Introduction to microservices

Architectural style

SOA

service oriented architecture

- Modernized version of SOA

New world:

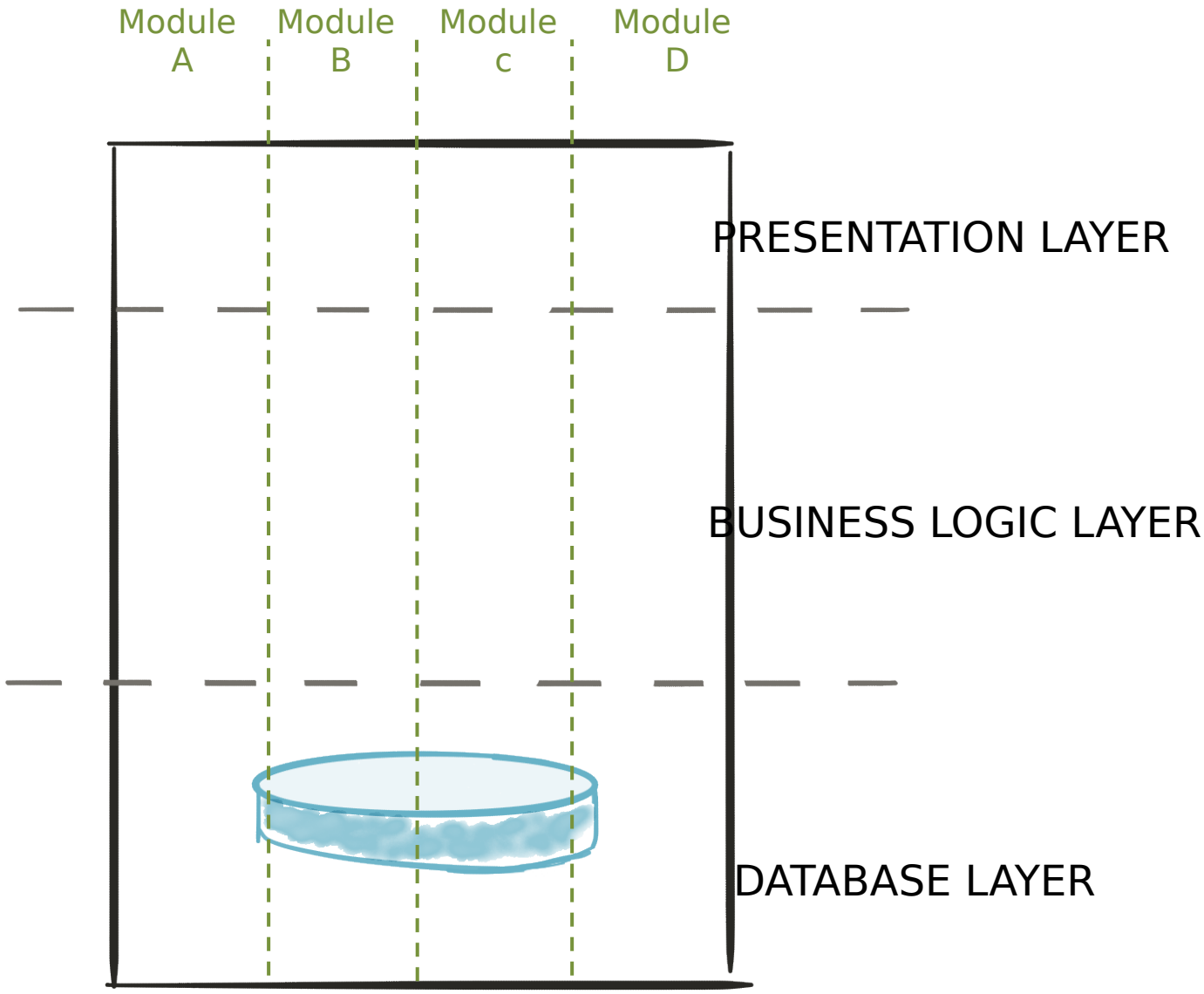
- Speed of delivery
- Scalability
- Innovation / experimentation
- Cloud / devops

VS

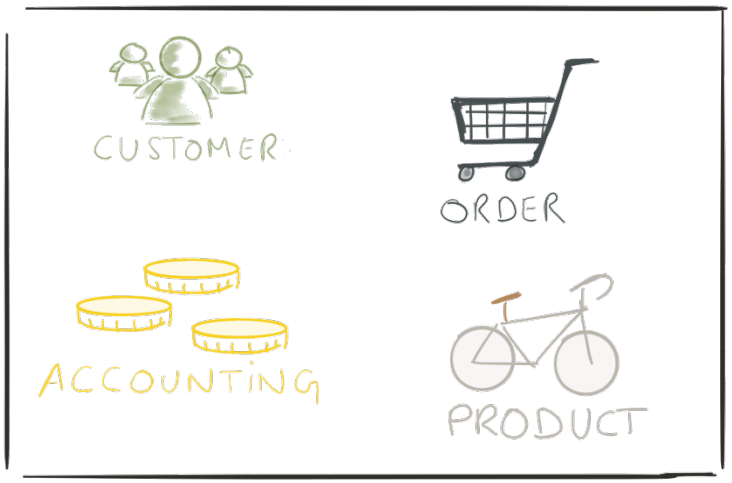
monolith

microservices

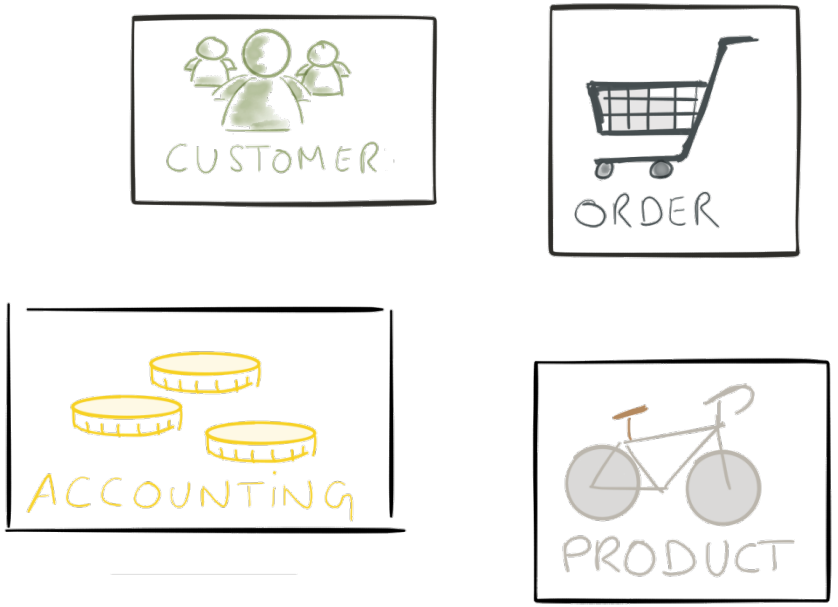
A monolith


Module A
Module B
Module c
Module D
PRESENTATION LAYER
BUSINESS LOGIC LAYER
DATABASE LAYER

