

# Module Overview



Brownfield Microservices  
Greenfield Microservices  
Microservices Provisos

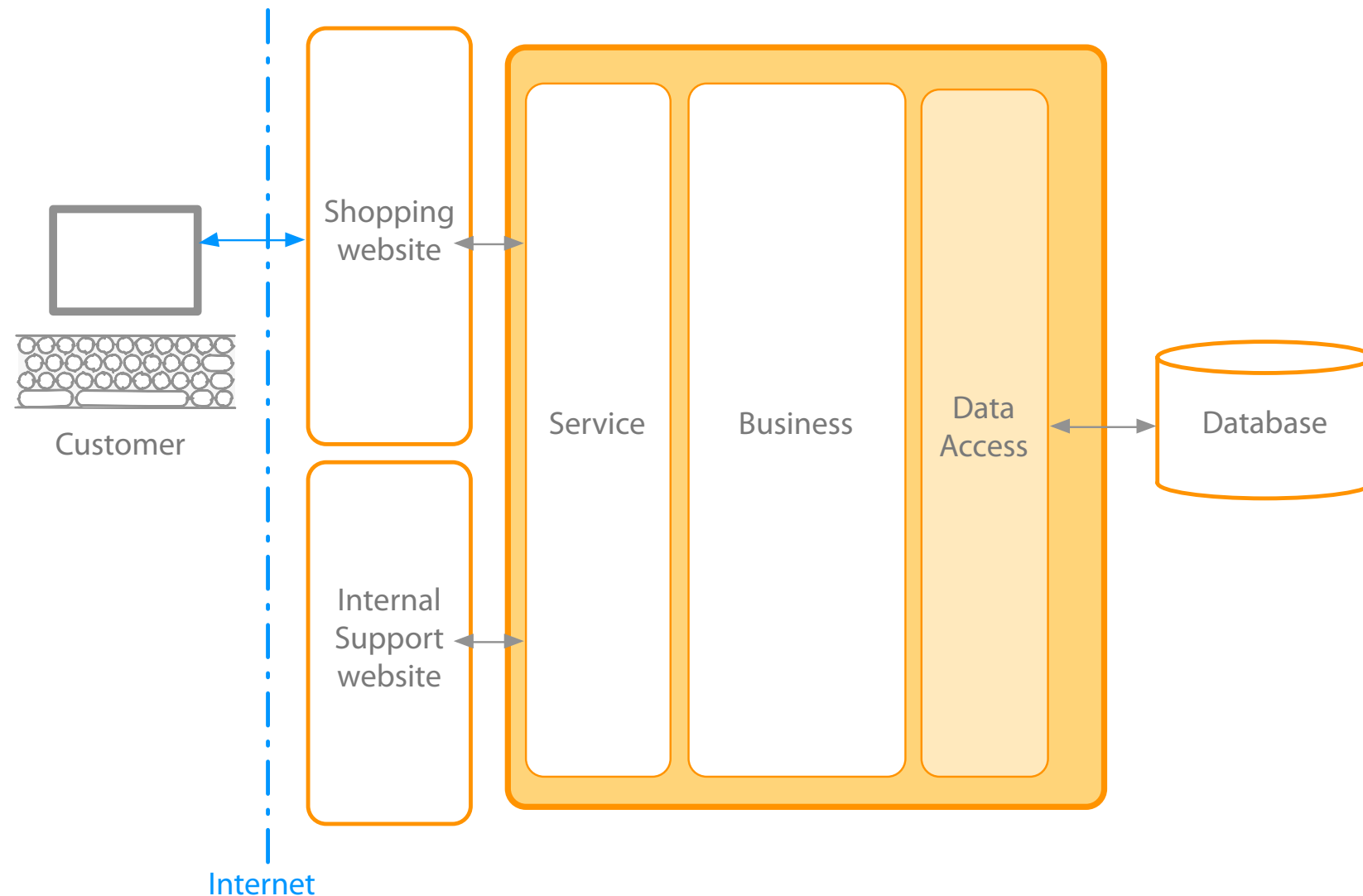
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# Brownfield Microservices

Approach | Migration | Database Migration | Transactions | Reporting

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# Brownfield Microservices: Approach



Existing system

Monolithic system

Organically grown

Seems too large to split

Lacks microservices design principles

Identify seams

Separation that reflects domains

Identify bounded contexts

Start modularising the bounded contexts

Move code incrementally

Tidy up a section per release

Take your time

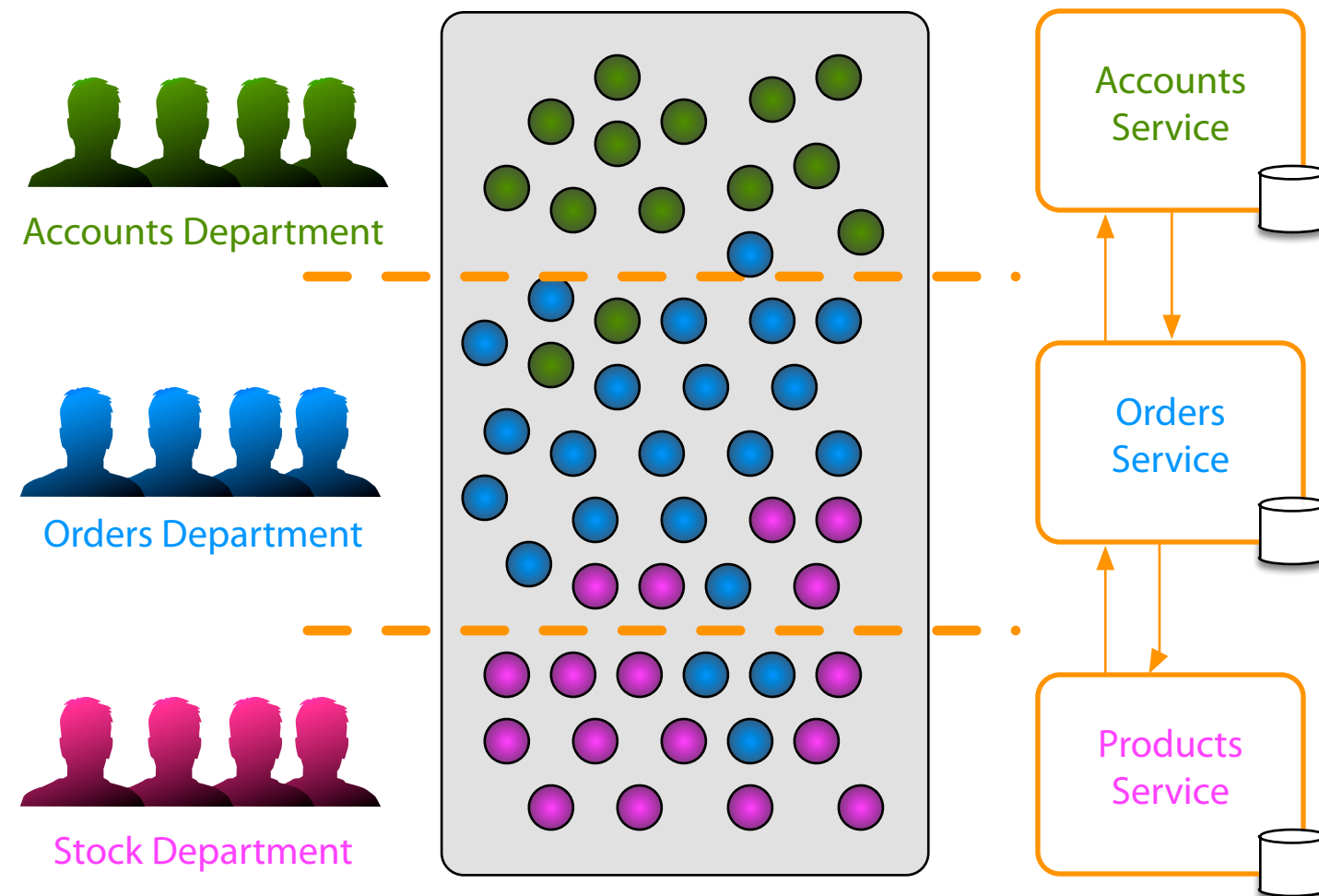
Existing functionality needs to remain intact

