**ARUN KUMAR B**

[roxon@theappliedthought.com](mailto:roxon@theappliedthought.com) | +1-754-946-4873 | [arunkumarbe](https://www.linkedin.com/in/arunkumarbe/)

**PROFILE SNAPSHOT**

* Highly skilled Individual Contributor with **17 years** of Embedded Software Development expertise in various areas of Data Center SAN Switching and Metro Ethernet Routing, like Silicon Bring-up | Board Bring-up | Porting BSP/ Cisco NXOS/ JunOS EVO (Linux Based) | Device Driver Development | Artificial Intelligence (AI) | High Availability | Control-plane Redundancy | ISSU | Zero Touch Provisioning | Secure Boot | Hardware Fingerprinting | TPM/ ACT/ SUDI | Chassis Management | Intel IEPS SDK | Open Source Legal | Yocto | Telemetry | GRPC | CGPB | Predictive Analytics | VMID Analytics | Network Security | SNMP MIB | Port License | Bootloader Firmware/ BIOS/ U-Boot integration
* Ability to promote innovation through technically leading teams, comprehending open-ended customer requirements, researching feasibility, completing PoC fast, creating comprehensive functional spec, architecting the software solution, driving design, expediting development, and prioritizing time to market with exceptional quality
* Proficient in troubleshooting customer issues, identifying and resolving complex software/ hardware flaws, and cooperating with cross-functional teams on unfamiliar, multi-million-line software stacks
* Worked in a dynamic, fast-paced, highly collaborative team atmosphere where excellent teamwork ethics were valued
* Well-versed in collaborating with the globally distributed cross-functional teams
* Outstanding communication abilities and the capacity to convey intricate technical ideas with executive leadership

**SCHOLASTIC & ACCREDITATIONS**

* Specialization in Embedded Systems Design | Centre for Development of Advanced Computing, India
* Bachelor of Electronics and Communication Engineering | Madurai Kamaraj University, India

**TECHNICAL SKILLS**

|  |  |
| --- | --- |
| **Programming:** | C | C++ | Python | Linux Bash Script | Assembly (x86 & PowerPC) | Data Structures |
| **Bus Protocols:** | PCIe | I2C | SPI | SMBUS | PMBUS | UART | RS232 | GPIO | DMA |
| **Debugging tools:** | GDB | JTAG debuggers (American Arium & BDI) | Traffic Generator/ Analyzer (IXIA & JDSU) | Dediprog |
| **Operating System:** | Cisco Nexus OS (Linux based) | JunOS EVO (Linux based) | Yocto | VMware ESXi |
| **Development tools:** | Git | CVS | ACME | Clear Case | GCC | Bitbake | CDETS | GNATS | Gerrit | PRRQ | Open Grok |

**CORE SKILLS**

Attention to Detail | Critical Thinking | Strong in Analytical and Problem Solving | Continuous Self-Development | Empowers Others | Risk-Taking | Engineering Design and Development | Post Project Assessment | Process Improvement

**AWARDS AND ACCOMPLISHMENTS**

* Receiving multiple awards
  + **Juniper**: Received *‘Rocket to Space* ‘ award for 14 months of aggressive/ startup-mode product development
  + **Cisco**: Received multiple *‘Amaze’* and *‘Inspire’* awards, for consistent innovation, initiatives & technical leadership
  + **Motorola**: Received *‘Bravo’* award, for saving $1 Million by preventing HW re-spin with software solution
* Foundation member of Embedded software & device driver development (platform) team in Cisco, India
  + Grown along with the team from its original three members to its current 18-members size, over 15 years stint
  + Travelled thrice to the US, to acquire KT on Embedded software development & technically groomed the India team
* Saving millions of dollars in engineering efforts by providing software solutions and eliminating hardware redesign, ASIC re-spin & reducing RMA expenses due to hardware faults/ FPGA or CPLD limitations
  + CPU Hung | FPGA power bad | ASIC counter overflow | Bad sensor | Faulty PSU controller | FAN direction | LED
* Consistently enhancing the customer experience
  + Automating recovery of hundreds of routers and switches to prevent downtime in the customer networks
  + Reducing the customer maintenance window significantly, from 58 hours to 12 hours, and switched from 138 snowflakes to a more manageable set of 8 common release images
* Participating & winning company-wide hackathon competitions at the site level, to showcase innovative ideas
  + Power savings, AI based troubleshooting and hardware failure prediction, debug log classification, link diagnostics

**WORK EXPERIENCE**

**Role and Responsibilities:**

* Individual contributor, with 75% coding and 25% customer requirements handling by technically leading the team
* Technically owning the end-to-end responsibilities, from ASIC bring-up, Board bring-up, Device Driver development, Hardware Abstraction Layers (HAL) development, integrating Firmware | SDK, chassis management, telemetry, collaborating with cross-functional teams in the US/ China for Hardware, FPGA, BIOS, BSP, DIAG, ODVT, EDVT, FIT, VMARG, SNMP MIB, Network mgmt, Licensing and UT automation
* Architecting complex Embedded software solutions, ensuring optimal power, performance, debuggability & resiliency
* Writing and reviewing functional spec, design spec, enhancing UT automation, examining system test plan & sanity
* Reviewing peer driver code, and ensuring software quality using regression sanity, code coverage & static analysis tools
* Collaborating with system test teams, to improvise the QA test plan, covering all customer use cases, with automation
* Integrating BIOS/ FPGA/ CPLD/ PHY Firmware, open-source SW and third-party SDKs into Linux OS, with legal clearances
* Innovatively solving customer field issues, by engaging with the globally distributed cross-functional teams
* Initiatives to creating several internal wiki pages, covering key development, troubleshooting & quality standards
* Introducing new products (NPI) and features to the TAC, customer facing escalation, and technical marketing teams
* Mentoring juniors by emphasizing on the quality coding practices like secure, readable, reusable & debug-friendly
* Representing the team in TL9000 audits over ten years & successfully renewing the certification three times in a row