VS

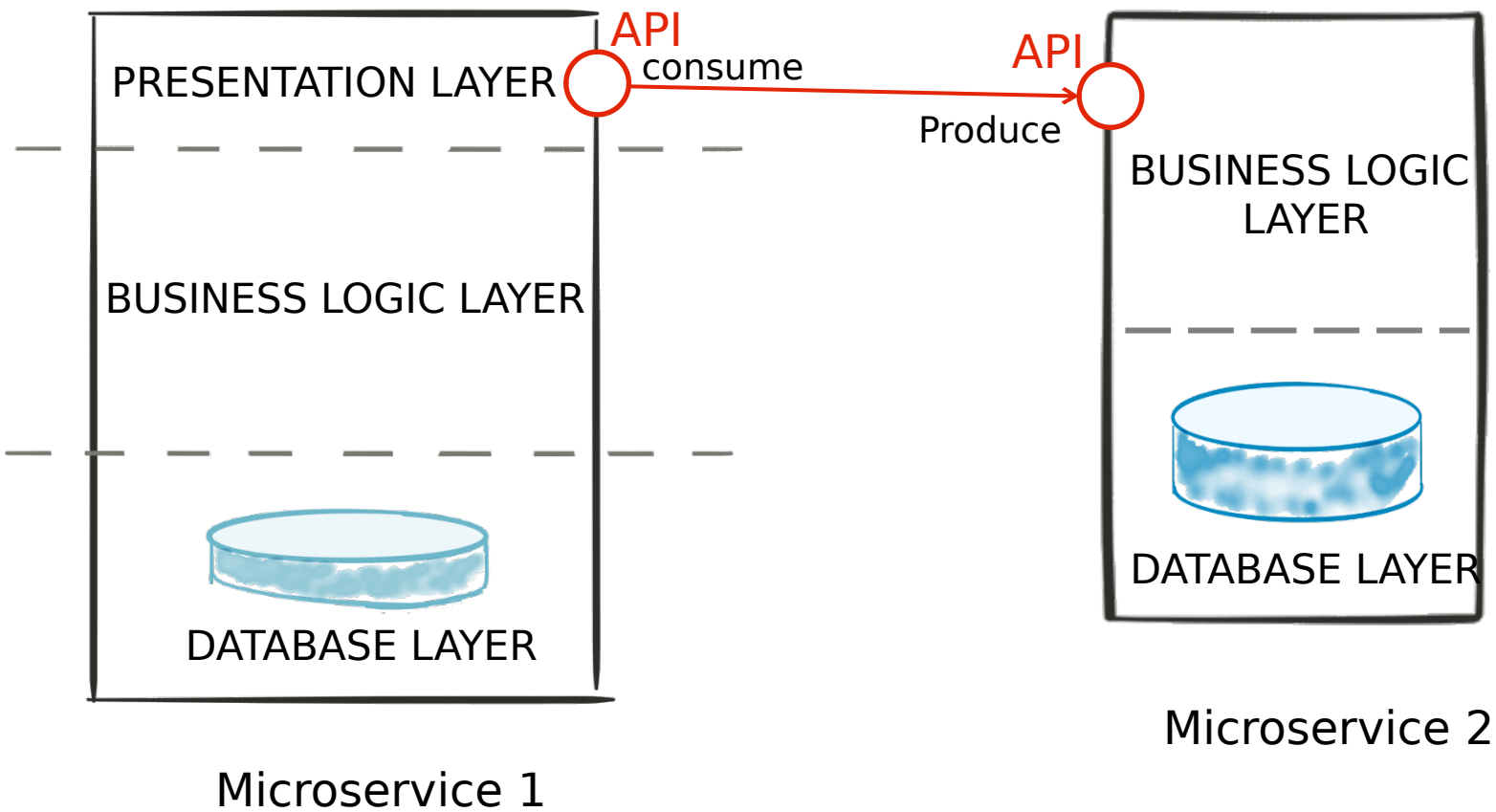


monolith



microservices

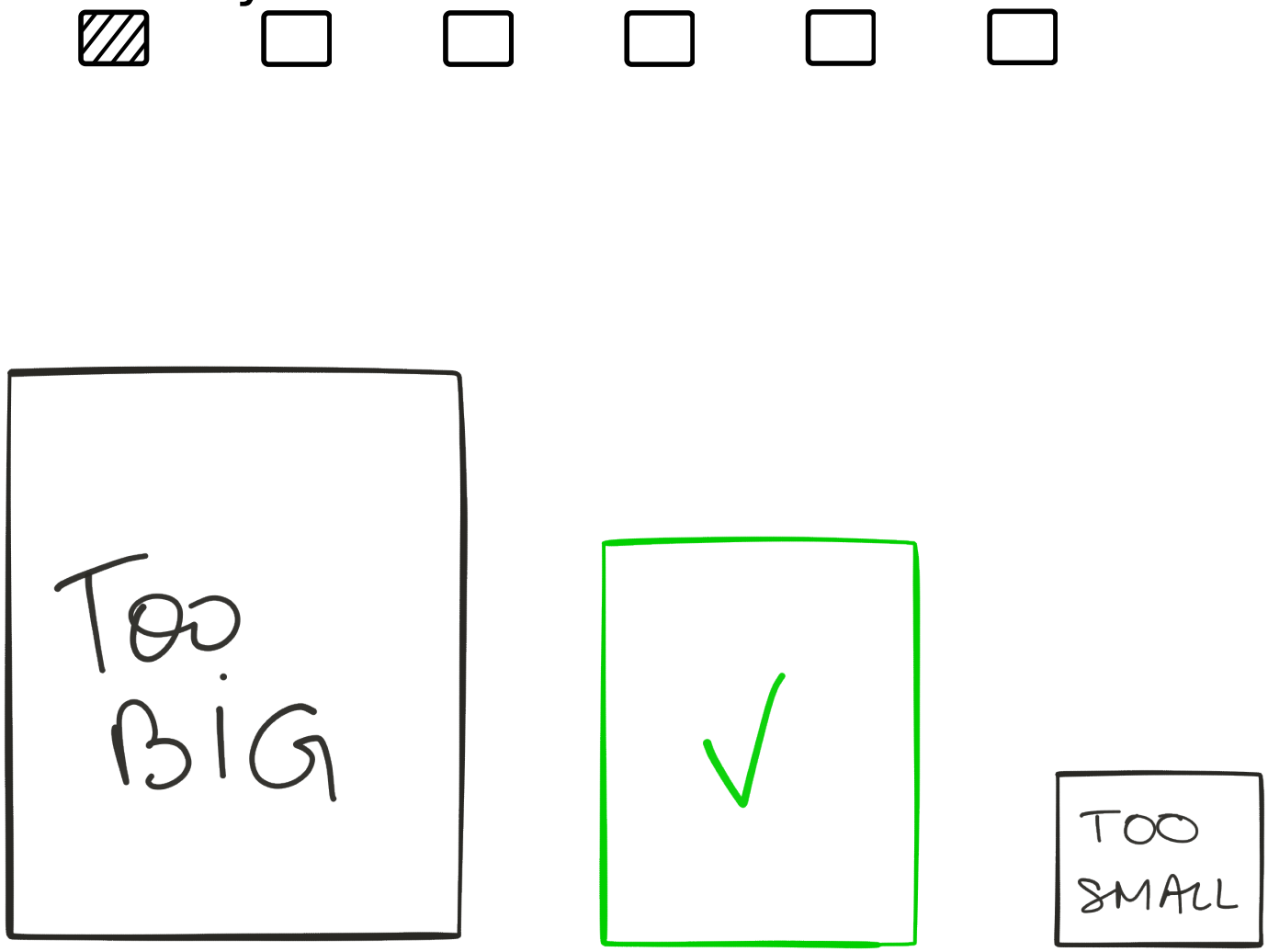
microservices



principles

- ❐ Modularity
- ❐ Autonomous
- ❐ hide implementation details
- ❐ automation
- ❐ Stateless
- ❐ highly observable

modularity



modularity

- ✓ ModeLled around business capability
  - Single responsibility
  - Single data domain
- ✓ Separation of concerns
- ✓ Low coupling
- ✓ Understandable by a person

Modularity (TEAM)

