

# Aakash Kumar

Software & Cloud Architect

18+ Years Experience

AWS Cloud Certified (Pro + Security Specialty)

EMAIL: [aakash.kumar1980@yahoo.com](mailto:aakash.kumar1980@yahoo.com)

LINKEDIN: <https://www.linkedin.com/in/aakash-kumar1980>

GITHUB: <https://github.com/aakashkumar1980?tab=repositories>

PHONE: +1 623 268 7048



## Professional Summary

### CLOUD-NATIVE ARCHITECTURE & AWS MODERNIZATION

Innovative Software Architect with 18+ years of experience designing and modernizing large-scale digital marketing and credit card offers platforms. I specialize in microservices architecture, event-driven design, and cloud transformation using Spring Boot REST APIs, Kafka, and AWS cloud-native services. Experienced in migrating on-premises systems (OpenShift, F5, Couchbase, Okta) to AWS-based architectures leveraging EKS, Kinesis, S3, Lambda, Glue, and Athena for scale, reliability, and observability.

### EVENT-DRIVEN & HIGH-VOLUME PROCESSING

Architected and optimized high throughput microservices for real-time offer and impression events, achieving sub-second latency under heavy traffic. Designed Kinesis → Firehose → S3 streaming pipelines and Spark/Lambda processing layers for aggregation and enrichment. Applied Vert.x reactive programming and Redis caching for parallelized processing, ensuring consistent throughput across millions of transactions per second.

### DATA LAKE & ANALYTICAL REPORTING

Designed enterprise-scale data lakes on Amazon S3, cataloged with AWS Glue and queried via Athena for ad-hoc analytics and fraud detection. Integrated Spark for batch transformations and OLAP data aggregation. Delivered campaign and merchant performance insights through QuickSight dashboards, enabling data-driven decision making and near real-time trend analysis.

### SECURITY, IDENTITY & COMPLIANCE

Implemented mutual TLS (mTLS) and certificate-based authentication across internal microservices. Integrated Okta for federated identity and Cognito for user access management. Applied defense-in-depth controls with IAM least privilege, KMS encryption, Secrets Manager, API Gateway, WAF, and Shield. Ensured alignment with PCI-DSS and internal governance frameworks through CloudTrail, GuardDuty, and AWS Config automation.

### RESILIENCE, SCALABILITY & COST EFFICIENCY

Engineered systems for elastic scaling using EKS horizontal pod autoscaling, Lambda concurrency limits, and event-driven retry strategies. Built multi-AZ deployments with automated failover, Resilience4j circuit breakers, and SQS DLQs for fault containment. Tuned infrastructure for cost-efficient compute and storage via Athena pay-per-query, S3 lifecycle policies, and serverless orchestration with Step Functions.

# Core Skills

**Architecture & Patterns:** *Microservices, Event-Driven Architecture, CQRS, Saga, Reactive Programming (Vert.x, WebFlux), Cloud-Native Design, AWS Well-Architected Framework, Distributed Systems Reliability*

**Languages & Frameworks:** *Java 21, Spring Boot, Spring Data, REST APIs (OpenAPI/Swagger), Concurrency (CompletableFuture, Streams, Multithreading), Python (data & analytics scripting)*

**Data, Messaging & Stores:** *AWS Kinesis (Streams, Firehose), Kafka (MSK), SQS, Redis (Elasticache), DynamoDB, Aurora (Postgres/MySQL), RDS, Couchbase (legacy), Amazon S3*

**Big Data & Analytics:** *Spark on S3, AWS Glue ETL, Athena OLAP Querying, QuickSight Dashboards, S3-based Data Lakes, Campaign & Fraud Analytics*

**Security & Compliance:** *Okta Federation with Cognito, IAM Roles (IRSA), KMS, Secrets Manager, WAF, Shield, API Gateway, AWS Certificate Manager (mTLS), CloudTrail, GuardDuty, Config Rules*

**CI/CD & Infrastructure Automation:** *EKS, Lambda, Step Functions, Terraform, GitHub Actions, CodeBuild, CodePipeline, SonarQube, SAST/DAST Scanning*

**Observability & Operations:** *AWS CloudWatch, X-Ray, ServiceNow Integration, Performance Tuning, Chaos & Resilience Testing, Automated Alerting*

# Work Experience

## Software Architect

**American Express (contract) | Phoenix, Arizona, United States**

**Apr 2023 - Present**

**Event-Driven Microservices Architecture on AWS:** Led the transformation of an on-premises OpenShift-based marketing platform into a cloud-native, event-driven ecosystem on AWS EKS. Defined service boundaries, data flow patterns, and non-functional standards for scale, security, and resilience. Adopted Kinesis, MSK (Kafka), Lambda, and S3 for event propagation and real-time insights across offers, eligibility, and redemption pipelines.

