

VISHAL SHETAGAR

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EDUCATION

Manipal Institute of Technology, Bengaluru

Bachelor of Technology in Computer Science and Engineering (Cybersecurity)

Bengaluru, Karnataka

Aug. 2024 – Jul. 2028

TECHNICAL SKILLS

Programming Languages: Go, C/C++, JavaScript/TypeScript, Java, Python, SQL

CS Fundamentals: Object-Oriented Design, Data Structures & Algorithms, Computer Networks, Operating Systems, DBMS, Problem-Solving

Backend & Infrastructure: Distributed Systems, Microservices, gRPC, REST APIs, PostgreSQL, Redis, Kafka, Docker, Kubernetes, AWS

DevOps & Observability: CI/CD, GitHub Actions, Prometheus, Grafana, Loki

PROJECTS

Argus – Distributed Fleet Management Platform | *Go, C++, PostgreSQL, Redis, gRPC, Kafka, MQTT, Kubernetes*

- Architected a distributed IoT platform in Go with separate fleet-control and high-volume telemetry services, communicating over gRPC and Kafka, with PostgreSQL/Redis for persistent and stateful workloads.
- Engineered a reliable command lifecycle (PENDING → DISPATCHED → ACKED/NACKED/TIMEOUT) spanning PostgreSQL, Kafka, MQTT, and ESP32 devices, with background workers handling timeout detection and state transitions.
- Built automated unit, integration, and full-stack tests across Go services and the C++ ESP32 SDK, with three GitHub Actions CI pipelines and a Prometheus/Grafana/Loki observability stack.
- Load-tested the telemetry pipeline with 100 simulated devices over 60 minutes, processing 359,900 messages with zero Kafka ingestion loss and zero primary consumer lag.

Aegis – Encrypted Overlay Network | *C++, OpenSSL EVP, Wintun, Winsock*

- Engineered a Windows-native encrypted overlay network in C++ that routes IP traffic across a decentralized multi-hop mesh using Wintun virtual networking, Winsock UDP transport, and NodeID-based peer addressing.
- Implemented decentralized mesh formation through leaderless peer-table gossip, with nodes propagating routing prefixes and converging on multi-hop paths without a central coordinator.
- Built the overlay data path from packet parsing through routing, session management, and onion forwarding, including ChaCha20-Poly1305 encryption, replay protection, session rekeying, and route-loop detection.

Atlas – Software-Defined Router | *C++, Npcap, Winsock, IP Helper API*

- Built a user-space software router in C++20 using Npcap to capture and inject raw Ethernet frames, implementing a 14-stage forwarding pipeline with Ethernet/IPv4 parsing, checksum validation, Longest Prefix Match routing, and ARP resolution.
- Designed the forwarding pipeline around zero-copy `std::span` packet views, pure parsing and routing functions, and non-throwing error handling, enabling deterministic packet processing and hardware-independent testing.

ACHIEVEMENTS

Top 10 finish among 50+ teams at HackNova, a 48-hour Capture The Flag (CTF) competition organized by the MIT Bengaluru ACM Student Chapter in collaboration with Schneider Electric (Dec. 2024)