A product not a project

UI - team

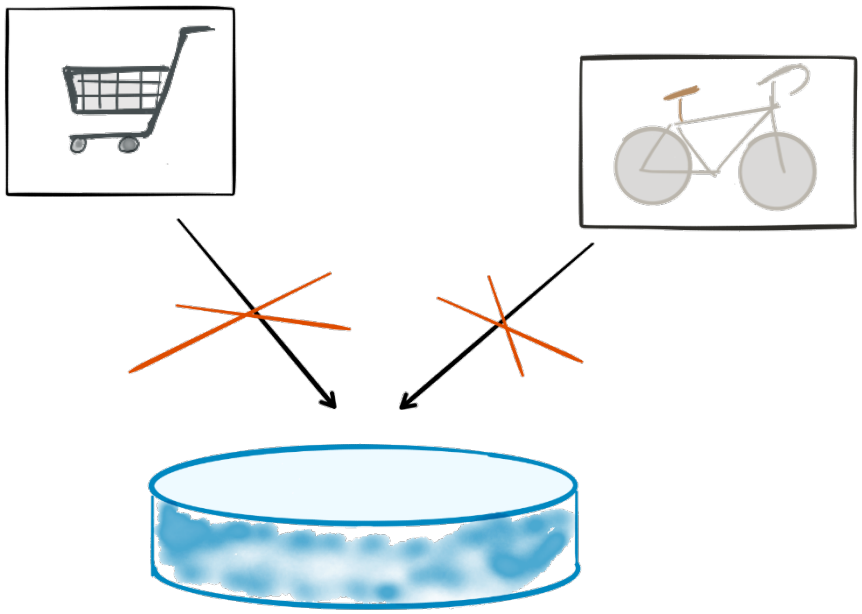
SERVER - team

Dba - team

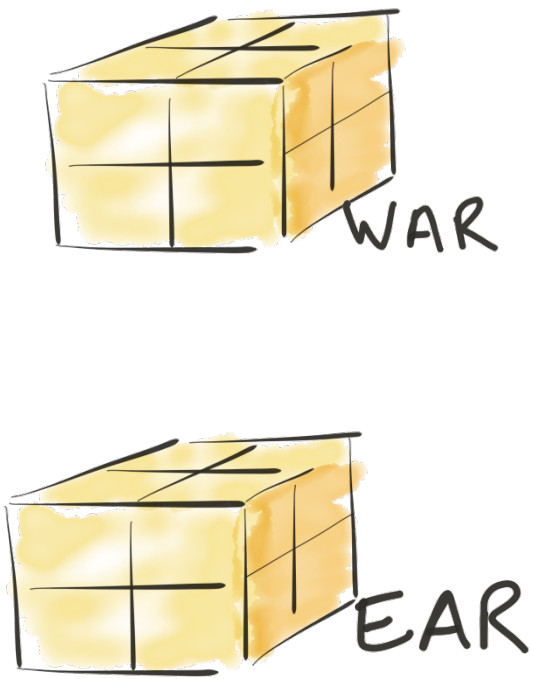
monolith

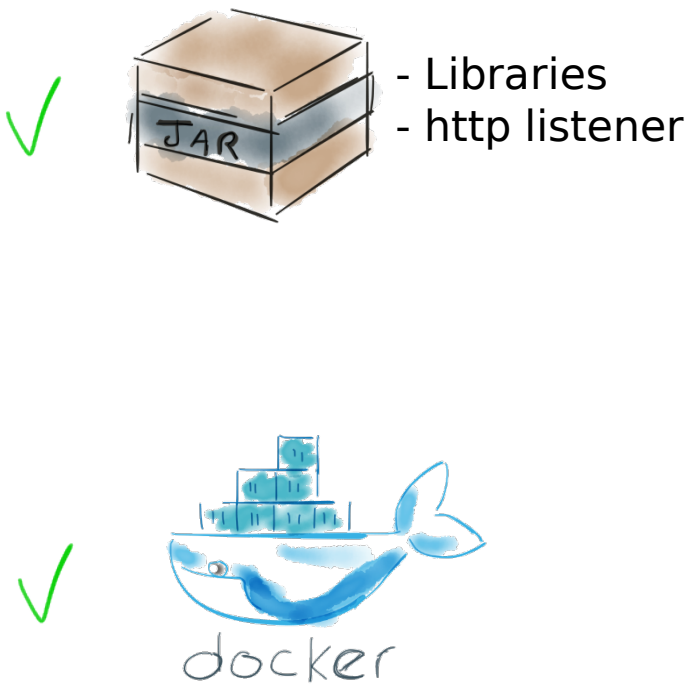
microservices

autonomous



autonomous

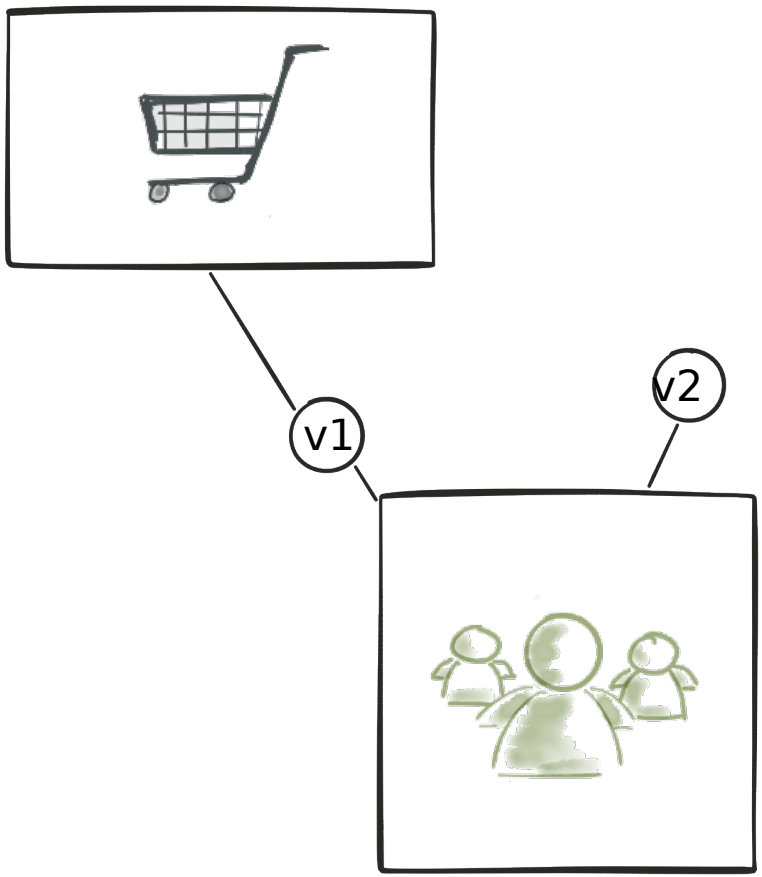




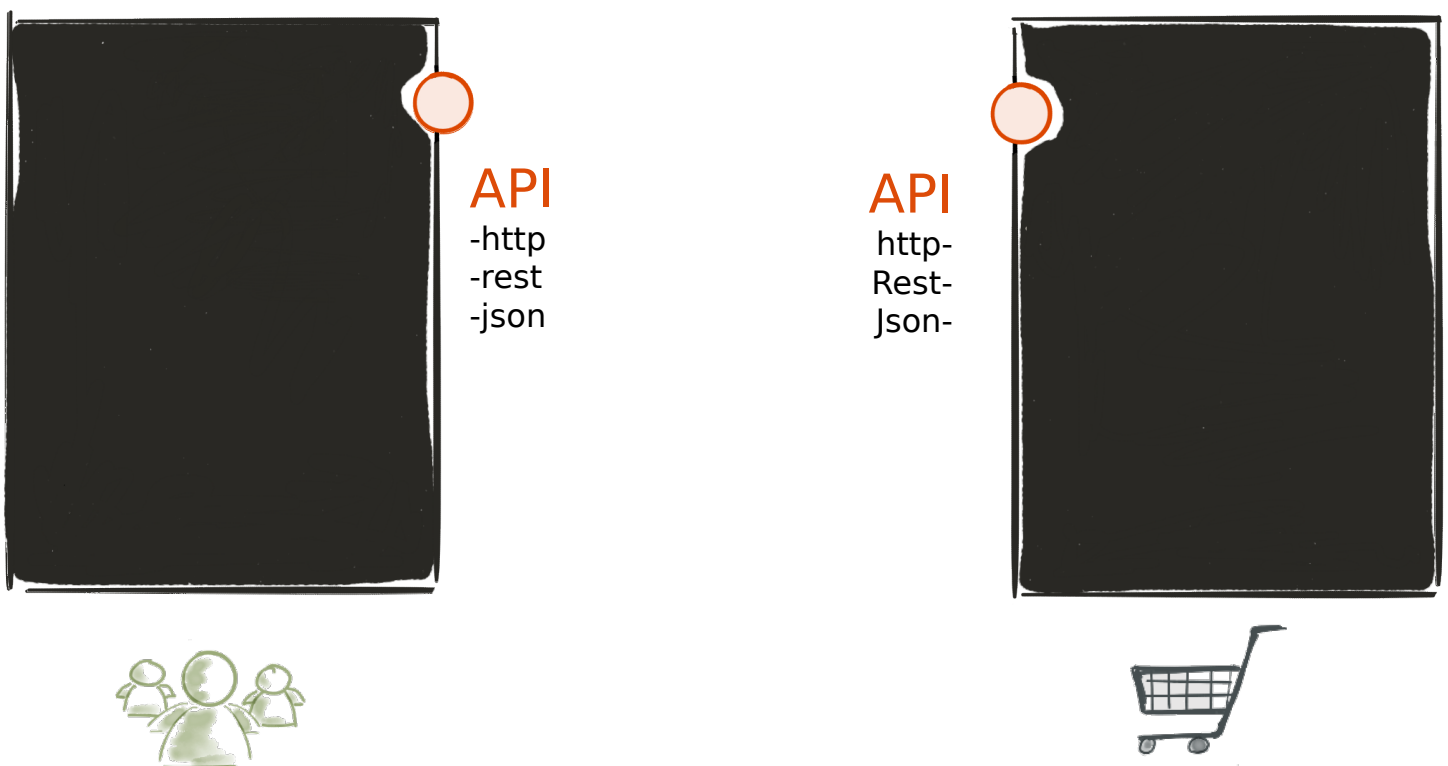
