FTP based message transmission and display on LED matrix

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ABSTRACT

Abstract-In last couple of year's communication technology has been grown so far by leaps and bounds. By adding embedded technology in communication system, it has given rise to very interesting applications. One of such application is public addressing systems. Now -a-day's there are many companies which are manufacturing audio/video systems like CCTV cameras, programmable sigh boards, public announcement system etc. But generally all these systems are wired, complex in nature and also difficult to expand. There is way to reduce the complexity of such systems by making them wireless i.e. operate through internet, Bluetooth, FTP, GSM etc. and by making them wireless we can also expand the system. So by adding wireless features like FTP in the systems that works only on internet we can overcome such limitations of the systems. In today's age, LED scrolling displays are becoming very popular and are used in many fields such as in shopping malls, highway sigh boards, colleges, offices etc. This paper describes FTP based LED display.

Keywords-*FTP, Interface, Message, Ethernet, LED, Server and Client .*

1.INTRODUCTION

FTP stands for 'File Transfer Protocol', it is basically a standard network protocol which uses TCP/IP based network a network that uses Transmission Control Protocol and Internet Protocol to deliver a stream of bytes from one computer device to another computer device or in between remove devices like internet. FTP guarantees delivering by using TCP protocol.

As we all know how much internet is important in today's age. The two major protocols that keep internet working properly are TCP (Transmission Control Protocol) and IP (Internet Protocol). FTP is a protocol through which internet users can upload files from their computers to the website or download files from the website to the PC. FTP is the easiest way to transfer files between different computers via the internet and utilizes TCP/IP to perform uploading and downloading tasks. In addition to that, FTP uses two ports to establish the connection and transfer of data respectively. First port number is Port No. 21, this port is known as Control connection Port which is used tom establish connection between the Client and Server Port and Second Port is Port No 20, this port is known

As Data Connection Port which is used to transfer the data over the internet.
Also this project is based on Server Client architecture.
Here Server is the device which provide services to the Client and Client has to establish a connection with the Server and request the services that are available on to the Server.

1.1 Modes of FTP protocol:-

1. Active Mode FTP
2. Passive Mode FTP

In active mode FTP first client establishes a control connection with the server on port number 21 and then server makes a data connection from its port number 20 to client device on random port. In data connection port transfer of data or files can

take place. While on the other hand in passive mode FTP firstly client makes a control connection with the server and then client request and make a data connection from its random port to server devices random port other than port 20.

Depending upon the mode of FTP used connection between server and the client is formed. By using FTP we can send more than one message or bunch of messages at the same time.

2. ANALYSIS OF PROBLEM

Modern age is an age of digital systems. Time is not so far when everything is going to be digital in the market. Every advertisement is found to be a digital in today's time. The big malls and shopping centers are using the digital moving displays now. In railway station and bus stand, information related to tickets and its cost along with on which platform train is coming is displaying in digital moving displays. Also there is need to change the message and style or we can say there is a need to update the message. So in conventional systems in order to change the message or style of the message there I s need to connect the laptop or PC to the system to update the message, this means that theses conventional systems are not flexible enough. Suppose a person wants to change the message in the center of the city it simply means he has to go there with laptop and can change the message by connection with the system. This system is also very useful for police force or any other defense force and they want to display any crucial or important message in the center of the city in 5 mins which they cannot. So keeping this in mind a new display system which can be accessed remotely using the FTP based technology which runs over the internet make the communication between Client and Server.

3. GOALS OF FTP

- Promote sharing of files (programs and/or data).
- Can send data from a remote place over the internet cloud.
- Provide shield to the system by using authentication technique.
- Transfer data reliably and efficiently over the internet.
- Making simple and easy way to transmit message using FTP protocol.

4 .DESIGN OF SYSTEM AND WORKING

Scrolling, moving or rolling message display, which can be used in digital notice boards, which is the latest technology used for communication between the Client and Server devices. In this system user can change or update the message remotely at any time. Two major thing that are required in changing or updating message remotely user must have Internet connection between the Server and the Client and the FTP Server that has to be installed on the laptop and the laptop then acts as a FTP server.

