the browser and they will be able to access the data whatever available on the PHP page [3].

All this work will be done on Raspbian OS platform and it will help to develop the server using the Raspberry pi. We are going to make partition on the SD card which is connected to the Raspberry pi which is used to store the media and it will be accessed by the user [4].

NLS stands for Network linked Storage. NLS helps to share a file across heterogeneous devices in a network. NLS uses a

networking protocols which helps to create file sharing server [5].

By Default, NLS uses server which is file sharing server helps others to access the files across multiple devices seamlessly in a network. If you have lots of computers it's tedious to share a data across multiple devices through wires. So, creating a Network linked storage helps to access the files wirelessly across all of your computers and mobiles which are connected to same network [6].

Imagine if you have lots of devices connected to the same network. It's very hard to transfer the data from one device to another device wirelessly. So, we'll build NLS Server so all of the devices will ask the server conjointly they'll see the files on the server with each read and write permissions. For Example, if I have an android device and I will copy all of my backup to the NLS Server so automatically other devices connected to the same network can have access to all the files [7].

This offline server works by providing a WIFI-signal from the pi adapter. By connecting to the WIFI from the pi, your phone, tablet or laptop is able to access the memory from the pi micro SD card through an offline-server provided by the pi [8]. Pictures, videos and music can be uploaded, downloaded and played from that. The whole system works mechanically by merely powering the pi zero w [9].

II. SYSYTEM DEVELOPMENT

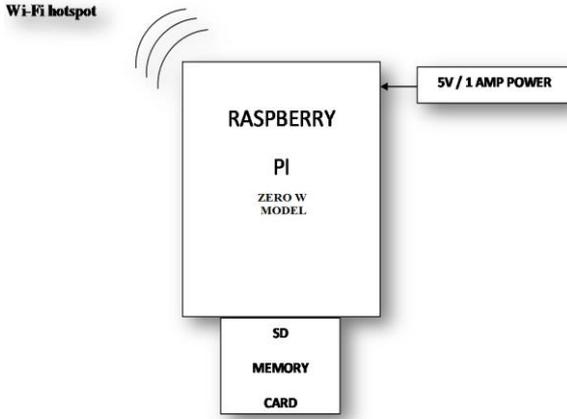


Fig.1 Functional Block Diagram of the System

In this project up on your Raspberry Pi zero w model, in this first we have to format the 32Gb micro SD card using Etcher tool. After that mount the micro SD card in the raspberry pi zero w model then we need operating system (OS) for the operation of the raspberry pi i.e. Raspbian OS or Noobs OS, we choose Raspbian operating system (OS) for our model. Then install the Raspbian OS on the micro SD card that is mounted on the pi model so we can configure the model and also do programming which is based on Raspbian OS [10].

A. Etcher tool

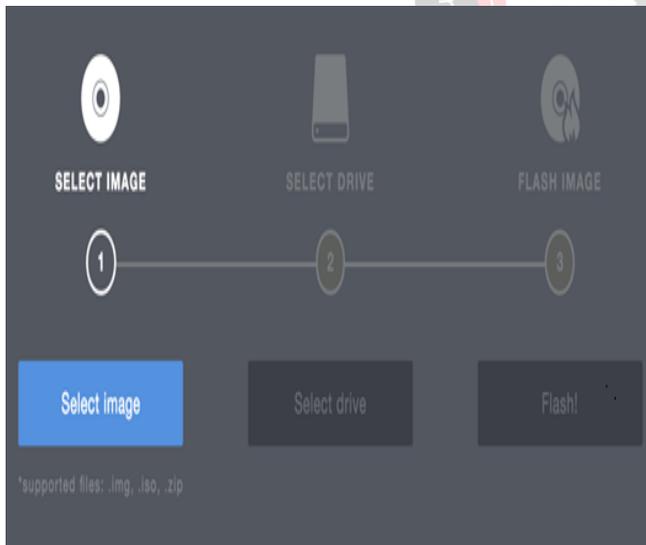


Fig.2 Etcher tool for image selecting

Etcher tool is very easy tool for burning images to SD cards, USB drives and other removable devices. The program keeps operations to the clean minimum, all of them clearly displayed on an easy interface. Choose your image, then your drive, and at last click the "Flash!" button. Etcher supports many different image formats: ISO, IMG, RAW, BZ2, DMG, DSK, ETCH, GZ, HDDIMG, XZ and ZIP. The "Choose a drive" step solely permits choosing removable devices, reducing the chance that you'll accidentally trash a

