System Design Roadmap for Java Fullstack Developer → Cloud Solutions Architect

1. Core System Design Foundations

- Grokking the System Design Interview – High-level concepts & interview prep.
- Designing Data-Intensive Applications by Martin Kleppmann – Deep dive into scalability, reliability, maintainability.
- System Design Interview Vol 1 & 2 by Alex Xu – Practical case studies.
- Fundamentals: Load balancers, caching, databases (SQL/NoSQL), CAP theorem, sharding, replication, consistency models.

2. Advanced Cloud-Native Architectures

- Cloud-Native Architectures by O'Reilly – Learn cloud-native principles.
- Building Microservices by Sam Newman – Service decomposition, communication patterns.
- Microservices Patterns by Chris Richardson – Saga, CQRS, Event sourcing.
- Understand Kubernetes, Docker, Service Mesh (Istio/Linkerd).

3. Distributed Systems & Scalability

- Designing Distributed Systems by Brendan Burns – Practical Kubernetes-oriented designs.
- Read papers like Google Spanner, DynamoDB, Kafka for real-world inspiration.
- Focus on concurrency, distributed consensus (Raft, Paxos), and messaging queues (Kafka, RabbitMQ).

4. Cloud Provider-Specific Architectures

- AWS Certified Solutions Architect Official Study Guide – Deep dive into AWS services.
- Google Cloud and Azure Architecture Center docs – Compare multi-cloud patterns.
- Master serverless (AWS Lambda, GCP Cloud Functions, Azure Functions).
- Understand hybrid cloud and edge computing patterns.

5. Practical Hands-On Learning

- Recreate famous systems (Twitter feed, WhatsApp chat, Uber dispatch system).
- Deploy projects on AWS/GCP/Azure using IaC (Terraform, CloudFormation).
- Set up CI/CD pipelines with GitHub Actions/Jenkins.
- Experiment with observability: logging, tracing, monitoring (Prometheus, Grafana, ELK stack).

6. Continuous Growth

- Follow tech blogs from Uber, Netflix, Meta, Google Cloud.
- Read Designing Evolvable Web APIs by Glenn Block for API-first design.
- Stay updated with new architecture patterns: Event-driven, Serverless, Data Mesh, AI integration.