Microservice Architecture

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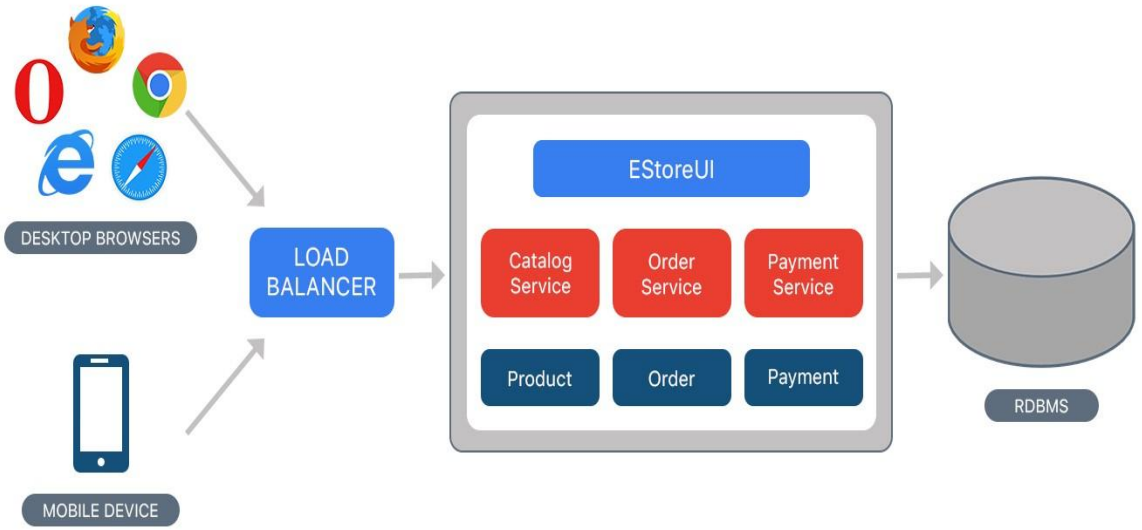
Outline

- Disadvantages of Monolithic architecture
- Characteristics of Microservice
- Components of Microservice Architecture
- Microservices and Cloud Technology
  - Distributed Data Management
  - Distributed Monitoring
- Challenges You might face
- Advantages of Microservice architecture
- Disadvantages of Microservice architecture

