Mandar Joshi

Linux Developer

About Me

I am a Linux developer having spent over seven years working with Linux. After working as a Network Engineer for over a year, I worked as a Software Engineer developing applications and libraries on Linux, Point-Of-Sale Systems, Embedded Linux, working with ARM based hardware, Smart Cards and experimenting & interfacing with different devices and peripherals under Linux. During this period I've dealt with many unique problems which required innovative solutions. I am always looking out for new hardware(Embedded,Handhelds etc) , new technologies to learn, new libraries to experiment with. Most of this has been in the OpenSource field and over time I've had exposure to lot of open source libraries, UI frameworks, hardware and technologies. My language of choice is C.

Employment

- *Development Engineer* in Teletronics, Mumbai (9 Months)
  Worked on a VoIP product.
- *Embedded Software Engineer* in SoftwareWorkshop.NET, Mumbai (2 years 1 month)
  Development of applications on Linux, Embedded Linux, Point-of-Sale systems running Linux, miscellaneous RnD and experimentation.
- *Network Engineer* in Excel Systems and Services, Mumbai (1 year 2 months)
  Management of Trading Facility.

Skills

Operating Systems	Linux(Gentoo, Fedora, Red Hat, CentOS, Knoppix, Debian, Ubuntu etc.), Windows
Architectures	x86, x86_64, ARM9, ARM7
Servers	Apache, IIS, Active Directory, Vsftpd, Samba, CUPS, DHCP, DNS, NFS, VNC, Qmail, SSH
Networking	Fortigate Firewall, Basic Cisco routers, Linux
Embedded Linux	Gentoo, Montavista, Gemalto's OS X, PlaszmaOS (Zii Egg)
Programming	C, C++, C#, PHP, Ruby, HTML, Javascript, Shell scripting(Linux), Microsoft .NET
C Libraries	Pthread, CURL, LibUSB, LibXML2, Gstreamer, Glib, Webkit, Cairo, Imlib2, Pcsc-Lite, GDK, GStreamer
GUI Toolkits	The GIMP Toolkit(GTK+,gtkmm),Fast Light Toolkit(FLTK), Qt, MFC (VC++), Clutter (OpenGL Based)
Databases	MySQL, MS SQL, SQLite, Oracle
Web Frameworks	Ruby on Rails, Django, Joomla, ExtJS
Point-of-Sale	Gemalto X-Series(ARM9) & C-Series(ARM9), Castles Vega 9300(ARM7)
SmartCards & RFID	Mifare(ISO1443), SLE4428, Contact Based(ISO7816)(128K,1K), MicroProcessor Cards(TimeCos), Magnetic Cards
Development Tools	SVN, Git, Doxygen,Eclipse

Bookmarks: Linux, Embedded Linux, Point-of-Sale, Mobile, Windows, Web, Other Linux/Embedded Linux, Network Engineer, Academic Projects, Other Interests

Experience

Linux Top

- Developed a motion detector plugin for Gstreamer. Hands on experience with developing applications using Gstreamer and GTK+, Qt.
- Developed licensing application for company product based on hard drive serial numbers.
- Was part of a team to determine feasibility of a distributed VoIP system for existing hardware.
- Developed **Net-Snmp** module for monitoring status of different components in a software solution.
- Worked in a team to develop a VoIP Conferencing system based of **Freeswitch**. This was an event driven system using the Twisted Python Framework. The VoIP library Opal was used on the clients. Qt was used in some parts of the system.
- **Data Processing** Software for processing large XML files using **C**, **Expat** and **MySql**.
- **Multi-Threaded** Applications written in **C++** that handle incoming call requests and make calls using **VoIP SIP** by communicating with an **Asterisk** server using TCP sockets (**Socket Programming)**.
- **Document** Scanning, Archival and **Management** software written in **GTK+** for usage by banking firms and data collection agencies on **Asus Eee PC**. GUI was designed using **Glade.**
- Development of an algorithm to **match addresses** from a large database. Project involved working on **Lex, Yacc**, **C, C++, PHP. Ruby on Rails** and **Ext JS Library** were used for creating the user interface. **MySQL** and **MS SQL** were used as databases. Experiments were also done on **Oracle**. The project also involved writing stored procedures for MS SQL server & Oracle.
- Reusable components like Carousel, Media Player (using GStreamer/Clutter-Gst), Virtual Keyboard, Playlist written using **Clutter** & **Tidy** keeping in mind their usage on touchscreen devices.
- C Library to interface with **PicoLCD** devices(20x4 & 20x2 USB LCD displays with IR and Keypad input) written using **LibUSB** 1.0
- **GTK+ Widgets** made using **Cairo** for level display, temperature monitoring, speed monitoring and user input, keeping in mind Industrial Automation.
- Experience working with **ALSA driver** codebase (usbaudio). Added support for volume control knob and LED control for Creative USB X-Fi Surround 5.1 external sound card.
- Have used and have working knowledge of **Semaphores**, **Mmap**, **IPC** using **Unix Sockets**. Exposure to and working knowledge of **Python**.

