Event-Driven Architecture

and CQRS

micro-23

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Designed in LaTeX

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- Event sourcing
- Command Query Responsibility Segregation (CQRS)
- Event-Driven Architecture properties

Chapter #1:

Event sourcing

Event Producer
Event Router
Event Consumer

“ The fundamental idea of Event Sourcing is that of ensuring every change to the state of an application is captured in an event object, and that these event objects are themselves stored in the sequence they were applied for the same lifetime as the application state itself ”

— Martin Fowler

"Event sourcing - is the process of persisting business entities as a sequence of events."

Event Sourcing
Event Sourcing Architecture
CQRS
Event Driven

Event sourcing Example

Aggregate pattern

"In Event sourcing an application state represented by simple graph of objects(events) called Aggregate"

Event CQRS Properties

[Def Aggregate Projection Saga]

Projection pattern

"In Event Sourcing, Projections (also known as View Models or Query Models) provide a view of the underlying event-based data model. Often they represent the logic of translating the source write model into the read model. They are used in both read models and write models."

Saga

POST /orders
Order Controller
Order Service
1 create()
Create Order Saga
2 create()
approve() 6
<<aggregate>>
Order
Order Service
Reserve Credit Command
3
Message Broker
Customer Service Command Channel
Create Order Saga Reply channel
Reserve Credit Response
5
Command Handler
Customer Service
4 reserve()
<<aggregate>>
Customer
Customer Service

Chapter #2:

Command Query Responsibility Segregation (CQRS)

Command
Check out
Command handler
Checked out
EventStoreDB
Query result
Query
Get order overview
Query handler

Clients
Commands
Queries
Aggregates
Business Logic
Event Store
Query
Handlers
Materialised
Views
Event Streaming
Event Bus

How to synchronize READ and WRITE model?

- Database trigger
- Message queue

Chapter #3:

Event-Driven Architecture properties

Event Store

Primary key	Attributes			
Partition key: PK				
123	created	type	last_events	version
	2021-02-01T12:00:00	Widget	{ 4: {"name":"WidgetStockUpdated"} }	2

"Event Store contains all events. These events can be fetched to build Event Projection"

Event Bus

"An event bus is a mediator that transfers a message from a sender to a receiver. In this way, it provides a loosely coupled communication way between objects, services and applications."

https://kafka.apache.org

https://aws.amazon.com/eventbridge

Event Store vs. Event Bus

"Event Store can be represented by any storage of events, while Event Bus can also spread them out to the related subsribers."

Event Replay

Less Control than Rq-Rs

Consistency

Complexity

"For some situations, this separation can be valuable, but beware that for most systems ES & CQRS adds risky complexity."

Event Sourcing vs. CRUD

Hexagonal Architecture