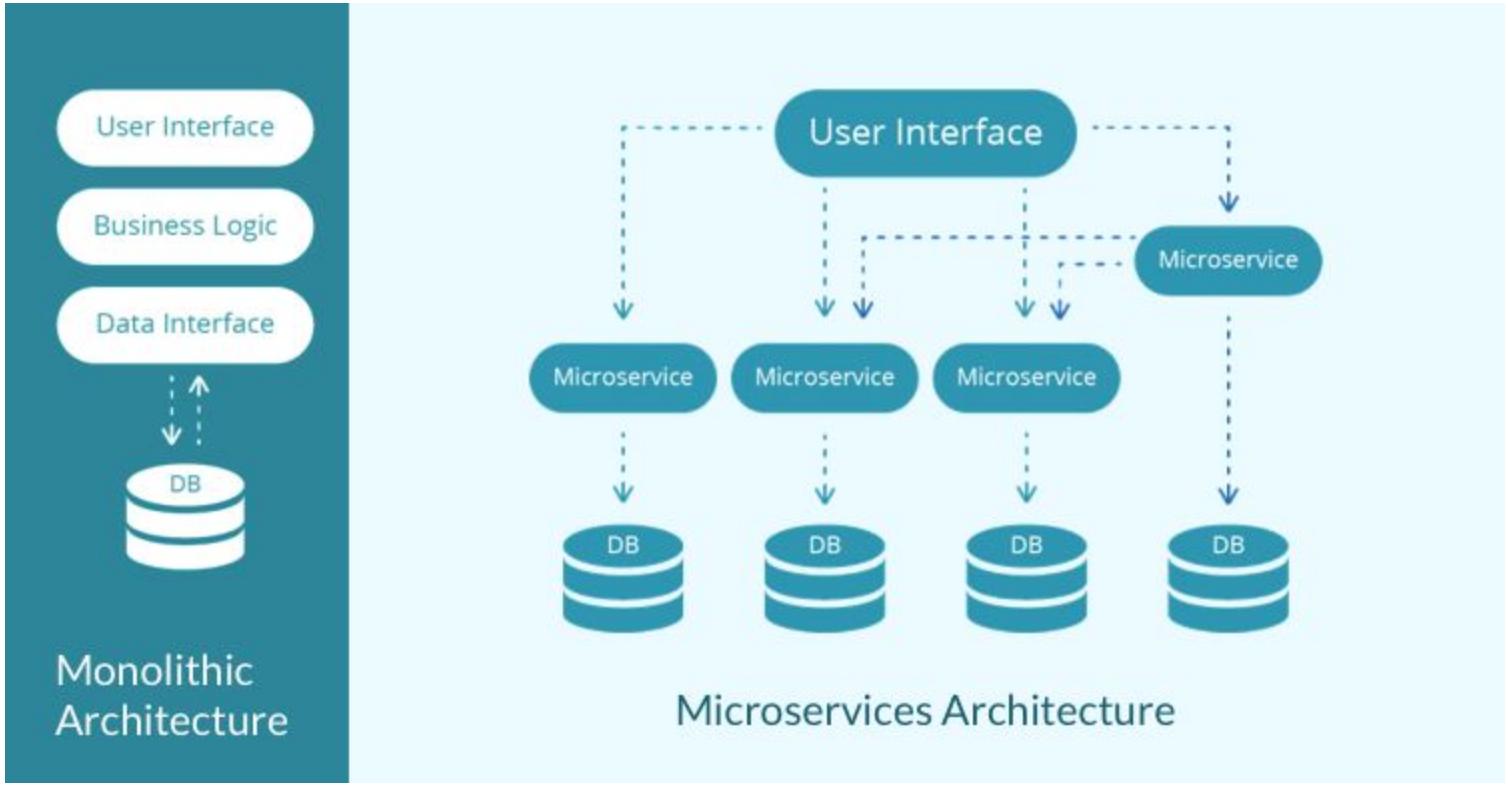
Disadvantages of Monolithic architecture

- Poor scalability
- Difficult to maintain large code base
- Continuous deployment is difficult
- Difficult in adopting new technologies
- Difficult to test the entire code base
- Less Reliable