Run unit tests and integration tests to validate change

Keep reviewing

Seams are future microservice boundaries

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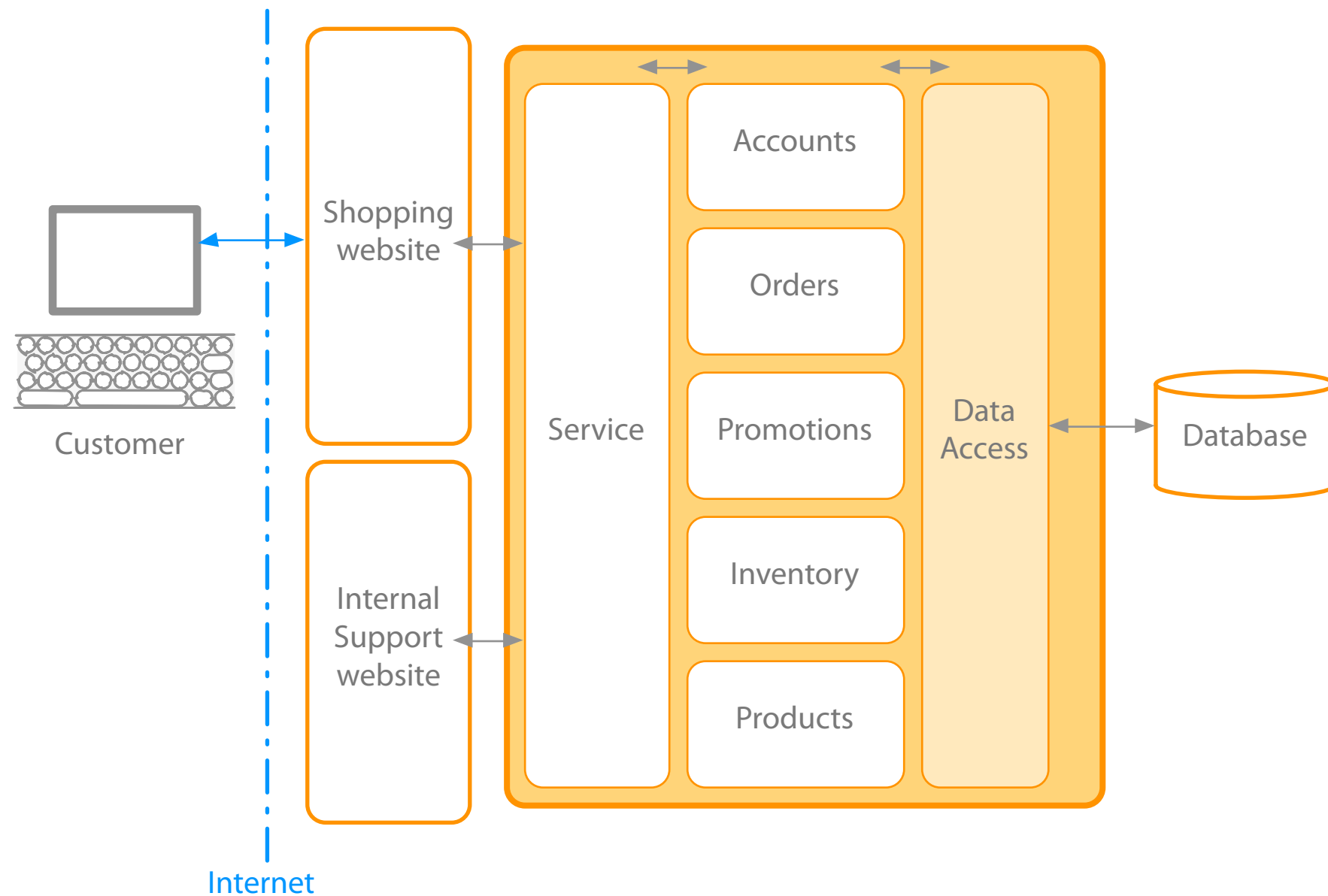
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# Brownfield Microservices: Migration



Code is organised into bounded contexts

- Code related to a business domain or function is in one place
- Clear boundaries with clear interfaces between each

Convert bounded contexts into microservices

- Start off with one
- Use to get comfortable
- Make it switchable
- Maintain two versions of the code

How to prioritise what to split?

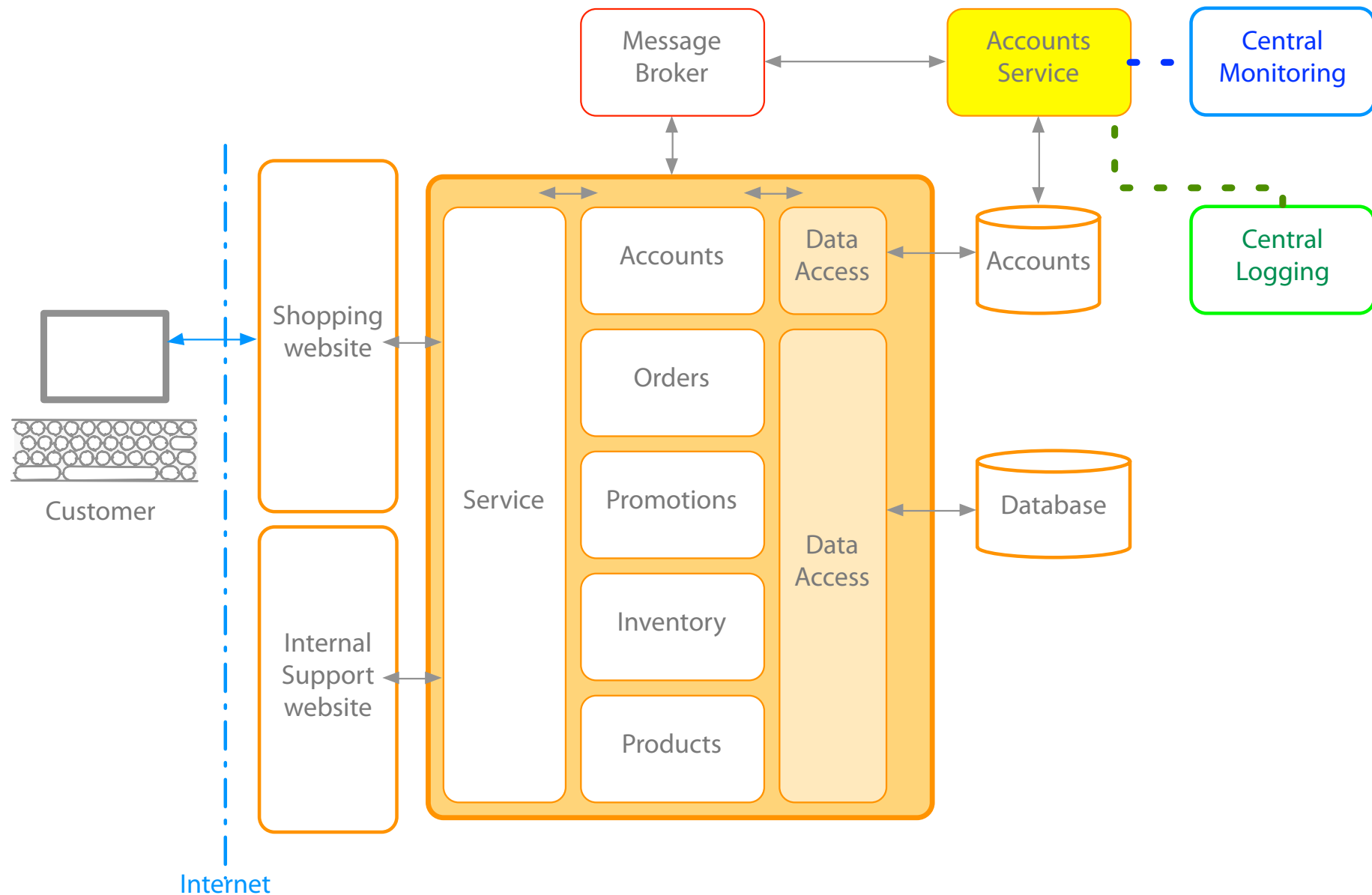
- By risk
- By technology
- By dependencies

