

Microservices With FastAPI

Franklin Koch

Outline

- Some more basics
 - Declarative code
 - Decorators
 - Async
- Microservices
- FastAPI

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- Some more basics
 - Declarative code
 - Decorators
 - Async
- Microservices
- FastAPI

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Declarative Code

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Declarative Code: What, not how.

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Declarative Code: What, not how.

Motivation:

- Easier to read and write

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Declarative Code: What, not how.

Motivation:

- Easier to read and write
- Exposes clearer *Interface*

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Declarative Code: What, not how.

Motivation:

- Easier to read and write
- Exposes clearer *Interface*

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Declarative Python

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Declarative Python

Not really the default

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 dataclasses

Declarative Python

Not really the default

In the standard library: **dataclasses**

Some more basics

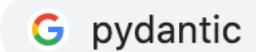
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Declarative Python

Not really the default

In the standard library: **dataclasses**

Gold standard: **pydantic**

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@decorators

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@decorators

These feel like magic.

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 python decorators

@decorators

These feel like magic.

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 python decorators

@decorators

These feel like magic.

They operate on a function/class to give it some new behavior.

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 python decorators

@decorators

These feel like magic.

They operate on a function/class to give it some new behavior.

The @ syntax is nicely declarative.

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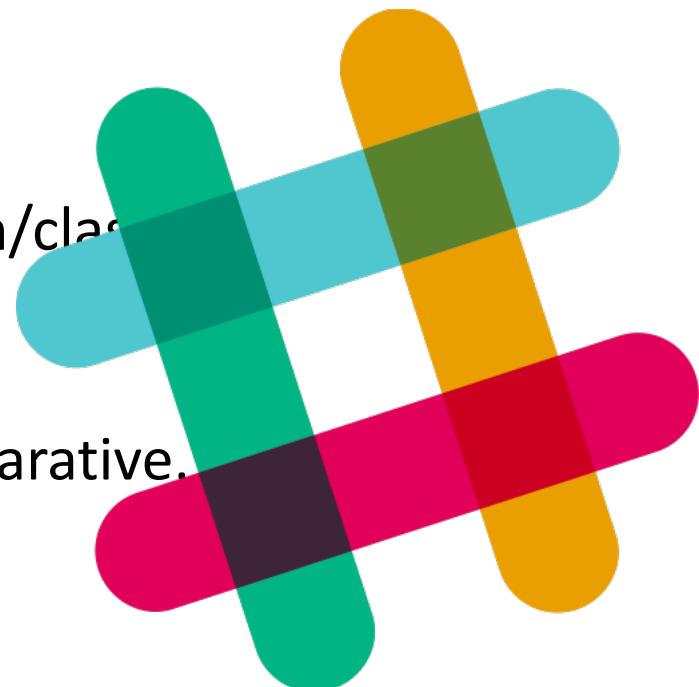
python decorators

@decorators

These feel like magic.

They operate on a function/class
give it some new behavior.

The @ syntax is nicely declarative.



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Concurrency and Parallelism

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Concurrency and Parallelism

Doing lots of stuff at the same time

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Concurrency and Parallelism

Doing lots of stuff at the same time

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Concurrency and Parallelism

Slow Operations

Intensive Computation

Responsive User Interfaces

Repetitive Tasks

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Slow Operations

Responsive User Interfaces

Intensive Computation

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Concurrency and **Parallelism**

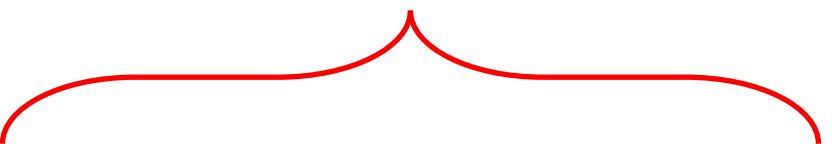
CPU Bound

Slow Operations

Responsive User Interfaces

Intensive Computation

Repetitive Tasks



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Concurrency and **Parallelism**

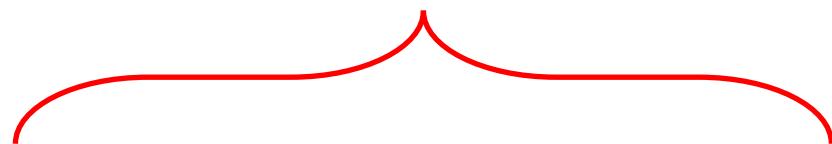
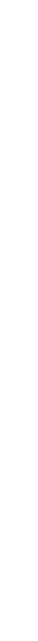
CPU Bound

Slow Operations

Responsive User Interfaces

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Concurrency and **Parallelism**

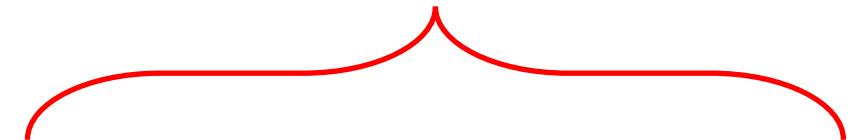
Slow Operations

Responsive User Interfaces

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Some more basics

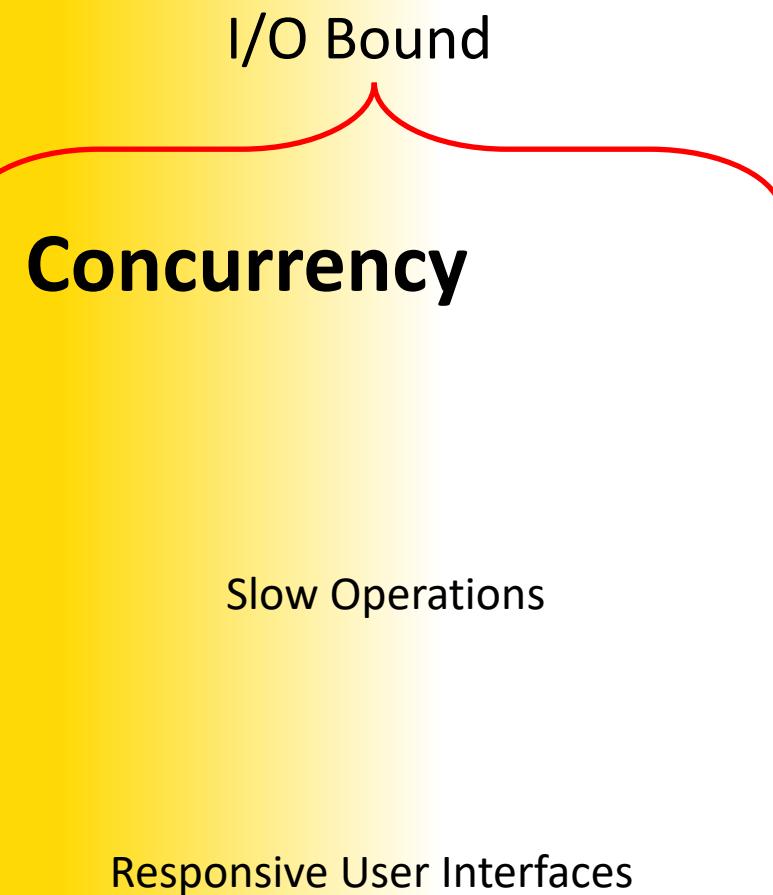
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Concurrency in Python

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Concurrency in Python

In the standard library: **asyncio**

Some more basics

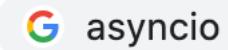
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Concurrency in Python

In the standard library: **asyncio**

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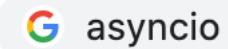
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Concurrency in Python

In the standard library: **asyncio**

Easy: Adding **async** / **await**

Some more basics

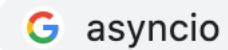
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Concurrency in Python

In the standard library: **asyncio**

Easy: Adding **async** / **await**

Less easy: Resolving coroutines

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Microservices Architecture

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Microservices Architecture

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Microservices Architecture

Loosely coupled services

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Microservices Architecture

Loosely coupled services
Single responsibility

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Microservices Architecture

Loosely coupled services

Single responsibility

Independent:

- Development
- Deployment
- Maintenance
- Scaling

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Microservices Architecture

In opposition to Monolithic Architecture

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Microservices Architecture

In opposition to Monolithic Architecture

- One big, centralized thing
- Does everything

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Microservices Architecture

Challenges

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Microservices Architecture

Challenges

- Orchestration and deployment

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Microservices Architecture

Challenges

- Orchestration and deployment
- Networking and resiliency

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Microservices Architecture

Challenges

- Orchestration and deployment
- Networking and resiliency
- Monitoring and log aggregation

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Microservices Architecture

Challenges

- Orchestration and deployment
- Networking and resiliency
- Monitoring and log aggregation
- Must follow standards