Characteristics of Microservice

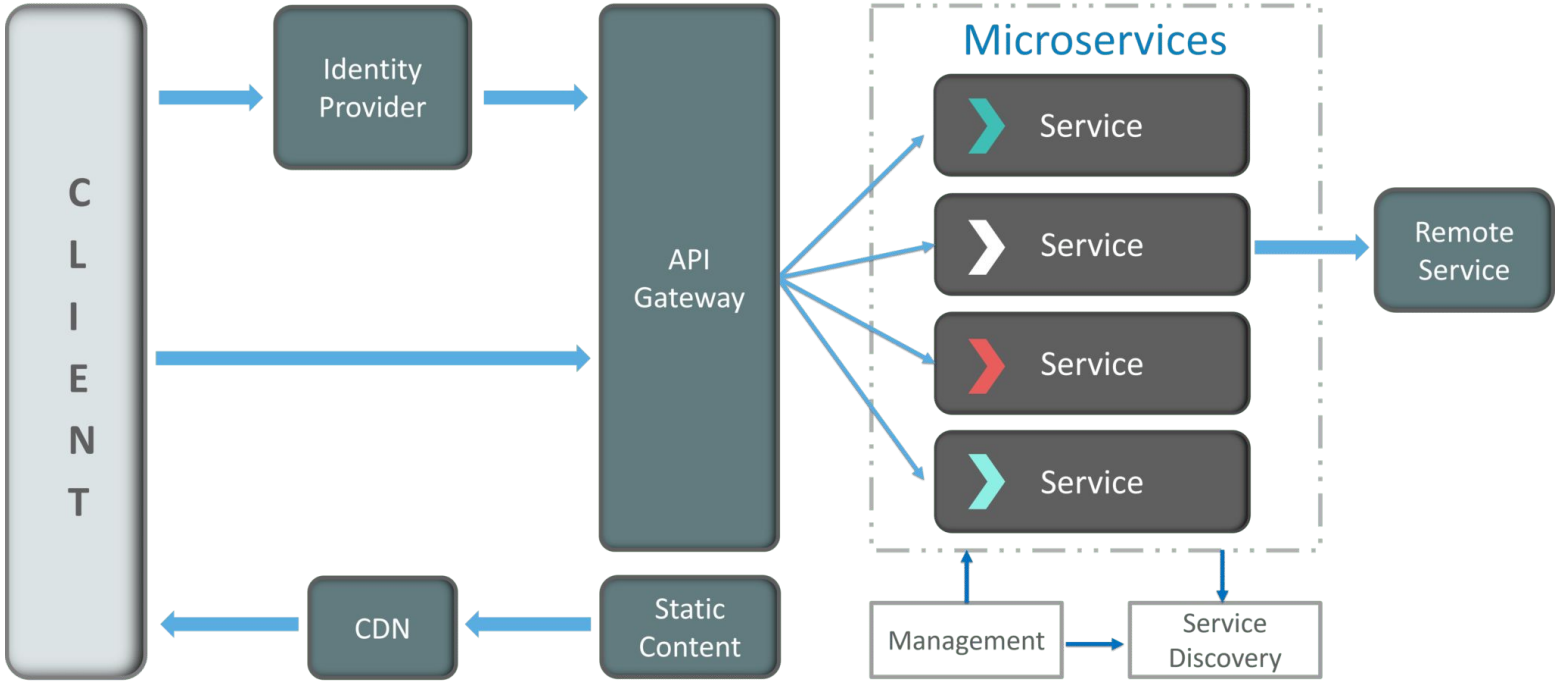
- Based on Single Responsibility Principle.
- Services are small, independent, and loosely coupled.
- Each service is a separate codebase.
- Services can be deployed independently.
- Services are responsible for persisting their own data or external state.
- Services communicate with each other by using well-defined APIs.
- Services don't need to share the same technology stack, libraries, or frameworks.


User Interface
Business Logic
Data Interface
DB
Monolithic Architecture
User Interface
Microservice
Microservice
Microservice
Microservice
DB
DB
DB
DB
Microservices Architecture

