

# CQRS/ES

Was ist das? Warum brauch ich das?

Einhorn Lunch

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# HYPOTHESE

*CQRS mit Eventsourcing ist ein fantastisches Architekturmuster zum Bau nachrichtenbasierter, lose gekoppelter (Microservice) Systeme*

**SYSTEMS HAVE  
STATE**

# STATE IS REPRESENTED BY DOMAIN OBJECTS

- aka. Entities
- aka. Aggregate (DDD)

**STATE CAN BE MODIFIED**

**STATE CAN BE MODIFIED**

**→ COMMAND**

**STATE CAN BE RETRIEVED**

**STATE CAN BE RETRIEVED**

**→ QUERY**



# CODE IS EASY

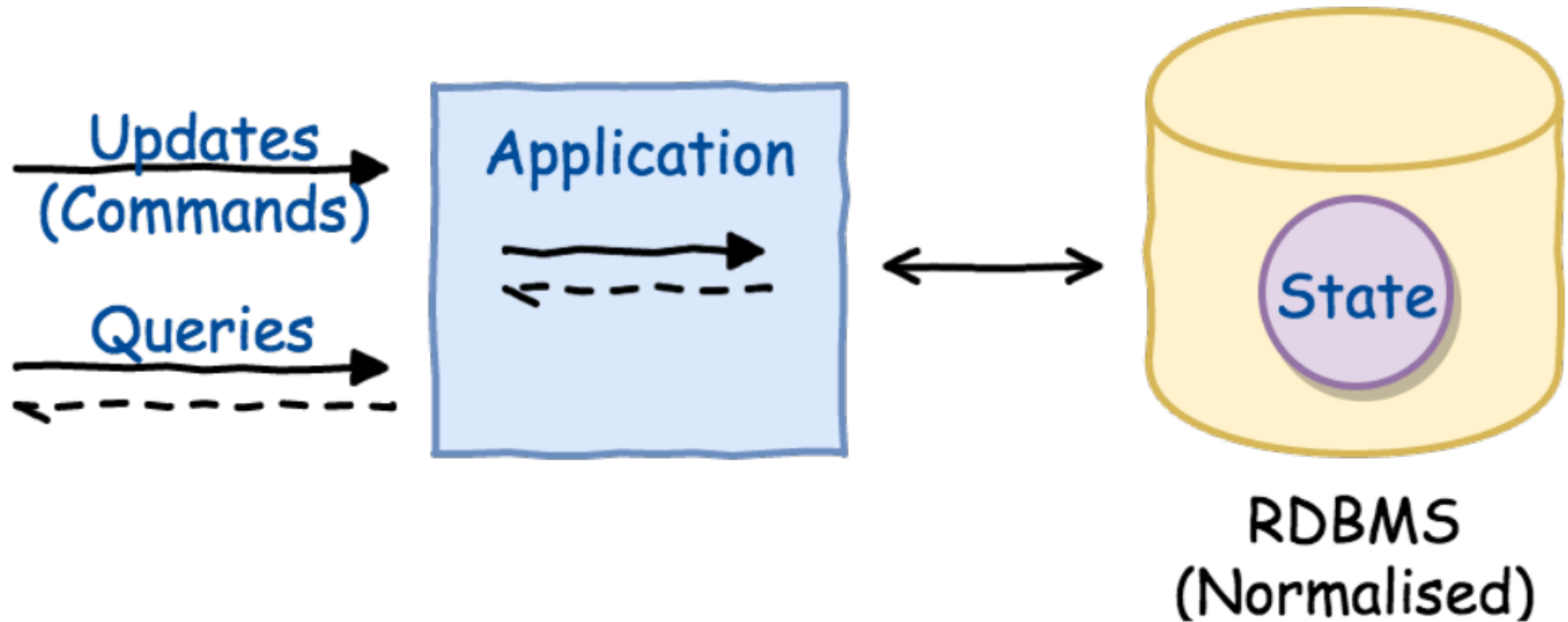
## State is hard

# CRUD

# CRUD

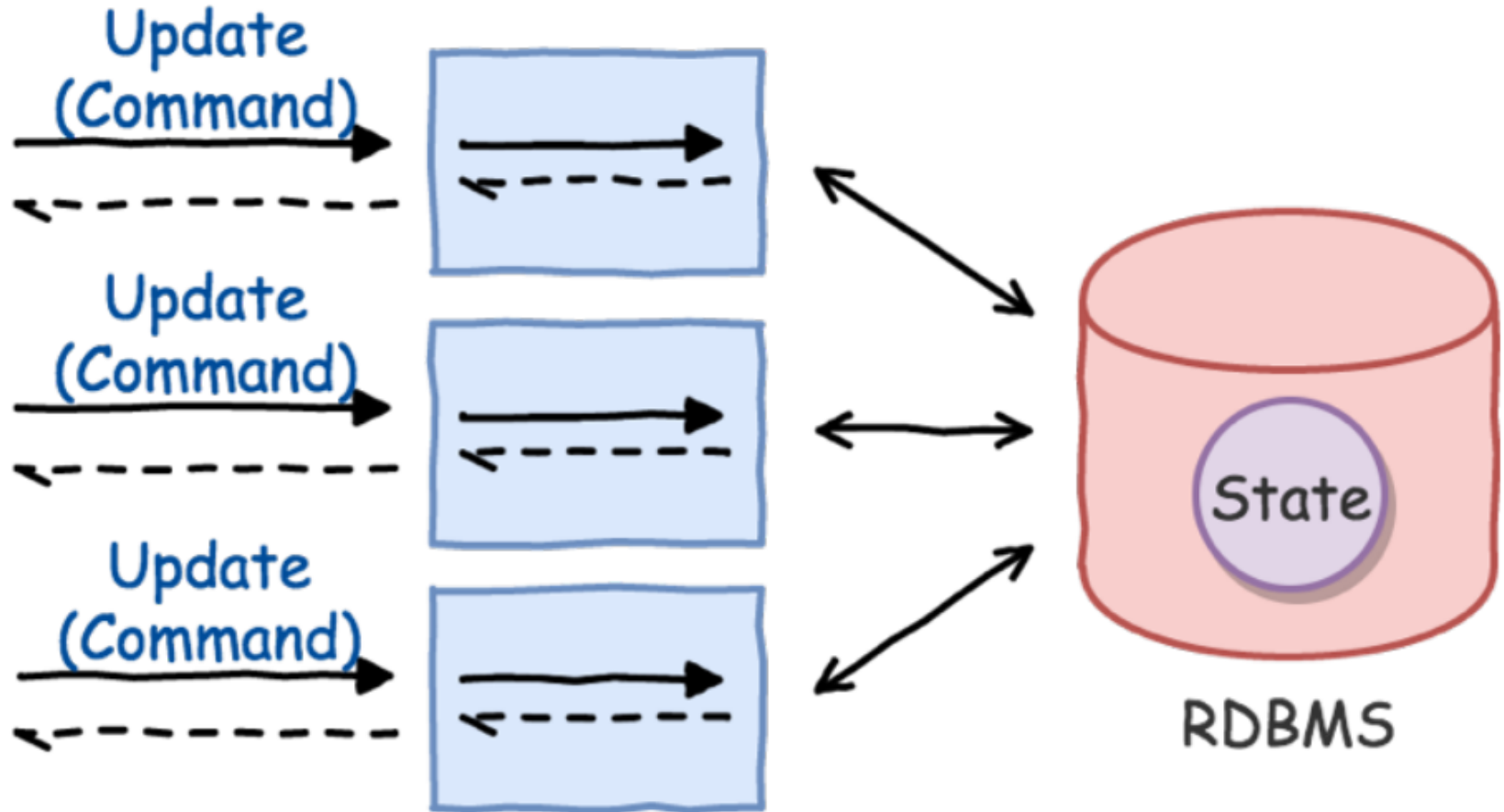
Create - Update - Delete

# REQUEST/RESPONSE



synchronous

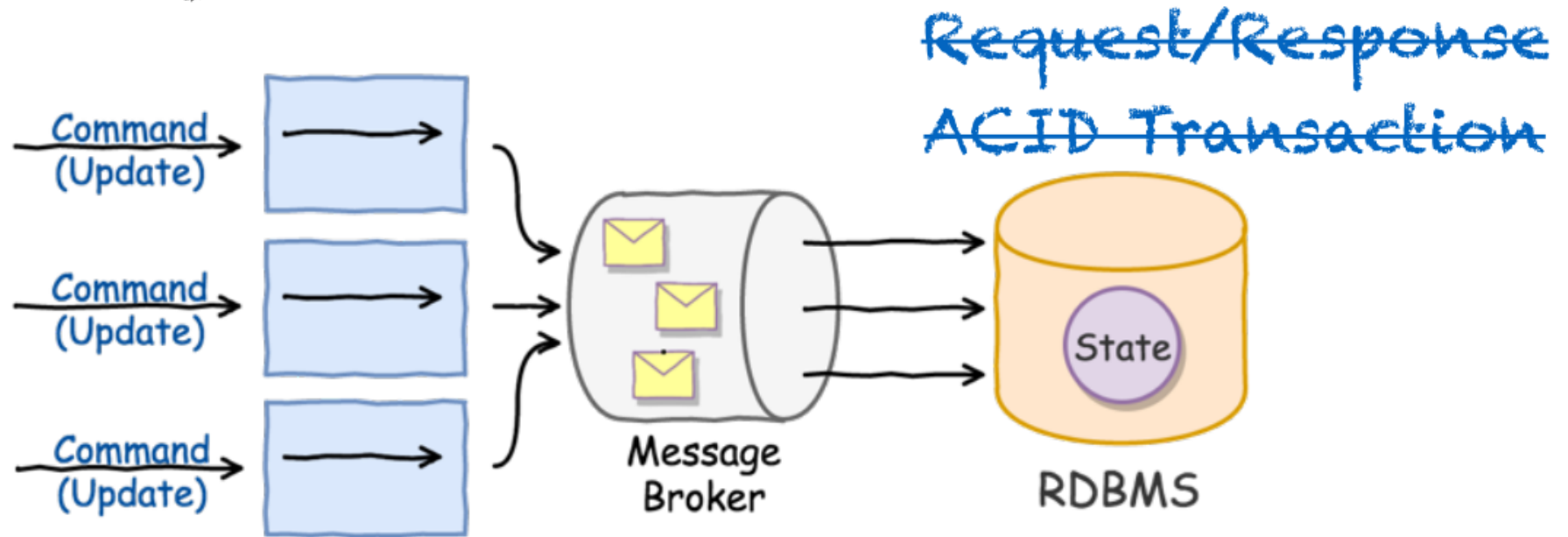
# SCALING UP



synchronous



# MESSAGE DRIVEN



asynchronous

# EVENTUAL CONSISTENT

- query will "soon" retrieve correct state
- ACID → BASE
- we no longer benefit from having the same read/write model



**CQRS**

**COMMAND**

**QUERY**

**RESPONSIBILITY**

**SEGREGATION**



User



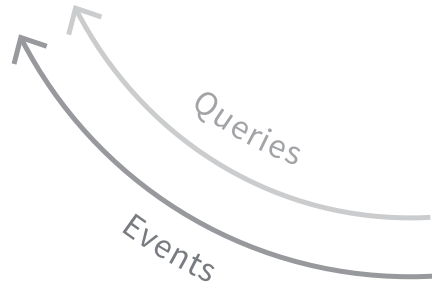
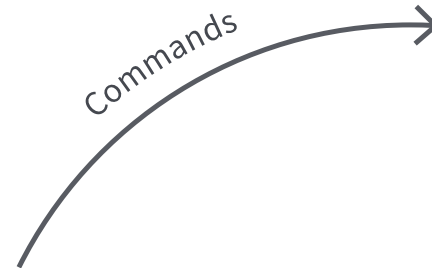
The client sends commands, subscribes to events, and reads and observes lists using queries.



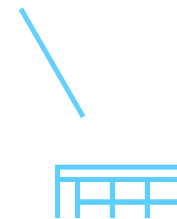
The write model handles commands, and stores and publishes events using the domain.



The read model handles events and transforms them into lists.