Totally Sketchy Monolith Marketplace



Totally Sketchy Monolith Marketplace

Client

Users
Inventory
Orders
Reviews
Recommendations



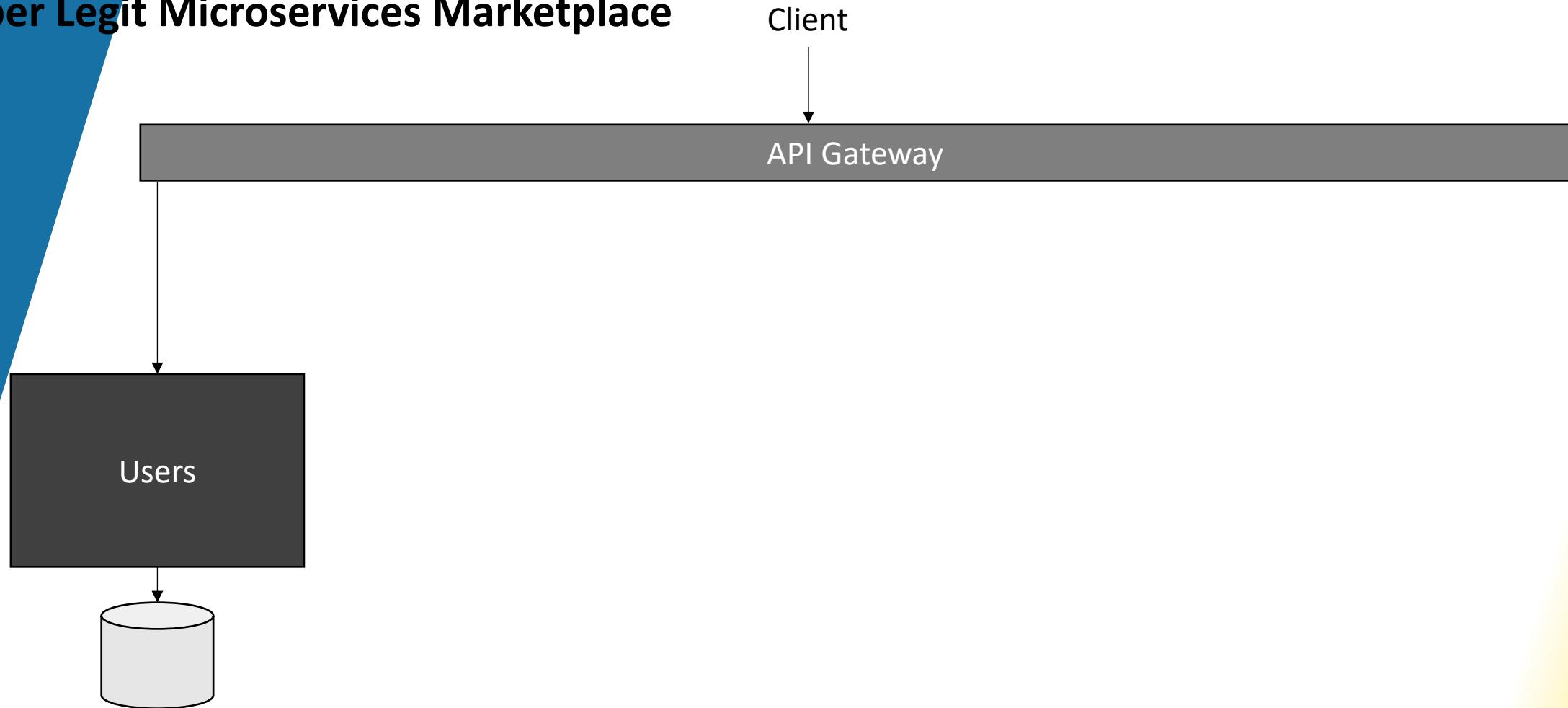
Super Legit Microservices Marketplace

Client

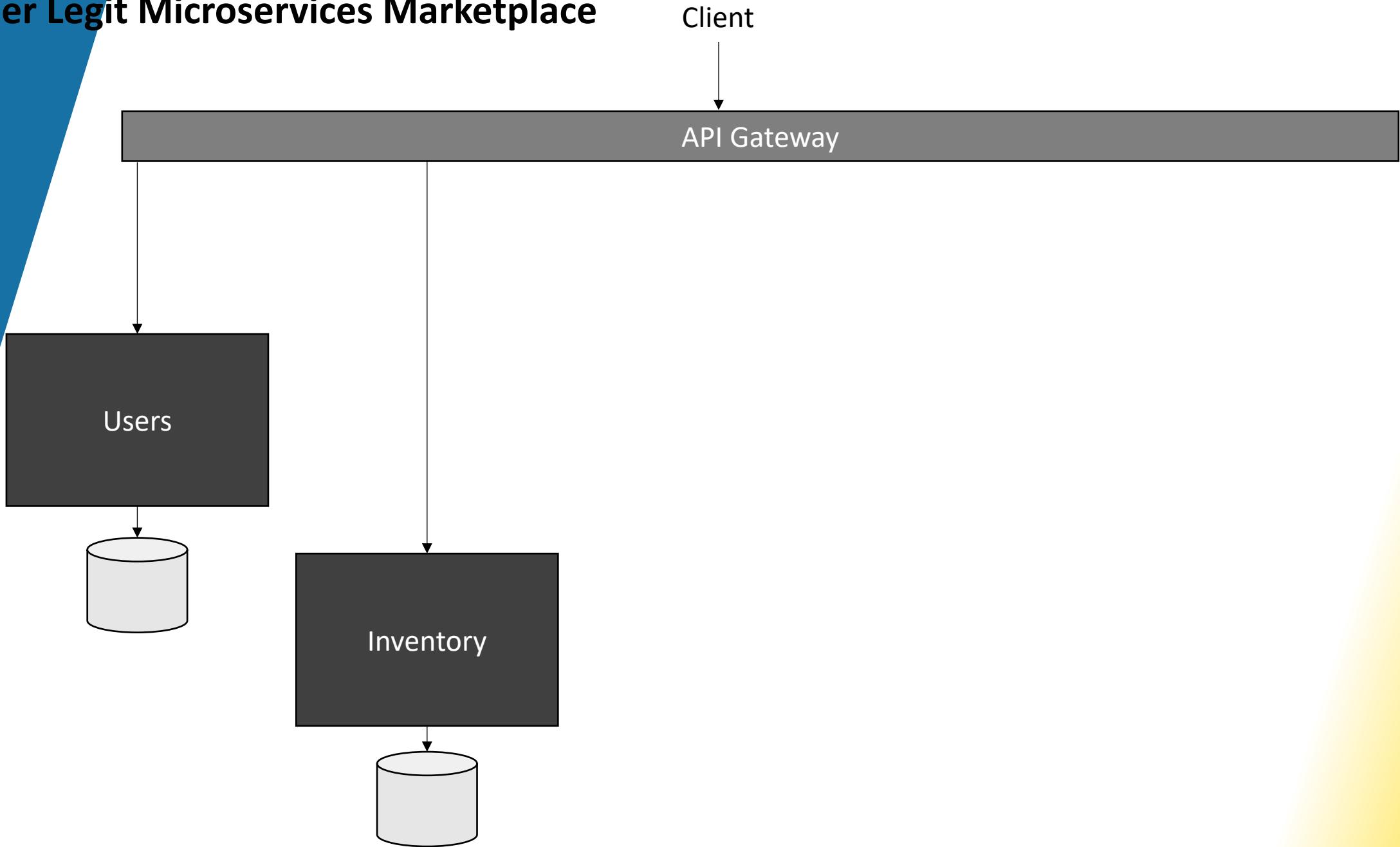


API Gateway

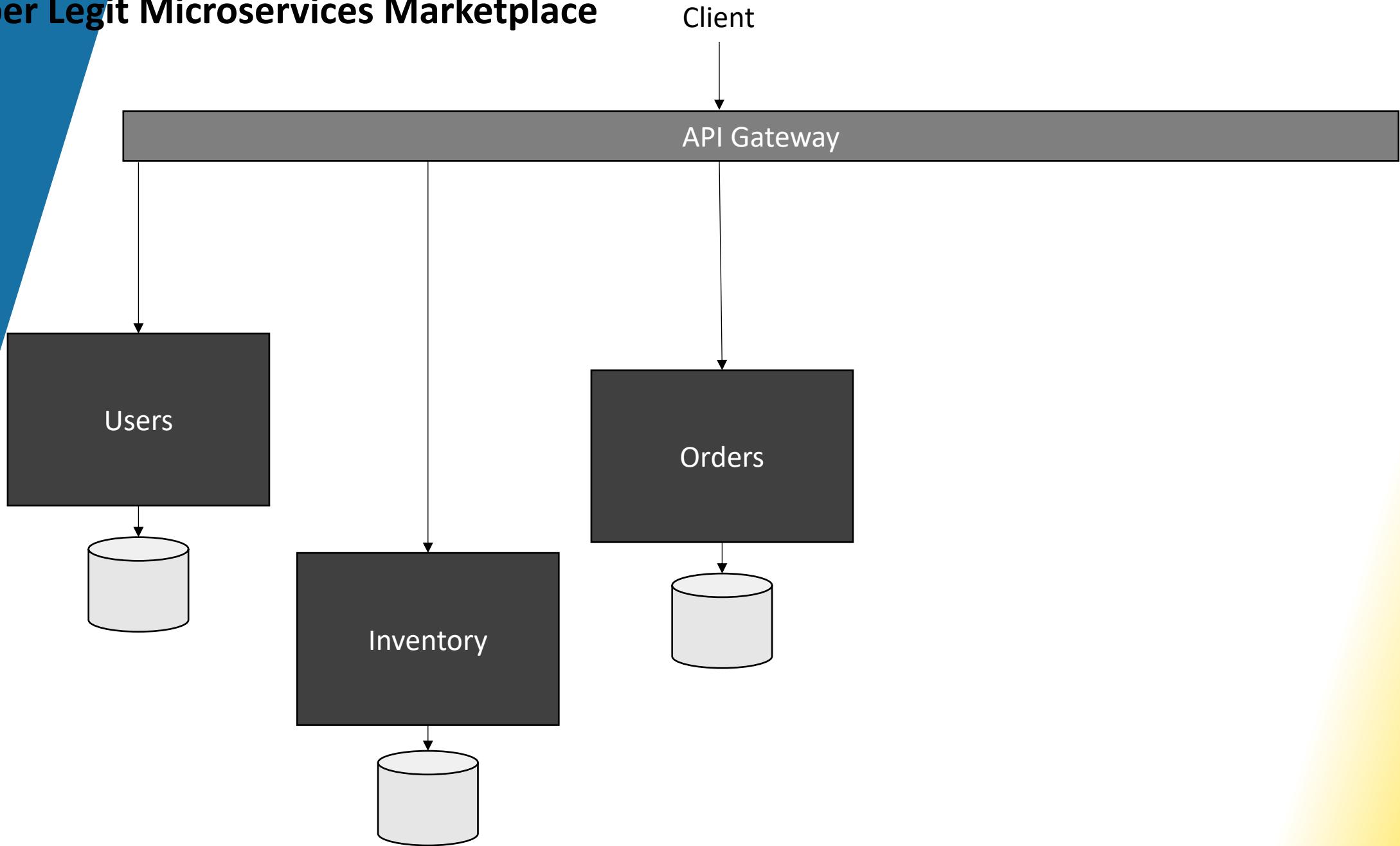
Super Legit Microservices Marketplace



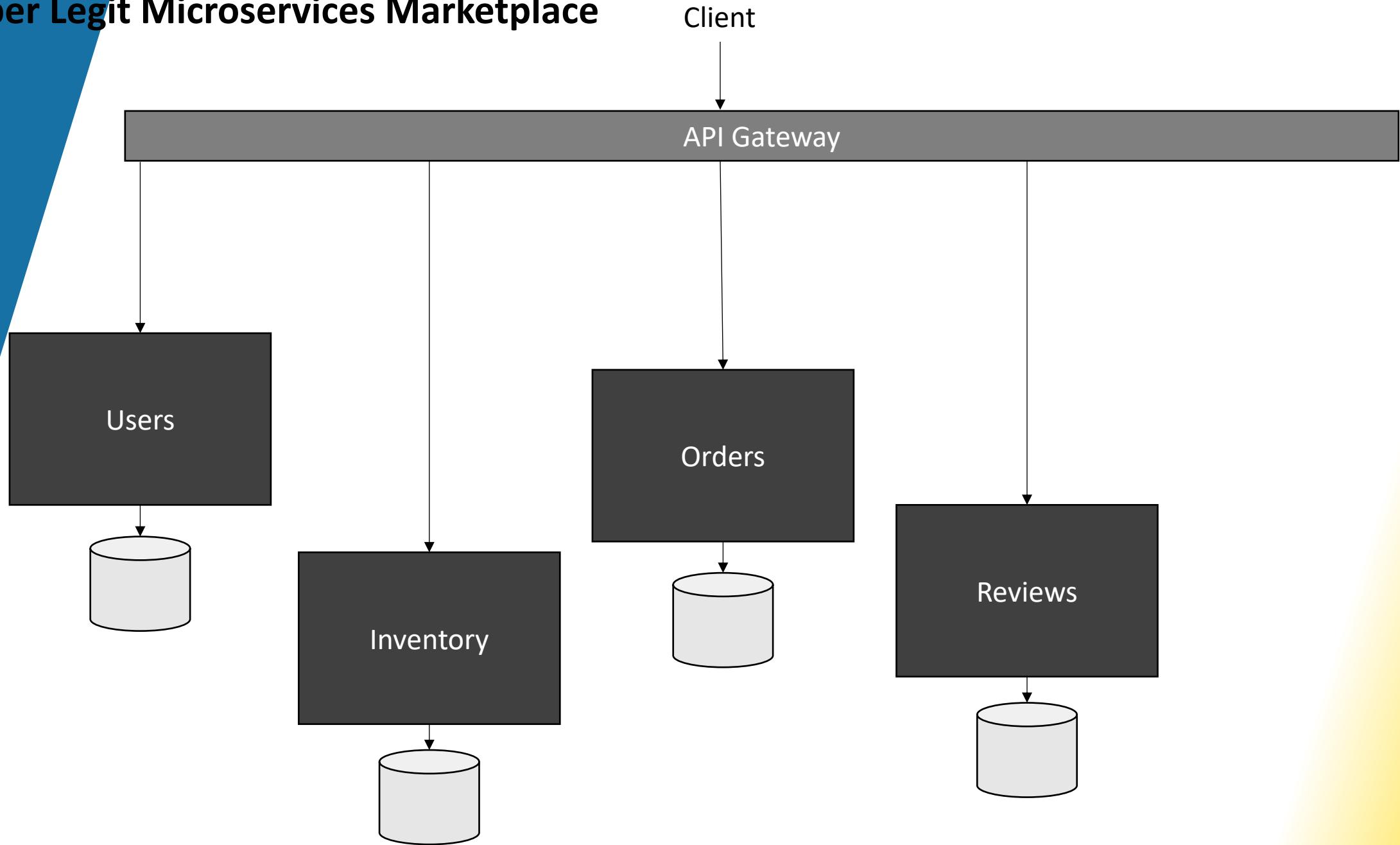
