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## HARISH KUMAR G

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### EMPLOYMENT

**Software Development Engineer**      **Cisco Systems, Inc**      **Mar 2021 - Present**

Cloud Networking - Data Center - IP Forwarding - Cisco NX-OS - N9K Ethernet Switches

- Developed [MPLS label, IPv4 & IPv6 route & adjacency](#) consistency checkers in [Layer 2.5/3 forwarding architecture](#) to maintain consistent labels, routes, and adjacencies in the system i.e., Nexus 9000 switches of Cloud-Scale and Jericho families. Thus, avoiding packet drops.
- Developed a [Binary Logging](#) mechanism in HAL infrastructure, User Space Drivers for Tahoe, CloudScale, Jericho, Innovium, Exablaze network hardware platforms. Achieved a 10x lesser memory usage, and 2x faster logging speed as compared to the legacy logging mechanisms.
- Developed [unit tests, integration tests, code coverage tests](#) using pyATS i.e., a python3 based network automation framework.
- Actively participated in [code reviews](#), static analysis, [design specification](#), and test specification reviews.
- Reproduced, analyzed, and fixed [QA bugs & customer found defects](#) in L3 networking stack.
- Presented [tech talks](#) on L3 forwarding components to groups of 30+ engineers.
- Worked with cross-functional teams across multi-geographic locations.

**SKILLS USED:** C; Python; System programming; Linux Device Drivers; Embedded Linux; Networking; Operating Systems;

**Embedded Software Engineer**      **NXP Semiconductors**      **Apr 2019 - Dec 2020**

Embedded SIM - System on a chip - ARM Cortex - RTOS

- Developed Junit test suite for [T=0 & T=1](#) Communication Protocol Stack for smart card chipsets to communicate with off-card device (modem in smartphone) based on ISO7816-4.
- [Developed](#) real time use cases in the form of Java-card applets and Junit tests and created eSIM test frameworks. [Upgraded](#) the same as new features added into the product.
  - UICC Terminal Interface: Command dispatching & File operations
  - USIM: Remote File & Application Management Over-the-Air (OTA)
  - GSMA Remote SIM Provisioning
  - UICC API, SIM API, and Toolkit API
- Developed test suite for [eUICC extended secure logical channels](#) to establish communication with MNO servers and other off-card entities.
- Demonstrated working knowledge of [cryptographic libraries](#) & [encryption standards](#) such as AES, DES, ECC, SHA-1, SHA-256, etc.
- Prepared golden chip samples to get the product certified by standard bodies, and to ship them to handset manufacturers(OEMs) and to MNOs for live/field testing.
- Performed validation of [live OTA deployments](#) of JCOP RTOS into the remote mobile equipment and [live eSIM phone call testing](#).
- Performed [Pre-silicon validation](#) on [FPGA](#) emulators before tape-out.

**SKILLS USED:** C; Java; Scripting; Embedded Systems; Automation; Debugging; OTA live updates; eSIM; IoT; Customized ARM boards;

**TECHNICAL SPECIFICATIONS:** ISO7816-3; ISO7816-4; ETSI TS 102 221; ETSI TS 102 223; Global platform card specification v2.3; GSMA Remote SIM Provisioning SGP22; Trusted Connectivity Alliance eUICC Profile Package v2.x; 3GPP test specifications;

## TECHNICAL SKILLS

- Languages: C, Java, C++ STL, Scripting, Data Structures, Algorithms, OOP, Junit, pyATS
- Linux Internals: System Calls, IPC Mechanisms, Signals, Threads, Synchronization, Networking; Process Management, Memory Management
- Embedded Platforms: System on a Chip (ARM Cortex M4, A8); PIC16F877A; RTOS;
- Linux Device Drivers: Character drivers, Platform drivers, netDevice drivers
- Tools: Eclipse IDE, Keil IDE, Vim, Trace Analyzers; Hardware debugging tools, Validation tools
- Host: Windows, Linux Ubuntu. Target: ARM, beagle-bone black hardware

## PERSONAL PROJECTS

### PCD Platform Driver [\[Github\]](#)

A device driver that is part of the kernel but do not correspond to any hardware device in the machine. The main features of this driver are

- a. It provides callbacks for the user application to interact with the devices and hence the application can perform file operations such as read, write, seek, etc. on the devices.
- b. Creates multiple nodes or instances of the device.
- c. Exports sysfs attributes to the user space via kernel file system so that the user space application can change device attributes.

### Memory Leak Detector [\[Github\]](#)

A C library to catch memory leaks produced by the applications, if any. This Memory Leak Detector(MLD) library which when integrated to your application will provide the facility to catch leaked objects and report them. MLD library will be a generic library and has the ability to parse any application's data structures and manipulate them.

## EDUCATION

### ANNA UNIVERSITY, CHENNAI

JUN 2014 - MAY 2018

- Bachelors in Electronics and Communication Engineering, May 2018.  
CGPA: 7.51 (3.3/4.0)  
12<sup>th</sup> Grade: 87.41%  
10<sup>th</sup> Grade: 83%

## OTHER SKILLS, INTERESTS AND RECOGNITIONS

- President & VP Education of Cisco-Vani Toastmasters Club, Cisco.
- Outdoor games: Runner up, Annual Volleyball tournament at NXP.
- Won Skill Summit competition organized by Anna University.
- Topper of the state in Dravidian literature, grade 12, academic year 2014.
- Served as the School Pupil Leader from grade 8 to 10 and 12.
- Played parts & characters in stage and theatrical plays [150+] during childhood.