fixed drive. If this doesn't suit your needs - maybe a removable device isn't being detected correctly - you can disable this protection by turning on "Unsafe Mode" in settings. Once the image is written, Etcher validates the results to make sure it's worked correctly. That's usually a good idea, but can take a while, and if you prefer you can disable validation in Settings. Etcher is a simple and straightforward image burner which works almost anywhere. It's a likeable tool, however detain mind that it solely burns the image. If you wish additional skills, like AN choice to burn a Windows image and create it bootable. In the fig.2 it shows the etcher tool for image selecting is an open source project by resin.io in that tool first we have to select the image file i.e. the operating system (OS) file for the supported format that are, .img,.iso,.zip [11].

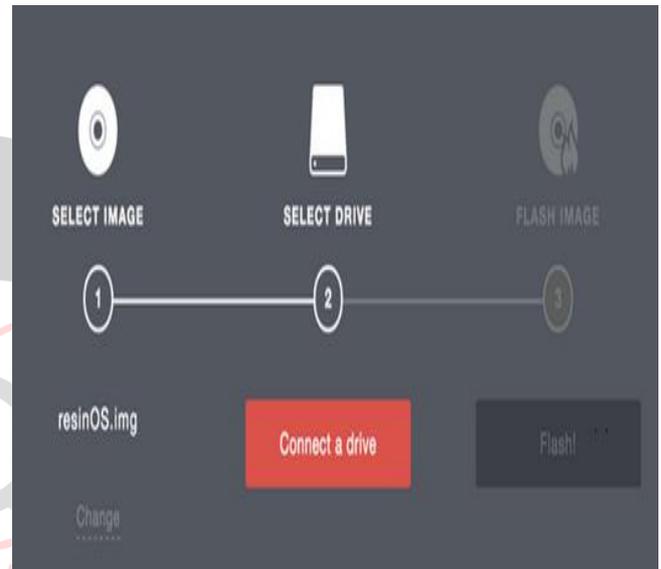


Fig.3 Etcher tool for drive selecting

In fig.3 we have to select the drive that is our micro SD card which is mounted on the raspberry pi, so select the drive i.e. micro SD card of size 32 Gb.



Fig.4 Etcher tool for image flashing

Then the third and last step is flash the image file for the selected drive i.e. is our micro SD card.

B. Raspbian OS (Operating system)

Raspbian is open source free operating system based on Debian packages optimized for the Raspberry Pi hardware. A software is that the set of basic programs and utilities that create your Raspberry Pi run. However, Raspbian provides over a pure OS: it comes with over thirty 5,000 packages, pre-compiled code bundled in an exceedingly nice format for straightforward installation on your Raspberry Pi.

Raspbian may be a Debian-based pc software for Raspberry Pi. There square measure many versions of Raspbian together with Raspbian Stretch and Raspbian Jessie. Since 2015 it's been formally provided by the Raspberry Pi Foundation because the primary software for the family of Raspberry Pi single-board computers.

The initial build of over thirty-five thousand Raspbian packages, optimized for best performance on the Raspberry Pi, was completed in June of 2012. However, Raspbian remains below active development with a stress on rising the soundness and performance of as several Debian packages as potential. A Raspbian image may be a file that you just will transfer onto AN Coyote State card that successively will be accustomed boot your Raspberry Pi and Via APC into the Raspbian operating system. Using a Raspbian image is that the easiest method for a replacement user to urge started with Raspbian.

This installer is a hacked-up version of the Debian installer, it was created by jerry.tk who no longer appears to be active (last forum post in January 2013, last forum visits in April 2013). To run on recently manufactured Pi with Hynix or Samsung memory it is likely you will need to replace the kernel and boot load included with the installer with more recent versions from the raspberry pi foundation.