Incremental approach

Integrating with the monolithic

- Monitor both for impact
- Monitor operations that talk to microservices
- Review and improve infrastructure
- Incrementally the monolithic will be converted

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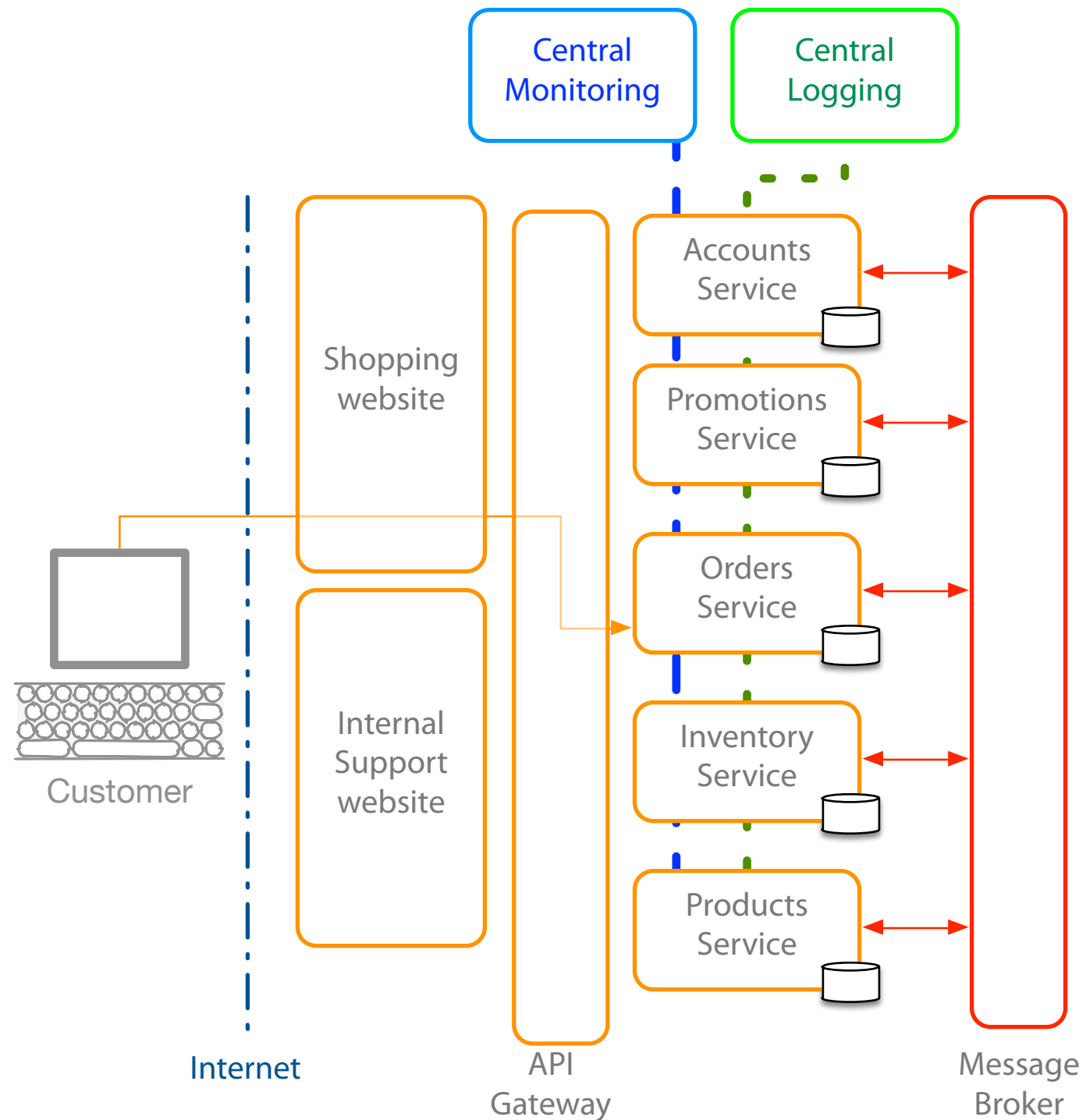
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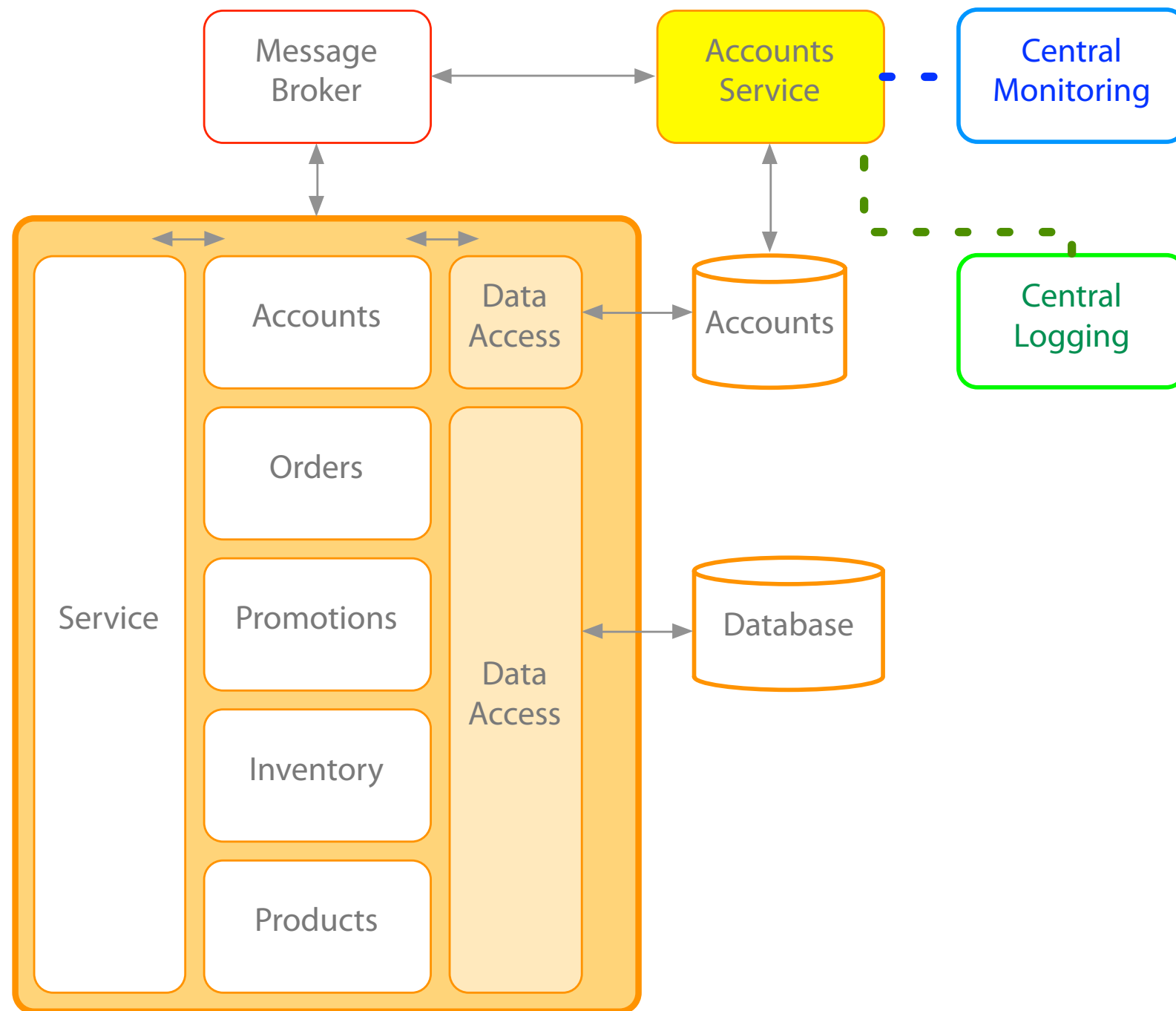
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# Brownfield Microservices: Database Migration



