



Bala

@0xba1a

🔧 AI Development 🐧 Linux Enthusiast 🛡️ Cybersecurity Pro

System Programmer with 14 years of expertise in Linux systems, specializing in cloud infrastructure, kernel development, and performance optimization. Passionate about artificial intelligence, with a focus on developing context-aware AI agents. Active open source contributor and tech blogger.

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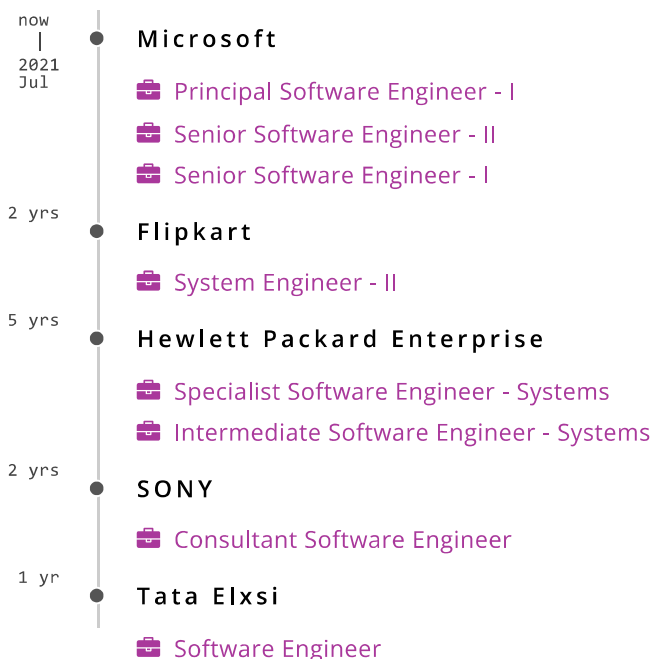
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Bangalore 📍

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## 📁 Work Experience



## 🏆 Patents

- [US10862859B2](#)
- [US11349653B2](#)
- [US20220214905A1](#)
- Common IP based network communication between virtual machine and host - Application Awaiting Examination

## 🔧 Skills

SWE-agent

Python

Context Engineering

Linux

## 👍 Work Highlights

- Microsoft**
  - Maintain stability and security of Azure Linux as stable maintainer
  - Automate release management for Azure Linux, including AI-driven testing and deployment pipelines
  - Develop AI agents to automate backporting of security patches
  - Research and apply compiler technologies for context-aware AI agent development
- Flipkart**
  - Analyze performance impact of L3-cache on VMs
  - Automate Baremetal life-cycle
  - Develop virtualization orchestrator
- HPE**
  - Enable forgetless kernel by updating syscon-reboot driver
  - Optimize boot time in kexec boot
  - Capture kernel core-dump to a remote-server
- Sony**
  - Validate IPv6 in Linux kernel

## Projects

Now  
|  
2024  
Nov

## AI Agent development

📍 Bangalore

- Customized [SWE-agent](#) to automate CVE backporting CVE patches.
- Developed [Microbots](#), a Python library of AI agents for automation pipelines; released as open source.
- Lead organization-wide AI initiatives, integrating agents for tasks such as core dump analysis and packet log inspection.
- Exploring context engineering through LLVM and advanced compiler technologies

Now  
|  
2021  
Jul

## Azure Linux Development

📍 Bangalore

- Serve as stable maintainer for Azure Linux, ensuring stability, security, and feature development.
- Architect and lead teams responsible for security automation and release management systems.
- Release systems automate daily, weekly, monthly, and fast-track testing and deployment pipelines, including in-house alerting, dashboards, and an AI-powered failure triage platform.
- Security automation includes scanning NVD for vulnerabilities, patching affected packages, and automating pull requests.
- Designed and implemented these systems, driving **Azure Linux adoption from 300K to 24M cores** over five years.

Now  
|  
2020  
Jun

## Utilization metric collector - Minute level granularity

📍 Bangalore

- Collect CPU, Memory, Network and Disk utilization every minute from 70K+ VMs and 30K+ BMs across 2 DCs
- Architected 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

- Investigated the effects of exposing L3-cache details to virtual machines on overall performance
- Measured IPI (InterProcessor Interrupt) and VM\_EXIT overheads associated with L3-cache exposure
- Utilized perf and perf-kvm to assess Linux scheduler behavior after schedule domain modifications
- Benchmarked using schbench, sysbench, fio, and NAS-PB to quantify performance changes
- Identified an approximate 8% reduction in performance for scheduler-intensive workloads

Now  
|  
2017  
May

## Linux OS development for ARM & ARM64

📍 Bangalore

- Brought up two boards: an ARM64-based SoC (NXP) and an in-house ARM32 SoC
- Prepared a custom Linux distribution using Yocto, including kernel configuration, userland package selection, and device-tree management
- Updated syscon-reboot driver for DDR self-refresh
- Enabled D-cache in kexec purgatory to optimize boot time
- Designed and implemented a core-dump capture system via NFS

Now  
|  
2018  
Sep

## Bootloader development for ARM32



📍 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

## 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-architected 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 TAMI 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 Blu-ray 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 Flickr - on Samsung Smart TV, Panasonic VIERA connect TV, ROKU and BOXEE streaming player

## Education

2011  
|  
2007

### B.E., Computer Science & Engineering

-  **Jeppiaar Engg. College**  **Chennai**  
 **72%**

2007  
|  
2005

### Higher Secondary Education

-  **SRV Higher Secondary School**  **Namakkal**  
 **92.6%**

2005  
|  
2003

### SSLC

-  **Govt. Higher Secondary School**  **Pattukkottai**  
 **93%**