Balakumaran Kannan

System Programmer

Linux system programmer having 9 years of experience with a Bachelor of Engineering degree specialized in computer science and engineering. Open source contributer, hobby blogger and a proud fan of Vim

kumaran.4353@gmail.com ☑

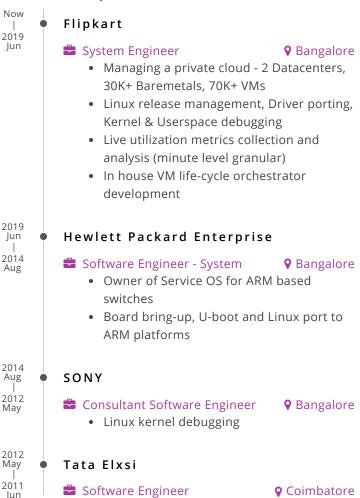
+91 7406479544 📞

Bangalore 🕈

github.com/0xba1a 🖸

www.eastrivervillage.com 🚱





Skills



Work Highlights

Flipkart

 Performance impact analysis of L3-cache on VMs - perf, Linux schedule domain, qemu, IPI -Inter Processor Interrupt, VM_EXIT

HPE

- Syscon-reboot driver update in ARM64 to enable DDR self-refresh before reboot. Kernel idmap, Cache-line alignment. Done for enabling secure-boot
- Enabled D-cache in kexec-purgatory to reduce boot time significantly
- Kernel core-dump capture to remote server

Sony

 Open source contribution to Linux kernel -Fixed bugs in loopback interface and phy driver

Education



P Patents

Patents Granted

1. [10862859] DHCP-HA service on a BlockChain

Patents Filed

- [20200195431] Multiple-site VPN secured by IPsec, using Blockchain
- [202141004517] Common IP based network communication between VM and Host
- System and method of optimizing VM disk data transfer time for cold migration by preloading page-cache

Projects

Now | 2020 Jun

Utilization metric collector - Minute level granularity



Bangalore

- Collect CPU, Memory, Network and Disk utilization every minute from 70K+ VMs across 2 DCs
- Architectured the project end-to-end from design to delivery
- Developed a new method for VM-Host communication and patented it

2020 May | 2020 Mar

Performance evaluation of virtual L3-cache



♀ Bangalore

- Thoroughly analysed the performance impact of exposing L3-cache information via Qemu
- Analysed the IPI (InterProcessor Interrupt) and corresponding VM_EXIT overhead of exposing L3-cache
- Used perf and perf-kvm tool to analyse the impact on Linux scheduler due to Linux schedule domain changes
- Used performance benchmark suites like schbench, sysbench, fio and NAS-PB
- Found out a loss of ~8% performance on scheduler intensive tasks

Now | 2019

Other significant activities

= Flipkart

♀ Bangalore

- Evaluated AMD EPYC CPUs
- Defining new VM types for customer needs
 compute, storage, graphics-SIME, etc.,
- Customizing Debian for different Baremetals - Volume management, RAID configuration, Network configuration, etc.,
- VMC (Virtual Machine Controller) development.
- Custom Image Builder development.
 Customer can build custom images on top of the image provided by us and use it on their VMs. Similar to Google custom images.

Now | 2017 May

Linux OS development for ARM & ARM 64

Hewlett Packard Enterprise

Bangalore

- Brought-up two boards. One is an ARM64 based SoC provided by NXP, another is an in-house developed ARM32 SoC
- Prepared our own Linux distribution using Yocto
- Worked on kernel config and userland package selection
- Managed device-tree changes for the board
- Fixed multiple compile-time and bring-up issues

Now | 2018

Bootloader development for ARM32

Hewlett Packard Enterprise

Bangalore

- Developed First Stage Loader (FSL) for the in-house build ARM32 platform
- U-boot is configured, built and kept as an integral part of FSL
- After console and DRAM initialization, control will be given to u-boot
- Worked closely with hardware team for DRAM initialization sequence and BIST enablement

Now | 2017

Other significant activities

Hewlett Packard Enterprise

Bangalore

- Updated syscon-reboot driver to set DDR in self-refresh mode before reboot. It required a proc-fs file creation, an ideal mapping section in kernel and careful alignment of reset code.
- Enabled D-cache in kexec purgatory code, which reduced boot time
- Debugged multiple early-boot issues with early_printk and JTAG
- Spent significant amount of time with ARM,ARM64 Assembly code
- Designed a core-dump capture system to capture kernel-core dump via NFS

Projects

2017 May 2014

HA/RFS module development



Hewlett Packard Enterprise Bangalore

- Owner of High-Availability [HA] and Redundant File System [RFS] modules for a range of HPE procurve switches
- Played a key role in the core-team that developed Front Plane Stacking [FPS] switches
- Re-architectured HA/RFS modules to make it work seamless in both BPS and FPS environment
- Participated in complete development cycle - Design, Develop, Test and Maintenance

Aug 2013

Preparation of SONY Linux



SONY

Bangalore

- Part of a team that developed a Linux distribution for SONY devices
- Ported open source network packages like Curl, OpenSSL, Squid, IPSEC tools
- · Performed IPv6 Ready Logo tests with TAHI test framework
- · Identified bugs with Linux kernel. Contributed fixes to kernel community

2013 Mar 2012 May

Networking library development



SONY

Bangalore

- Developed a network library with wired and wireless support
- It was used in SONY TVs and Blueray DVD players and are still in use
- Participated in all phases of development cycle

2012 May 2011 Jun

Application development for connected devices



Tata Flxsi

Coimbatore

• Developed two prototype applications -BigFlix and Flikr - on Samsung Smart TV, Panasonic VIErA connect TV, ROKU and **BOXEE** streaming player