monolith

microservices

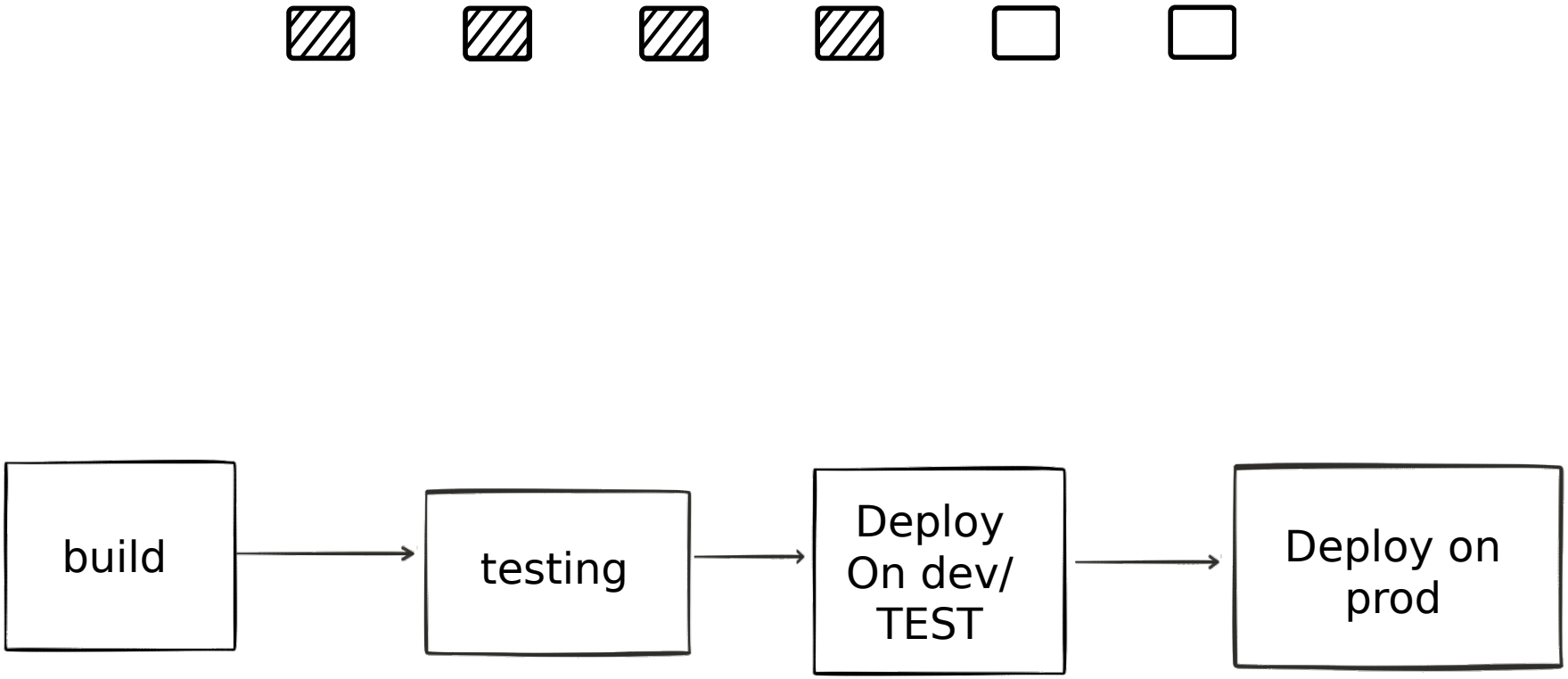
autonomous



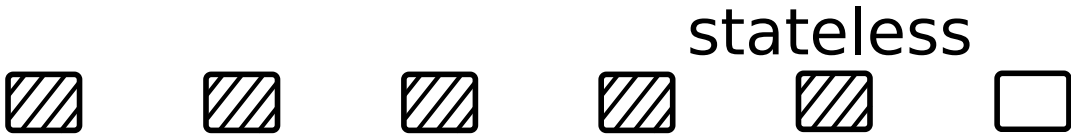
hide implementation details

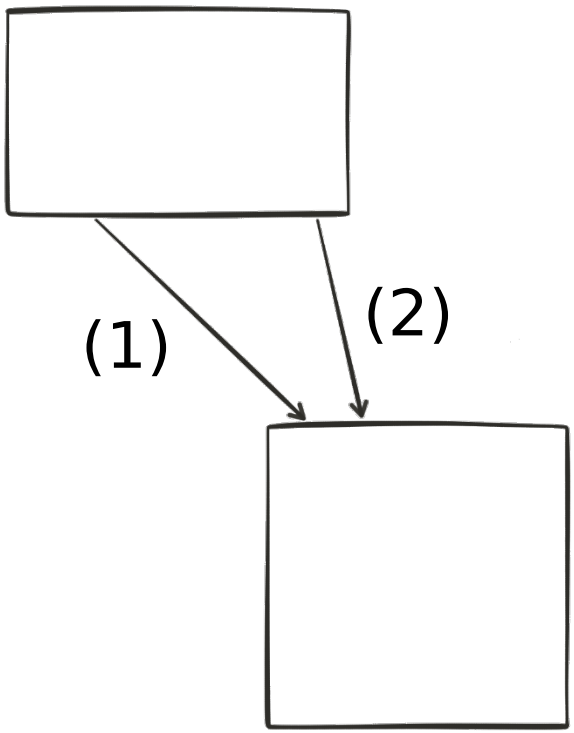


automation



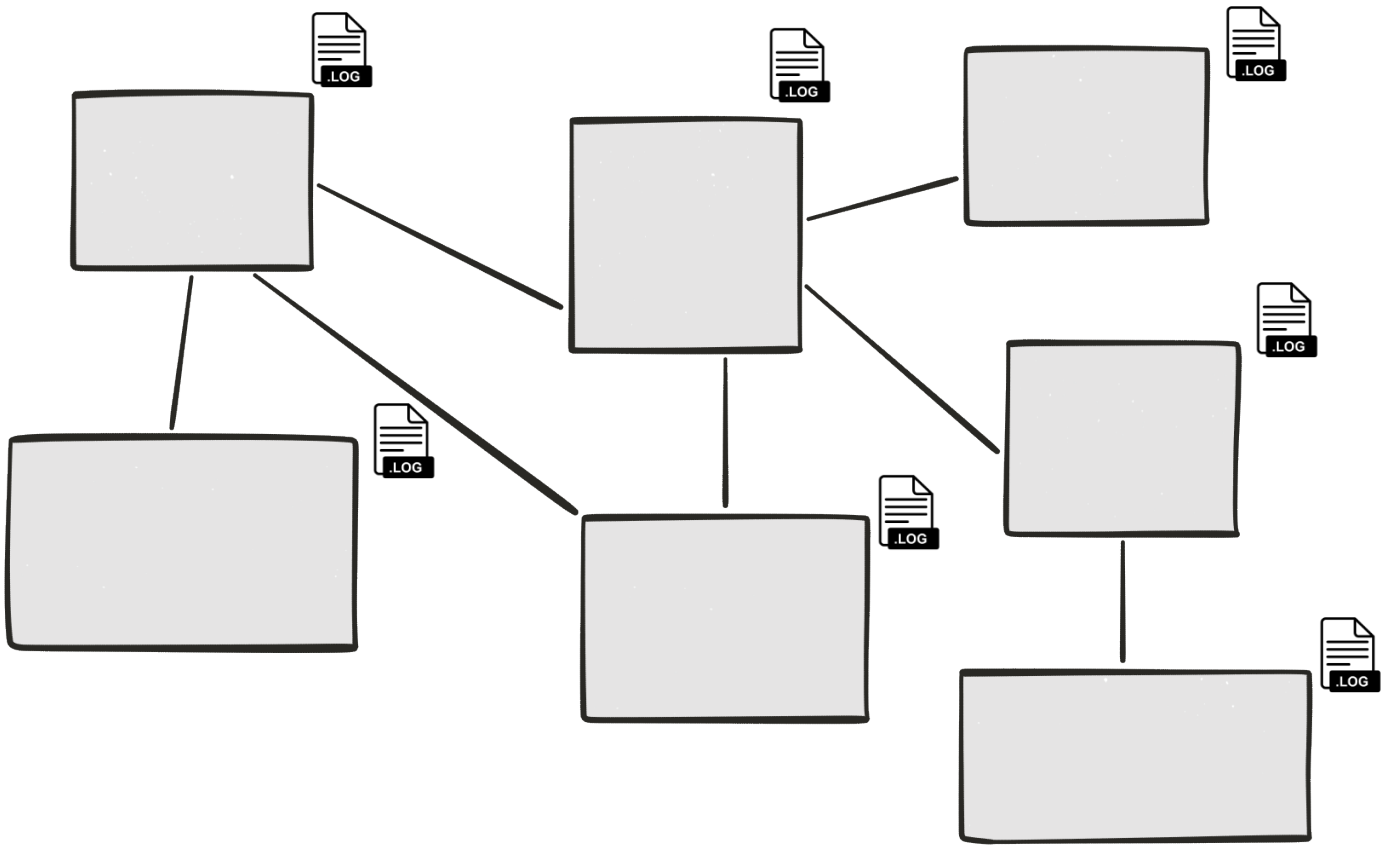
- Continuous integration
- Continuous deployment


stateless


(1)
(2)