Embedded Linux Top

- Development Experience on OpenMoko Freerunner using Gentoo Embedded. Building kernel ,rootfs, testing GPS, Accelerometers etc.
- Built a **tiny Linux distribution** (based on **Gentoo**) for a **x86 embedded** board running a **Vortex x86** processor. The project also involved writing an application(using **GTK+, FLTK**) to capture an image using a USB camera and sending it over the network.
- Development of 2 prototypes(**GPS** Tracker[Serial Port] and **VT100** Terminal[**Serial Port**]) using a development board based on **Samsung S3C2410**. **Gentoo** Linux was used as the development environment. The toolchain and kernel were compiled in this development

environment. The filesystem used was **cramfs.** The libc used was **uClibc**. The bootloader supplied by the board vendor was **'vivi'**. Successfully setup file system images to run **Matchbox Desktop Manager**(using **X11**) and another one to run **Qt Embedded 4.5**(using **Framebuffer**). **Glibc** was used for these.

- Experiments on **Texas Instruments DM355** Development board having a **DaVinci DSP** processor. Wrote simple applications to draw PNGs on composite video out. The board ran **Montavista** Linux.

- Porting of software packages **Glib**,**Curl**,OpenSSL,**PCSC-Lite**, thttpd, **Libxml2**, **SQLite**, **Alsa**, **BlueZ,** OpenObex**, Libusb,** Ncurses**,** Expat**, Busybox,** WirelessTools**, Mysqlclient** to **Gemalto X-Series** Terminals. Wrote small demo apps to demonstrate the functionality of each library including one using BlueZ for communicating with a cellphone.

- Interfacing hardware like USB Keyboards, **Smart Card readers**(**ACS & Omnikey**), **USB Audio** devices, **Bluetooth** Adapters,WiFi adapter, **CDMA** modem, USBtoSerial devices, **Webcam** with Gemalto X-Series Terminals. This involved **cross compiling** the required kernel modules and libraries under Cygwin. Also interfaced with **Serial Port Devices** like Pin Pads,Smart Card Readers etc.

Point-of-Sale Top

- Development and Implementation of a **Loyalty Solution** for a client in Bahrain. The smart cards used were **Mifare Classic 1K** cards. The project involved writing an application that runs on a POS terminal (**Castles Vega9300**). The server side software included a Windows service and few other utilities written in **C#** for activities like creation of customer cards, editing its contents and report generation using transactions logs collected from the POS terminals. The database used was MS SQL 2005.

- Completed **training from Gemalto** on X-Series terminals and **PCI** (Payment Card Industry) **PED**(PIN Entry Device) Standards.

- An application to retrieve customer information from a **Siebel** server using data read from a **Magnetic Card**. Gemalto X-Series terminals were use for this purpose.

- Development of library to write to **SLE4428** cards on Gemalto X-Series Terminals. A partially written library which implemented only the read functionality was provided by Gemalto. This involved understanding the **technical data sheet** from Siemens about SLE4428.

- Developed client side of a **Canteen Management** System on Castles Vega9300 Terminals. This involved reading employee information from **Mifare** cards, retrieving information over Ethernet from server using **HTTP**, performing transactions and printing receipts.

Mobile Top

- A simple **J2ME** application to communicate with a Point-Of-Sale system over **Bluetooth** using **RFCOMM**.

Windows Top

- Development and Implementation of server side applications for a **Attendance Solution using networked RFID readers** for a client in Bahrain. Software included a Windows service and few other utilities for creation of cards, configuration of terminals, generation of reports written in **C#**. Database was **MS SQL 2005**. PC based RFID readers were **Omnikey 5121**.

- A **key stroke monitor** utility to validate user input. This was used on many trading terminals in a broking firm.

Web Top

- A **Google Maps** based project to map live GPS data. Project also involved PHP scripts to feed XML data, manipulate marker images (using the **GD Library**).

- **Web Interface** to Address Matching solution to display possible address matches. Web Services were written in Ruby on Rails and the user interface was written in **ExtJS**.

