Printing a Document Remotely Using Print on a Click Technology

Amrita Kungwani[1*], Rukhsar Mirza[2], Surjit Mansach[3]

[1,2,3]CSE, JIT, India

Abstract : Mobile printing is the process of sending data to a printer wirelessly from a smart phone or tablet. There are two main approaches to mobile printing. The other approach involves communication between a mobile device and a computer connected to a printer. While a mobile phone is simply not just a phone these days, the numbers of applications are building on a wide range of platforms for mobile phone is astounding. Wireless means transmitting signals using radio waves as the medium instead of wires and with the help of air medium. A Wireless network has offers the whole world an alternative solution for such problem of information access. Today wireless is very popular technology that is giving shape to more convenient and cost-effective world. Wireless printing using mobile devices is gaining popularity and this paper aims to address this particular functionality from Android Application. The Raspberry Pi is a low cost single-board computer which has recently become very popular. In this paper we showcase our attempt at building a low cost stand-alone device which transmits data using the Raspberry Pi with WI-FI and has a resistive touch screen display providing a user interface.

Keywords : Android, HCI, Wi-Fi technology, Raspberry pi 3 Model B, Printer.

I. INTRODUCTION

Wi-Fi technology offers a more flexible and easy way for mobile professionals and telecommuters to print documents without having a physical connection between the Smart Phone and the printer.

This technology allows devices to communicate, or transmit data or voice, wirelessly over a particular range or distance. Radio waves are used by Wireless network, as it is also used in the cell phones, televisions and radio. Wireless communication can be used as a one-way(broadcasting) or two-way communication but it is mostly used as a two-way communication. Radio frequencies are used in wireless transmission so that communication can be done between devices and data can be shared amongst them. Wi-Fi Enables printers can communicate with the Smart phone having Wi-Fi in them. Smartphone should be used within the range of the Wi-Fi enabled printer. If a Wi-Fi module is connected to the printer then it can be possible to print remotely from outdated Wired printer.

Wireless technology involves transferring of information back and forth between electronic devices using radio waves instead of cables and wires. Wireless technology offers us a cordless phones, garage door openers and television remote controls before it was used successfully in computers and printers. Many printers are equipped for what is called fixed wireless transmission. Fixed wireless is wireless communication that takes place in single area, such as a building or even just a portion of a building. A basic

wireless will be equipped with the following features:
i. Reusability
In this project we use an old printer which does not have any WI-FI connection. We an old printer with intermediate raspberry pi and print document wirelessly.

ii. Cost-Efficient
We use the old printers to print our document with WI-FI. For creating Wi-Fi we use raspberry pi. Because of reuse of printer it is a cost-efficient for users.
iii. Platform Independent

II. CUPS AND THE CUPS SERVER

At the heart of the CUPS printing system is the cupsd print server which runs as a daemon processes. The CUPS configuration file is normally located in /etc/cups/cupsd.conf. The /etc/cups directory files also contains other configuration files related to CUPS. CUPS is usually started during system initialization process, but may be controlled by the CUPS script located in /etc/rc.d/init.d or /etc/init.d, according to your distribution. For newer systems using system initialization, the CUPS service script is likely in /usr/lib/systemd/system/cups.service. As with most such scripts, you can and you will stop, start, or restart the daemon. See our tutorial Learn Run levels, boot targets, shutdown, and reboot for more information on using initialization script.

The configuration file, /etc/cups/cupsd.conf, contains parameters that control things such as access to the print

systemd, whether remote printing is allowed, the location of spool files, and so on. On some systems, a second part describes individual print queues as per the based on their algorithm and is usually generated automatically by configuration tools. Listing 11 shows some entry for a default cupsd.conf file. Note that comments start with a # character. Defaults are usually shown us the comments and entries that are changed from the default have the leading # character removed.

i. Design Overview

Like most printing systems, CUPS is designed around a central print scheduling process that dispatches print jobs, in that processes administrative commands, provides printer status information to local and remote programs, and informs users as needed. Figure 1 shows the basic organization of CUPS.
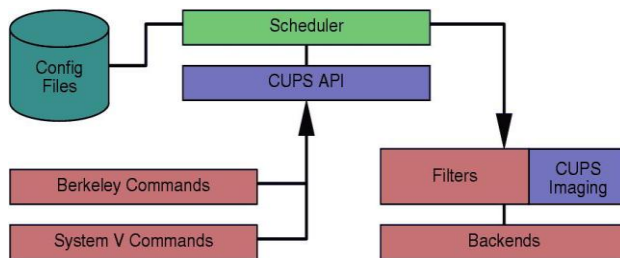

Figure 1 − CUPS Block Diagram

ii. Scheduler

The scheduler is a HTTP/1.1 server application it handles HTTP requests. Besides handling printers requests via IPP POST requests, the scheduler also acts as a full−featured web server for documentation, status monitoring, and administration.

