

Mohamed Saleh

Software Engineer

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Software Engineer with 2.5+ years building REST APIs and distributed microservices in Java/Spring Boot with Spring Data JPA/Hibernate and Kafka, plus C++/FFmpeg media transport. Led the N400 FFmpeg migration and a Kafka/EKS alarm platform, owning features end to end from design to production in a budding startup.

Experience

Software Engineer

Dec 2023 – Aug 2026

TekMedia Software, Coimbatore, India

Intelitor | Multi-tenant security-monitoring SaaS

- Architected the platform as **8 domain-bounded microservices**, each with its own **PostgreSQL** schema via **Spring Data JPA** and tenant isolation, plus **MongoDB** for alarm, audit and delivery logs, and owned end-to-end the alarm ingestion, processing & workflow, notification and API gateway services, with **gRPC** on the hot alarm path.
- Built **Spring Cloud Gateway** for JWT validation and rate limiting, with a **Kafka-to-WebSocket** bridge streaming alarm events to the operator portal in real time and **OpenTelemetry** tracing across Kafka and gRPC.
- Designed the **Kafka** event backbone with Avro schemas in Schema Registry, **Kafka Streams** correlation (two same-site sensors within 60 seconds collapse into one incident) and **CDC** from PostgreSQL to Elasticsearch, partitioned per alarm.
- Wrote the **Elixir/Phoenix** ingestion service handling thousands of concurrent device connections via process-per-connection concurrency and **OTP** supervision, parsing **SIA-DC09** from HikVision and Ajax panels.
- Built an incident workflow engine with **15 step types** on **Redis-backed** distributed state, replacing ad hoc manual triage with structured, auditable, partially automated response across 7-step automated and 8-step manual templates.
- Built a pluggable notification service (**Twilio**, **Google FCM**) with escalating retries and a **26-key** preference system.
- Hardened authentication with **RSA-256 JWT**, **TOTP** and **RBAC**, found and closed a privilege-escalation bug where the forgot-password flow let a site-user reset operator/admin/dispatch-supervisor passwords, and shipped to production on **EKS** with **Istio mTLS**, **HPA** and **Jenkins**, with quality gates (**JUnit 5**, **Mockito**, **Testcontainers**, **SonarQube**) in CI.
- Drove the in-house alarm-panel POC over **MQTT**, benchmarking **EMQX** vs **HiveMQ** for 5x throughput headroom and emitting **SIA-DC09** into the production receiver.

NetInsight N400 | Broadcast-grade IP media transport appliance

- Led the **FFmpeg** major-version migration, porting every custom encode, decode and interleave module from the legacy **3.8 fork** to **6.0** and **7.x** in **C++11**, shipping to production with full backward compatibility.
- Unlocked **4:2:2 10-bit** at **4K** for **H.264/HEVC**, brought **H.266/VVC** support to the platform and restored **Intel QSV** hardware acceleration for real-time 4-channel encoding.
- Rebuilt the media path with **zero-copy** frame passing and **lock-free ring buffers**, so encode, decode and interleave stages never block each other across multithreaded pipelines.
- Fixed broadcast-compliance bugs including **SMPTE 2038 ANC**, **SCTE-35** and **PTS/DTS A/V sync**. Validated across **H.264/HEVC/VVC** on **Zixi**, **RIST**, **SRT** and **RTP/RTSP** transports against **DekTec** and **Kiloview** decoders.
- Automated encode/decode test-cycle setup from 15 minutes of manual steps down to a single command, ran week-long stability runs with CPU-affinity scripts eliminating frame drops, and validated releases **VA18**, **VA20** and **VA22** across 4 full testing cycles.
- Diagnosed production core dumps with **GDB/Valgrind**, patched an **SSH** key exposure before deployment, and open-sourced **MPEG-TS-Generator** (**Go** + **FFmpeg**) to cut decoder validation time.

Technical Skills

Languages: Java 17+ (OOP, Collections, Streams, Multithreading), C++ (STL, concurrency), Python

Spring: Spring Boot 3, Spring MVC, Spring Security, Spring Data JPA/Hibernate

APIs & Protocols: REST APIs, gRPC, WebSockets, MQTT, OpenAPI

Data & Messaging: PostgreSQL, MongoDB, Redis, Apache Kafka, Kafka Streams

Cloud & Infra: Microservices, Docker, Kubernetes, Helm, AWS, Jenkins, Terraform

Media: FFmpeg, H.264/HEVC/VVC, MPEG-TS, RTP/RTSP, SRT/RIST/Zixi, Intel QSV

Systems: Linux/POSIX, C++ multithreading, IPC/shared memory, lock-free ring buffers, GDB

Testing: JUnit 5, Mockito, Testcontainers, SonarQube

Observability & Tools: OpenTelemetry, Prometheus, Grafana, SigNoz, Maven, Git, Bash

Education

Coimbatore Institute of Technology

2020 – 2024

B.Tech, Information Technology | Department Gold Medalist, CGPA 9.7/10

Publication

Automated Multilingual Multimedia Dissemination of Government Press Releases

ICITIIT 2024, IIT Kottayam (IEEE) | IEEE Xplore | DOI 10.1109/ICITIIT61487.2024.10580027

Built a Python multilingual pipeline that crawls PIB releases with Selenium and BeautifulSoup, parses PDFs with PyMuPDF, summarizes with Hugging Face DistilBART, translates via deep-translator to 10 languages, generates gTTS audio and renders a Blender 3D lip-synced mascot.