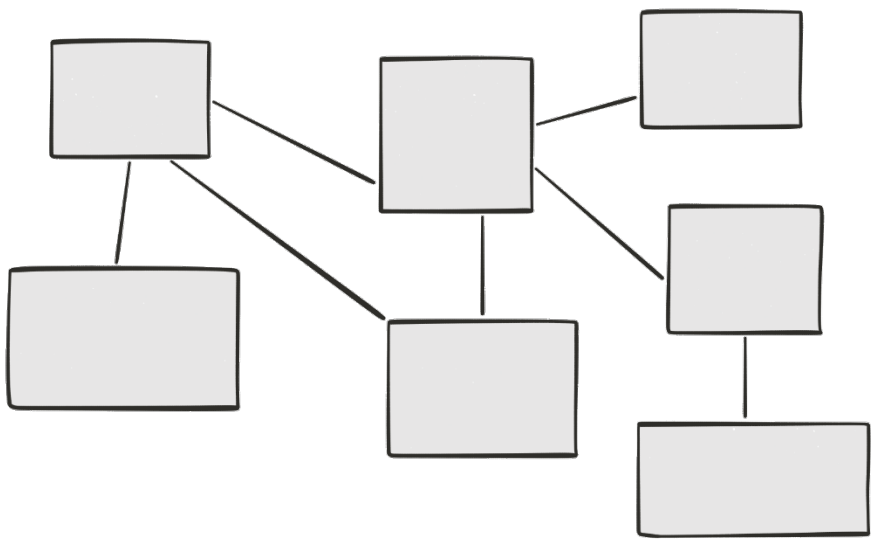
Highly observable

Logs



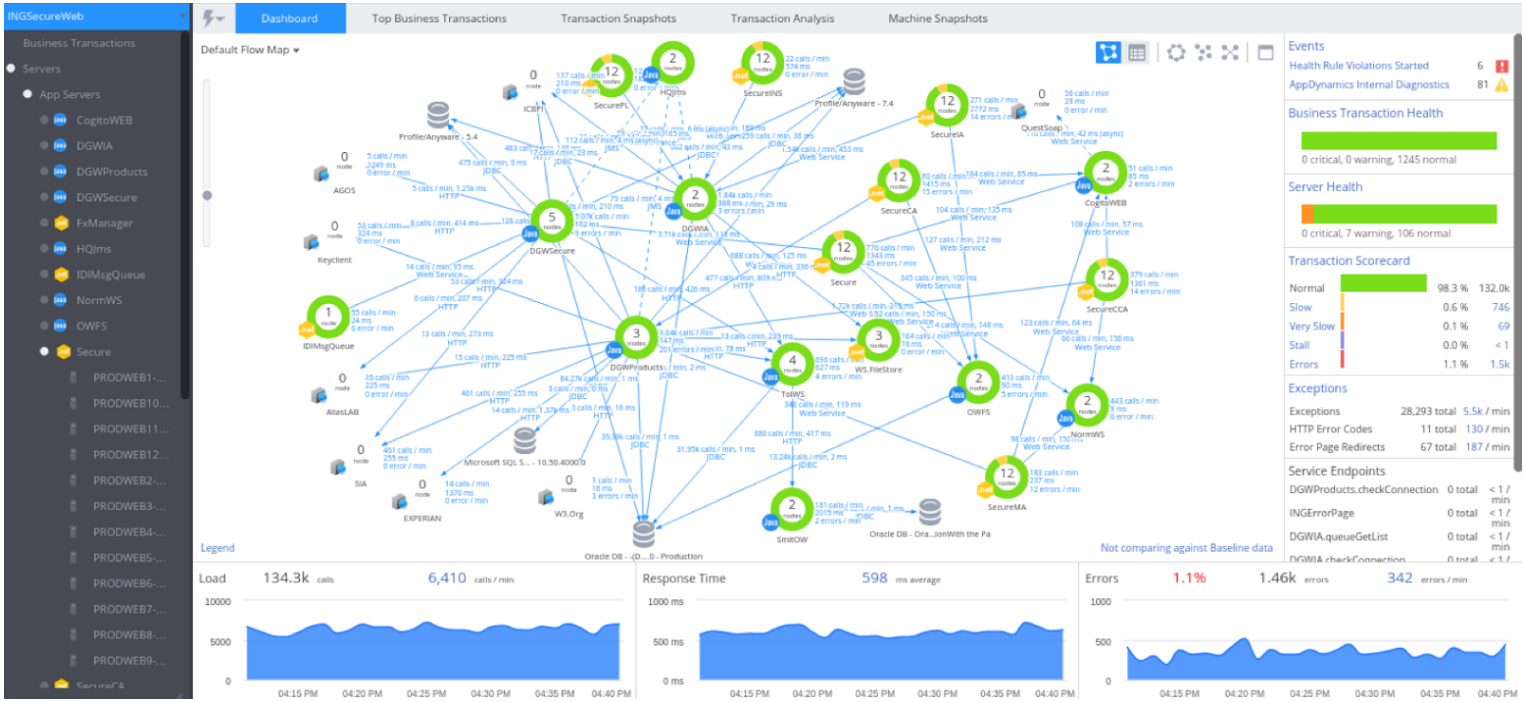
Highly observable

Centralized logging



Highly observable

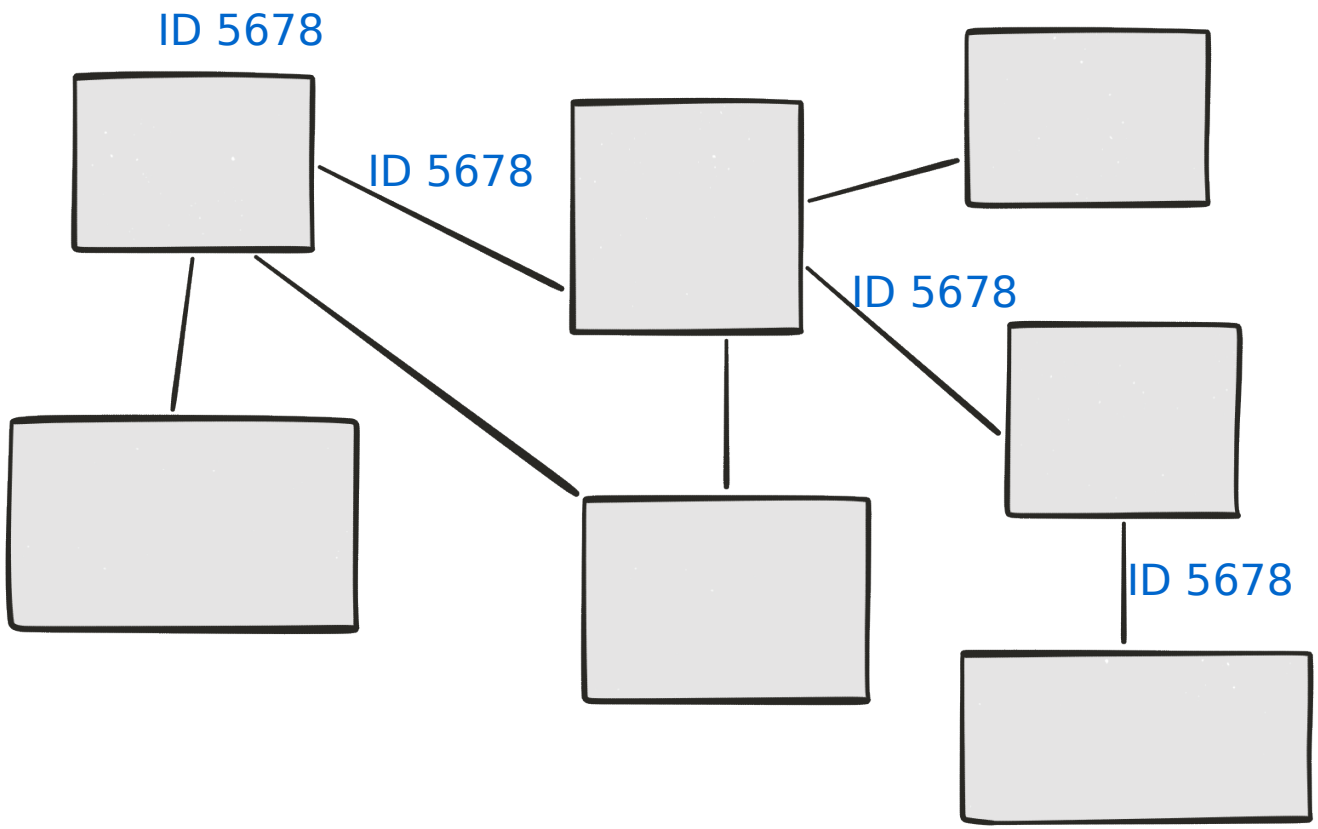
monitoring



AppDynamics

Highly observable

Correlation ids



principles

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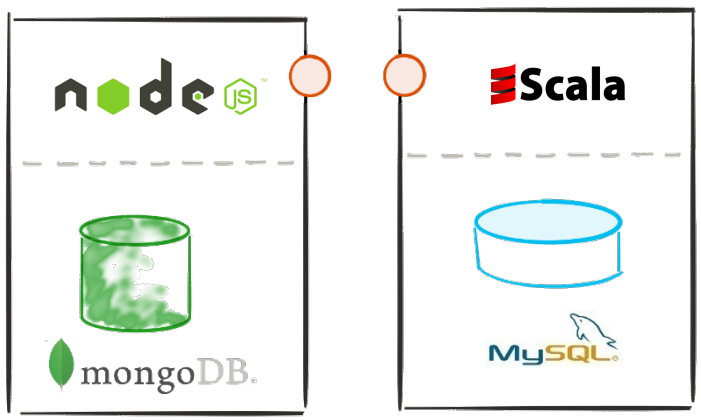
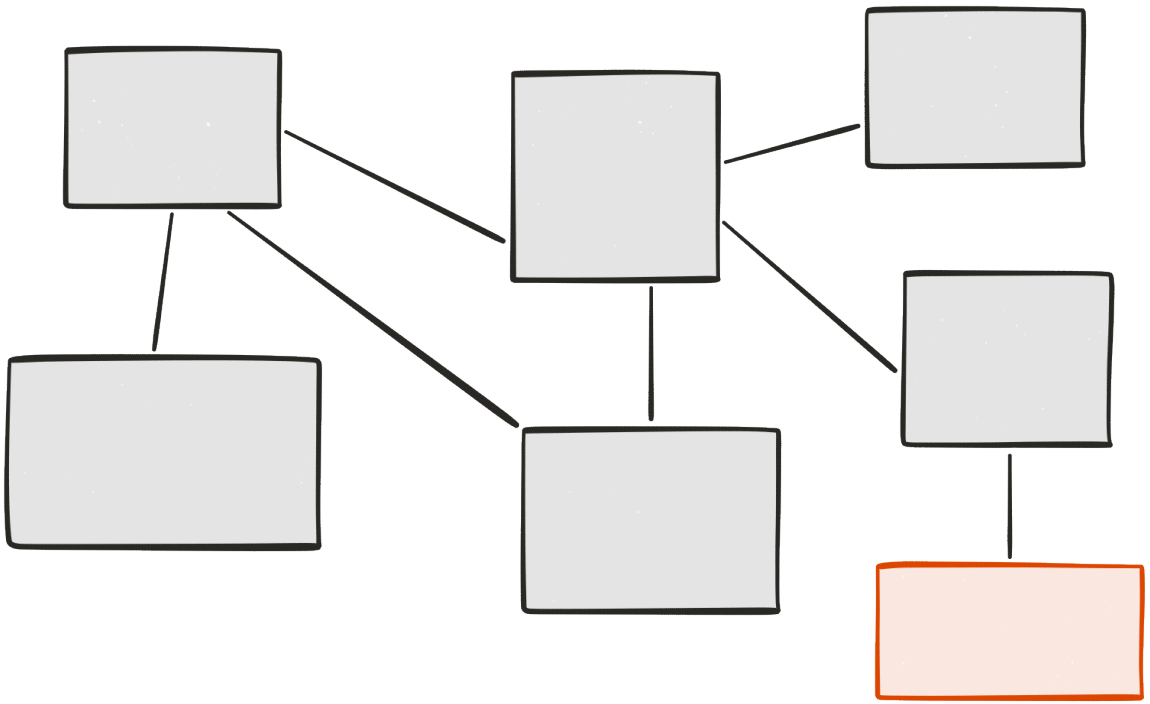
Advantages

