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

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Work Experience

Flipkart

Now | 2019 Jun

System Engineer — Bangalore

- Managing a private cloud - 2 Datacenters, 30K+ Baremetals, 70K+ VMs
- Linux release management, Driver porting, Kernel & Userspace debugging
- Live utilization metrics collection and analysis (minute level granular)
- In house VM life-cycle orchestrator development

Hewlett Packard Enterprise

2019 Jun | 2014 Aug

Software Engineer - System — Bangalore

- Owner of Service OS for ARM based switches
- Board bring-up, U-boot and Linux port to ARM platforms

SONY

2014 Aug | 2012 May

Consultant Software Engineer — Bangalore

- Linux kernel debugging

Tata Elxsi

2012 May | 2011 Jun

Software Engineer — Coimbatore

Education

B.E., Computer Science & Engineering

2011 | 2007

Jeppiaar Engg. College — Chennai
72%

Higher Secondary Education

2007 | 2005

SRV Higher Secondary School — Namakkal
92.6%

SSLC

2005 | 2003

Govt. Higher Secondary School — Pattukkottai
93%

Skills

C | Linux | Python | Ansible | Shell

Patents

Patents Granted

1. [10862859] High available DHCP service by running DHCP servers on a BlockChain network

Patents Filed

- [202200195431] Multiple-site Virtual Private Network secured by IPsec, using Blockchain application for key exchange to optimize number of IPsec rules
- [202141004517] Common IP based network communication between VM and Host
- System and method of optimizing VM disk data transfer time for cold migration by pre-loading page-cache

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Projects

Utilization metric collector - Minute level granularity

Now | 2020 Jun

Flipkart — 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

Performance evaluation of virtual L3-cache

2020 May | 2020 Mar

Flipkart — 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
- Found out a loss of ~8% performance on scheduler intensive tasks

Other significant activities

Now | 2019 Jun

Flipkart — Bangalore

- Evaluated AMD EPYC and ARM64 processors and NVIDIA GPUs. Introduced AMD EPYC and NVIDIA ampere hardware into the fleet
- Defining new VM types for customer needs - compute, storage, graphics-SIME, etc.,
- Customizing Debian for different Baremetals - Volume management, RAID configuration, Network configuration, etc., based on their capacity serving
- Debian OS release cycle
- VMC (Virtual Machine Controller) development. It runs on every Baremetal and manages the VMs' creation-start-stop-destroy cycle based on requests from central orchestrator
- 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.

Linux OS development for ARM & ARM64

Now | 2017 May

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

Bootloader development for ARM32

Now | 2018 Sep

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

Other significant activities

Now | 2017 May

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

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Projects

2017 May | 2014 Aug

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

2014 Aug | 2013 Apr

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 Elxsi — Coimbatore

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