Swamy D K V

Bengaluru, Karnataka, India
Email: swamydkv@gmail.com | Phone: +91 8095691701 | LinkedIn | Personal Blog

Professional Summary

Software Senior Principal Engineer with 15+ years of proven expertise in designing, developing, and leading complex software solutions across cloud-native environments, networking infrastructure, and 5G mobile technologies.
Demonstrated proficiency in Go, Python, and C for high-performance, scalable product development.
Recognized innovator with 5 filed patents in edge computing and network virtualization.
Expert in translating customer requirements into actionable solutions, mentoring engineering teams, and driving organizational innovation, with strong focus on network virtualization, end-to-end call flows, and user outcomes.

Core Competencies

- Cloud-Native and Container Orchestration: Kubernetes, Docker, Podman, container orchestration platforms, microservices architecture
- Networking and Infrastructure: Software Defined Networking (SDN), Network Functions Virtualization (NFV), Policy-Based Routing (PBR), network virtualization, Ethernet, Wi-Fi, cellular networks
- 5G and Mobile Core Technologies: 5G Core Session Management Function (SMF), Cloud Native Broadband Network Gateway (cnBNG), Packet Gateway (PGW), Serving Gateway (SGW), SAEGW
- Security and Firewall Technologies: network security, firewall management, iptables, ebtables, nftables, virtual network segments
- Technical Leadership and Innovation: team leadership, cross-functional collaboration, technical mentoring, strategic architecture design, patent development
- Software Engineering: Go (Golang), Python, C programming, REST APIs, multithreading, high-performance computing
- Agile and DevOps Practices: CI/CD, test automation, performance optimization, troubleshooting

Professional Experience

Software Senior Principal Engineer

Dell Technologies, Bengaluru | August 2022 - Present

Enterprise Edge Orchestration Platform Dell NativeEdge is an enterprise edge operations software platform enabling secure, scalable edge computing deployments across diverse use cases.

- Own all network architecture, network virtualization, and network security initiatives within the platform, providing the foundation for host, VM, and container communication from release 0 onward, with all committed networking features delivered on schedule across 10+ consecutive releases.

- Design and ship 2-3 customer-visible networking features every 3-month release cycle, with the initial release delivering 4-5 features across routing, multihoming, ingress, and diagnostics.

- Implemented multihoming in an enterprise automation/orchestration platform running on Kubernetes, enabling control-plane pods to connect to both in-band and out-of-band networks for common enterprise server deployments.

- Implemented policy-based routing and a "block-by-default, open-by-policy" firewall model to strictly isolate VM, container, and host traffic to dedicated network ports and prevent unintended host exposure.

- Built a unified ingress layer using MetalLB and NGINX to accept incoming traffic from both in-band and out-of-band networks, simplifying deployment of mixed management and data paths.

- Designed a Layer-2 service console and protocol for diagnostics (including multi-part log collection and IP configuration), filed as a patent.

- Maintained a low true-defect rate in networking: only a small fraction of reported issues from system test and customers were actual code bugs, with the majority clarified as enhancements or usage gaps and resolved early.

- Mentored multiple engineers in and outside the team, helping them grow from minimal networking background to independently owning networking design and implementation.
- Act as AI Champion for Spec-Driven Development (SDD), leading adoption of a spec-first approach where structured specifications are the single source of truth for networking features.

- Ran an internal SDD bootcamp and introduced workflows where designs drive automatic generation of code skeletons, unit tests, and component tests, reducing manual effort in test creation and onboarding while improving design quality and consistency.

Senior Software Engineer

Cisco Systems, Bengaluru | January 2015 - August 2022

Cisco Cloud Native Mobility Products (February 2019 - August 2022)
Cloud Native Broadband Network Gateway (cnBNG) and 5G Core Session Management Function (SMF)
The cnBNG serves as the subscriber access point for broadband connectivity, implementing Control Plane and User Plane Separation (CUPS) architecture for ISP scalability. SMF is a critical control-plane network function within 5G core network infrastructure.

- Designed, developed, and optimized 5G Session Management Function (SMF) for comprehensive mobility and session management according to 3GPP technical specifications.

- Optimized 5G SMF state machines and EPC gateway code paths, increasing transaction handling capacity by 2 times by significantly reducing memory footprint (50%+).