Polyglot architecture



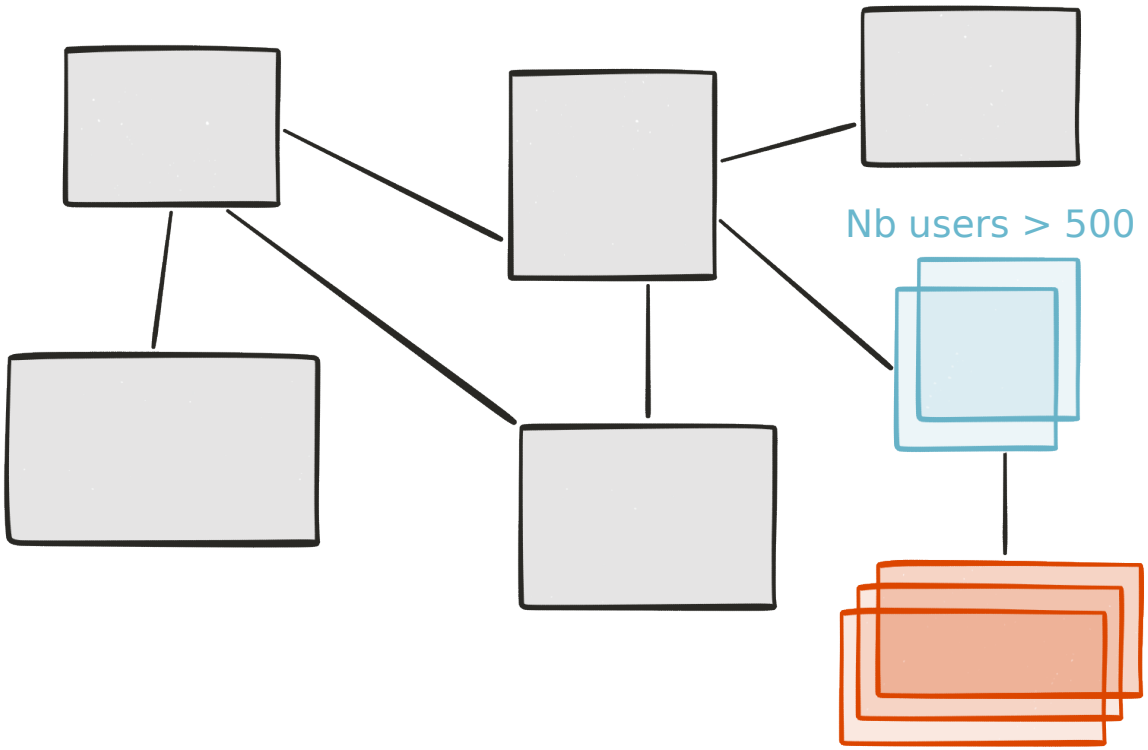
- The right technology for the job
- reduce technical debt

Evolutionary design



- Remove
- Add
- Replace
- Experimental microservice
- Grow at “no” cost

Selective scalability



Big vs small

- Smaller code base
- Simpler to develop / test / deploy / scale
- Start faster
- Easier for new developers

drawbacks

- Distributed system
  - Consistency
  - Transaction
  - Request travelling

- Slow (http)

- Requires an ecosystem

- Synchronous vs asynchronous

- Integration tests

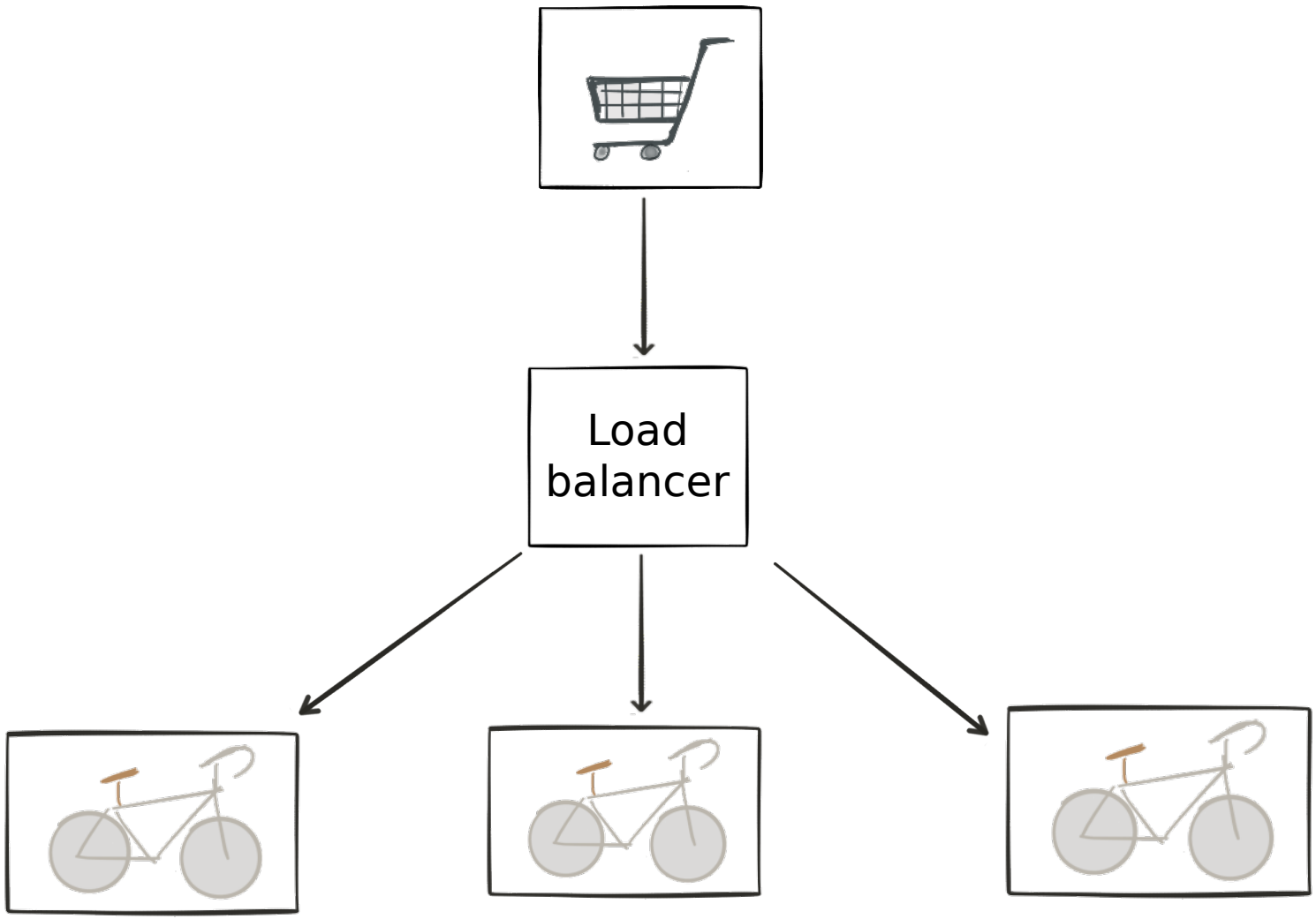
Conclusion:

- The Microservices architecture is more complex Than a monolith.