Avoid shared databases

Split databases using seams

Relate tables to code seams

Supporting the existing application

Data layer that connects to multiple database

Tables that link across seams

API calls that can fetch that data for a relationship

Refactor database into multiple databases

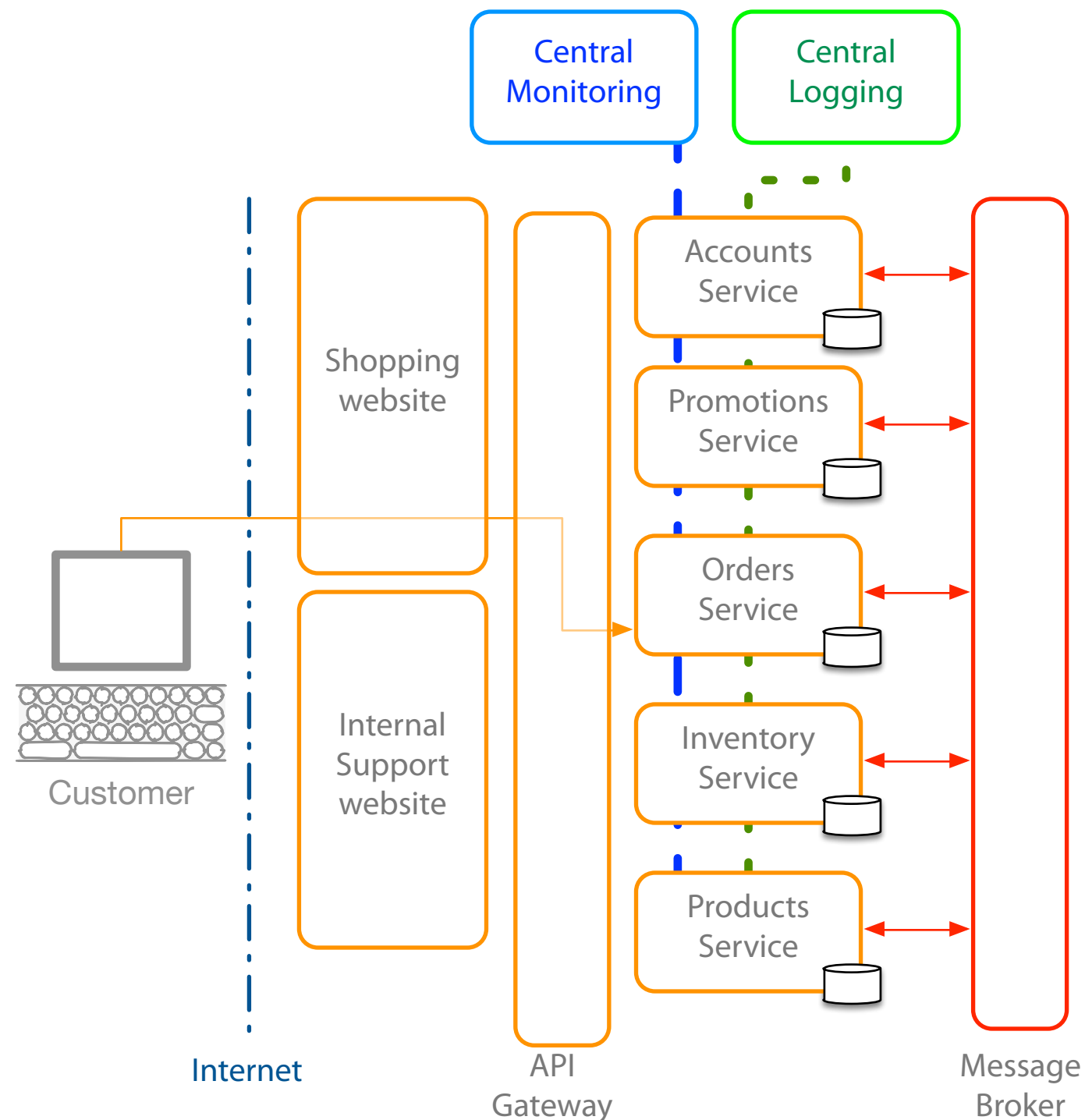
Data referential integrity

Static data tables

Shared data



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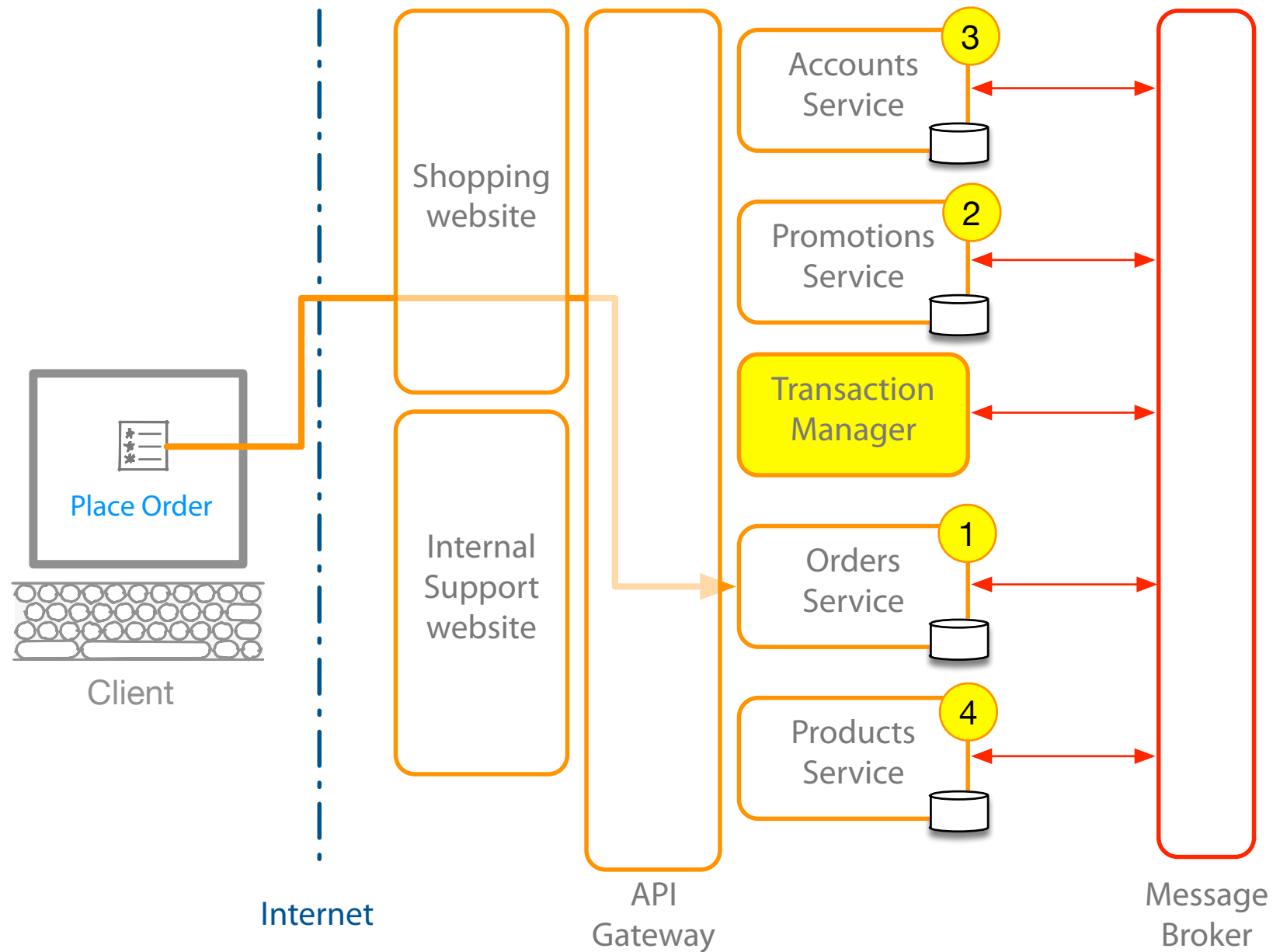
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# Brownfield Microservices: Transactions



