Technologies and Skills for a Senior Backend Engineer

Core Knowledge & Concepts

- Data Structures & Algorithms (search, sort, hash tables, trees, graphs, etc.)

- System Design (scalability, high availability, microservices, CAP theorem)

- Concurrency & Parallelism (multi-threading, asynchronous programming)

- Design Patterns (Singleton, Factory, Observer, etc.)

- Architecture Patterns (Monolith vs Microservices, Clean Architecture, Hexagonal Architecture)

Backend Languages (at least one deeply)

- Python (Django, Flask, FastAPI)

- Java (Spring Boot)

- Node.js (Express, NestJS)

- Golang

- Rust (up-and-coming)

- C# (.NET Core)

Databases

- Relational (SQL): PostgreSQL, MySQL, MS SQL Server

- NoSQL: MongoDB, Redis, Cassandra, DynamoDB

Cloud & DevOps

- Cloud Platforms: AWS (EC2, S3, Lambda, RDS, CloudWatch, ECS/EKS), GCP, Azure

- CI/CD: GitHub Actions, GitLab CI, Jenkins, CircleCI

- Infrastructure as Code: Terraform, AWS CloudFormation

- Containers & Orchestration: Docker, Kubernetes (k8s), Helm

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Security

- Authentication & Authorization (JWT, OAuth2, SSO, OpenID Connect)

- Secure password handling (hashing, salting)

- Rate limiting

- Data encryption (at rest and in transit)

- API security best practices

APIs & Communication

- RESTful API, GraphQL, gRPC, WebSockets

- Message Brokers: RabbitMQ, Kafka, SQS

Monitoring & Observability

- Logging: ELK Stack, Fluentd, Loki

- Monitoring: Prometheus, Grafana

- Tracing: OpenTelemetry, Jaeger

Testing & Quality Assurance

- Unit, Integration, and End-to-End Testing

- Tools: Pytest, JUnit, Mocha, Postman, Newman

- Contract Testing (e.g., Pact)

Other Useful Tools

- Git & GitFlow

- Swagger / OpenAPI

Technologies and Skills for a Senior Backend Engineer

- Postman

- Make / Bash scripting

- Nginx / Apache

- API Gateways (Kong, AWS API Gateway)

Soft Skills & Responsibilities

- Mentoring junior developers

- Code reviews

- Technical writing and documentation

- Leading architecture discussions

- Aligning technical decisions with business goals

- Stakeholder communication