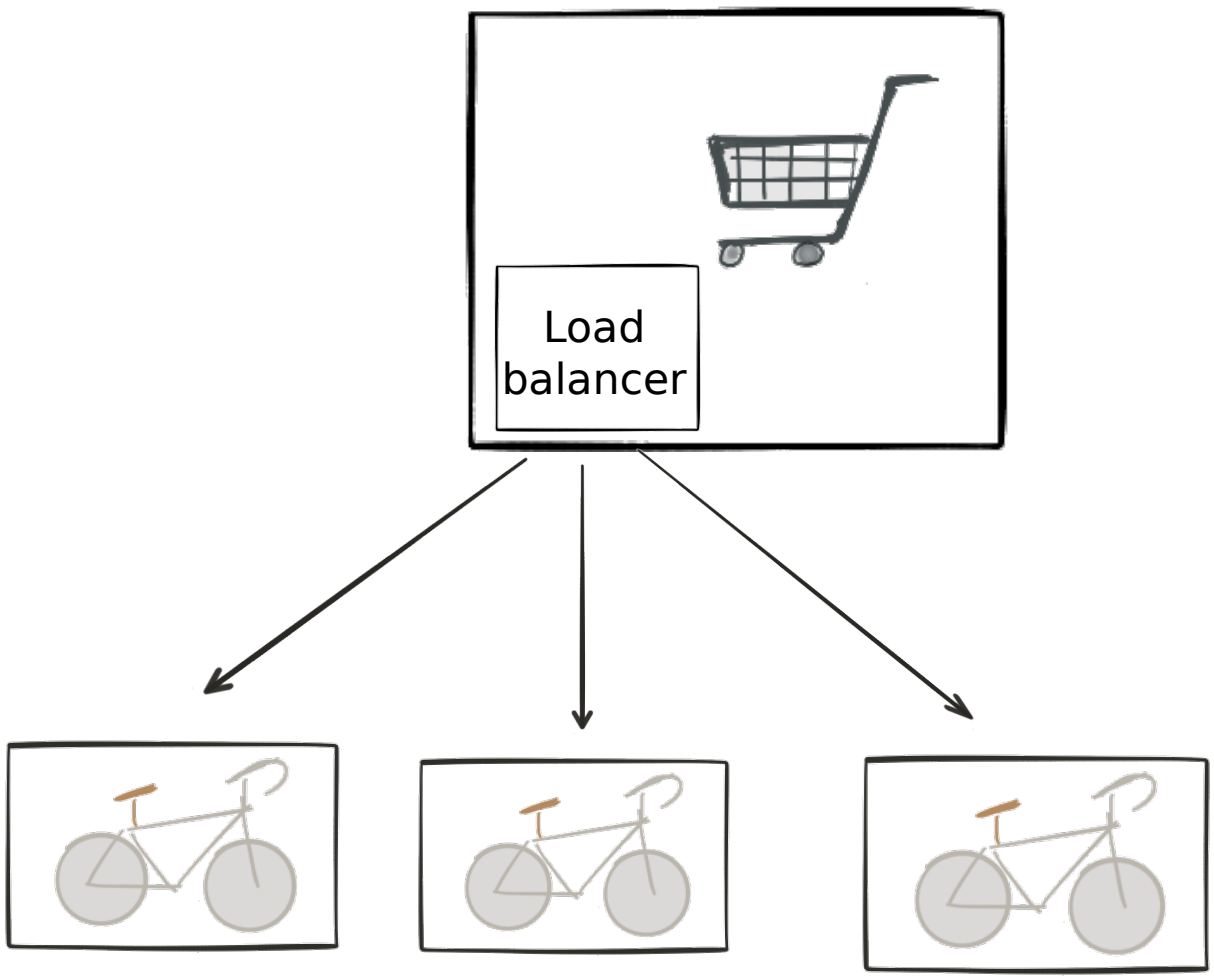
- This the cost of growing and scaling easily

Microservices ecosystem

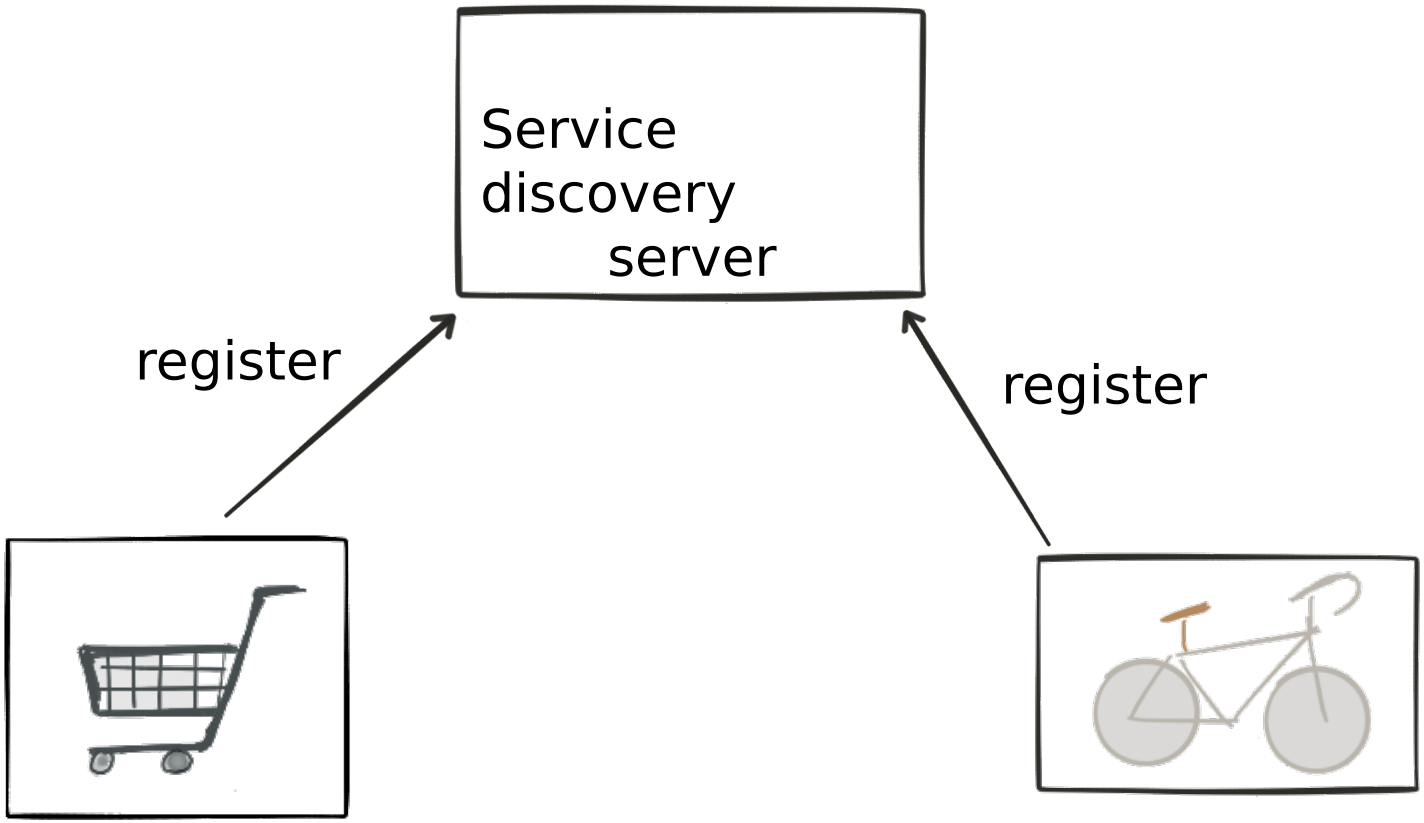
Load balancer



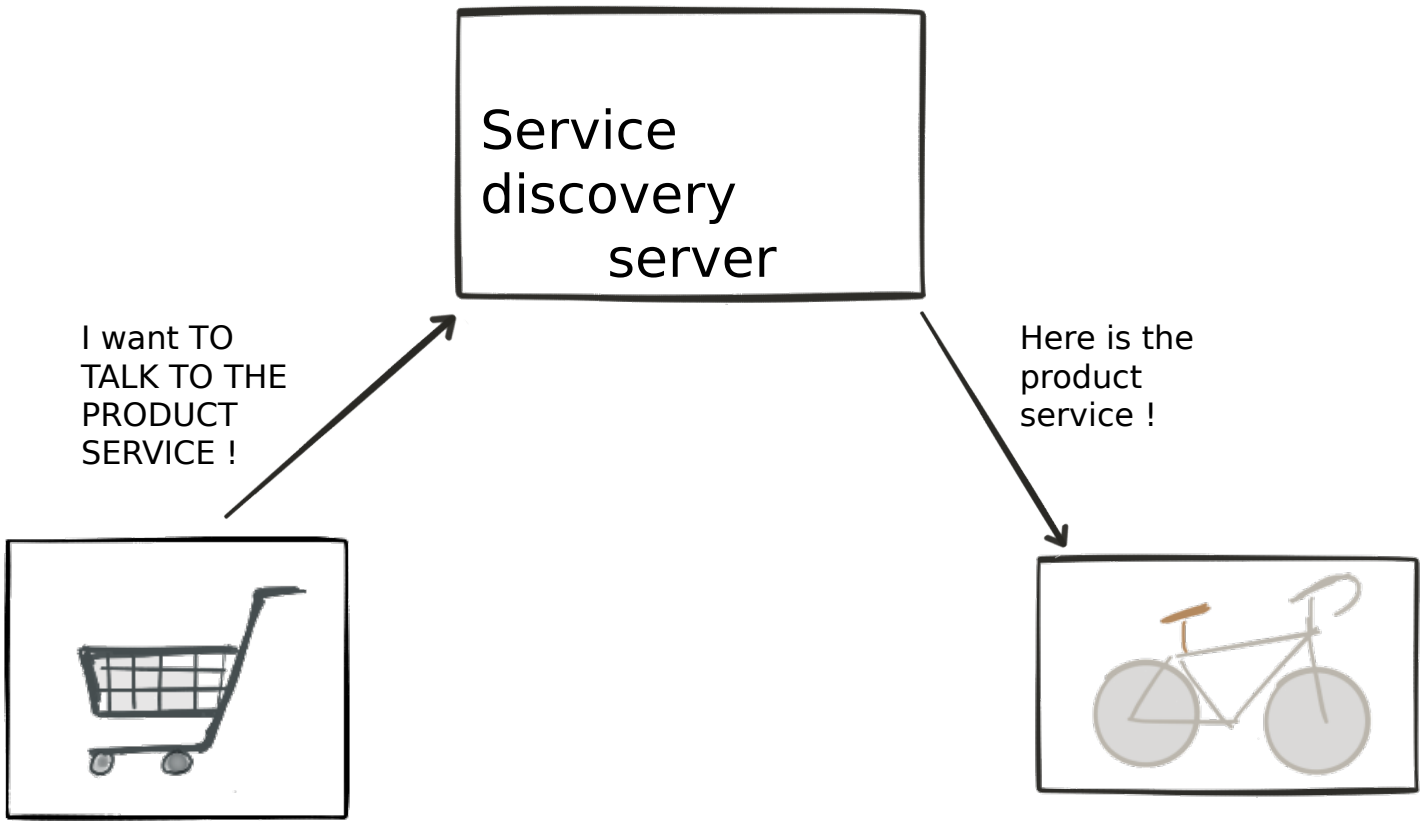
Load balancer (client side)