Event store



# COMMAND

- expresses an Intent that something should happen in the future
- has an imperative name (CreateOrder)
- can fail
- modifies the state
- triggers events

# EVENT

- expresses something that happened in the past
- has a participle name (OrderCreated)
- is an immutable fact
- can not fail

# EVENT SOURCING

*Event Sourcing ensures that all changes to application state are stored as a sequence of events.*

*Martin Fowler*

# EVENT STORE

- append only, lock-free
- optimized for quick write
- easy to distribute
- single point of truth
- can be used to (re-)create State

# EVENT SOURCING

Account	Balance
12345678	€ 50,00
...	...

Account Created	
Account number	12345678



Money Deposited	
Account number	12345678
Amount	€ 100,00



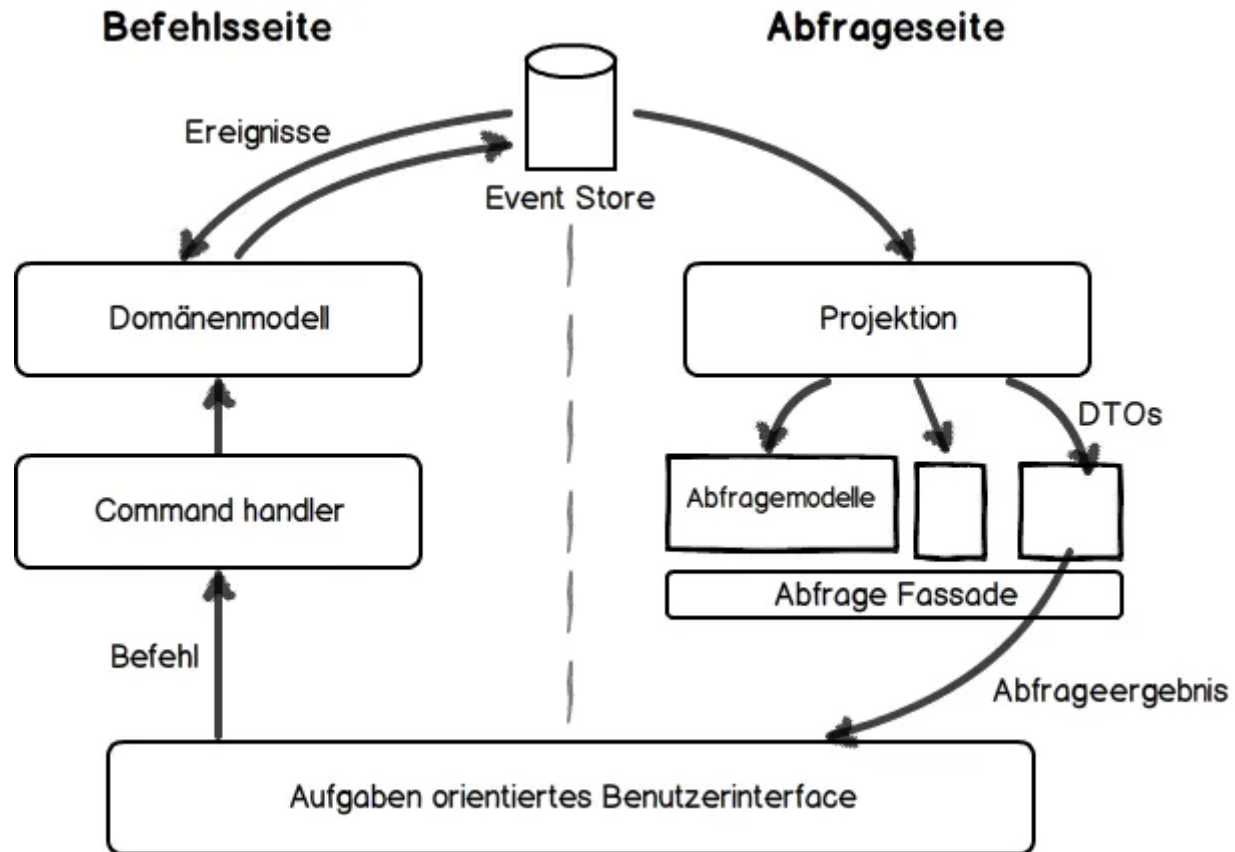
Money Withdrawn	
Account number	12345678
Amount	€ 50,00