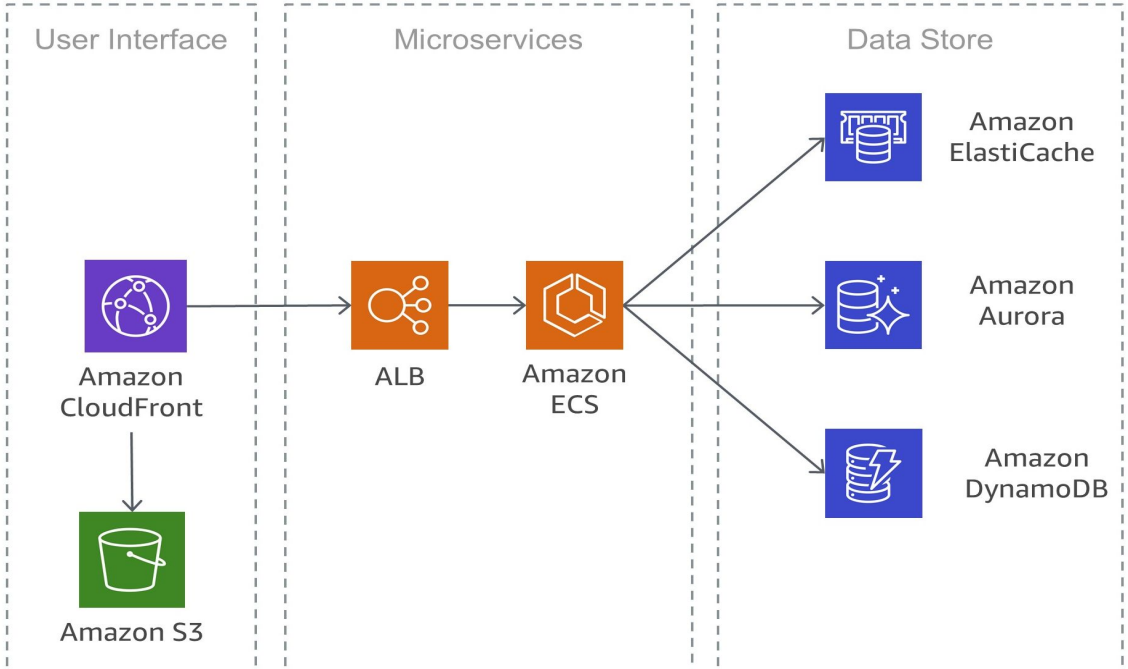
Components of Microservice Architecture

- Clients
- Identity Providers
- API Gateway
- Messaging Formats
- Data Handling
- Static Content
- Management
- Service Discovery

