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Raspberry Pi for Offline Media Server Deployment

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Abstract- *In this research paper, an economically low computing environment using Raspberry Pi Zero W model-based systems is very well organized to use computing systems in a developing environment. All this work will be done on the Linux OS platform, and it will help to develop the server using the Raspberry Pi. A partition will be made on the SD card, which is connected to the Raspberry Pi and helps store the media and work with them offline. This allows up to 50 users to work offline.*

I.INTRODUCTION

A greater number of entertaining devices are available, some of which are recordable players or broadcast media receivers. But all devices have some problems. If there are five people or more, crowds will exist, and they will all enjoy the same track. Another problem of broadcast players is the range issue, and much more problems will additionally exist [1]. In this 21st generation, everyone is using a smart phone that has a smart Wi-Fi connection. By considering this as an advantage, we are going to use an offline Wi-Fi media streamer that will be used by every user who can enjoy the different media that is stored on the server with no buffering at anytime and anywhere, where the device is present [2]. We are going to use the Raspberry Pi, which has an inbuilt hotspot function, to broadcast the media. In the Raspberry Pi, it has only one static IP, in

that there are some PHP files that will access the user end using the theme browser, and they can access the data whatever is available on the PHP page [3]. All this work will be done on the Linux OS platform, and it will help to develop the server using the Raspberry Pi. We are going to make partitions on the SD card, which is connected to the Raspberry Pi, to store the media, and it will be easily accessed by the user [4]. Network-linked storage helps to share a file with heterogeneous devices in a network. It is used to share a file or data on a server. This offline server works by providing a WiFi signal from the Pi adapter. By connecting to the WiFi from the pi, the connected phone, tablet, or laptop will be able to access the memory from the pi micro SD card through an offline server provided by the pi. Pictures, videos, and music can be uploaded, downloaded, and played from there. The whole system works automatically by simply powering the pi zero.

II. LITERATURE SURVEY

A review of the literature provided in this section includes a brief overview of Raspberry Pi, a review of previously published articles, and the contributions of our research. The Raspberry Pi is a low-cost, credit card-sized microcontroller. The memory card that we are using is an HDD, which has 64 GB of capacity to store the data. The Raspberry Pi already has built-in Wi-Fi and Ethernet connections, which are required to develop this system. Apart from this, it has 4 USB ports, HDMI, 1 GB of RAM, an audio jack, etc. Paper 1: Lynn [1] In this paper, Lynn discusses two researchers, Bock and Jalia from Cambridge University, who conducted "a pilot project exploring possibilities of providing computing access and education in rural schools in India (p. 1)" by using the Raspberry Pi. The main idea of using the Raspberry Pi was to get students engaged in computing and learning to program. However, the Raspberry Pi was used as a standalone computer to compose music, draw drawings, and build robots. Paper 2: Slaven [2] Slaven explained about the "development of an offline server named „RACHEL", which was not connected to the internet. Raspberry Pi was used as a means of improving education provision in rural

areas. 25 Raspberry Pi"s were installed in schools to be used in Cameroon for the power generator to give possibilities to their students and teachers to learn spreadsheet and word processing. Slaven also discussed that two researchers, Bock and Jalia, from Cambridge University, introduced Raspberry Pi in Ecuador as "part of their long-term plan to ensure the sustainability of using Raspberry Pi-based education content.".

III. PROPOSED SYSTEM

In this project of the Raspberry Pi (zero W) model, we need to format the microSD card. We decided to install the image file, which is burned to a new microSD card. The file (ArOZ Alpha) is 1.45 GB and is compressed.
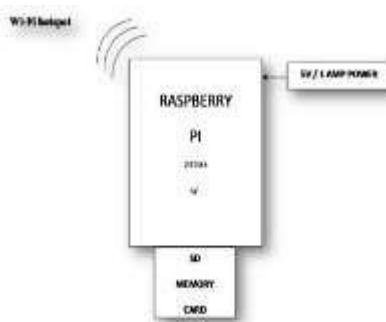

Fig.1. Block diagram of system

2.1 Testing the System

The microSD card is now plugged in the slot of the Pi Zero W, and the power supply to the Raspberry Pi is given by the micro USB cable. After a few seconds, you are able to see „ArOZ-online". It is to be connected with the help of Wi-Fi, which is built into 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 or PC and connect to the ArOZ-Online system in the Wi-Fi settings. Open VNC Viewer and type this address in the address field: 192.168.0.1. It will prompt for a username and password.