Format AN Coyote State card with one FAT32 (MS-DOS or Windows formatted) partition and replica the installer files from this nada file onto the top-ranking directory. On a Raspberry Pi with AN connected monitor and keyboard boot with the Coyote State card to begin the installer computer code. The partition and files on this card are overwritten throughout the installation method.

This installer is a "network" installer. This means installer needs local area network network property to the net and Raspbian packages are force down from remote servers. When the installer first starts the DHCP server on the local LAN will be queried to provide an IP address, default route and name server required for network connectivity.

The Raspbian repository is that the entire set of Raspbian packages organized during a special on-line directory tree which may be accustomed install thousands of extra computer code packages on your Raspberry Pi.

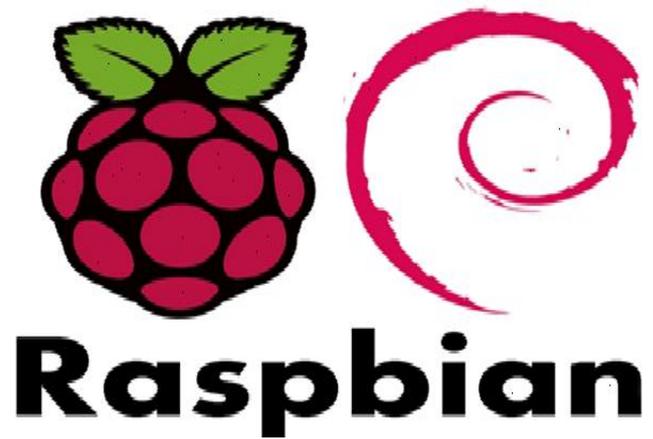


Fig.5 Raspbian operating system logo

In fig.5 it shows the design logo of Raspbian operating system.

C. VNC Viewer

In system, Virtual Network Computing (VNC) could be a graphical desktop-sharing system that use the Remote buffer protocol (RFB) to remotely management another laptop. It transmits the keyboard and mouse events from one laptop to a different, relaying the graphical-screen updates back within the alternative direction, over a network [16].

VNC is platform-independent – there are a unit purchasers and servers for several GUI-based operative systems and for Java. Multiple purchasers could hook up with a VNC server at an equivalent time. Popular uses for this technology embrace remote technical support and accessing files on one's work laptop from one's computing device, or the other way around [16].

VNC was originally developed at the Olivetti & Oracle research laboratory in Cambridge, UK. The original VNC ASCII text file and plenty of trendy derivatives area unit open supply beneath the wildebeest General Public License.

There are a unit variety of variants of VNC which provide their own explicit functionality; e.g., some optimized for Microsoft Windows, or providing file transfer (not a part of VNC proper), etc. Many area units compatible (without their else features) with VNC correct within the sense that a viewer of 1 flavor will connect with a server of another; others area unit primarily based on VNC code however not compatible with normal VNC [16].

D. Testing the system

Now that the micro SD card is set up, plug the micro SD card in the slot on the pi zero w. Power the raspberry with the micro USB cable. After about 1 minutes, you should be able to see 'ArOZ-Online' as a new network. Try connecting to it using another device.

It should be connected to be wifi from the raspberry pi, but there is no actual internet available. Navigate to your browser and type:

192.168.0.1(Default Static IP)

You should now be able to see the ArOZ-Online website if everything was done correctly. Now that it works, some files need to be edited. To edit the files, download VNC Viewer from here on your Laptop/PC and connect to the ArOZ-Online system in the wifi settings.

Open VNC Viewer and type this address in the address field:

192.168.0.1

It will prompt for a username and password.

reboot the device by typing this in Linux Terminal:

sudo reboot (command for reboot the system in Linux terminal) After the reboot, you'll be able to login.

E. Final Configuration

No matter what size your micro SD card has, the full extent of the memory cannot be simply used as-is. To use the full memory available by your micro SD card, open up LX Terminal, then type in:

sudo raspi-config (command for configure the memory of pi)

The next thing to do is changing the default password. This can be done by clicking the raspberry icon located at the bottom left corner, then selecting 'Preferences' and clicking on 'Raspberry Pi Configuration'. Click on 'Change password' and type in 'raspberry' as the current password. Type in a new password and retype it in the last field. Lastly, click on enter to apply the change. When connecting to VNC another time, use your specified password.

