



Architectural Patterns and the Cloud

Event-Driven Architecture

- **What is Event-Driven Architecture?**
 - Systems communicate through events.
 - Decoupled services respond to events as they occur.
- **How Cloud Providers Implement It**
 - AWS: AWS Lambda for serverless event-handling, SNS for notifications.
 - Google Cloud: Google Cloud Functions, Pub/Sub for event messaging.
 - Azure: Azure Functions, Azure Event Grid for event routing.

Pipeline Architecture

- **What is Pipeline Architecture?**
 - Process data through a series of stages or steps.
- **How Cloud Providers Implement It**
 - AWS: AWS Data Pipeline, Step Functions for workflow.
 - Google Cloud: Google Dataflow for batch and stream data processing.
 - Azure: Azure Data Factory for data integration at scale.

Multi-Tier Architecture

- **What is Multi-Tier Architecture?**
 - Separate responsibilities into layers or tiers.
- **How Cloud Providers Implement It**
 - AWS: EC2 for compute, RDS for database, S3 for storage.
 - Google Cloud: App Engine for application, Cloud SQL for database, Cloud Storage.
 - Azure: Azure App Services for apps, Azure SQL Database, Azure Blob Storage.

Hexagonal Architecture

- **What is Hexagonal Architecture?**
 - Also known as Ports and Adapters; focuses on decoupling application core logic from external concerns.
- **How Cloud Providers Implement It**
 - AWS: Lambda for application logic, API Gateway for external interfaces.
 - Google Cloud: Cloud Functions for core logic, Endpoints for APIs.
 - Azure: Azure Functions, Azure API Management for APIs.

Microservices

- **What Are Microservices?**
 - Small, autonomous services that work together but can be deployed independently.
- **How Cloud Providers Implement It**
 - AWS: ECS and EKS for container orchestration, API Gateway for routing.
 - Google Cloud: Kubernetes Engine for orchestration, Cloud Endpoints for APIs.
 - Azure: Azure Kubernetes Service for orchestration, Azure API Gateway for routing.

Storage Architectures

- **What Are Storage Architectures?**
 - Mechanisms to store, retrieve, and manage data.
- **How Cloud Providers Implement It**
 - AWS: S3 for object storage, RDS for relational databases, DynamoDB for NoSQL.
 - Google Cloud: Google Cloud Storage for object storage, Firestore for NoSQL.
 - Azure: Azure Blob Storage for object storage, Azure SQL Database, CosmosDB for NoSQL.