**Embedded Software Developer | Applied Thought Auditors and Consultants, Inc. | Cupertino, US | Jul 2024 - Present**

* Waiting for a new Project/ Client/ C2C

**Software Engineer Senior Staff | Juniper Networks India Pvt Ltd. | Bangalore, India | May 2022 - Jul 2024**

* Resolving board bring-up issues, like PCIe AER issues due to MCTP/ ASPM/ Cmn CLK settings and other FPGA/ FW issues
* Standardizing Intel IEPS SDK/ NAC Firmware/ ICE driver across several ACX routers and leveraging common Insyde BIOS
* Handling Yocto integration of various third-party tools in Wind River Linux & ownership of mitigating vulnerabilities.
* Maintaining embedded OS design based on Wind River Linux; device-side C++ development.
* Embedded C++ Coding for networking elements of the NASA Artemis III spacecraft.
* ‘c’/C++ coding for court-required Breath-a-lyzer technology in use within automobiles.
* Microsoft HoloLens + Unity + C++/Vuforia – Brain MRI 3d model to assist with neurosurgery.
* Add functionality to their Solar Array SubSystem; Linux / c / c++ / STM32 boards.
* Initiatives in power-saving measures by shutting off idle interfaces, sub-utilized channel groups & optimal fan speed
* Bringing-up the control-plane/ RE redundancy on ACX 7348/7332 cloud metro router, supporting 1GbE to 400GbE ports
* Owning the longevity test suites, identifying the stability issues, and resolving them much ahead of the release

**Software Engineering Technical Leader | Cisco Systems (India) Pvt Ltd. | Bangalore, India | Mar 2007 - May 2022**

* Delivering 10+ SAN Data Centre Storage Switching products, owning full Embedded Software | Firmware development
  + DS-C9396T-K9 | DS-C9148T-K9 | DS-X9232-256K9 | DS-X9248-256K9 | DS-X9448-768K9 | DS-X9648-1536K9 | MDS 9718 | Port Profile Manager | Nexus 7000 CoPP | DPVM | NXOS IO-BUF
* Technically leading Embedded SW team, interacting with various cross-functional teams, including PLM, HW, QA, & TAC
* Silicon bring-up using the simulation environment & netlist, and collaborate with ASIC team to find any potential issues
* Writing device drivers for Cisco's proprietary SoC/ ASIC from the scratch, in the Linux environment (NXOS).
* Maintaining embedded OS design based on Wind River Linux; device-side C++ development.
* Designed, Coded and Delivered six (6) OPC/XML-DA & AE Servers (Windows COM/DCOM and RH Linux) use by SCADA / PLC security subsystems - Java, C#, C++, JNI.
* Provided embedded architecture and coding for a wide spectrum of pattern matching applications in Java and C++ using the NeoCore patented algorithms discovered at NeoCore.
* Bluetooth Low Energy (BLE)/I2C C++/FreeRTOS coding with accelerometers/pressure sensors.
* Verification of Iridium satellite flight instrument coding (C/C++/C#).
* Designed, coded, and deployed NeoCore's first suite of three application products for distribution to LAN analyzer customers – NeoSuite for AG Group's EtherPeek – C++, MFC, Visual Studio 6
* Designed, Coded and Delivered an OPC/XML-DA service (C/C++) using the Green Hills MULTI 2000.
* Development environment using a NetSilicon NetARM-50 (ARM7) RISC processor board; Ontario Airport installations.
* Artificial-Intelligence (AI) integration to foresee hardware problems much ahead and preventing network disruptions.
* Designed/coded embedded Linux-BACnet/IP Gateway (C++/QT4.x) for use in lighting controls.
* Design and coding services for a Wireless Bluetooth LAP, 802.11 and 802.15.4 (ZigBee) using C/C++/assembler for an ARM7-based processor (VxWorks RTOS).
* Replacing I2C accesses to FPGA assisted PCIe access & resolving clock stretching issues, improvising stability & efficiency
* Porting hardware-anchored secure boot to ensure network security by guarding the unauthorized software booting
* Integrating hardware fingerprinting to prevent anti-counterfeit parts, by using trusted anchor module/ TPM (SUDI)
* Decreasing the OS image size by 4%, the boot-up time by 9%, and error logs cleanup for efficient troubleshooting
* Designing a network security application, QoS two-rate three-color policer to protect the control-plane from DoS attacks
* Developing network protocol applications like DPVM, infra features like ACL-LOG and utility libraries like IO-BUF, in Linux
* Productizing the pet project of fabric wide SFP policing feature, to prevent using unauthorized SFP/ transceiver modules
* Establishing a new IoT team for the CR-Mesh, handling Smart Grids using 6LoWPAN Neighborhood Area Network
* Offering network insights, by streaming port statistics using telemetry infra, GRPC protocol and CGPB encoding
* Developing VMID granular SAN analytics solution to uniquely track each virtual-machine specific network utilization

**EDUCATION:**

Bachelor of Engineering in Electronics and Communication – Madurai Kamaraj University.

Post Graduate Specialization in Embedded Systems Design.