Transactions ensure data integrity

Transactions are simple in monolithic applications

Transactions spanning microservices are complex

Complex to observe

Complex to problem solve

Complex to rollback

Options for failed transactions

Try again later

Abort entire transaction

Use a transaction manager

Two phase commit

Disadvantage of transaction manager

Reliance on transaction manager

Delay in processing

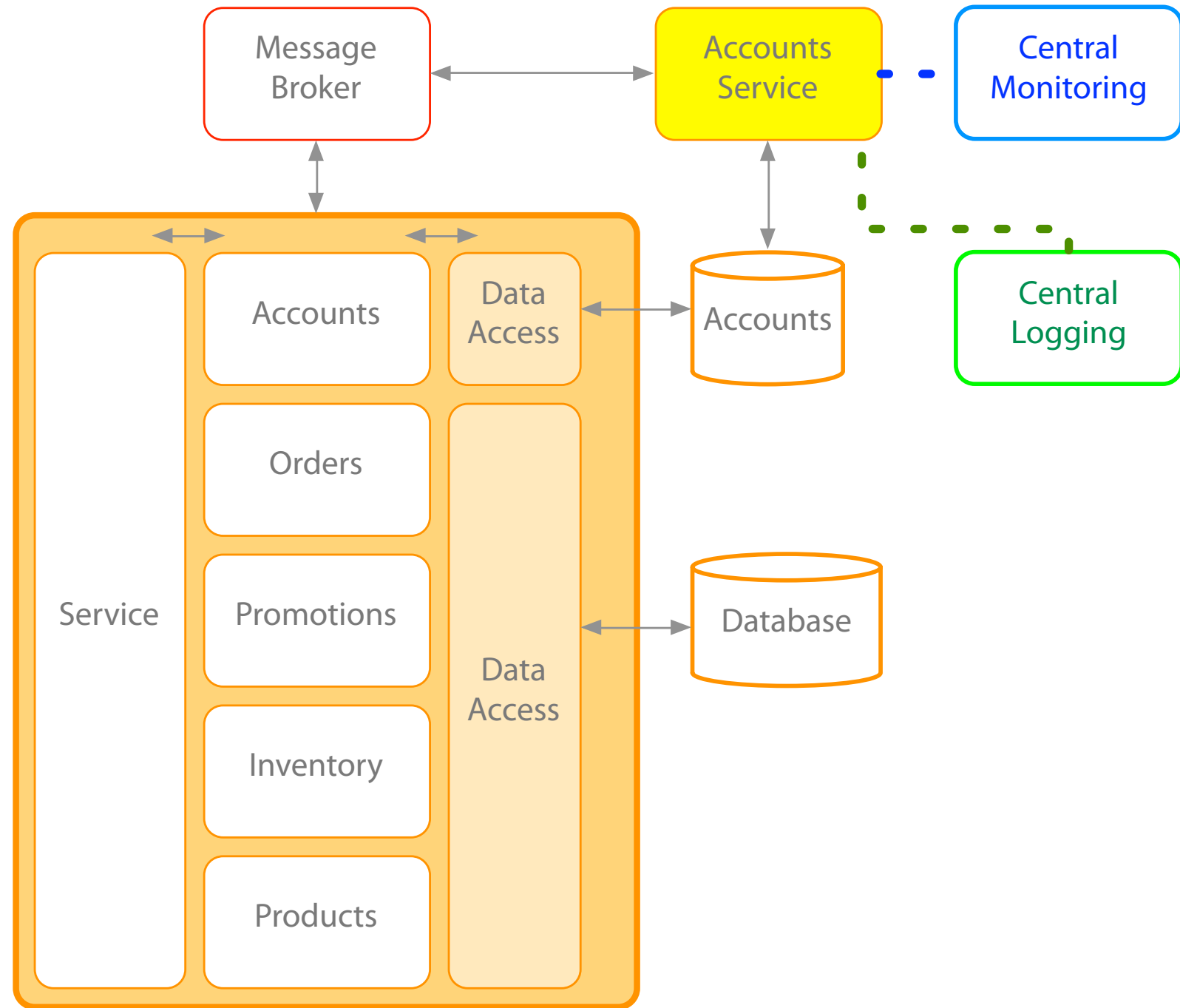
Potential bottleneck

Complex to implement

Distributed transaction compatibility

Completed message for the monolith

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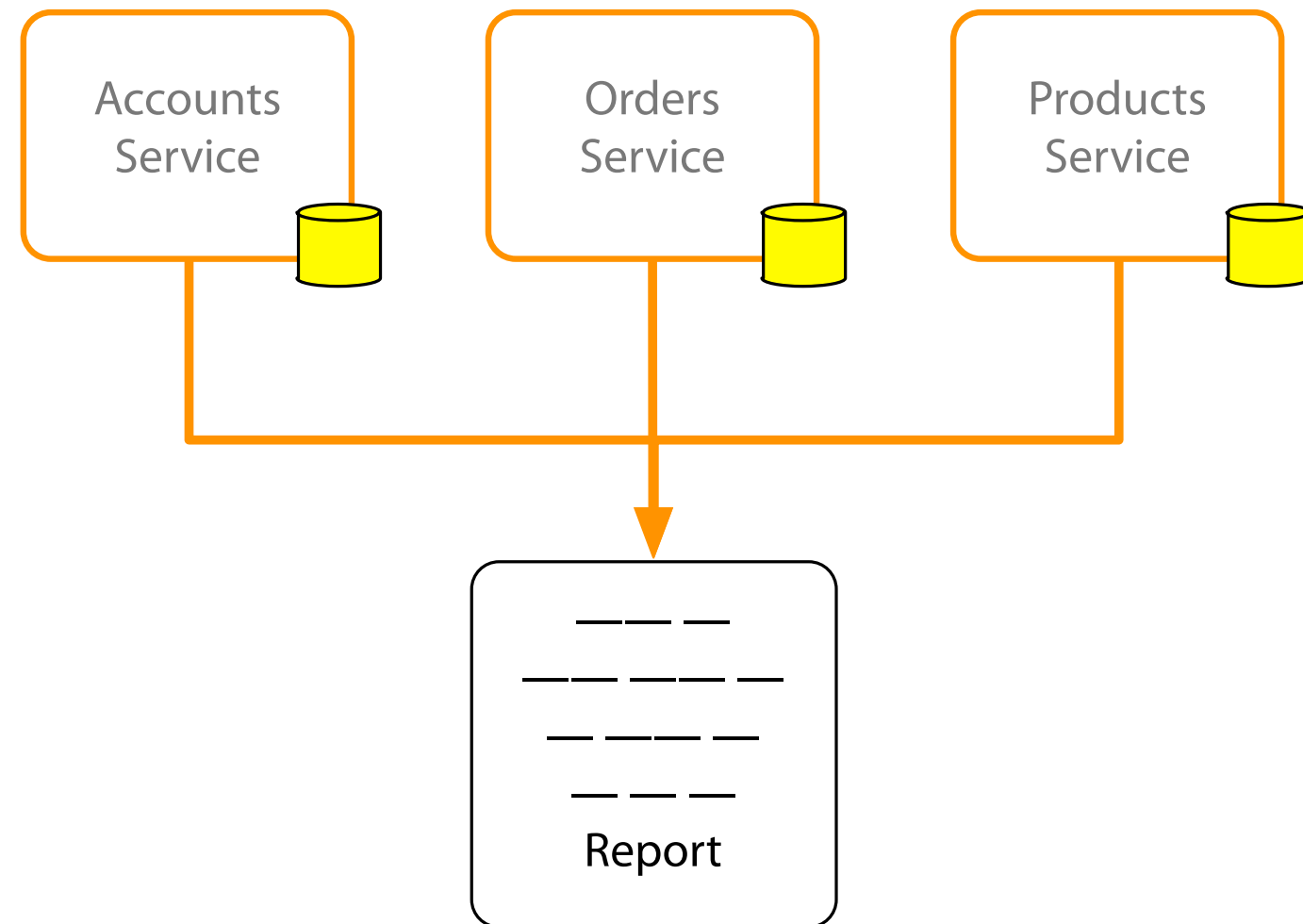
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# Brownfield Microservices: Reporting