Super Legit Microservices Marketplace



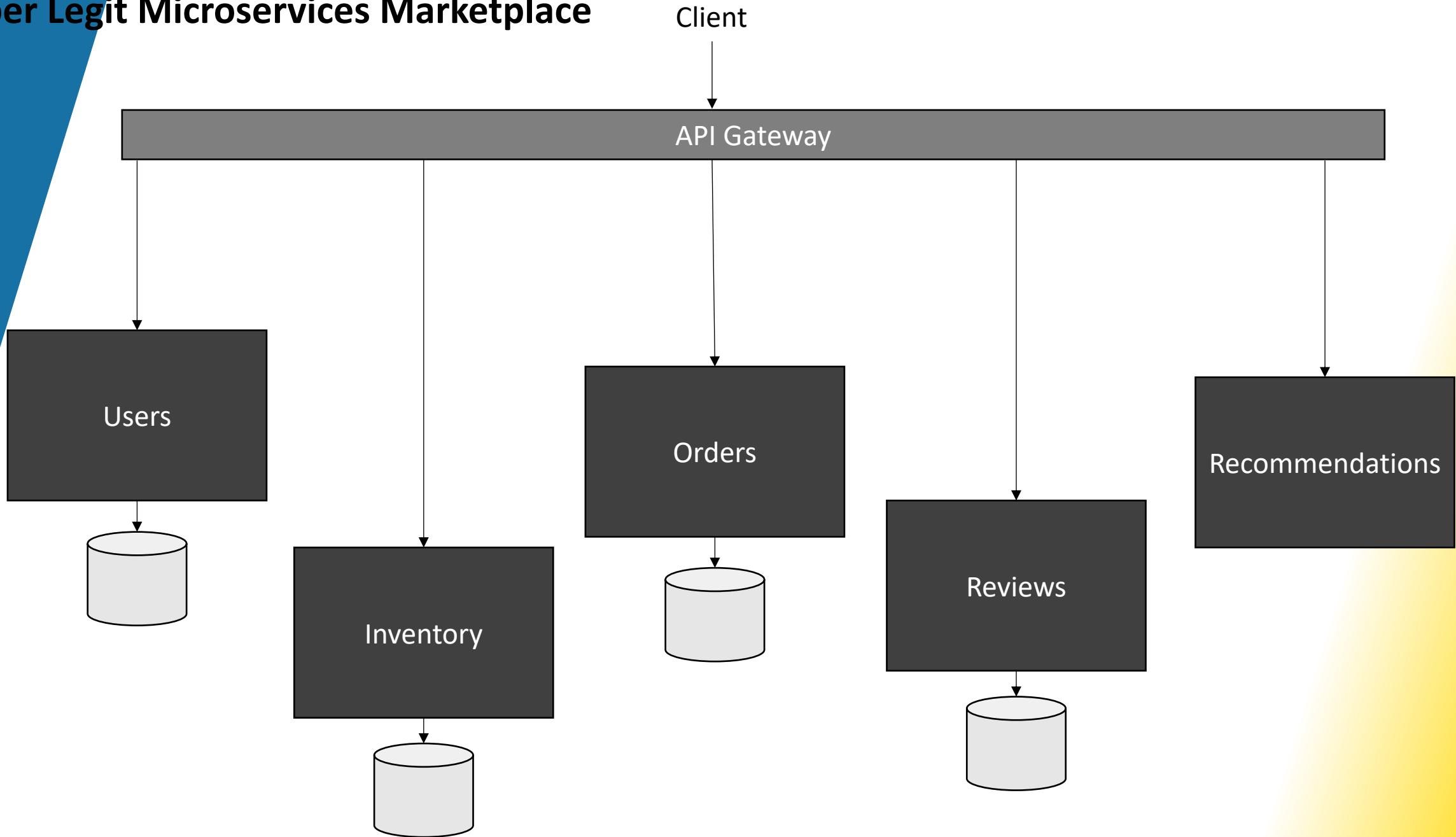
Super Legit Microservices Marketplace



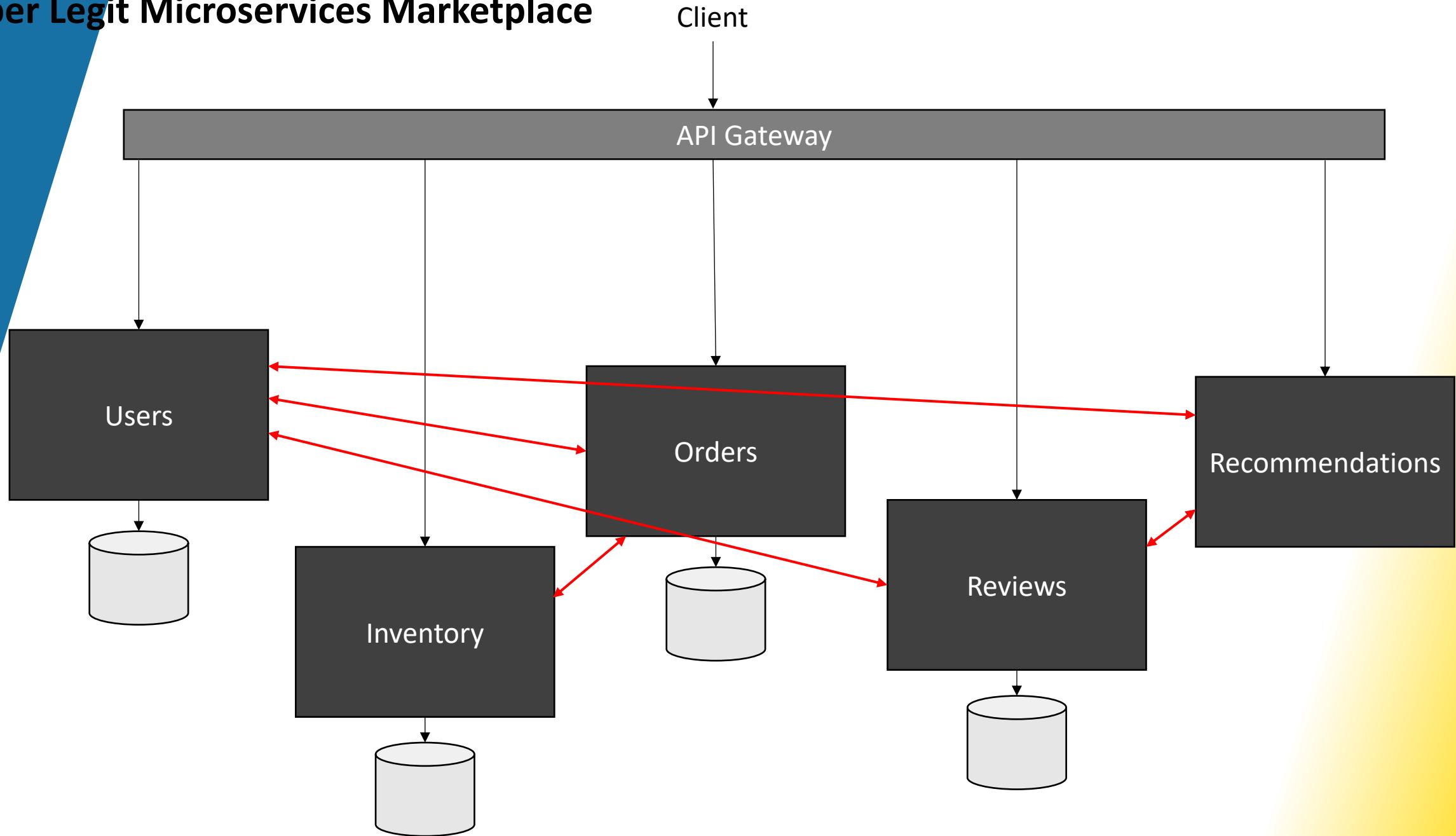
Super Legit Microservices Marketplace



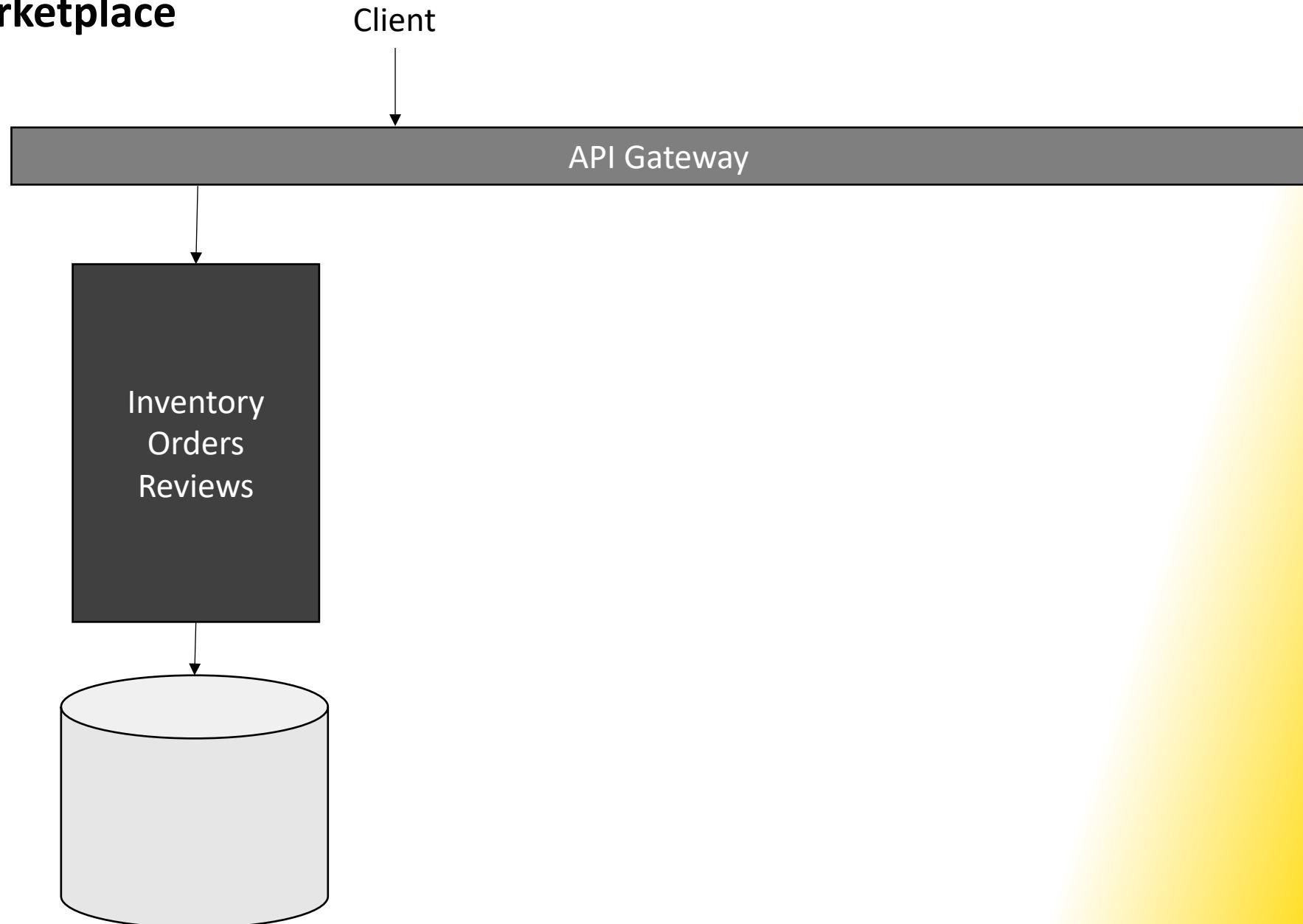
Super Legit Microservices Marketplace



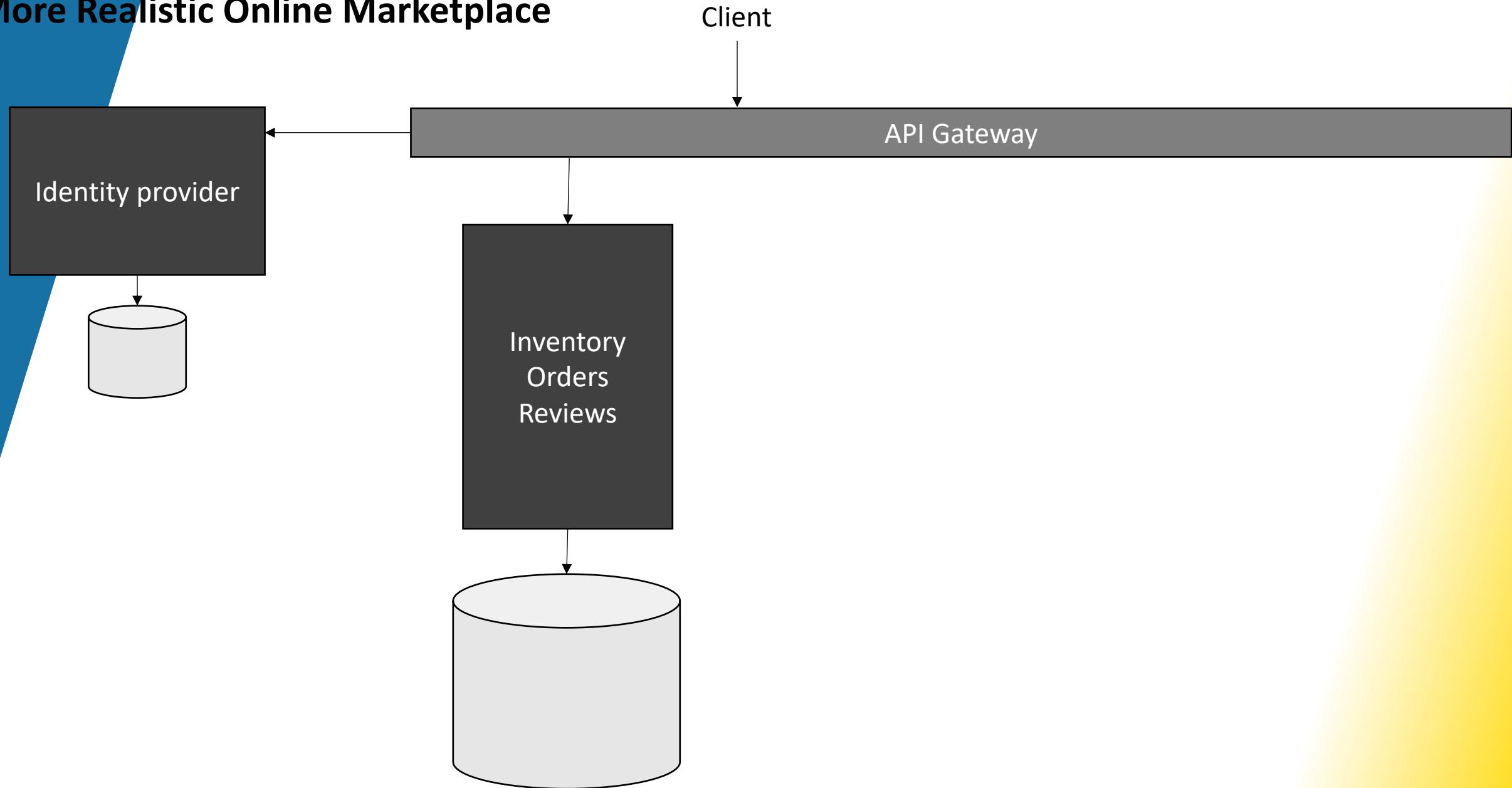
Super Legit Microservices Marketplace