Other Linux/Embedded Linux Top

I am a complete technology enthusiast and am very passionate about Linux, Open Source technologies, Mobile devices and Hardware in general. I keep experimenting with different technologies whenever I get a chance. Here are some of the things I have worked on.

- Experiments using **Webkit** with Clutter and GTK+ by using them inside these frameworks.

- Experiments with sample **OpenGL** code, exposure to some OpenGL concepts. Using **Gstreamer** and **Xine** Libraries from C. Exposure to **Plaszma OS** & **Android** on hardware(Zii Egg). Development is done using Eclipse, Cmake, Mtpfs/Scp.

- Got some experience in **Image Processing** by experimenting with **Edge Detection** on hand scans to determine edges in an attempt to measure the width of fingers. Used **Sobel Operator** for edge detection and made a Line Profile to determine absolute edges. Used **Imlib2** for image reading and writing.

- Understanding of **Linux Device Driver model**. Wrote simple character device that stores data echoed into it and prints out this data when read. Also experimented with **USB Drivers**.

- Worked with an ex-colleague to figure out the method of **capturing stock trades** as they happen in a live trading environment. This involved knowhow of the NSE trading software.

- Have tinkered with the **Linux kernel** to speed up services and to improve system performance and boot time. Compiled & tested modules for different webcams, **Tv Tuners** etc. in the process.

- Built few small Linux systems for x86 computers to experiment with **Unionfs**, **Initramfs**. Built a system a read/write Unionfs system which can be restored to factory state by just formatting the writable partition.

- Experimented with **Qt 4.** Wrote small network applications in the process of learning Qt.

- A **proof of concept** code that allows **playback of music** located on a **remote computer** using **Amarok**(a music player for Linux). The **Amarok Engine** code was written under **Qt/KDE**.

- Wrote a C program and Javascript code that generates an **encrypted password**, eliminating the need to use proprietary software from an ISP. I had written an alternative dialer for another ISP.

- PHP scripts to fetch PAN card details (using **CURL**), solve jumbled words, retrieve **stock prices**, indices, check IP, view browser details, read user agent. **Search plugins** for **Mozilla Firefox.**

- I have excellent knowledge about computer hardware, peripherals. I am good at computer **assembling** and **troubleshooting** computer problems in hardware, networking and software.

- Excellent knowledge about setting up Linux computers, firewalls (**iptables**),**muti-path routing** (**iproute2**), restricting access, running web servers, FTP servers, proxy servers, sharing data using **Samba**(Windows sharing) and **NFS**.

As Network Engineer in Excel Systems and Services

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- Managed an **Internet Trading** platform in a brokerage firm along with a network of about hundred computers having 4 Database servers (MS SQL), a **Domain Controller** (Windows 2000 Server), 3 Leased Lines and a **VSAT** connection for over an year.
- Gathered **vast experience** in installing, configuring, securing via software firewalls and Registry tweaks, **troubleshooting**, **debugging** hardware and software failures, recovering partitions and data on Windows (98, 2000, 2000 Server, XP, 2003 Server, 2003 SBS) systems.
- Configured **RAID** arrays on multiple **IBM** and assembled **x86** servers.
- Configured and managed SMB firewall(s) and anti-virus solutions (**Fortigate 60, Mcafee Protection Pilot**) at multiple locations including one for a live Internet Trading system.
- Configured few **Cisco routers** (Cisco PIX Firewall, 1700 Series, 2500 Series) for brokerage firms.
- Implemented few FTP and **Active Directory** solutions.
- Wrote a **web interface** to **vsftpd**, designed using PHP, MySQL and **Shell scripts** that was designed keeping in mind the broker community.
- Worked on migration of a **Coldfusion** based software from Windows to Linux.

Academic Projects

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- An electronic circuit that did '**data scrambling**' and 're-assembly'.
- An IR remote to control **Winamp** in Windows. It used a special parallel port device for IR reception and had display unit to display time/track time.
- A utility made in **VC++** that implemented the RSA algorithm to encrypt text files.
- DC motor driven robots having wired controllers made for a robo-soccer event.
- Technical papers and articles submitted to college societies like **IEEE**, CSI.
- Actively participated and won in intra-college and inter-college technical events like Computer Interfacing, Software designing, Article Writing and Robotics.

Other Interests

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I am pretty well versed with using Inkscape and few other graphics software like GIMP and ImageMagick and enjoy using them from time to time. I especially enjoy playing with logos and SVGs. Apart from my computer related interests, I've always enjoyed reading about cars, bikes,industrial machinery,medical devices and intrigued by the field of media and advertising and would love to implement solutions in these domains.