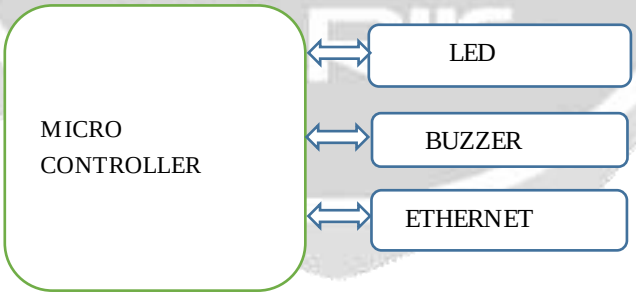

Fig-1: CLIENT UNIT

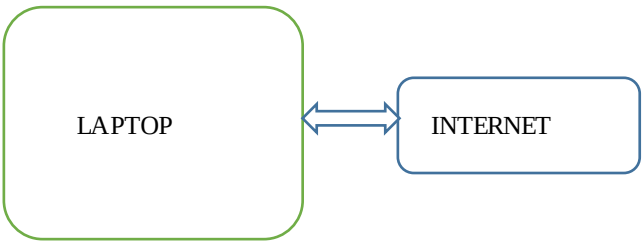

Fig-2: SERVER UNIT

After installing FTP server on the laptop, give an Ethernet connection having internet connectivity to the router and then connect Client device to the router.

After connecting client device switch on the router which automatically creates a hotspot network. Now you can connect Server Laptop or device to the internet by connecting the hotspot. User then can open FTP Server that he installed on laptop and create a text file, in text file write a message that you want to display on LED matrix and also assign some security to the Server such as Authentication in which user has to enter USERNAME and PASSWORD to enter into the Server.

Now Client request to Server after establishing a control connection with the Server, then Server send the file to the Client over the internet. Then Client displays the message. User can change the message by just changing the text message in the server and give a little delay in the program such as 5 ms delay to display updated message.

5. DESCRIPTION OF BLOCK DIAGRAM

In this project basically consists of Ethernet module, LED display and microcontroller.

Ethernet Module:

Ethernet module used in our project is "WIZ810MJ". WIZ810MJ is the network module that includes W5100 (TCP/IP hardwired chip, include PHY), MAG-JACK (RJ45 with X'FMR) with other glue logics. Ethernet is a way in which you can connect your client systems with the internet. It can be used as a component and no effort is required to interface W5100 and Transformer. This Ethernet module is an ideal option for those users who wants to make a rapid connection with the internet.

It supports both half as well as full duplex operation. Operating temperature is in between (0 to 70) ◦c and operates at voltage 3.3V with 5V input output signal tolerance. Ethernet also provide good enough speed to in order to receive file from the internet i.e. it supports 10/100 Base TX.

Microcontroller:

In this project ATmega328microcontroller is used to design the systemby using the FTP protocol.

- The Atmel 8-bit AVR RISC-based microcontroller combines.
- It consist of 32 general purpose registers, 23 programmable I/O lines, master/slave SPI serial interface and six PWM channels.
- Operating voltage is in between (1.8-5.5)V, also temperature range is in b/w (-40 to 85) ◦c.
- It consist of 32KB of ISP flash memory with read-while-write capabilities, 1KB EEPROM.
- It consist of 2KB of SRAM, programmable watchdog timer with separate On-chip oscillator.
- It consist of internal as well as external interrupt sources and six sleep mode operations.

Buzzer:

The main function of the buzzer is to make sound. In this systems when we send a message from server to the client device, on reaching the message the buzzer is going to make a buzzing sound which indicates that message has been received or reached to the client device. It is optional device.

It is this flow of current that causes the buzzer to sound. Buzzer is connected to micro-controller port pin, so micro-controller will give high or low to switch on/off buzzer.

LED Matrix:

LED Matrix is a device which is used to display any message on it through wired or wireless. LED has a scrolling display ability in which the message is scrolled continuously. Here in this prototype system we are using 8*8 display LED Matrix which can show characters up to 64 only.