Microservices complicate reporting

Data split across microservices

No central database

Joining data across databases

Slower reporting

Complicate report development

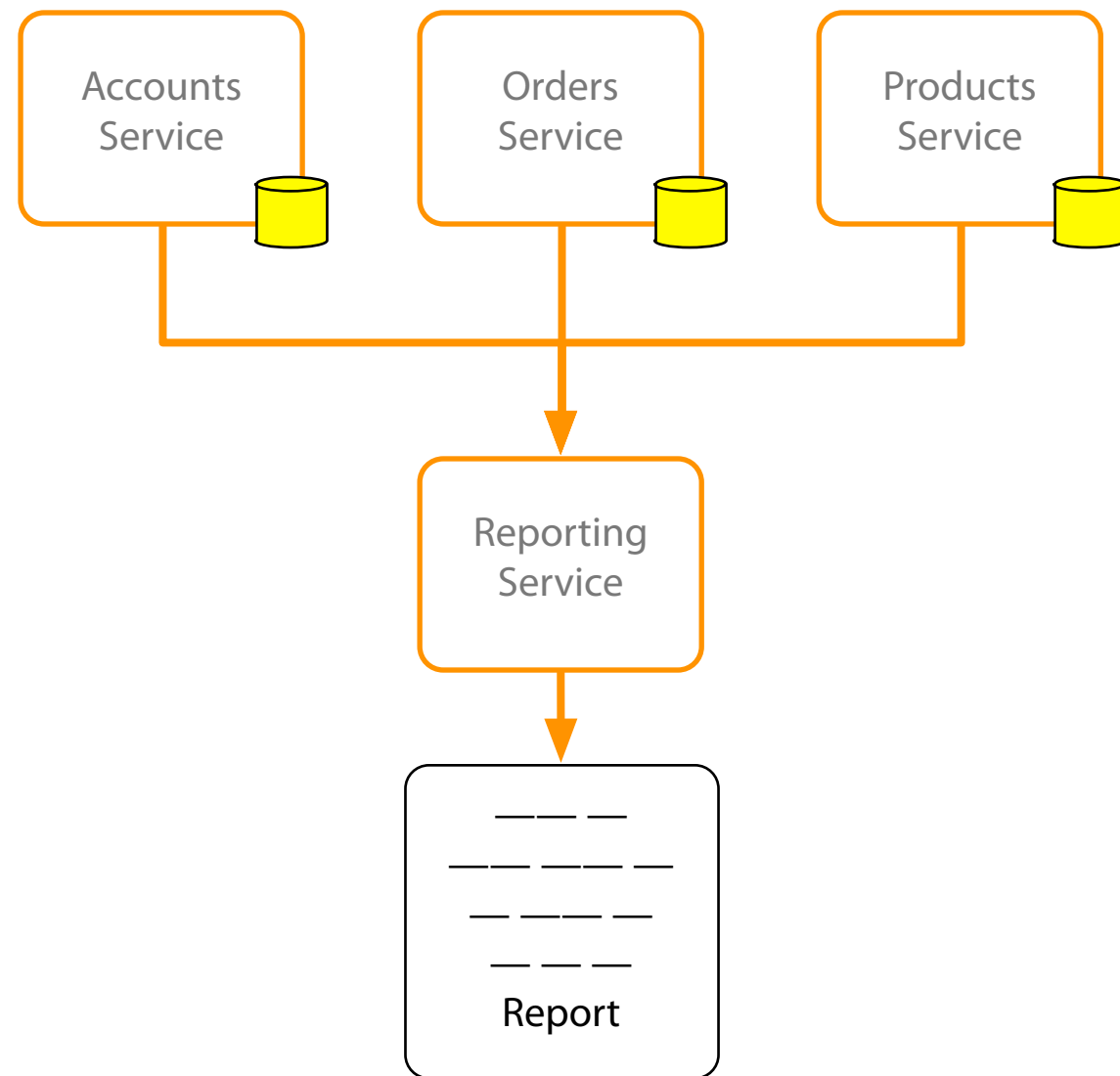
Possible solutions

Service calls for report data

Data dumps

Consolidation environment