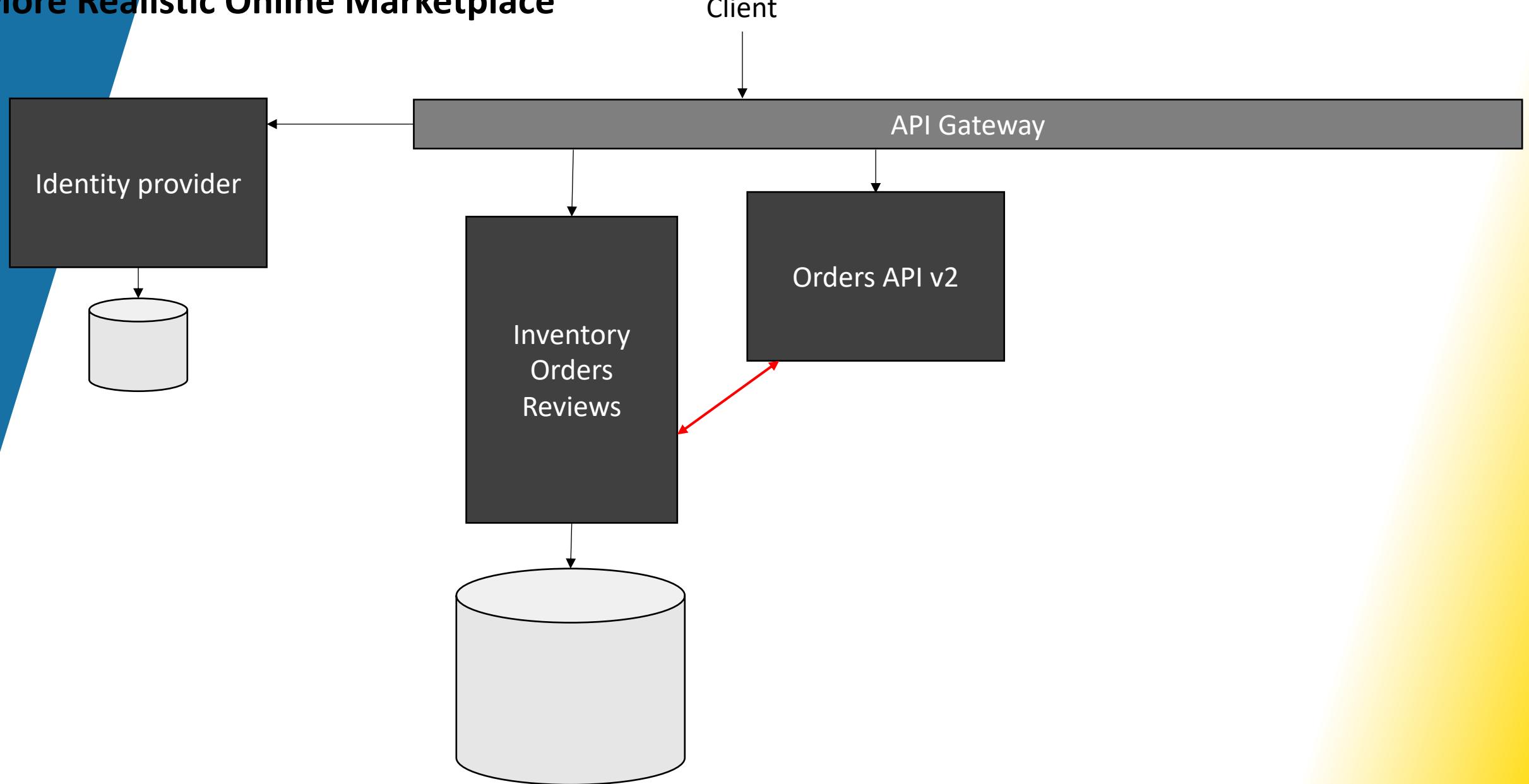
More Realistic Online Marketplace



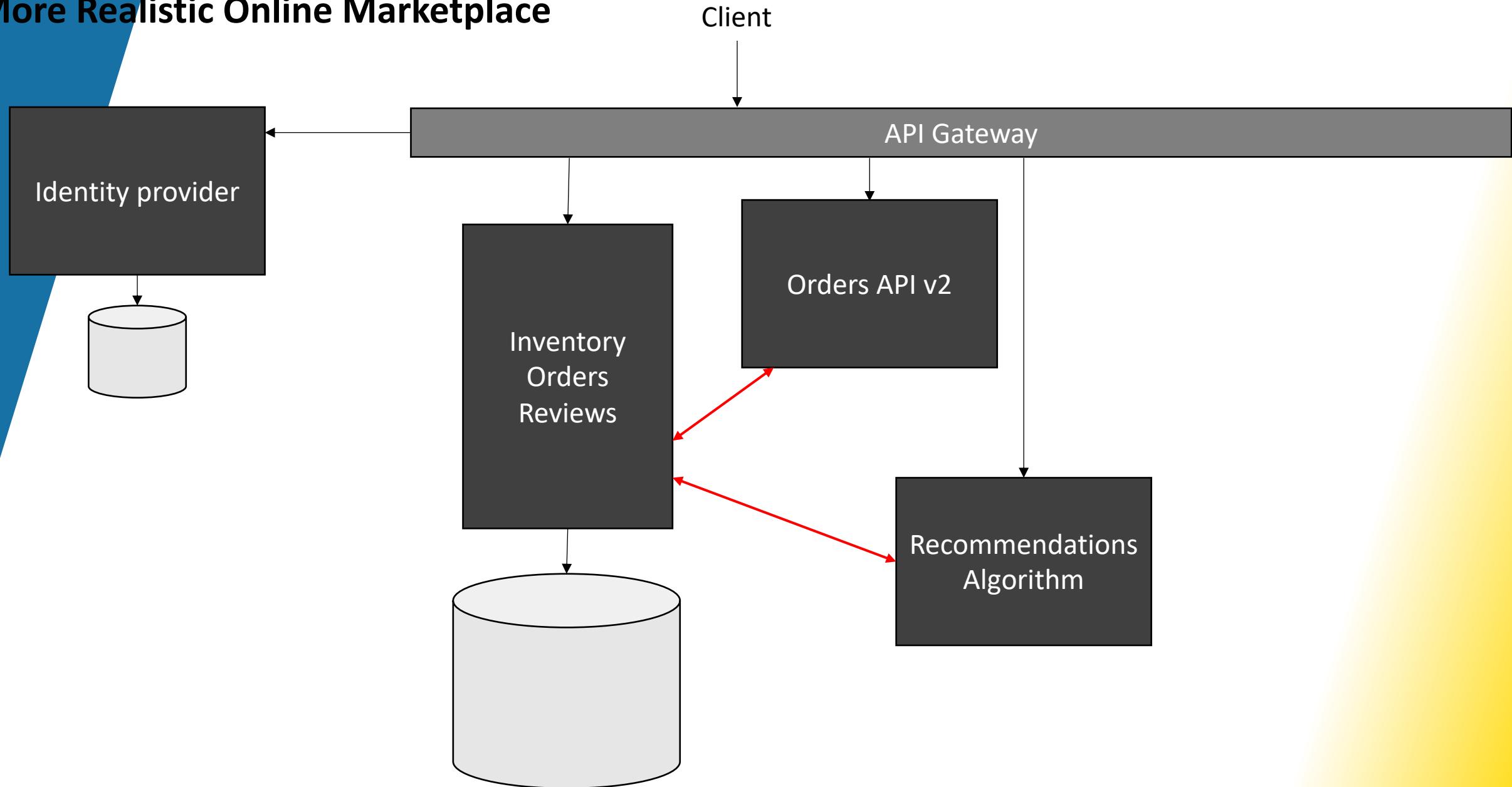
More Realistic Online Marketplace



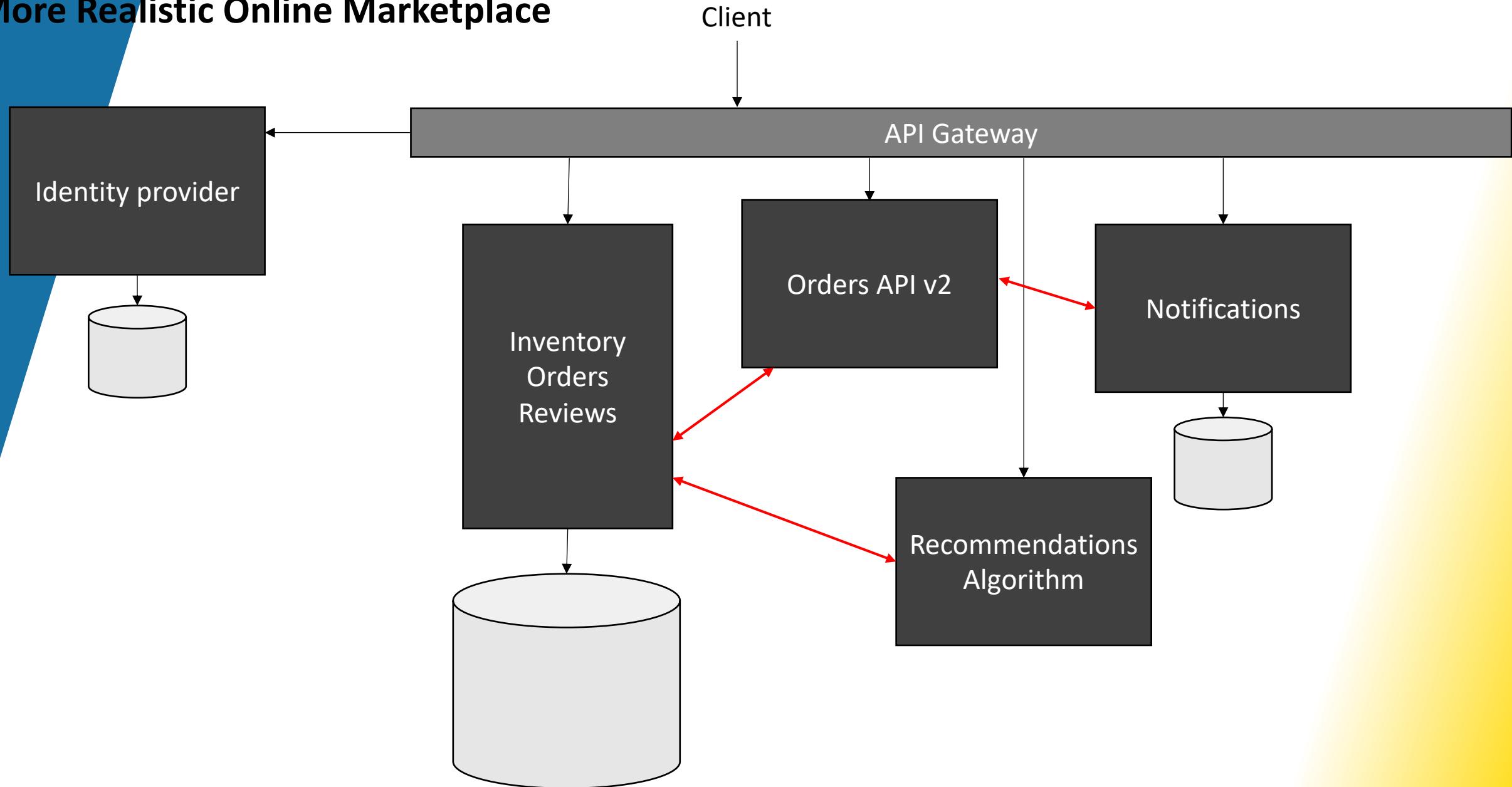
More Realistic Online Marketplace



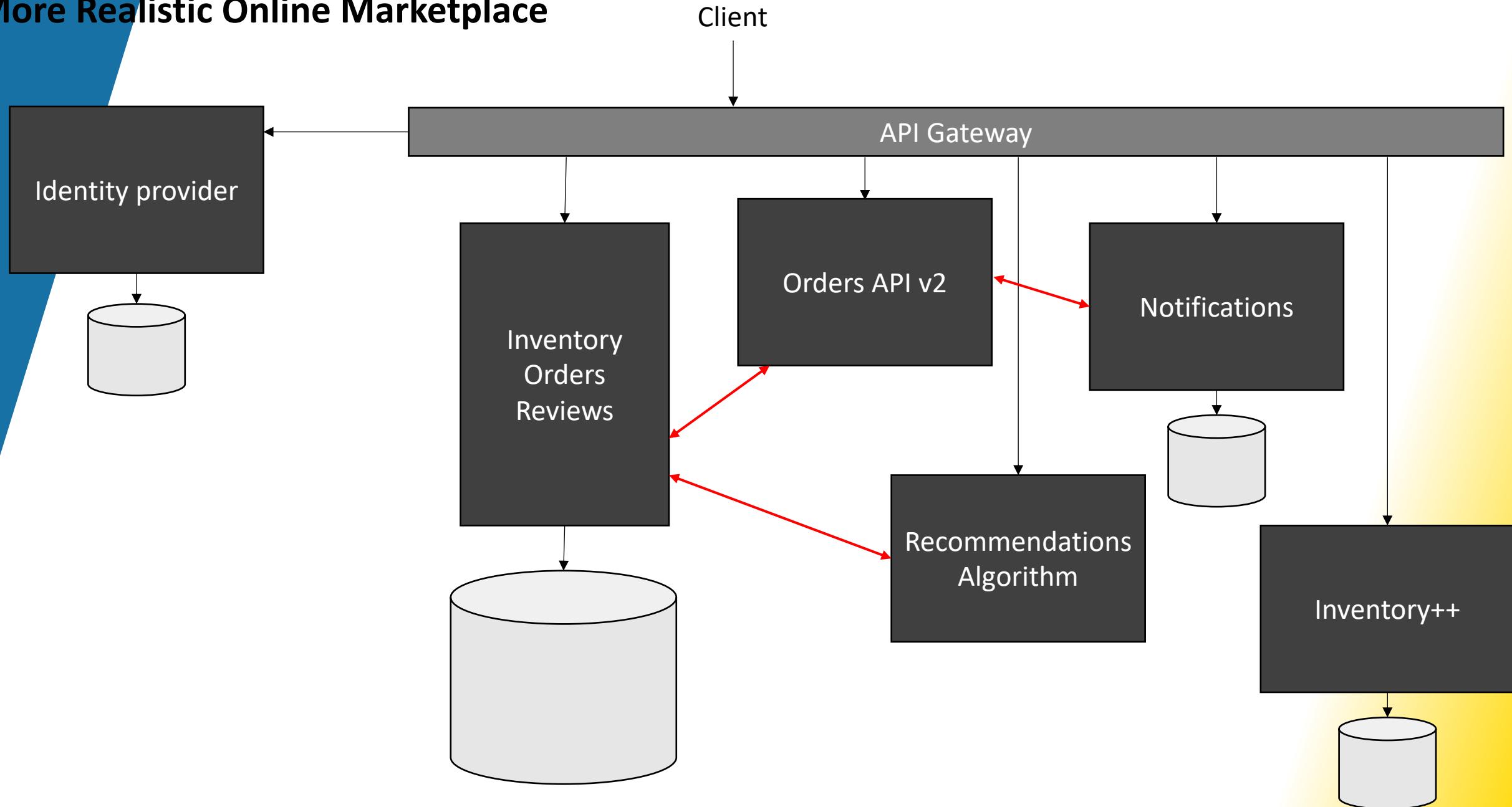
More Realistic Online Marketplace



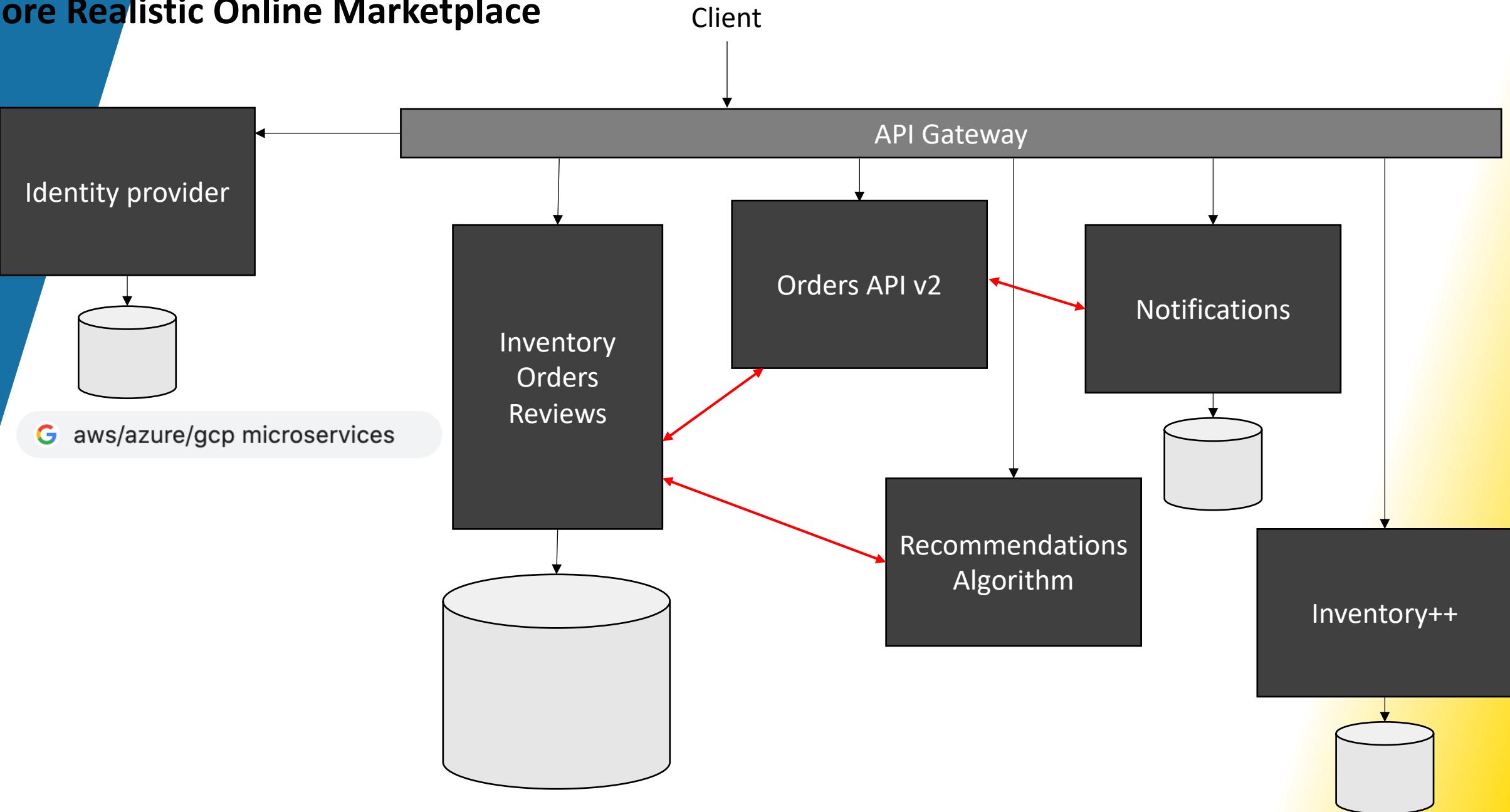
More Realistic Online Marketplace