**Real-Time Data Ingestion and Stream Processing:** Built a Kinesis → Firehose → S3 streaming layer for high-velocity event intake. Lambda functions enriched payloads and triggered downstream workflows, while Athena provided real-time query capabilities for engagement metrics and trend analytics.

**Asynchronous Event Distribution and Reactive Compute with Distributed Caching:** Adopted Kafka (MSK) as the backbone for domain event broadcasting. Leveraged Vert.x for non-blocking consumption and Redis for high-frequency access caching. Configured SQS DLQs to handle message recovery and isolate transient failures.

**State Management and Orchestration:** Implemented DynamoDB for atomic state management and distributed counters, ensuring transaction consistency. Used AWS Step Functions for orchestrating asynchronous approval and lifecycle workflows, and Aurora for analytical queries requiring relational joins.

**Streaming Analytics and Data Lake Enablement:** Established a Kafka → Lambda → S3 (Parquet) pipeline for large-scale transaction processing. Built a data lake on S3 cataloged with Glue and queried via Athena, supporting near real-time reporting and fraud detection. Business dashboards powered by QuickSight delivered campaign, redemption, and performance analytics with automated refresh via Lambda aggregations.

**Security, Observability & Compliance:** Implemented mTLS between services using AWS Certificate Manager, ensuring authenticated communication. Secured APIs behind API Gateway, protected via WAF and Shield, with secrets centralized in Secrets Manager and encrypted using KMS. Enhanced visibility with CloudWatch metrics, X-Ray traces, and automated compliance workflows integrated into ServiceNow for proactive issue management.

**Resilience and Scalability:** Achieved 30% throughput gain through reactive patterns, non-blocking I/O, and event batching. Deployed across multi-AZ EKS clusters with auto-scaling, retry with exponential backoff, and circuit breaker patterns for fault containment and graceful degradation.

## **Software Architect**

**Infosys Limited | Pune, Maharashtra, India**

**Aug 2016 - Apr 2023**

Architected cloud-native, event-driven microservices for BFSI clients. Designed architectural blueprints, system diagrams, and modernized applications with AWS EKS, S3, and Kafka integration. Developed responsive UI components with React.js and RESTful backends using Spring Boot to deliver scalable, secure financial applications.

### **Real-Time Scoring Engine (Credit Risk Assessment)**

Developed a real-time scoring engine that analyzed behavioral and transactional data for credit risk evaluation. Deployed on EKS with Kafka-based ingestion, processed scoring logic through Spring Boot microservices, and persisted results in S3 and DynamoDB for downstream analytics. Integrated explainable scoring APIs for regulatory compliance.

### **Security & Compliance**

Implemented PCI-DSS-aligned architectures with VPC isolation, private subnets, IAM-based least privilege, and end-to-end encryption using KMS. Automated compliance monitoring through AWS Config, Security Hub, and CloudTrail.

## **Lead Software Engineer**

**Trimble Mobility Solutions India Pvt. Ltd. | Pune, Maharashtra, India**

**Oct 2011 - Aug 2016**

Developed system for handling large-scale streaming GPS data, utilizing Netty 3 Sockets and a JBoss Queue.

## **Senior Software Engineer**

**BNP Paribas India Solutions Pvt. Ltd. | Chennai, Tamil Nadu, India**

**Apr 2009 - Oct 2011**

UI development was performed using the ExtJS 3 UI Framework for a reconciliation project.

## **Software Engineer**

**KPIT Cummins Infosystems Ltd. | Pune, Maharashtra, India**

**Dec 2006 - Dec 2008**

Worked on the promotions section of the e-commerce website were based on the customer profile

# Education

## **Bachelor's degree in electrical, electronics and communications engineering**

**Dr. Babasaheb Ambedkar Marathwada University | Aurangabad, Maharashtra, India**

**Aug 1997 - Jun 2002**