6. FTP CLIENT-SERVER FLOW DIAGRAM

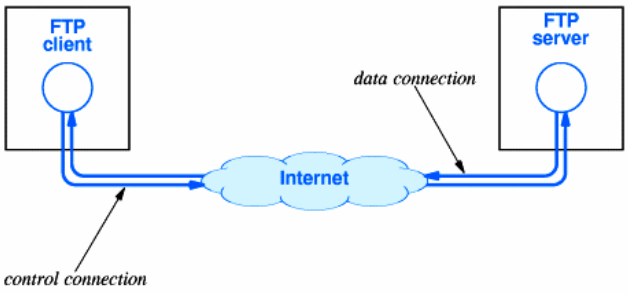

Fig3-control and data connection

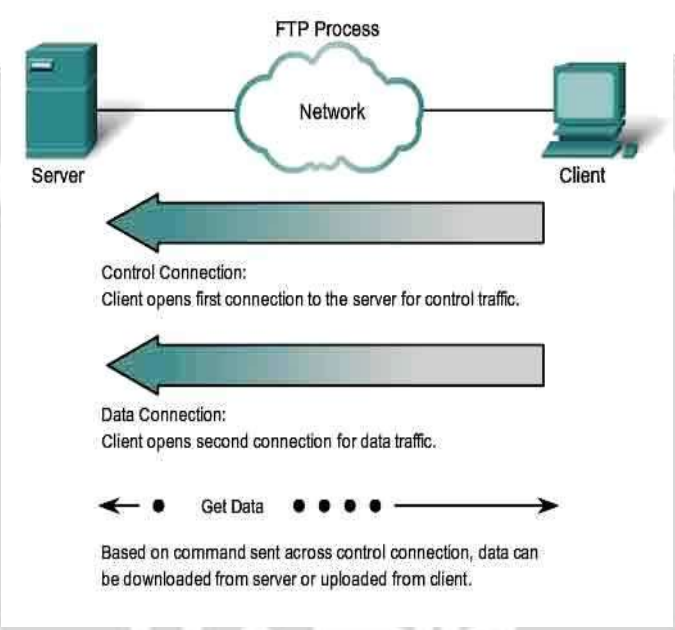

Fig-4: FTP process

7. ADVANTAGES

- Secured wireless communication.
- It Automatic update display on New file transfer to the Ethernet.
- It display messages in a quick, efficient manner for one, and it also allows you the flexibility in the messages that can be displayed.
- Simple and less human effort is required.
- Easy to operate.
- Low Cost.

8. APPLICATIONS

- Colleges: for displaying important messages EX: placement news, cultural activities news, etc.
- Hotels: information about the available rooms and rents.
- Restaurants: to display the menu and offers etc.
- Railway stations: used to display the information related to the schedule of the train and also shows the information of platform.
- Offices: to display the information related to the project, bonus, holidays etc.

- Traffic Sign Boards: to display traffic signs such as 'right' or go 'left'.
- Nursing homes: to display the staff attendance, the availability of the doctors, the list of the specialized doctors, number of patients etc.

9. FUTURE ENHANCEMENT

- Future display systems can show more than one message at a time.
- In our system we are sending messages via FTP Server and displaying on a LED by utilizing FTP commands. The same principle can be applied to control electrical appliances at a distant location.
- There is some security issues in FTP but we can resolve it by using SSH protocol along with FTP or we can perform tunnelling or in order for more security we can create VPN networks in order to transfer files in between the two systems
- Robots can be controlled in a similar fashion by sending the commands to the robots. This can be used for spy robots at distant locations, utilized by the military to monitor movement of enemy troops.

10. CONCLUSION

From above study and analysis we can conclude that this project can be very beneficial for the society and general public benefits because of simple structure, strong practicability and wide application field. By adding wireless technology to this system we have made this systems flexible. Now it is easy to change the message from a remote place. Two major thing that are necessary for sending the files are FTP server and internet connection. This system is less complex in nature as it is wireless. So in short, this system is very beneficial for the public because in today's digital age people can see any message from a large distance because this LED display is more cache in nature and is easy to read from it.

11. REFERENCES

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