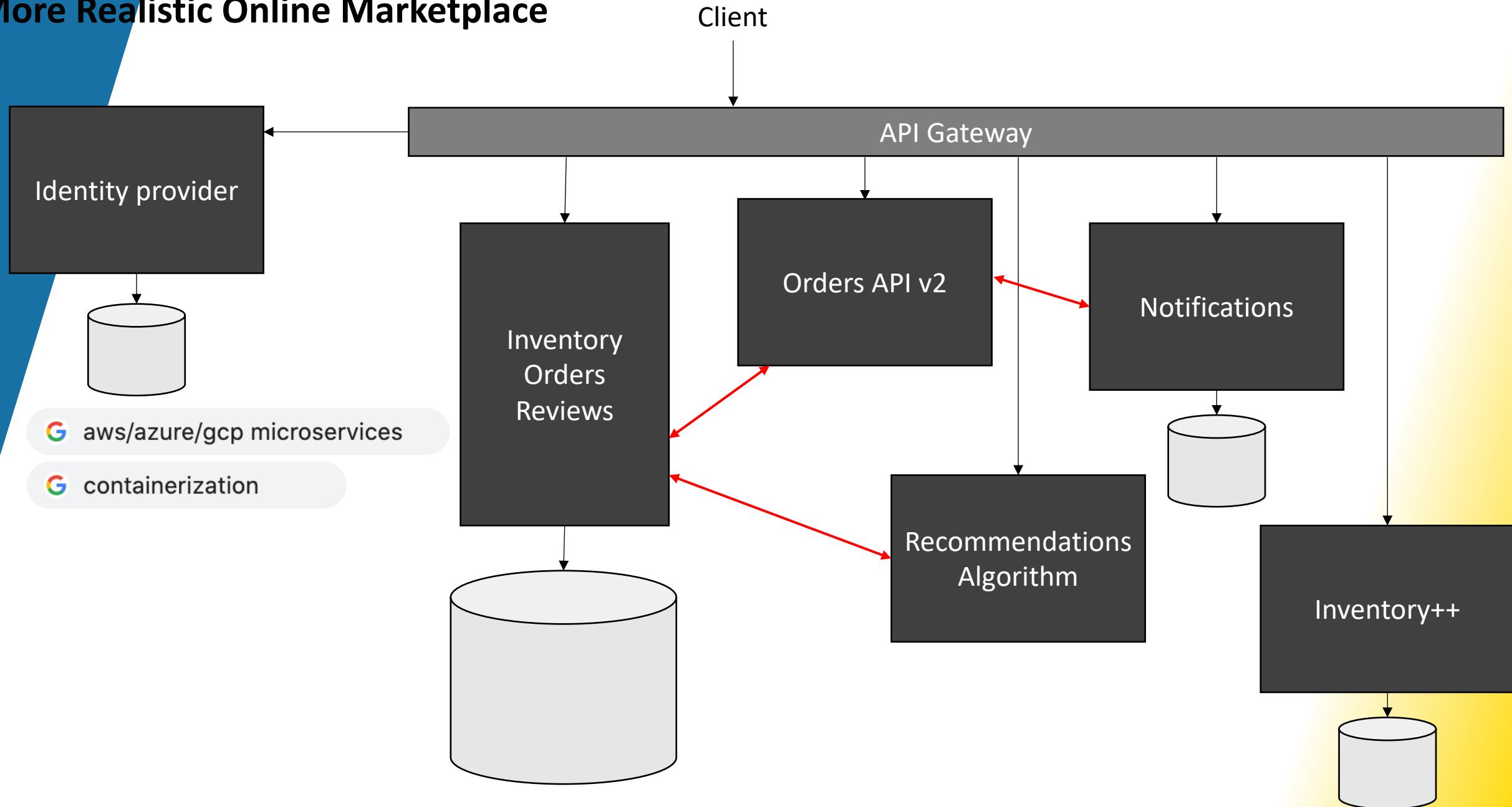
More Realistic Online Marketplace



More Realistic Online Marketplace

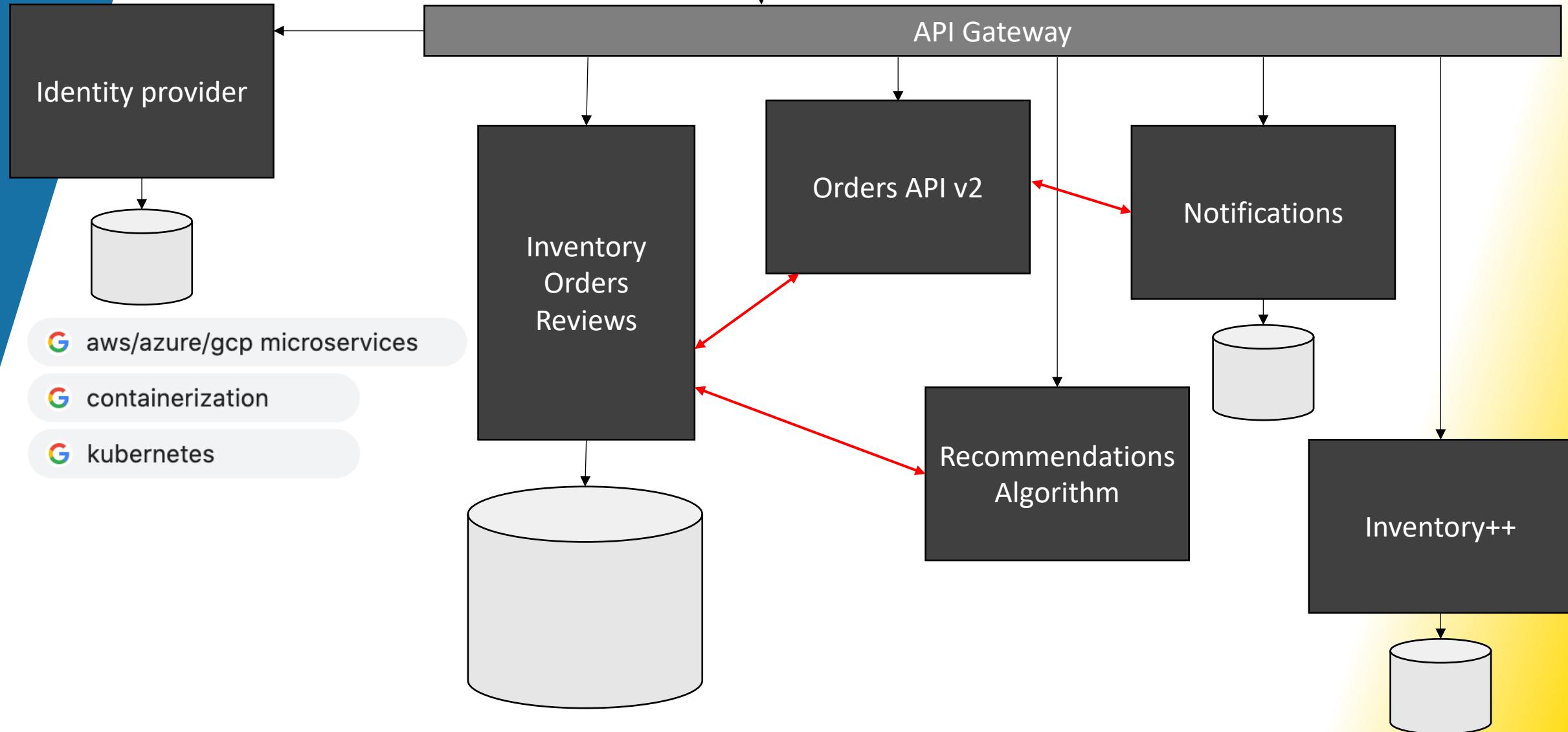


More Realistic Online Marketplace



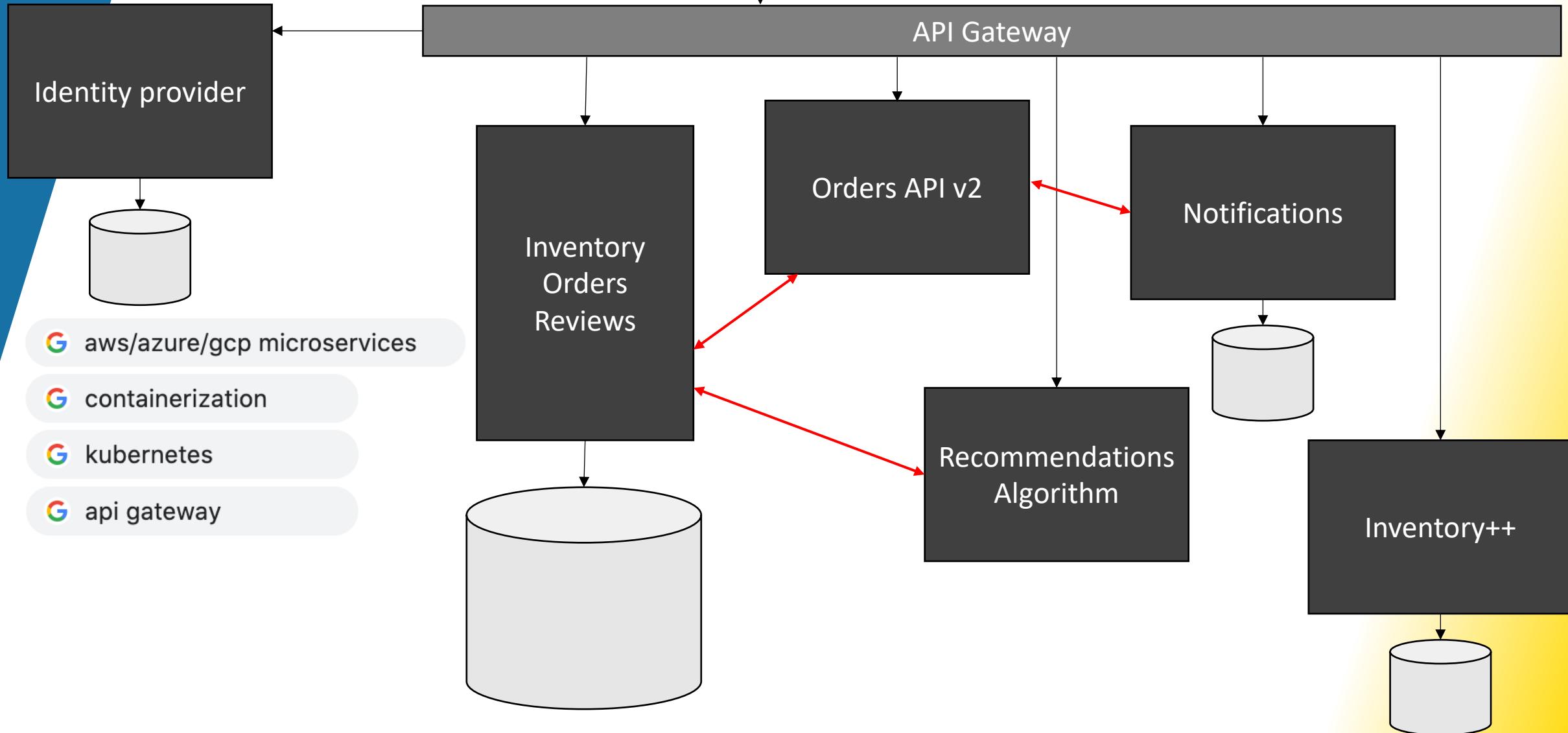
More Realistic Online Marketplace

Client



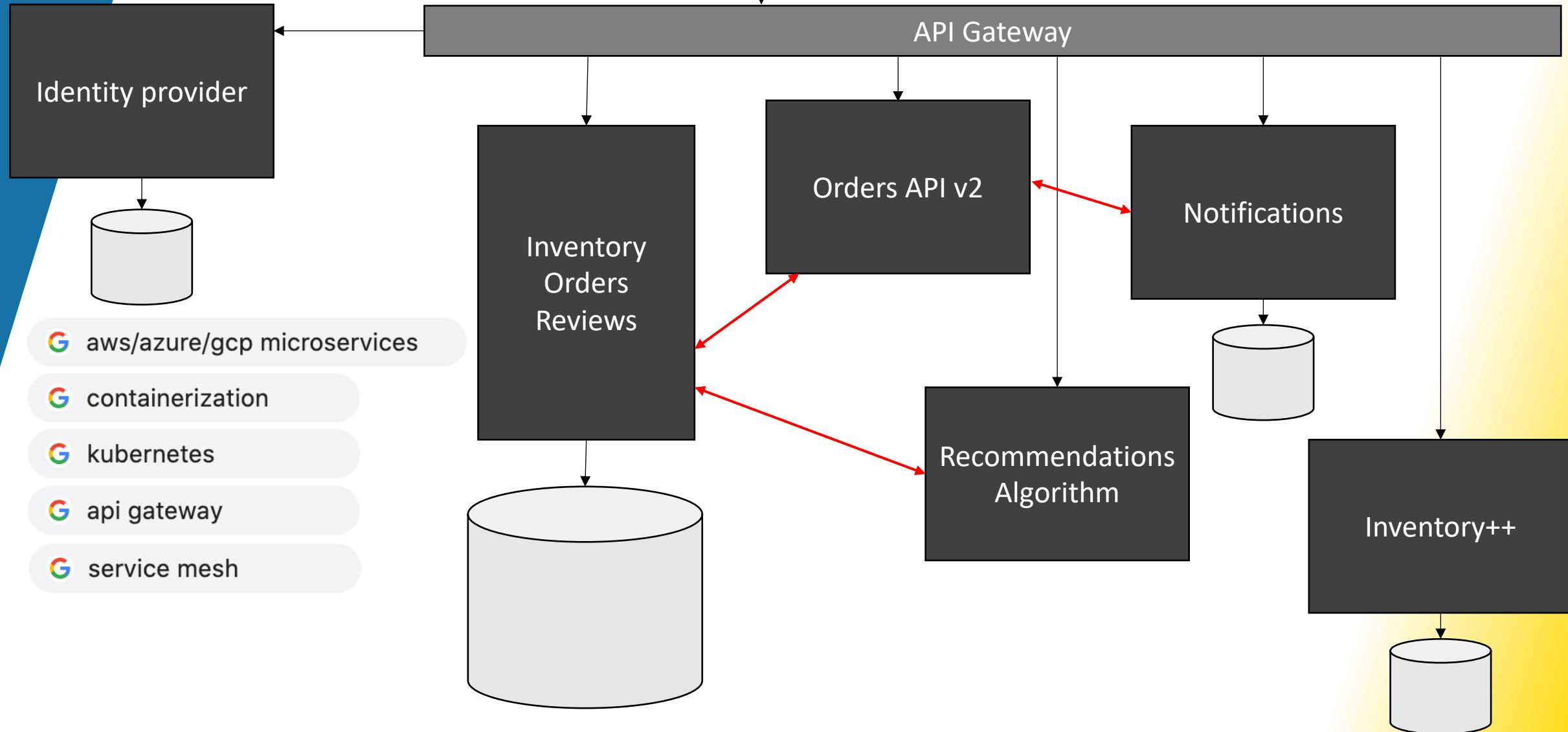
More Realistic Online Marketplace

Client