The scheduler manages a list of available printers on the LAN i.e local area network and dispatches print jobs as needed using the appropriate filters and back ends.

iii. Configuration Files

The configuration files consist of:
• The HTTP server configuration files.
• Printer and class definition files.
• MIME type and conversion rule based files.
• PostScript Printer Description i.e ("PPD") files.

The HTTP server configuration file is purposely same as the Apache server configuration file and defines all of the access control properties for the server.

The printers and classes definition files list the available printer queues and classes. Printer classes are collections of printers. Jobs sent to a class are forwarded to the those printers which is available first in the class, round−robin fashion. The MIME type files list the supported MIME

types (text/plain, application/postscript, etc.) and "magic" rules An Overview of the Common UNIX Printing System for automatically detects the format of the files. These are used by the HTTP server to determine the Contents−Type field for GET and HEAD requests and by the IPP request handler to determine the file types when a Print−Job or Send−File request is received with a document−format of application/octet−stream.

iv. CUPS API

The CUPS API contains CUPS−specific convenience functions for queuing print job, getting printer information, accessing resources via HTTP and IPP, and manipulating PPD files. Unlike the rest of CUPS, the CUPS API is provides under the terms of the GNU LGPL so it may be used by non−GPL applications.

v. Berkeley and System V Commands

CUPS provide the System V and Berkeley command−line interface for submitting jobs and checking the printers status. The lpstat and lpc status commands also show network printers ("printer@server") when printer browsing is enabled. The System V administation commands are supplied for managing printer and classes. The Berkeley printer administration tool (lpc) is only supported in a "read−only" mode to checks the current status of the printer queues and scheduler.

vi. Drivers

CUPS 1.1 includes drivers for HP Lasejet printer and inkjet printers. As with the other printers drivers, the EPSON drivers don't necessarily provide the best possible output for each printer but should provide adequate printing quality for general day−to−day printing.

vii. Operating Systems Using CUPS

One of our team goals has always been to get as many UNIX/Linux distributions using CUPS as possible. Debian is currently providing CUPS as part of its stable assesment, and many other assesments are considering it in their next releases.
But currently we are using the rasberian OS i.e rasberian operating system for the configuring the cups.

III. ALGORITHM

An algorithm is a detailed series of instructions for carrying out an operations or solving a problems. In a non-technical approaches, we use algorithms in everyday task, such as a recipe to bake a cake or a do-it-yourself handbook.

Technically, computers use algorithms to list the structure instructions for carrying out an operation. For example, to compute an employee paycheck, the computer uses an algorithm. To accomplish this task, appropriate data must be entered into the system. In terms of efficiency, various

algorithms are able to accomplish operation or problems solving easily and quickly.

i. FIFO

This is the simplest page replacement algorithm. In this algorithm, operating system keeps track of all pages in the memory in a path, oldest page is in the front of the queue. When a page needs to be replaced page in the front of the queue is selected for expatriation.

Example

consider page reference string 1, 2, 0, 3, 4, 6 and 3 page slots.

Initially all slots are empty, so when 1, 2, 0 came they are allocated to the empty slots —> **3 Page Faults.** when 2 comes, it is already in memory so —> **0 Page Faults.**

Then 4 comes, it is not available in memory so it replaces the oldest page slot i.e 1. —>**1 Page Fault.** Finally 6 comes, it is also not available in memory so it replaces the oldest page slot i.e 3 —>**1 Page Fault.**

IV. MOBILE PRINTER WITH BLUETOOTH COMPATIBILITY USING RASPBERRY PI

This paper proposes a design of a device which directly prints the data stored inside the Mobile without the assistance of a desktop computer. The common data printing procedure has to use desktop computer as a relay medium, first receiving the data from mobile and then sending it to printer using an appropriate printing Method. This is rather cumbersome. The design compromises Raspberry pi having Debian flavor of Unix. The Common Unix Printing system installed on Raspberry Pi do the print job.The inbuilt Bluetooth of Raspberry Pi accept file from paired Mobile and gives to RPi. The Printer driver is a program to control a printer that is connected to your system.

V. EFFICIENT WIRELESS THERMAL PRINTING FROM ANDROID APPLICATION

It is convenient, easy to use and has the bandwidth to meet most of today's demands for mobile and personal communications. Bluetooth technology handles the wireless part of the communication channel; it transmits and receives data wirelessly between these devices. It delivers the received data and receives the data to be transmitted to and from a host system through a host controller interface (HCI). While a mobile phone is simply more than a phone these days, the number of applications being built on a wide range of platforms for mobile phones is astounding. Wireless printing using mobile devices is gaining popularity and this paper aims to address this particular functionality from Android Application. Nowadays size and cost are more important in consumer electronics, the Bluetooth thermal printer need to be designed considering these things.