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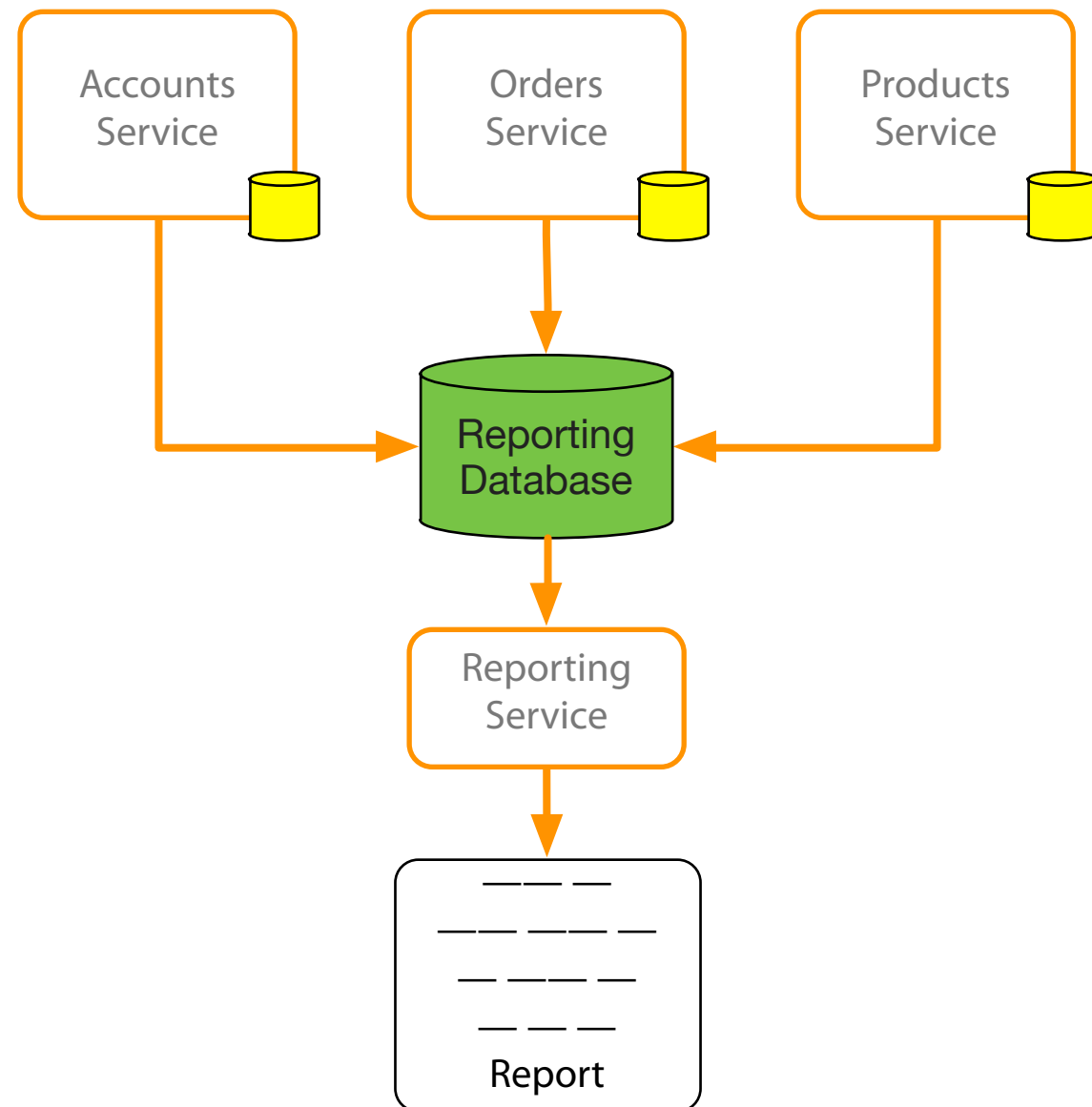
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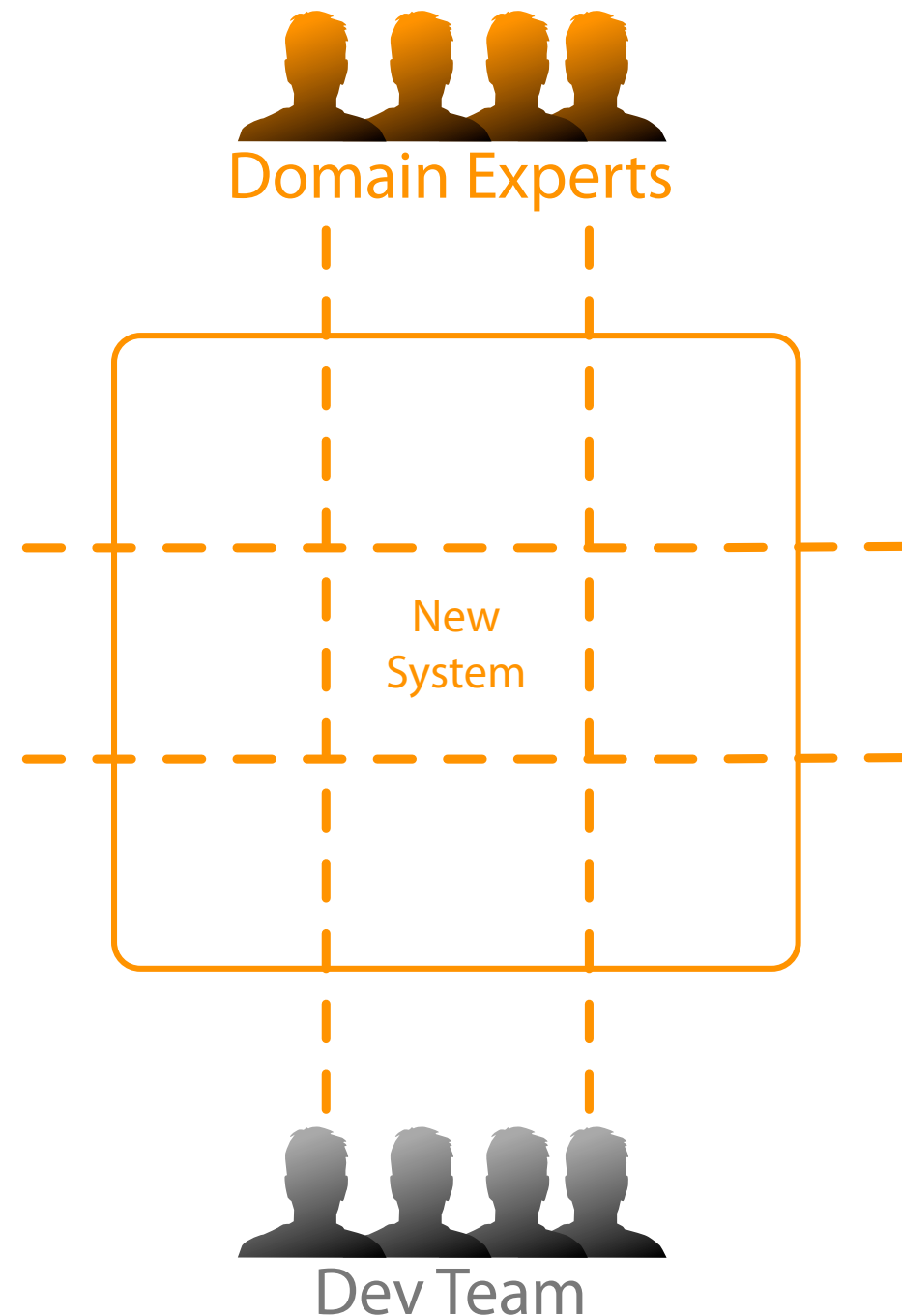
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# Greenfield Microservices

Introduction | Approach

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# Greenfield Microservices: Introduction