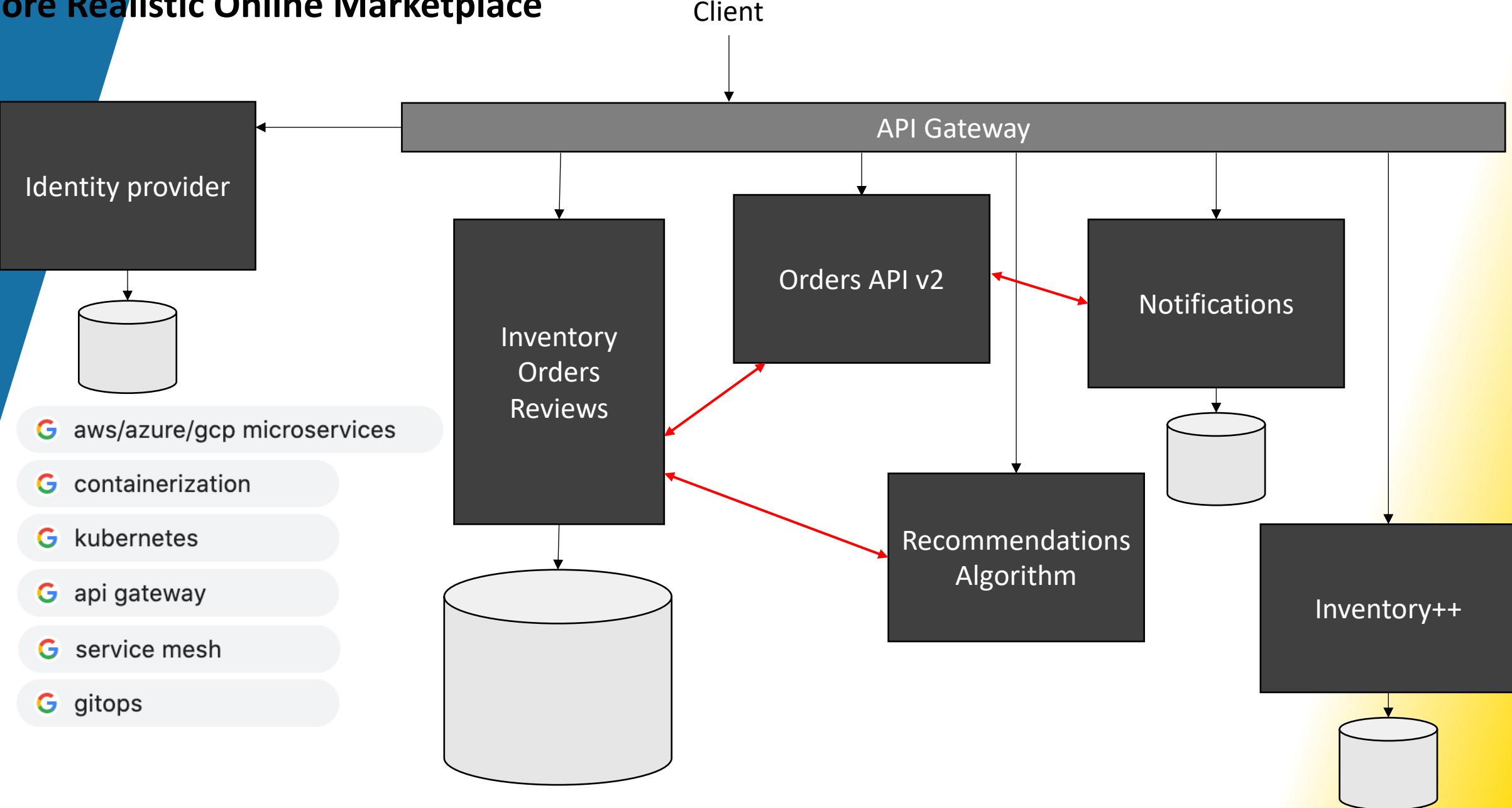


More Realistic Online Marketplace

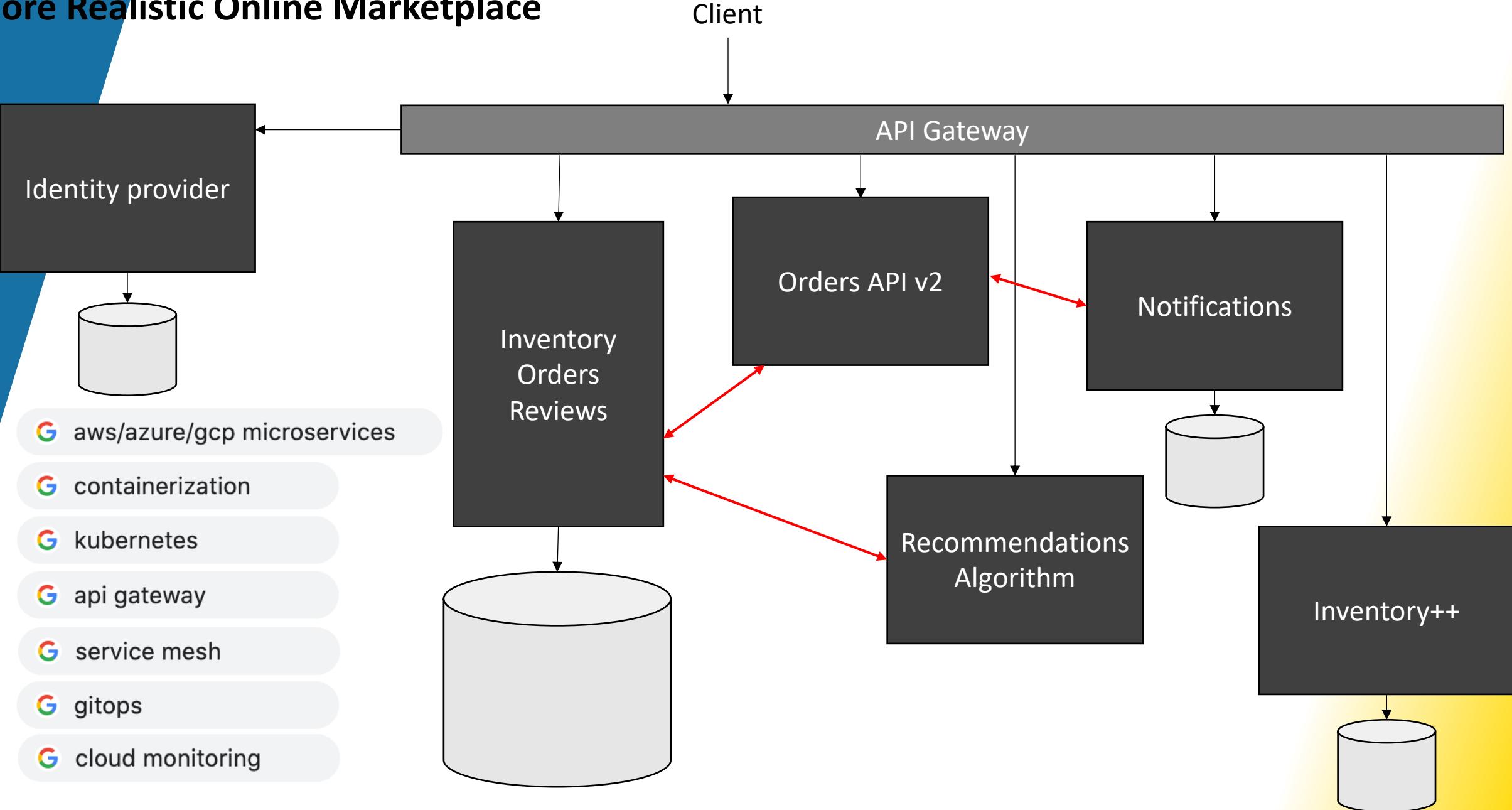
Client



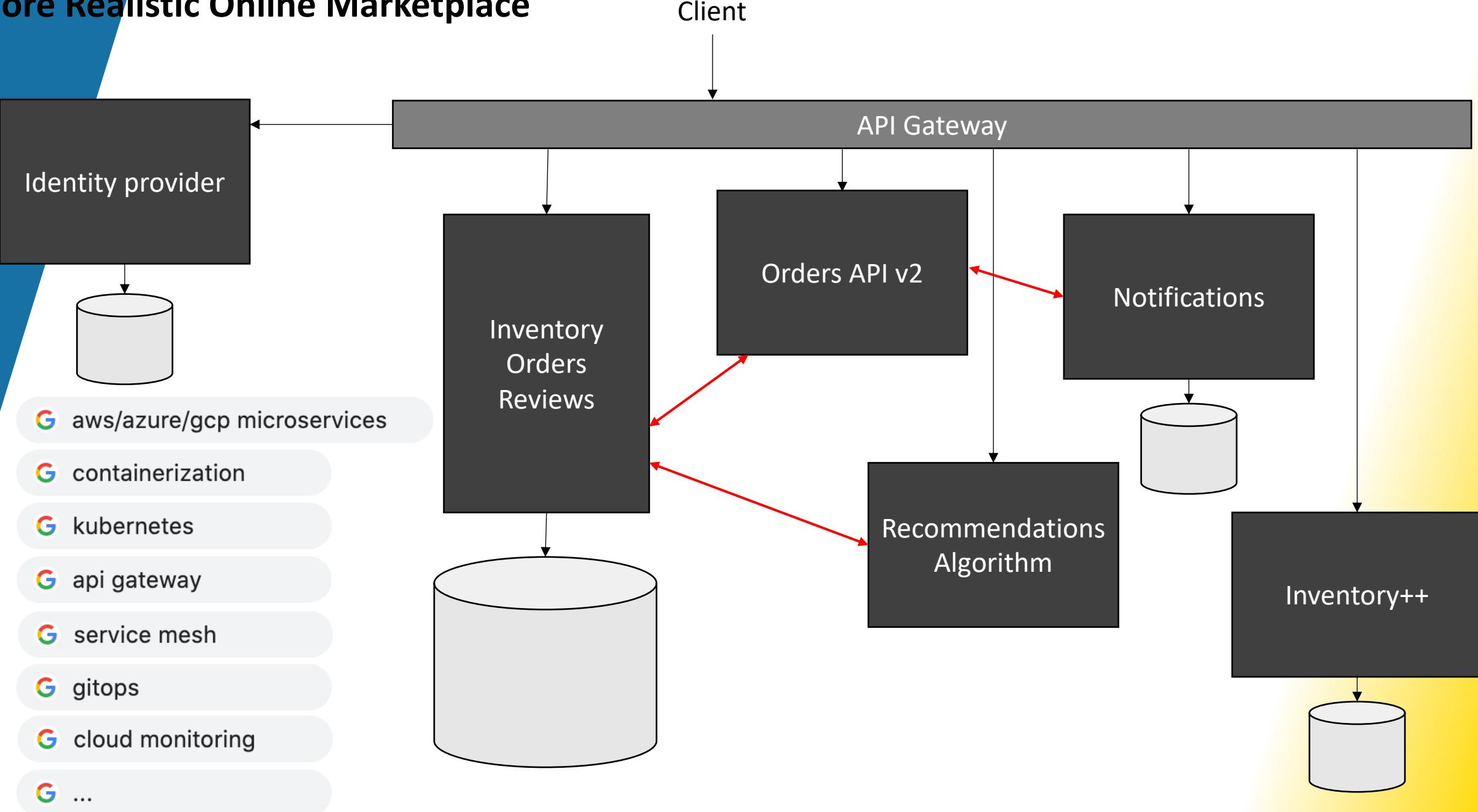
More Realistic Online Marketplace



More Realistic Online Marketplace



More Realistic Online Marketplace



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Modern Python web framework for microservices

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FastAPI

Modern Python web framework for microservices

- Declarative

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Modern Python web framework for microservices

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- Data validation

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Modern Python web framework for microservices

- Declarative
- Data validation
- Documentation

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Modern Python web framework for microservices

- Declarative
- Data validation
- Documentation
- Async

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Modern Python web framework for microservices

- Declarative
- Data validation
- Documentation
- Async
- Follows modern Python

