DineshKumar Bhaskaran

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Professional Experience

Embedded/Storage Professional with 13+ years of progressive experience in embedded systems, parallel programming, storage products involving embedded fibre channel switch virtualisation and Linux kernel development projects.

Area of expertise

Experienced in Linux Kernel Programming, Porting and Board bring-up. Development of devices drivers for proprietary hardware.

FC, SAM/SCSI 2 architecture, Storage Virtualisation, and Storage applications.

Experienced in High performance computing using OpenCL on various(Nvidia/AMD) GPGPU platforms.

Professional summary

- ◇ Principal Engineer - Canon India private limited (Mar '10 - till date)
- ◇ Engineer - Brocade Communications Pvt. Ltd. (Jan '08 - Mar '10)
- ◇ Specialist - Tata Elxsi Pvt. Ltd. (Sep '03 - Dec '07)

Education

- M.S Software systems (Distance learning course) 2006-2009, BITS Pilani (cgpa 5.8).
- B.Tech, Computer Engineering 1999-2003, Govt. Engg. College Trichur(71%).
- 12th (CBSE), Kendriya Vidyalaya Trichur. (88.8)%

Skill Set

Protocol and Protocol Stack
Expertise in Fiber Channel and Understanding of SCSI protocol and the SCSI protocol stack in Linux. Exposure to USB

Storage Devices
Brocade switch series. Primarily Brocade's 48K switch & Pizza boxes
Flexline Array Controller, Sony AIT SCSI, IDE tape drives SDX series, L180 Tape Library

Medical Image processing
Image registration and related algorithms

Programming Languages, Tools
C, OpenCL, Exposure to C++, Python, GNU development tools, Rational Clear case, SVN, Synopsys Virtualisation Platform.

Career Profile

Most relevant Technical Projects executed till date.

Canon Embedded Linux Platform
Canon Inc, Japan and Canon India 2 year and 10 months
This project requires porting, enhancing and maintaining Linux based operating system and Canon's proprietary real time OS for Canon embedded products like Surveillance cameras, Projector, Network scanners etc. The project involves wide scope ranging from

- ∗ Porting Linux kernel (3.x based) with Real Time support to various Industry known SoCs like Intel Haswell, TI AM437x, Beagleboad, Xylinx ZC-702/ZC-706, Raspberry Pi-3 and Canon proprietary embedded boards.
- ∗ Backporting of new age Linux technologies like Alljoyn IoT, TrustZone, Xenomai etc.
- ∗ Support GCC based custom toolchain for architectures x86 and ARM 32, 64bit.
- ∗ Investigation of new Linux based technologies and fixing of Kernel Vulnerabilities.

Involvement

- Responsible as a Lead for Project planning, execution, management, hiring, training, budgeting.

- Responsible for porting of multiple Linux kernel versions (3.10.x) for Canon proprietary board, ZC-706, Raspberry Pi-3 etc.
- During initial phase of the project I was responsible for bringing up of Linux 2.6.36 on Coware Virtual platform and later on the board (targeted towards network processors) itself.
- Involved in building, testing, enhancing and maintenance of Cross compiler toolchain.
- Responsible for streamlining and automation of Testing process for Linux kernel and Real time testing.
- Involved in automation of Linux kernel vulnerabilities investigation.

Canon Parallelized Image processing library
Canon Inc, Japan and Canon India 3 year and 8 months
This project involves in preparing an advanced parallel library on Linux for medical image processing algorithms with support for NVIDIA, AMD and X86 based platforms. The whole library is developed in OpenCL and highly optimized to perform faster than some of open and free solutions in this domain like OpenCV and ITK and Canon internal solutions.

Involvement
- Responsible for Implementing and enhancing a complete Parallelized Image registration framework for both intensity based and Point based image registration related algorithms and simpler image processing algorithms.
- Responsible for performance analysis and comparison of OpenCV CUDA and OpenCL OCL implementation of various image processing algorithms.
- Responsible for porting a image processing algorithms to CELL broadband engines using proprietary compilers for performance analysis and study.

SAS (Storage area services)
Bangalore and US 2 years and 3 months
Brocade Storage Application Services (SAS) on Brocade 7600 Fabric Application Platform Switch provides fabric-based services through integration with high-performance storage applications. SAS delivers intelligence in SANs to perform fabric-based storage services, including online data migration, storage virtualisation, and continuous data replication and protection. SAS is successfully deployed in storage world with Brocade and OEM partners storage solutions like DMM, EMC Recover-point and Invist.

Involvement
- Responsible for SAS enhancements and related development features. Worked through SAS v2.x to v3.x versions.
- Responsible for handling SAS related customer issues and maintenance.
- Ownership of virtual initiator module in SAS.
- Multiple deputations in Brocade-US for facilitation of SAS co-ordination activities between on-site team and India team.
- Involved in every phase of porting, development and enhancement of SAS (primarily Virtual Initiator module) to next generation platforms like in Brocade WAN optimizer.

DVR-SMM (Digital Video Recording) Client - Seagate, US
Bangalore 6 months
This project involved in conceptualization of a DVR (Digital Video Recording) product based on client proprietary Hard drives. This solution involved component development like stream file

system, stream I/O scheduler and enhanced disk driver for the hard-drives.

Involvement

- Module lead for Stream Scheduler (SS) module. Deputed on-site for demonstration purposes for POC phase.
- Zero copy implementation in Linux-2.6.12-3. Back porting of blktrace utility for testing.

FCTMD (Fibre channel Target mode driver) Client - CMS, Japan
Bangalore 1.2 Years
The project involves in development of Target Mode driver for LSI logic FC HBAs which are based on LSI-Logic Fusion Message passing technology.

Involvement

- Development of LSI Logic Fibre channel driver to work in standalone mode with real world devices and with Software RAID Controller system when required.
- Developed a proficient kernel memory leak detector which will trace various kernel memory allocation interfaces like kmalloc, vmalloc, alloc_pages etc. for a kernel module and will generate a report when required or when the module exits.

Virtual Storage Management Client - SUN, USA
Bangalore 8 months
The VSM product line involves complete development of virtual storage management solutions for MVS (Mainframe) clients. The fibre channel tapes(3x90 series) are virtualised for infinite storage and high availability with SUN proprietary tape drives and libraries.

Involvement

- Implementation of 3490, 3590 Tape drive emulation (TDE) in the VSM product for MVS clients. This involved implementation of 3490 commands (READFWD, WRITE, BSF, FSF, REWIND, WTM, and NOP).
- Implementation of Linux character driver IOCTL interface for dynamic testing by injecting tape commands to TDE.

Technical Writing/Papers

1. A novel approach for GPU based derivative computation in similarity metrics for Image Registration(Internal): - This paper discussed the parallelization of similarity metric and it's derivative for a gradient based optimizers. A novel mathematical formulation for derivative computation of RatioImage Uniformity (RIU) and Sum of Absolute difference (SAD) metrics. This idea is currently under the process of patenting. - 2015

2. Userspace I/O driver performance benchmarking (Internal) - 2010

3. Linux Block I/O elevator (Internal) - 2008

4. Writing a Network Device driver. Published in Linux Gazette online magazine - 2003
http://www.tldp.org/LDP/LG/issue93/bhaskaran.html

Extra Activities

I have interests in games like Table Tennis, Badminton, reading novels.

Declaration

The information I have provided is true to the best of my knowledge and belief.