The main aim of this work is to design the wireless thermal printer and develop an android application so as to implement Bluetooth thermal printing from real-time android mobile phone.

VI. BLUETOOTH IN WIRELESS COMMUNICATION

Bluetooth is a method for data communication that uses short-range radio links to replace cables between computers and their connected units. Industry-wide Bluetooth promises very substantial benefits for wireless network operators, end workers, and content developers of exciting new applications. This article delves into the implementation and architecture of Bluetooth. It also describes the functional overview and applications of Bluetooth, and deals with the development of a model for recording, printing, monitoring, and controlling of eight process variables at the same time, using a distributed control system. We explain industrial automation via Bluetooth using IISS. Industrial automation is one of the major applications of Bluetooth technology. Industrial automation, in terms of controlling or monitoring a factory, office, or industrial process, means to install machines that can do the work instead of human workers. Industrial plants consists of many devices interconnected in different ways ranging from simple data collection units (I/O) to more intelligent devices such as sensors, one-loop controllers, or programmable controllers, and a supervisory system used as a human-machine interface (HMI) for data logging and supervisory control. An IISS is a controlling device that monitors the devices in a company. It basically communicates via the interface card in the PC; the hardware is connected parallel across the device, and it is interfaced with the PC via a transceiver. The device can be accessed both manually via the switches and remotely via the PC. A simulation of connecting a PC with the machines in a company was executed. Also, we wrote a software program using C language; we will show how the remote monitoring takes place between the control room and the PC. These details in the article establish the growing need for Bluetooth technology.

VII. MOBILE THERMAL PRINTER WITH BLUETOOTH INTERFACE FOR RECEIPTING

After knowing that wireless printing is available with bluetooth communication.we first started checking is it possible to print with bluetooth communication.
The IEEE Project 802.15.1 [2] has derived a Wireless Personal Area Network standard based on the Bluetooth v1.1 Foundation Specifications. The lower transport layers (L2CAP, LMP, Baseband, and radio) of the Bluetooth wireless technology are defined. Ehsan Bayaki, Lutz Lampe, and Robert Schober [3]. developed an evaluation framework, which includes the spatial distribution of Bluetooth devices, path loss, fading, realistic data traffic models, scheduling, automatic repeat request (ARQ), and

baseband packet selection. David Kammer., et al.,[4] published a book that teaches what Bluetooth technology is all about, and how to write Bluetooth applications for several popular operating systems.

VIII. IOT BASED HOME AUTOMATION USING RASPBERRY PI

This paper proposes the design of Internet of Things (IoT) based home automation system using Raspberry pi. From this paper we know about raspberry pi. Raspberry pi is credit card size computer. Raspberry pi supports large number of peripherals. Raspberry pi is having different communication media like Ethernet port, HDMI port, USB port, Display Serial Interface, Camera Serial Interface, Bluetooth, Bluetooth low energy. Using this paper we easily configure raspberry pi with the any object like computer. This paper is helps us to understand the complexity of raspberry pi. The raspberry pi is also control no of object at a time.IoT has received much attention from scientists, industry and government all over the world for its potential in changing modern day living. IoT is envisioned as billions of sensors connected to the internet through wireless and other communication technologies. The sensors would generate large amount of data which needs to be analysed, interpreted and utilized The Raspberry Pi is a series of credit card–sized single board computers developed in the United Kingdom by the Raspberry Pi Foundation with the intention of promoting the teaching of basic computer science. They develop free resources to help people learn about computing and how to make things with computers.

IX. CONCLUSION

In this paper, we have presented an approach of using the Bluetooth and wi-fi technology for mobile printing, from a palm handheld and explained the application for the purpose of printing from a cloud printing.

REFERENCES

Here specify the description of the study material referred for the development of the project

[1]IOT based home automation by B.P.Kulkari volume 3 and issue 4

[2]Intelligent Smart Home Automation and Security using Arduino by J. Chandramohan Volume 6 Issue 3.

[3] Raspberry pi home automation using android application by himani singh dhami volume 3 issue 2.

[4]NupurTyagi, "A REFERENCE ARCHITECTURE FOR IoT", in International Journal of Computer Engineering and Applications, Volume X, Issue I, Jan.

[5] "RASPBERRY PI HOME AUTOMATION WITH WIRELESS SENSORS USING SMART PHONE" by P BHASKAR RAO volume 4 issue 5.

[6] "IoT based Simple Home Automation using Raspberry Pi"by Aditya Vikram Jajodia (ISSN: 2231-5381)

[7] Souza, Alberto M.C. Amazonas, Jose R.A. "A Novel Smart Home Application".