Decomposing Monoliths CSSE6400

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May 15, 2023



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Answer

• Simple deployment

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- Simple system testing & debugging

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- Cannot scale components of system
- Monolith databases scale poorly

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What can be done if a monolith architecture is no longer suitable?

- Greenfields replacement
- Migrate to another architecture

How do I migrate a monolith to a new architecture?

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Answer

Decompose the monolith into services.

Strangler Fig Pattern

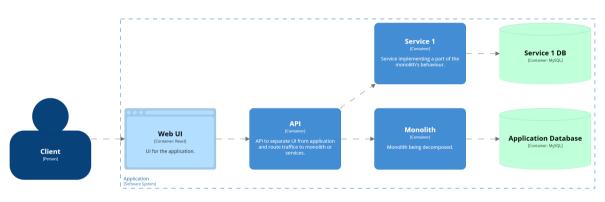
- Develop API for application's UI
- Proxy intercepts API calls
 - Proxy directs calls to application or new services
- Implement a service
 - Redirect calls to service
- Progressively replace monolith
- Shadow & Blue-Green Deployment



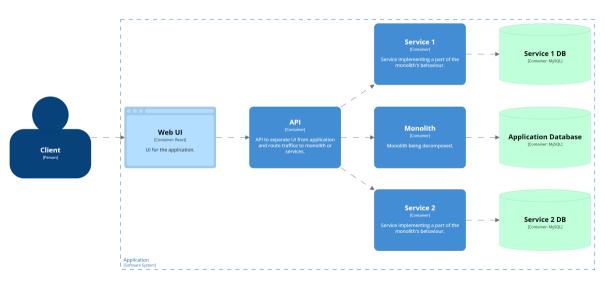
Monolith Deployment



Monolith Decompose: Step 1



Monolith Decompose: Step 2



Decomposition Process

- Identify bounded-contexts
- Simple first service
 - e.g. Authentication
- Minimise dependency from services to monolith
 - Monolith may use services

Decomposition Process

- Reduce coupling between bounded- contexts
 - e.g. Customer account management
 - Profile, Wish List, Payment Preferences separate services
- Decouple vertically
 - Service delivers entire bounded-context
 - Data is decoupled from monolith

Decomposition Process

- Focus on pain points
 - Bottlenecks
 - Frequently changing behaviour
- Rewrite, don't reuse
 - Redesign for new infrastructure
 - Reuse complex logic
 - e.g. Discounts based on customer loyalty and behaviour, bundle offers, ...

Atomic Decomposition

- Refactor monolith
 - Use service to deliver application functionality
 - Monolith may need to invoke service
 - Remove service logic from monolith

Stepwise Decomposition

Replace application functionality one service at a time.

Definition 1. Macroservice

Separate service, but may span more than one domain or share a database with the monolith or other services.

Definition 2. Nanoservice

deployed independently – its context is too small.

Service that depends on other services and cannot be