Components of Microservice Architecture



Microservices and Cloud Technology

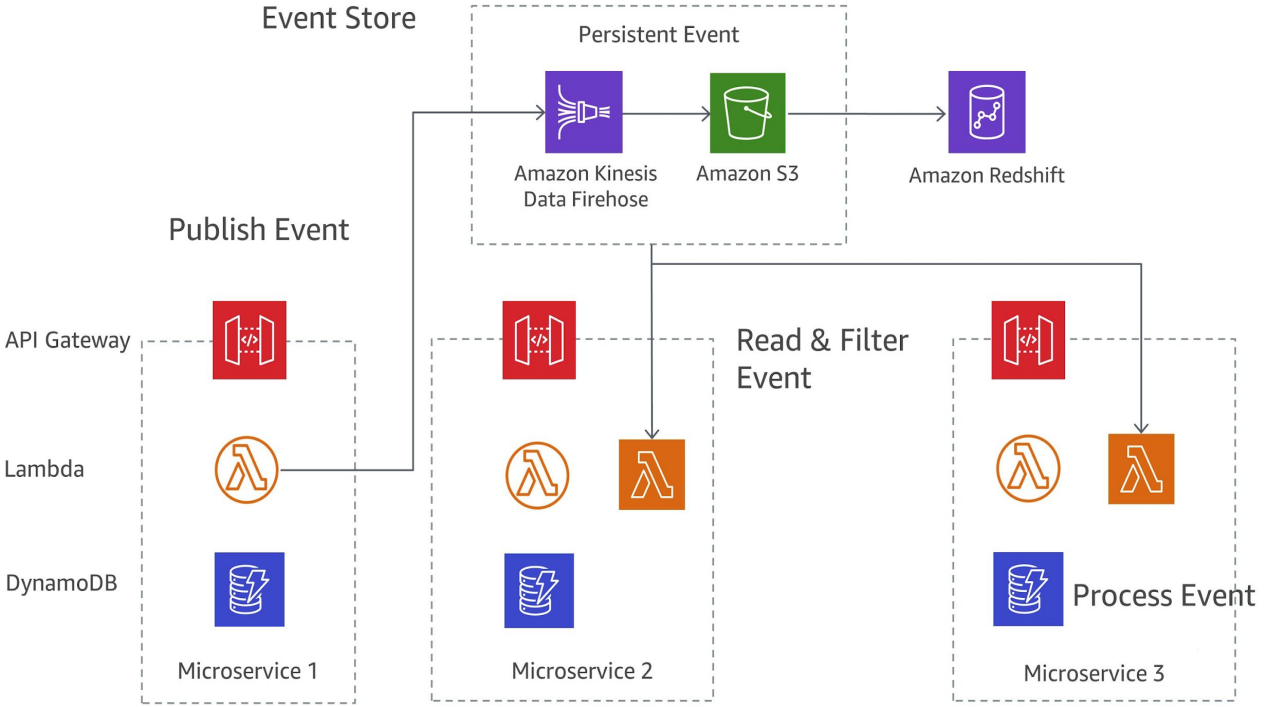


Simple Microservices Architecture on AWS

Distributed Data Management

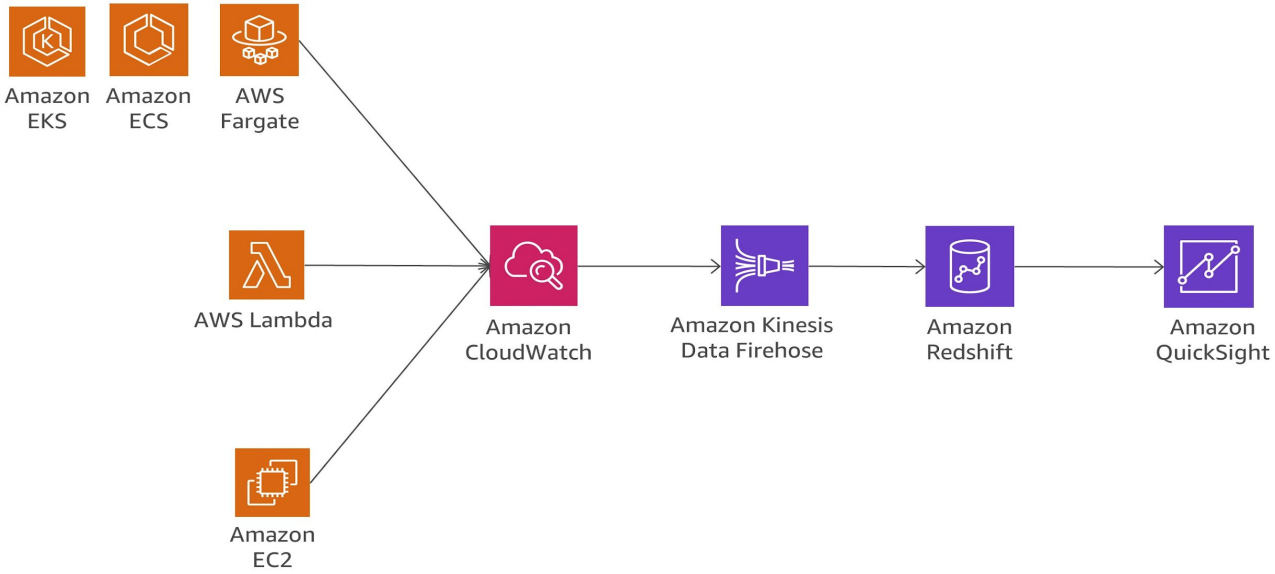
Saga Pattern
Handling transactions in distributed environment

Event Sourcing
Keeping data consistent across multiple services



Distributed Monitoring

- Centralized Logging And Distributed Tracing
- Log Analysis on AWS



Challenges You might face

- When to use microservice architecture.

- Decomposing the application into services
  - Decompose by business capability
  - Decompose by particular use case
  - Decompose by resources

- Maintaining data consistency
  - Shared database or a individual database per service

- Testing the services
  - Contract testing

- Communication among services
  - Remote Procedure Invocation - HTTP/REST API calls
  - Messaging based communication.

- Monitoring the services
  - Centralized logging service
  - Distributed tracing.

Advantages of Microservice architecture

- Granular scaling
- Independent deployments
- Independent development
- Small, focused teams
- Fault isolation
- Mixed technology stacks
- Re-usability of services

Disadvantages of Microservice architecture

- Additional complexity of creating a distributed system
- Inter-service communication mechanism
- Testing the interactions between services
- Requires careful coordination between the teams
- Increased memory consumption and High infrastructure cost

Thank you for listening.