

Swadhin Sekhar Behera

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Summary:

- **9+ years of experience** in designing, developing, and optimizing high-performance applications using C, Golang, and Python for Linux/Embedded systems, with expertise in network security, SD-WAN, and cloud-native solutions.
- **Proven track record in security hardening** (OpenSSL, PKI, eBPF), device fingerprinting (JA3/JA3S, DHCP, TLS), and REST/gRPC microservices (AWS DynamoDB, API Gateway).
- **Deep networking expertise** in TCP/IP, DNS, DHCP, SD-WAN, and TLS interception, with hands-on experience in eBPF for scalable packet processing.
- **Full-cycle development ownership**—from architecture (JSON/YAML schemas) to deployment (Docker, Jenkins CI/CD)—with Agile methodologies and Test-Driven Development (TDD).
- **Embedded systems specialist:** Ported SD-WAN software to ARM platforms, developed I2S drivers, and 4G/5G modem integrations for IoT/CPE devices.
- **Backend development** in C/Golang for multithreaded/goroutine systems, leveraging data structures, algorithms, and design patterns (Singleton, Factory, Observer).
- **Cloud & DevOps proficiency:** AWS (Lambda, S3, ECR), containerization (Docker), and infrastructure automation (shell/bash scripting).
- **Debugging & troubleshooting** complex issues using GDB, Valgrind, Wireshark, OpenSSL, and syslog-ng for real-time log analysis.
- **Leadership & collaboration:** Mentored junior engineers, led cross-functional teams, and delivered critical features (Parental Controls, Speed Test Agent).
- **Strong analytical skills** with experience in root-cause analysis, and performance optimization for large-scale networks.
- **Continuous learner** with adaptability to new technologies (e.g., eBPF) and clear communication for stakeholder alignment.

Technical Skills:

Programming Languages	C & Golang
Networking Protocols	DNS, DHCP, TCP/IP, SD-WAN/SDN, TLS (JA3/JA3S), mDNS/SSDP
Security	PKI, Certificate Validation, eBPF, Device Fingerprinting
Libraries/Frameworks	Gorilla-mux, websockets, REST API, gRPC, scikit-learn, pandas, redis-py-cluster
Tools	Git, Jira, Confluence, Swagger, OpenSSL, Wireshark
DevOps/Infra	Linux, Docker, Jenkins CI/CD, AWS (Lambda, ECR, S3, ElastiCache, API Gateway)
Data Formats	JSON, YAML

PROFESSIONAL EXPERIENCE

Cambium Networks. - Staff Engineer

March 2024 - Continue

- Cloud Agent Security Enhancement
 - Fixed critical certificate validation issue in C-based cloud agent using OpenSSL 3.3.1
 - Enhanced ssl_cert_verify_callback to properly handle 3-tier AWS certificate chain (root/intermediate/leaf CA)

- Implemented comprehensive certificate chain verification, strict hostname validation against CN, and graceful handling of not-yet-valid certificates
- **Impact:** Resolved intermediate CA validation failures while strengthening security checks
- **Skills:** C, OpenSSL, PKI, Certificate Validation, Security Hardening
- Endpoint Device Classification System
 - Developed a Golang-based solution to classify endpoint devices by analyzing network attributes including MAC addresses, DHCP fingerprints, TCP/IP stack, TLS (JA3/JA3S), HTTP headers, DNS OS Update hits, and mDNS/SSDP data.
 - Created structured JSON profiles for each device (keyed by MAC address) by aggregating multiple fingerprinting techniques.
 - Integrated with cloud REST API to enrich device profiles with manufacturer/model information.
 - Implemented using eBPF for efficient and scalable network data collection and processing.
 - **Impact:** Enhanced network visibility and device identification accuracy for security monitoring.
 - **Skills:** Golang, eBPF, Network Fingerprinting, REST APIs, JSON Data Modeling.