# BENEFITS

- multiple Read models (Projection) with dedicated purpose
- audit log for free
- analyse/debug State by replaying selected events
- correct errors with compensation events

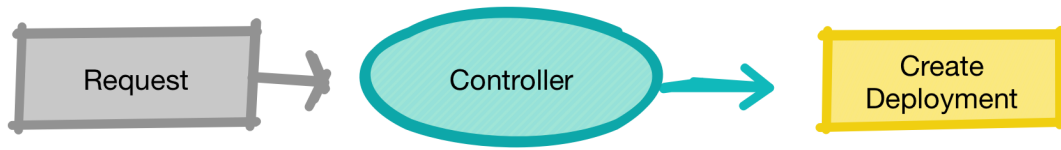
# SYSTEM OVERVIEW

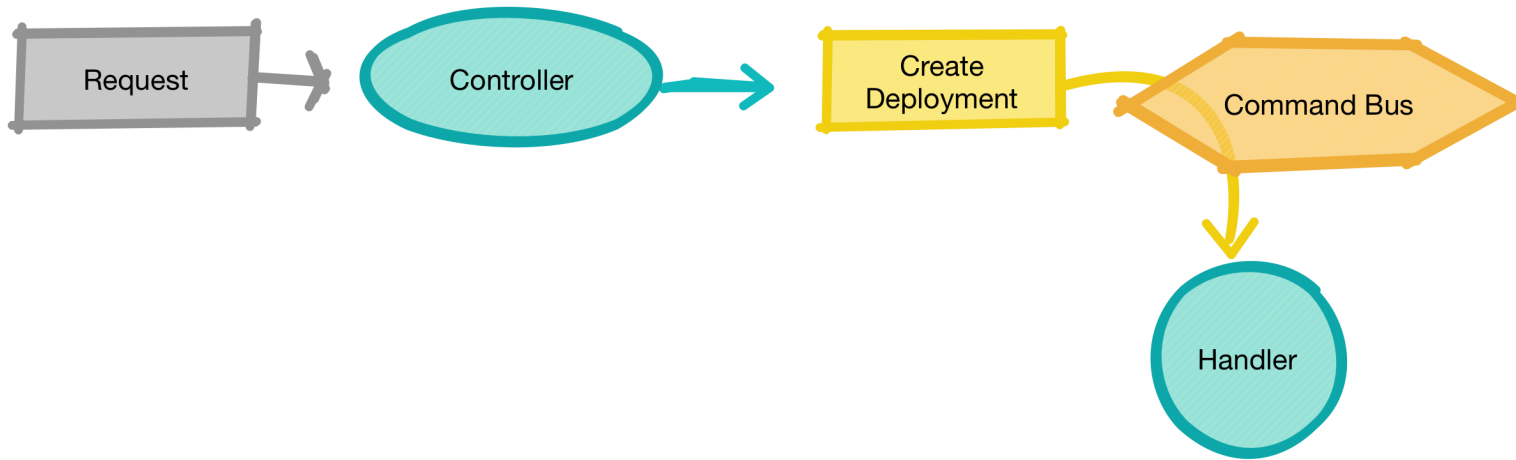


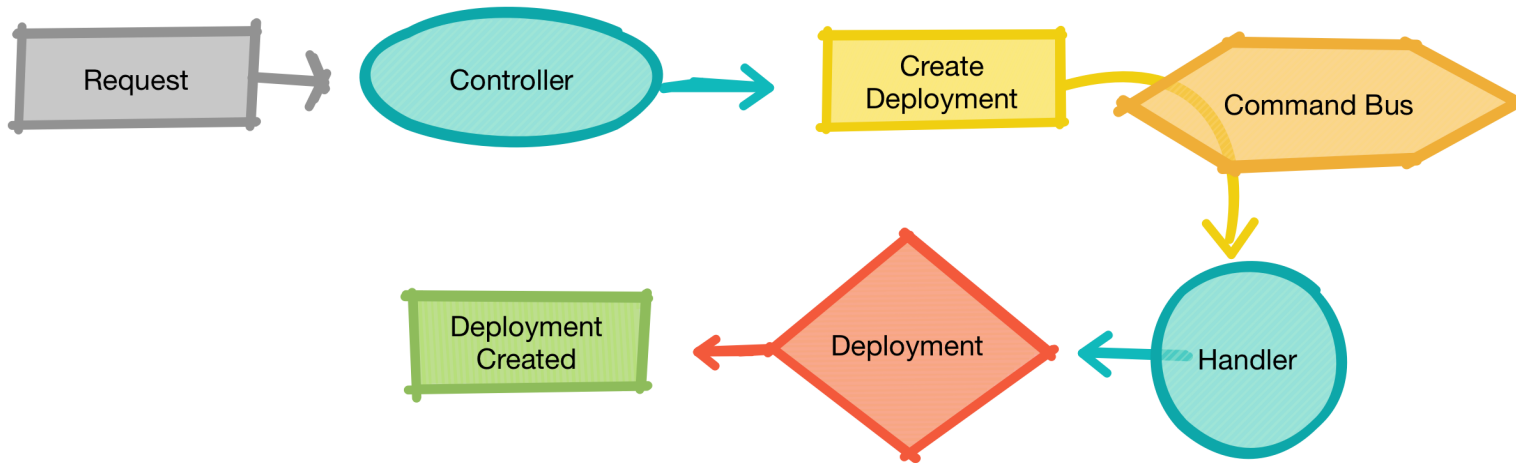
# "DEMO"