To change the wifi password from the ArOZ-Online system, a specific file has to be modified. Type this in the Terminal:

sudo leafpad /etc./hostapd/hostapd.conf

make sure that the new password has at least 8 characters long and not easy to guess. Save the file by pressing 'Ctrl' and 's' and after saving, quit the editor by pressing 'Alt' and 'F4'. To apply the changes, reboot the raspberry pi by typing:

sudo reboot

you'll realize that the password has been updated and no device is able to connect to it anymore. Either the device from which you're trying to connect to will tell you to retype the password or you might have to manually change the password for this network in the network settings. Once connected, type in 192.168.0.1 in your browser.

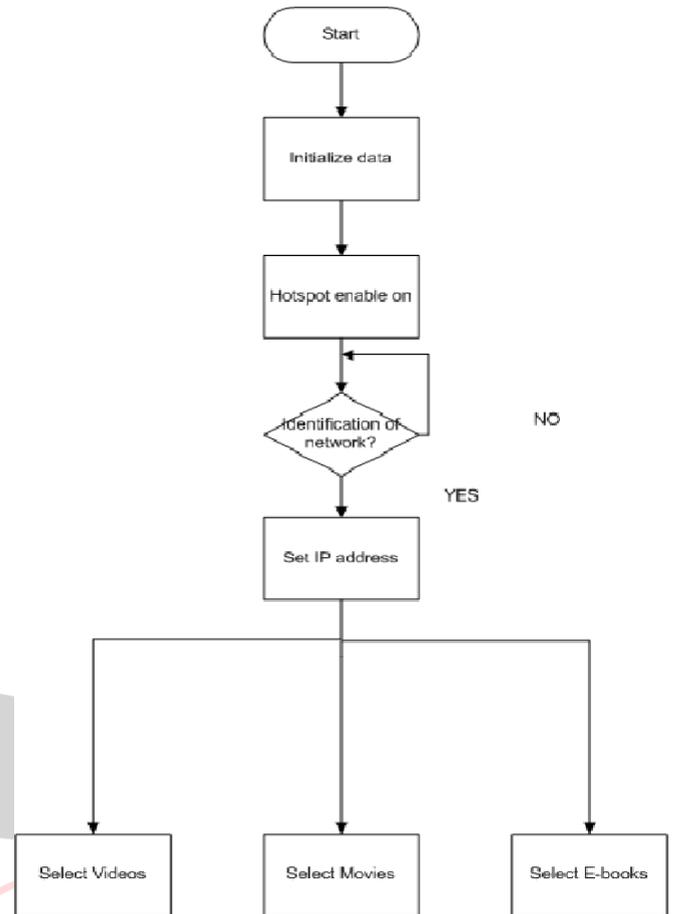


Fig.6 System operation

III. RESULT AND DISCUSSION

First you have to connect the WIFI of raspberry pi zero w then the Following IP address is search in browser. 192.168.0.1(Default Static IP), Then it will display the main login screen where you can login by using admin ID and password.