Cambium Networks. - Sr Engineer

Nov 2021 - March 2024

- Developed microservice applications to manage REST API calls from the Subscriber Mobile App.
 - Designed REST API endpoints and JSON schemas for requests and responses.
 - Utilized AWS DynamoDB for storing user data, including notifications and speed test history.
 - Implemented user authentication from AAA Server using gRPC.
 - Implemented test cases for all REST API endpoints, adhering to Test Driven Development practices.
- Engaged in Full Product Design and Development Lifecycle for Network Solutions.
 - Designed json schema between Network Cloud Server and Wi-Fi Router for all the features required in the product.
 - Collaborate cross-functionally with multiple teams, actively contributing to the end-to-end development of key features and driving their successful implementation.
 - Guides the Quality Assurance team in prioritizing critical issues and steering them towards successful delivery of core functionalities.
 - Implemented a speed test agent feature in Wi-Fi routers, enhancing network performance evaluation for users.
 - Successfully integrated a robust Parental Control feature into the device, enabling enhanced control and security for families.
 - Languages & Tools: C, Golang, Shell, Python, docker, Jira, Confluence, AWS EC2, S3 Bucket etc
- Leading the Development of an Observability Engine with Elastic stack and Grafana for stats & logs visualization of CPE, Wi-Fi APs and Wi-Fi Router.
 - Integrated syslog-ng within Network Access Points (APs) to enable streamlined log export to the Observability Engine, enhancing network monitoring and analysis.
 - Developed a stats-collector agent in Golang responsible for collecting data from APs and seamlessly transmitting it to the Grafana server, enabling real-time monitoring and data-driven insights.
 - Successfully containerized the ELK Stack, Grafana, and syslog-ng server, streamlining deployment and enhancing system scalability.

Lavelle Networks. - Senior Software Engineer - III

Sept 2020 - Nov 2021

- Fault Visibility & TCA(Threshold Crossing Alerts) implemented in the Product.

- Integrated the fault events generation in various SD-WAN components such as (Dataplane, Control Plane, DPI Engine, Security Engine).
- Integrated LMDB(mmaped) for tracking events status such as RAISE or CLEAR.
- Written libraries in C, Golang & Python which are used in various user space services.
- Developed System Resource Manager in Golang
 - Watchdog application which monitors system resources such as CPU, Memory, Disk, Open FD and temperatures of the system.
 - Certain critical applications such as Dataplane process, DPI Engine process and Control Plane process are monitored by this service.
- Implemented inline DNS Proxy in Datapath
 - Implemented the DNS proxy into the product.
 - Used hashmap db for DNS Answer headers.
 - Handle the json configuration pull in Control Plane (python) from Cloud and store in the appropriate directory.

Etrance Networks (Client Lavelle Networks) - Software Engineer

Aug 2018 - Sept 2020

- Active-Active HA
 - Did UT on its entire feature and handle all the bugs raised during the QA phase.
- SD-WAN software ported on ARM Platform
 - All the SD-WAN CPE components Cross Compiled & ported in ARM devices.
 - Developed Multi Pattern Matching Library for DPI Engine which runs in ARM architecture.
 - Integrated the Switch Software (RTL8367) into the product.
 - Visited onsite for verification of the board for manufacturing.
- DHCP Server integrated in the SD-WAN Platform
 - Integrate the DHCP Server in the control plane
 - Implemented DHCP Option such as 150, 66, 67 into the dhcp server.
- Integrated Modem Support as WAN Link into the SD-WAN Platform
 - Developed software which will manage all kinds of USB Based 4G devices.
 - Written Modem Driver for mini-pci based devices.

Etrance Networks (Client TATA Power SED) – Software Engineer

Dec 2015 -Aug 2018

- Video Conference Bridge
 - Developed Video Conference software using Gstreamer
 - Ported the Video Conference software in TI DM8168 & TI 6636K2H board.
 - Integrated the Video Codec Plugins into the embedded board.
- VoIP based Call Server - SDR (Software Defined Radio)
 - Developed the User authentication module using SIP REGISTER Headers.
 - Implemented feature server for various IVR related queries.
 - Integrated Web Calls into the VoIP Server
- CREW Terminal - SIP Client
 - Developed SIP Client software for Client Customized Hardware.
 - Written various drivers & firmware for embedded components used in the device.

Etrance Networks. – R & D Engineer

Sept 2015 – Dec 2015

- Users Authentication over wifi router
 - Integrated the Splash software (nodogsplash from openwrt) in TP Link Router.
 - Developed the Cloud Server to manage distributed routers.
 - Integrated google analytics in the platform.

- Smart Landline Calls over wifi - IOT
 - Developed an embedded device which will convert BSNL landline calls to Home Wifi network and be received in android mobile phone.
 - Implemented the firmware for the various embedded chips used in the device. (DAA CPC5622, ESP8266)
 - Written I2S driver for audio codec chip WM8510
 - Verify the digital signals using Oscillator.

Education:

- B.Tech in ECE From Biju Pattnaik University Of Technology, Odisha (CGPA 7.78, 2014).
- +2 Science from Sri Aurobindo I H S R, Matrubhaban, Cuttack, Odisha .
- Matriculation from Khannagar High School, Cuttack, Odisha.

Declaration:

I do hereby declare that the information stated above is true to the best of my knowledge.

SWADHIN SEKHAR BEHERA