2.3 Final Configuration

No matter what size your microSD card has, the full extent of the memory cannot be simply used as-is. To use the full memory available by your microSD card, open up LX Terminal, then type in: sudo raspi-config (a command to configure the memory of Pi). The next thing to do is change 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 Wi-Fi password on 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 is 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 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.

2.4 Adding Security

Security is important. Nobody would like it if some evil hacker was looking through someone"s data. At the moment, your Pi is pretty secure since it's not actually connected to the internet, but local hackers could still gain access to your data from your cloud. By 'local' I mean people who can see the SSID of your cloud. A few things can be done to improve the security of your cloud: Forcing the'sudo' user to enter your password: On the terminal, type'sudo password'. It will ask you for a new password. Don't worry, the terminal won't show you any characters you type, but that's normal. Hit enter and retype your password. Now, the user'sudo' has a password, but it won't ask for it so far. To force'sudo' users to enter a password, type: sudo nano /etc/sudoers.d/010_pi-nopasswd and change 'no password' to 'password' (just remove the 'no'). Press the Control button and the letter 'X' on your keyboard, and hit enter. To save the file, simply press 'y' and hit enter. Creating a password for the user 'root': The user 'root' has more rights than any user. By default, the user 'root' will not ask for a password, which is a security hole. Creating a password for the 'root' user will improve security. To do so, enter'sudo-su' in the terminal to switch to the user 'root'. Once

there, type 'password' and add a password. Hit enter and retype your password. Hit enter again to finish. Now your cloud or server is more secure against hackers.
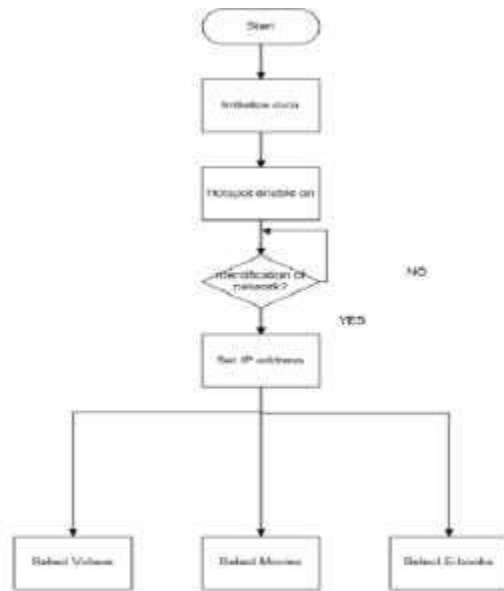

Fig.2. System operation

IV. RESULTS

When 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
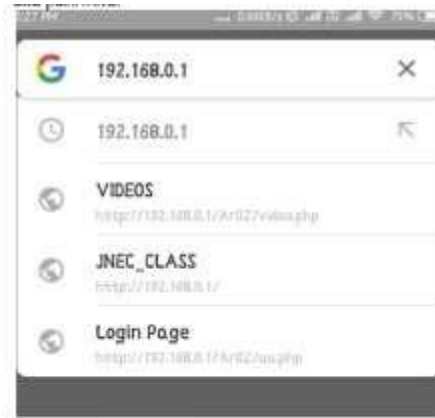
password.

Fig.3. Set IP address

Fig.4. Login for uploading

We can access various e-books and technical videos using the IP address; we can browse this IP on any PC or mobile device without internet. Fig. 5 shows the welcome screen where e-books and technical videos are accessible.
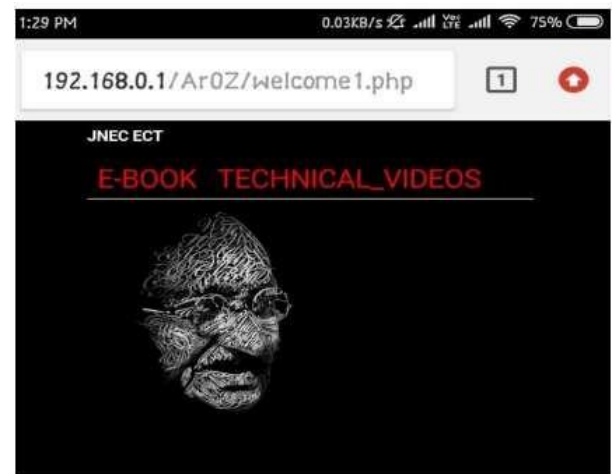

Fig.5. Content Folder

V. CONCLUSIONS

In this paper, we can use an offline media server for data transmitting and sharing. For that, the Linux OS platform is used, and it will greatly help to develop the server using the Raspberry Pi. The offline media server has many advantages, like the fact that it doesn't require an internet connection and doesn't need a router for data transmission. Due to this, it can be used to access videos, music, e-books, etc.

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