

# Decomposing Monoliths

*CSSE6400*

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- Simple deployment
- Simple communication between modules
- Simple system testing & debugging

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- Easy to defeat modularity
- Cannot scale components of system
- Monolith databases scale poorly

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- Greenfield replacement
- Migrate to another architecture

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How do I migrate a monolith to a new architecture?

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*Answer*

Decompose the monolith into services.

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- Progressively replace monolith
- Shadow & Blue-Green Deployment



# Monolith Deployment



# Monolith Decompose: Step 1



# Monolith Decompose: Step 2





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- Minimise dependency from services to monolith
  - Monolith may use services

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      - Separate Services
- Decouple vertically
  - Service delivers entire bounded-context
    - Data is decoupled from monolith



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- Focus on pain points
  - Bottlenecks
  - Frequently changing behaviour

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- 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 0.* Macroservice

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

*Definition 0.* Nanoservice

Service that depends on other services and cannot be deployed independently – its context is too small.

## References

[Fowler, 2024] Fowler, M. (2024).

Strangler fig.

<https://martinfowler.com/bliki/StranglerFigApplication.html>.