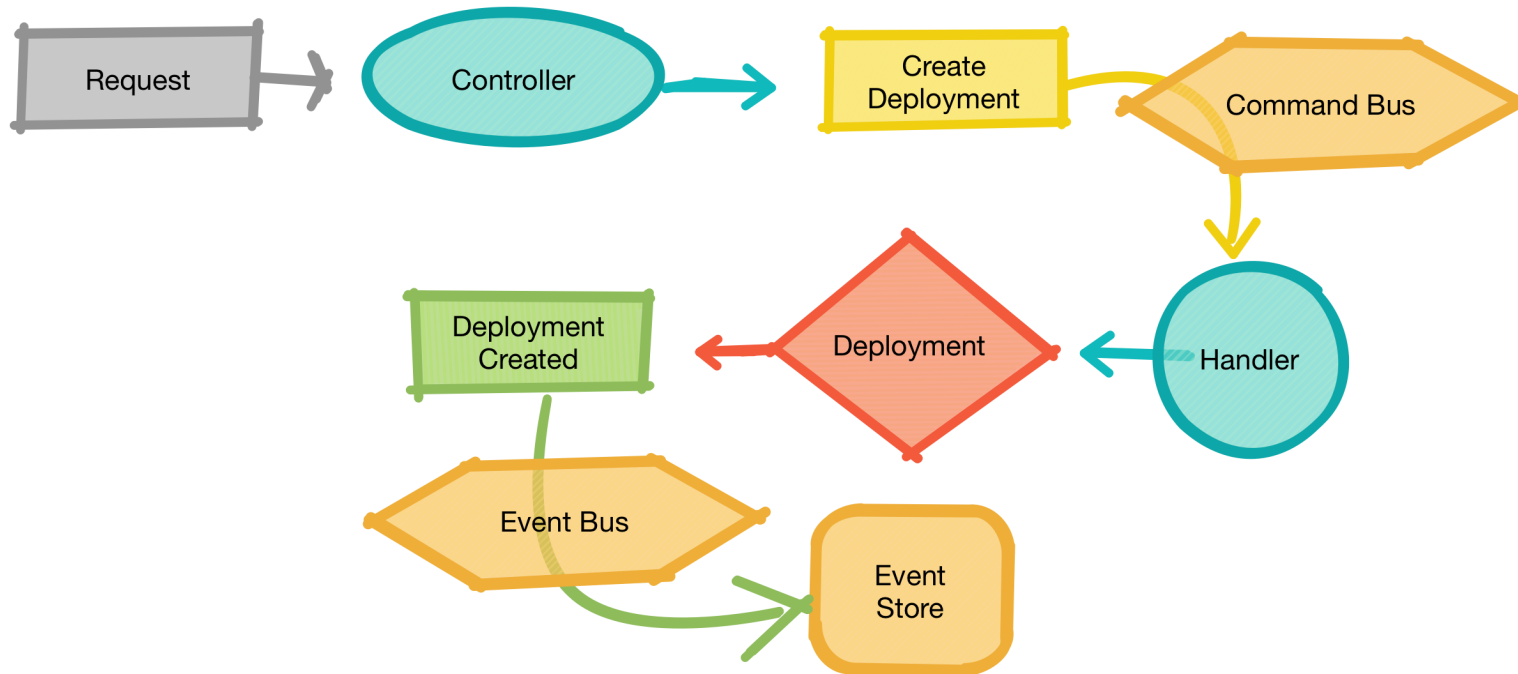
- create a deployment