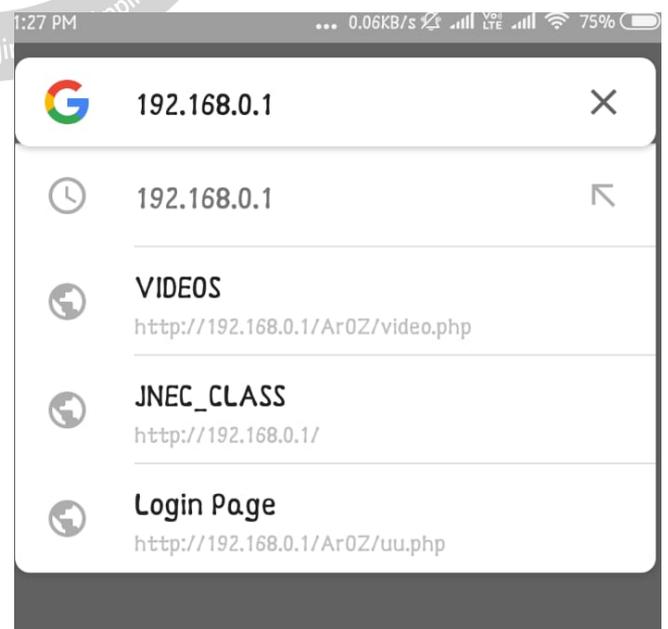


Fig.7 Inserting IP address in browser



Fig.8 Welcome page

In fig.8 this is the welcome page of your offline data streamer, there are two sections in it, i.e. on is Entertainment and second is educational. And also the name of developer as well as guide person.



Fig. 9 Entertainment sub contents

In the fig.9 it is the sub contents of the entertainment section; one is videos and second one is movies.

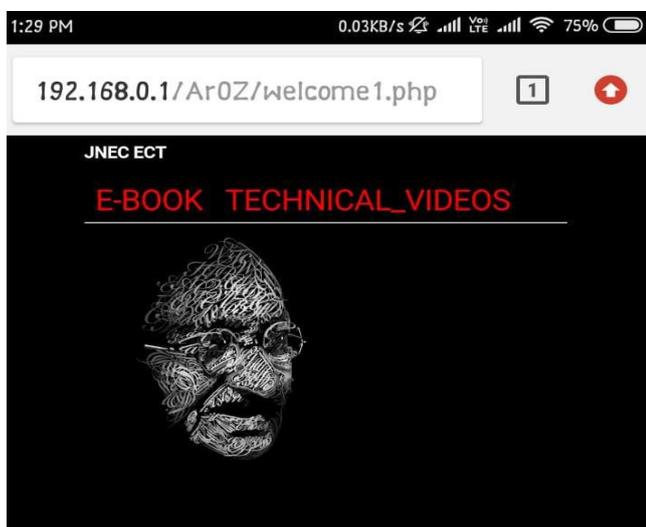


Fig.10 content folder

We can access various E-book, Technical Video using the IP address, we can browse this IP on any PC, mobile without internet. Fig.10. show the welcome screen where E-book and technical videos are accessible.

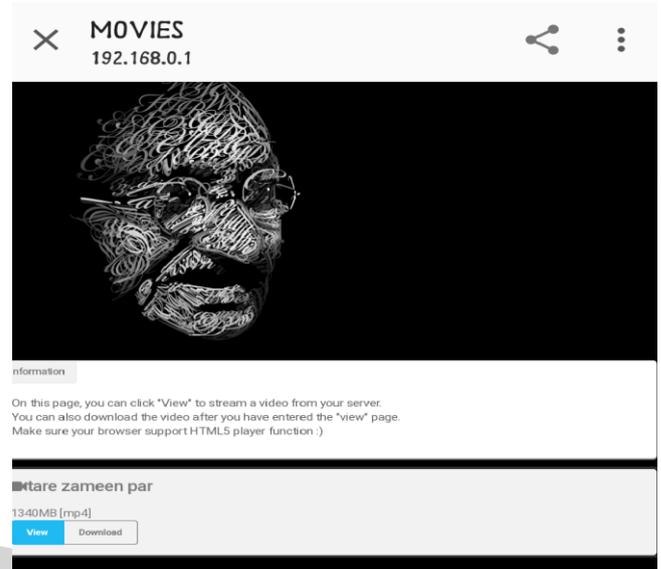


Fig .11 Movie playlist

In this movie section of entertainment, we have uploaded a movie named as tare jameen par. Also, we can watch it directly or we can also download it.



Fig.12 Movie streaming in offline mode

In the fig.12 we can see the movie streaming on offline mode on mobile view.

IV. CONCLUSION

In this paper, we can use offline data streamer for data transmitting and sharing, for that Raspbian OS platform is used and it will help to develop the server using the raspberry pi zero w model. The offline data streamer has many advantages such as it doesn't require internet connection, so it is very fast in operation.

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