- Enhanced state machine handling for 5G call flows, improving system reliability and behavior in negative test scenarios.

- Architected and implemented critical network functions including AMF temporary reject handling, seamless handover mechanisms, and Policy Control Function (PCF) rule integration.

- Led debugging, root cause analysis, and performance tuning initiatives, achieving substantial memory usage reduction and operational efficiency improvements.

- Delivered critical customer escalation support, resolving complex high-priority technical issues and ensuring customer satisfaction.

Cisco Crosswork SON Suite (August 2016 - February 2019) Self-Optimizing Network (SON) solutions for multi-vendor RAN.

- Designed high-performance REST APIs and optimized MongoDB ORM layers, improving system throughput and scalability.

- Developed multi-vendor RAN optimization solutions supporting Ericsson and Nokia infrastructure.

- Engineered and optimized algorithms for automated network optimization, improving intelligence and decision-making in RAN operations.

LTE Core Network Gateways (January 2015 - August 2016) Evolved Packet Core (EPC) development.

- Developed network functions for 4G mobile core (SGW, PGW, SAEGW) within EPC architecture.
- Implemented CUPS architecture for optimized session management and scalable deployments.
- Developed inter-chassis session recovery mechanisms, reducing failover time and improving reliability.
- Designed ARP-level granular statistics tracking, enabling detailed performance analytics and monitoring.
- Architected Overcharging Protection features to prevent billing for dropped data during network failures.

Senior Analyst - Software Engineer

Accenture Services Pvt Ltd, Bengaluru | August 2014 - January 2015
- Contributed to telecom and networking projects with focus on software development, integration, and testing.

Engineer - Software

Sasken, Bengaluru | October 2010 - August 2014

- Built proof-of-concept dynamic spectrum allocation (DSATPA) systems, enabling public-safety priority access while maximizing commercial spectrum utilization.
- Developed Python-based automation frameworks for continuous testing and validation of DSATPA functionality.
- Created LTE Core Network Test Automation Framework using simulation stubs for SGW, PGW, SAEGW and charging systems (OCS, OFCS).
- Developed API frameworks and Python-based test scripts for modem testing using AT commands in the Sasken Automation Test Suite (SATS).
- Performed RF data analysis and KPI-driven optimization for telecom networks, including benchmarking and parameter tuning.

Engineer

TelecomOne Teleservices Pvt Ltd | December 2009 - October 2010

- Conducted network performance benchmarking across multiple cities and towns.
- Authored 60+ detailed technical reports and led a team of 4 engineers in optimization projects.

Education

- MCA - Indira Gandhi National Open University, 2024
- PGDCA - Indira Gandhi National Open University, 2020
- BE (Electronics & Communication Engineering) - Visvesvaraya Technological University, 2010

Certifications and Awards

- Dell GenAI Foundations Certification (October 2024)
- Cisco MBG Excellence Award
- Dell Game Changer Award (2x)
- Dell Hackathon Judges Choice Award for Edge Database Service Innovation
- Ignite 3 Data Science Competition Finalist (Cisco)
- Dell Technologies TechEDGE Program - Technology Leadership & Advanced Engineering (with IIM Bangalore & NIIT StackRoute) (2025)
- Cisco Aspiring Leadership Program (2019)
- Active leadership in mentoring, technical hiring, and cross-team collaboration initiatives

Technical Skills

- Programming Languages: C, Python, Go (Golang)
- Cloud and Container Technologies: Kubernetes, Docker, Podman, container orchestration platforms, microservices architecture

- Networking and Infrastructure: SDN, NFV, VLAN, Wi-Fi, 5G/4G/3G/2G cellular networks, Policy-Based Routing (PBR), network virtualization
- Security Technologies: network security, firewall management, iptables, ebtables, nftables
- Database Technologies: MongoDB, SQL, SQLite
- Web Development Frameworks: Flask, Django
- Development and Collaboration Tools: Git, Bitkeeper, CDETS, Jira, REST APIs
- Network Analysis and Testing: TEMS Investigation, NEMO Outdoor, MapInfo Professional, Gladiator, XCAP, Actix Analyzer
- Testing and Automation: unit testing, CI/CD, test plan development, test automation frameworks