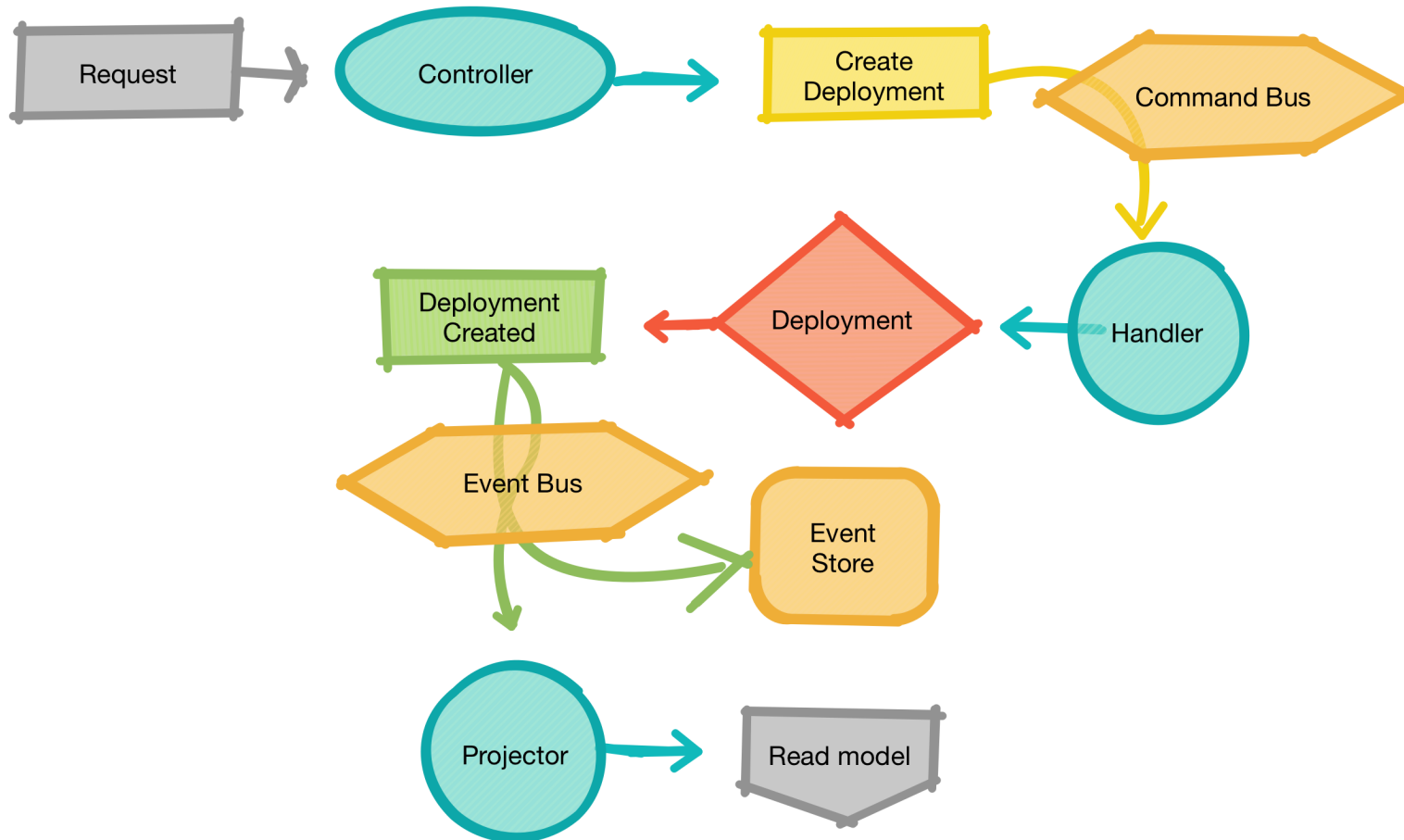