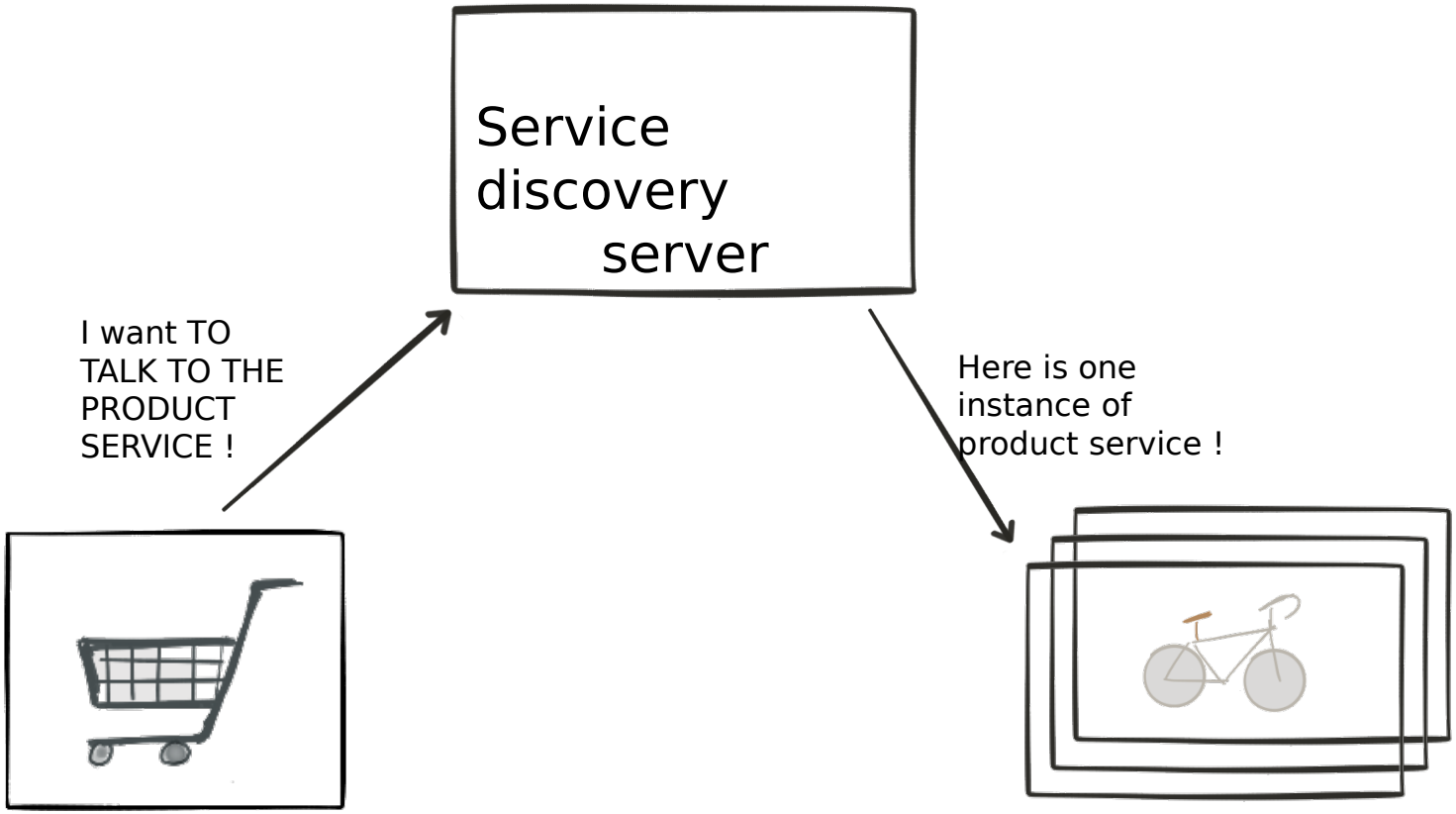
Service discovery



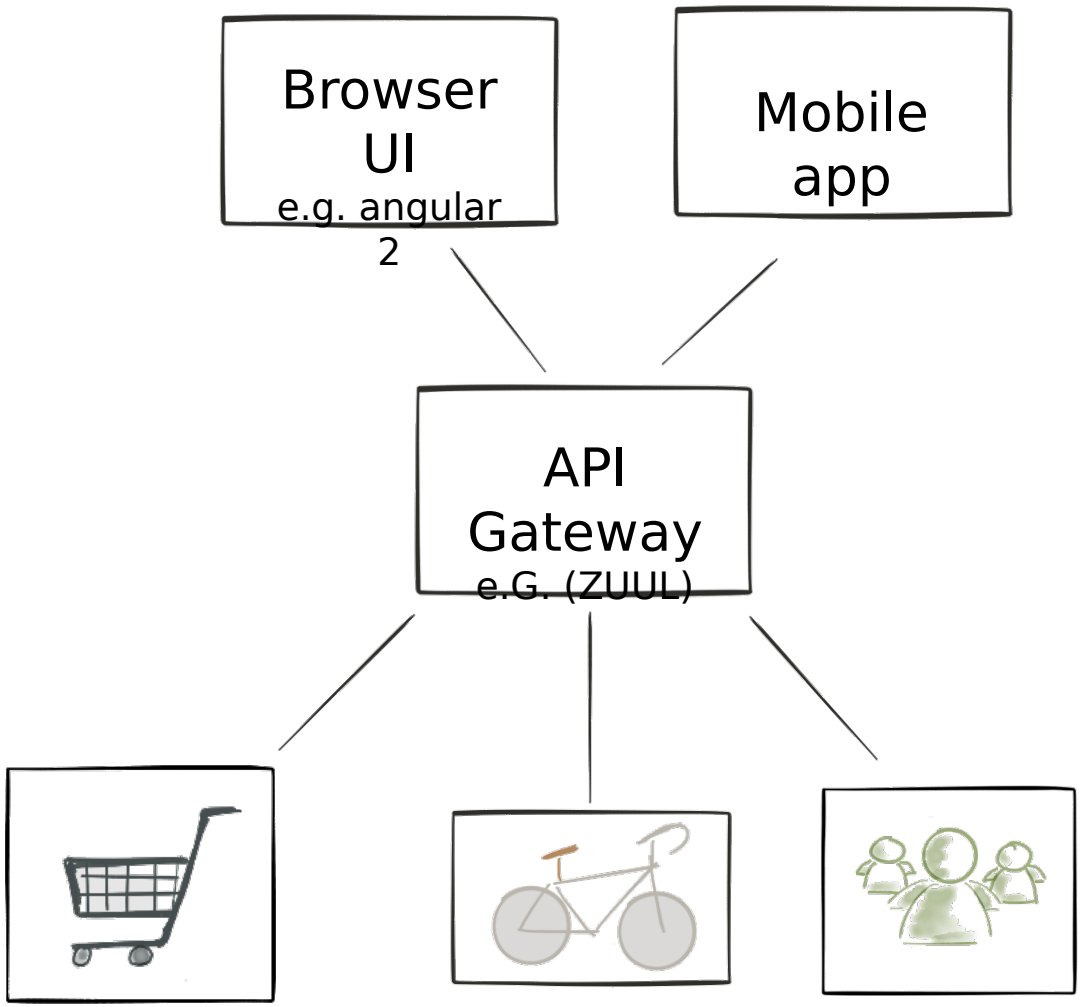
Service discovery



Service discovery (load balancing)



Api Gateway



This is not new!

The old new thing...

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advantages

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- Evolutionary design
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drawbacks

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ecosystem

- Load balancer
- Service discovery

12 Factor Apps

The Twelve Factors

I. Codebase
One codebase tracked in revision control, many deploys

II. Dependencies
Explicitly declare and isolate dependencies

III. Config
Store config in the environment

IV. Backing services
Treat backing services as attached resources

V. Build, release, run
Strictly separate build and run stages

VI. Processes
Execute the app as one or more stateless processes

VII. Port binding
Export services via port binding

VIII. Concurrency
Scale out via the process model

IX. Disposability
Maximize robustness with fast startup and graceful shutdown

X. Dev/prod parity
Keep development, staging, and production as similar as possible

XI. Logs
Treat logs as event streams

XII. Admin processes

THANKS !