



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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Bangalore 🗺

github.com/0xba1a 🐾

www.eastrivervillage.com 🌍

💼 Work Experience

now
|
2021
Jul 1

Microsoft

- 💼 Principal Software Engineer - I
- 💼 Senior Software Engineer - II
- 💼 Senior Software Engineer - I

2 yrs

Flipkart

- 💼 System Engineer - II

5 yrs

Hewlett Packard Enterprise

- 💼 Specialist Software Engineer - Systems
- 💼 Intermediate Software Engineer - Systems

2 yrs

SONY

- 💼 Consultant Software Engineer

1 yr

Tata Elxsi

- 💼 Software Engineer

🏆 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

Balakumaran Kannan

Principal Software Engineer

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Projects

Now
|
2024
Nov

AI Agent development

 Microsoft

 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

 Microsoft

 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

 Flipkart

 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

 Flipkart

 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

 Hewlett Packard Enterprise

 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

 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

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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-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 TAH1 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%