New project

Evolving requirements

Business domain

Not fully understood

Getting domain experts involved

System boundaries will evolve

Teams experience

First microservice

Experienced with microservices

Existing system integration

Monolithic system

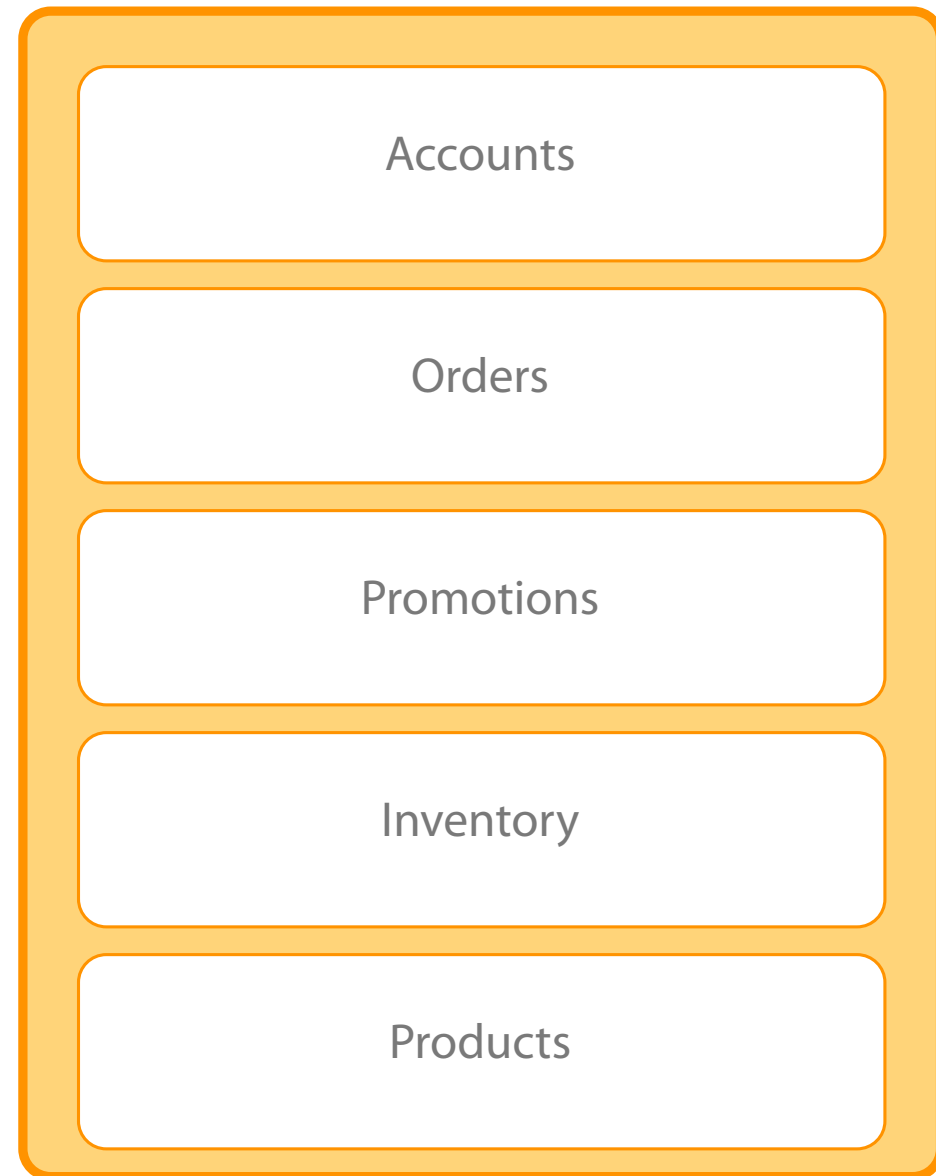
Established microservices architecture

Push for change

Changes to apply microservice principles



# Greenfield Microservices: Approach



Start off with monolithic design

High level

Evolving seams

Develop areas into modules

Boundaries start to become clearer

Refine and refactor design

Split further when required

Modules become services

Shareable code libraries promote to service

Review microservice principles at each stage

Prioritise by

Minimal viable product

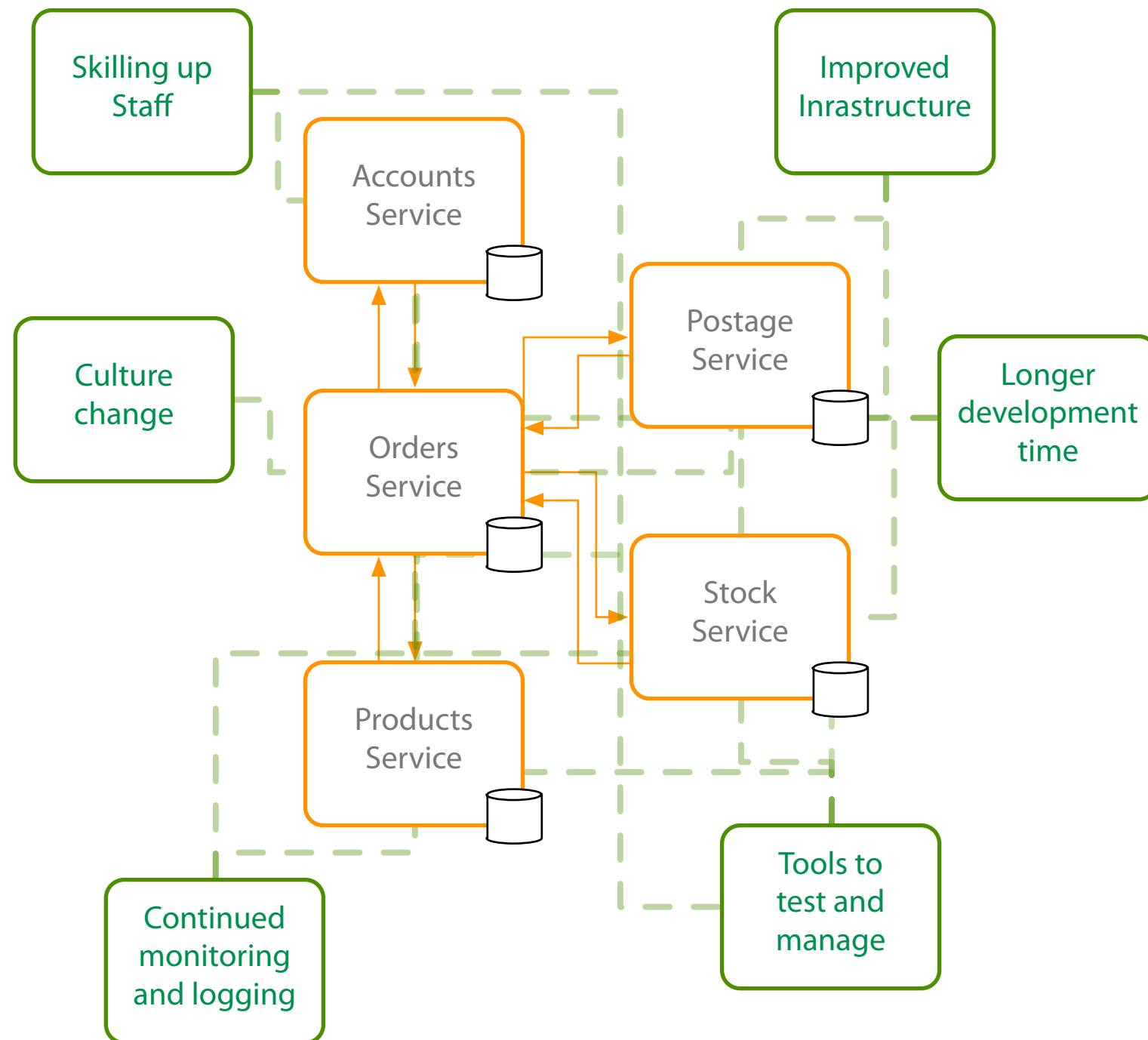
Customer needs and demand

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# Microservices Provistos

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# Microservices **Provisos**



Accepting initial expense

Longer development times

Cost and training for tools and new skills

Skilling up for distributed systems

Handling distributed transactions

Handling reporting

Additional testing resource

Latency and performance testing

Testing for resilience

Improving infrastructure

Security

Performance

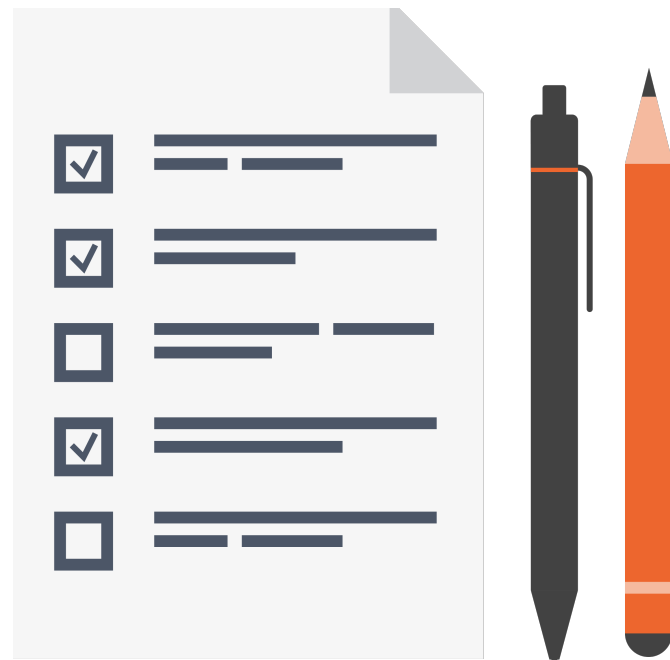
Reliance

Overhead to manage microservices

Cloud technologies

Culture change

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