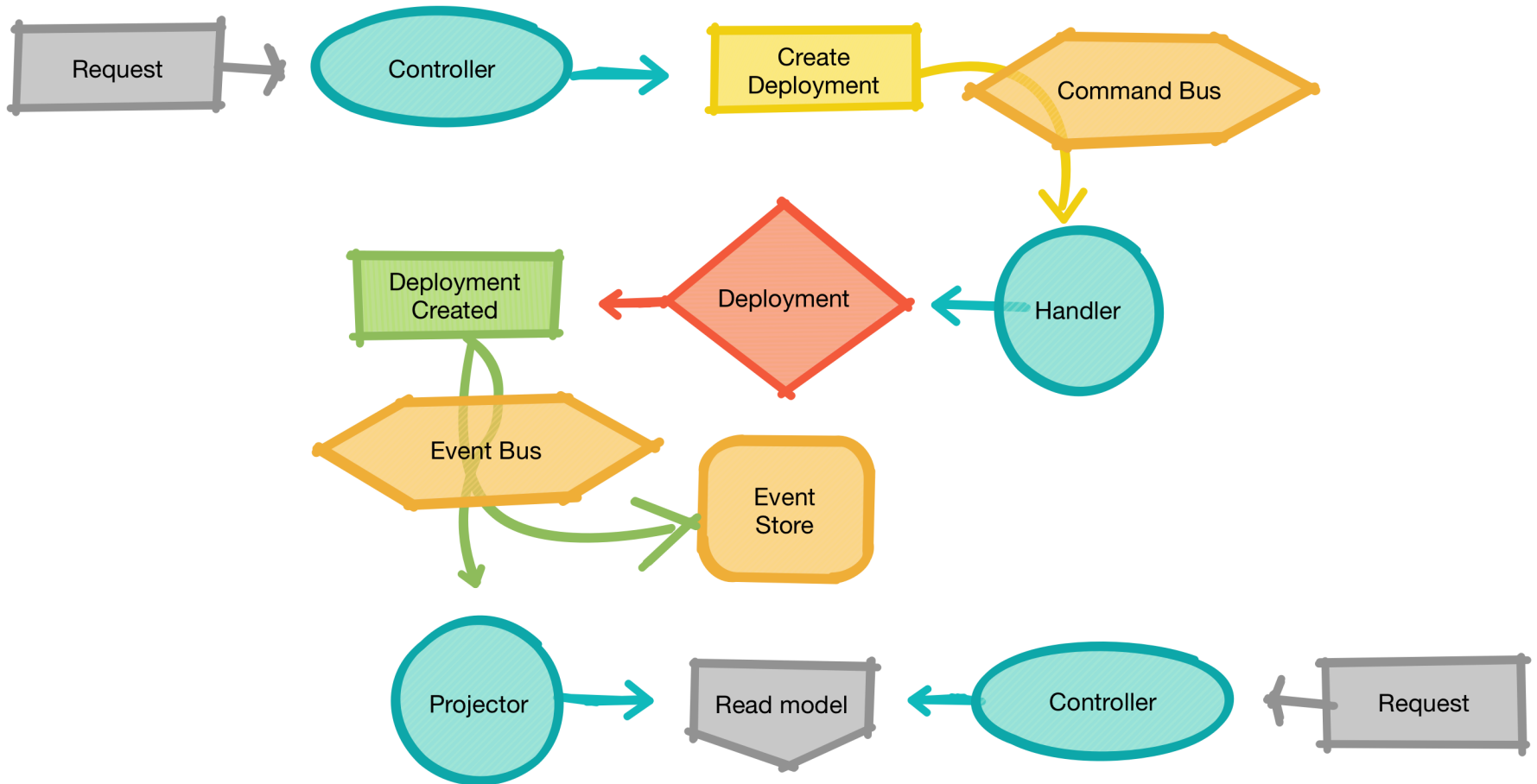












**exit (0)**