WIND HIM UP

Mit SAGA service-übergreifende Transaktionen verwalten

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ÜBER MICH

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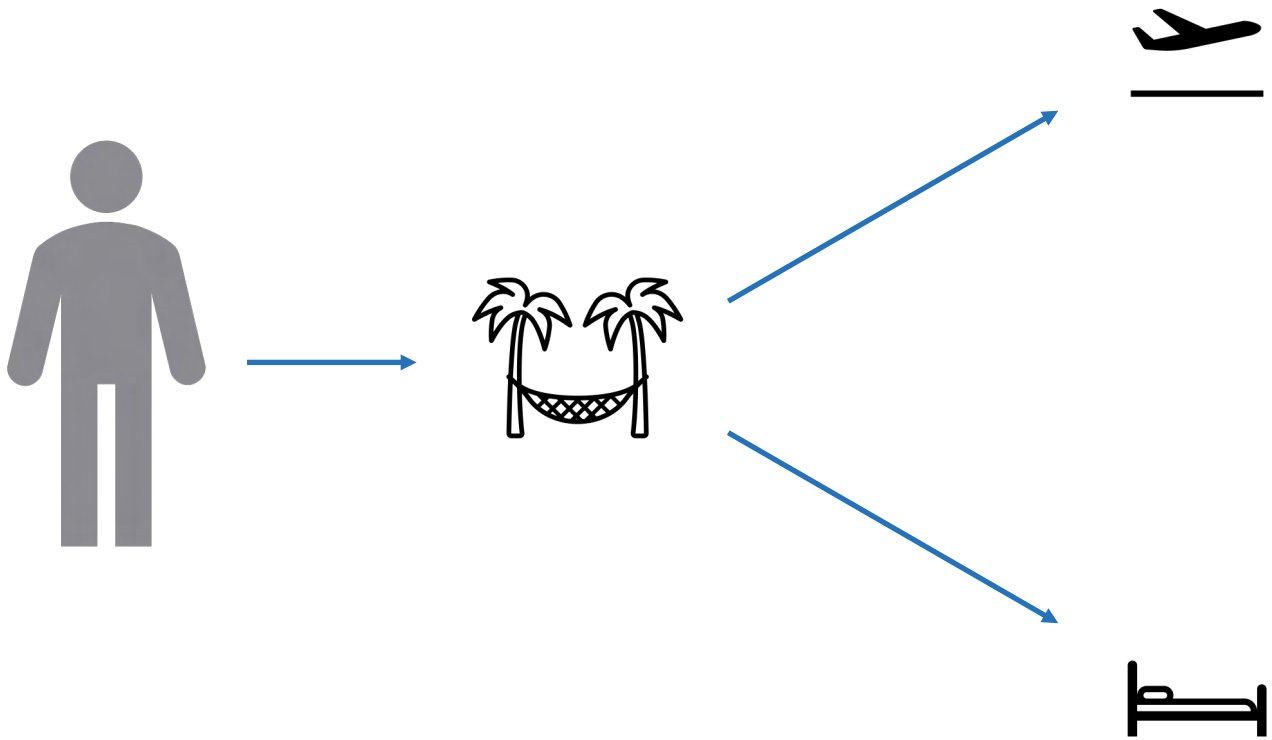
AGENDA

1. Szenario / Problemstellung
2. Distributet Transactions
3. Saga-Pattern
4. Choreography-based Saga
5. Orchestration-based Saga
6. Edge Cases
7. Coding

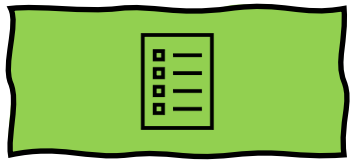
SZENARIO / PROBLEMSTELLUNG

SZENARIO



MIT SAGA SERVICE-ÜBERGREIFENDE TRANSAKTIONEN VERWALTEN

SERVICES

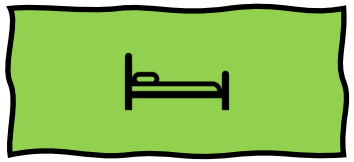


BookingService

- REST-API für Frontend
- Koordinator der Buchung

FlightBooking Service

- handelt Flugbuchung

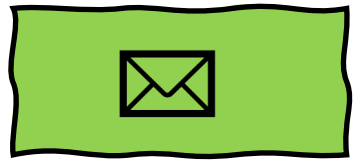


HotelBooking Service

- handelt Hotelbuchung

PaymentService

- Validiert Kreditkarte
- handelt Zahlung



Confirmation Service

- Bestätigungs-Email

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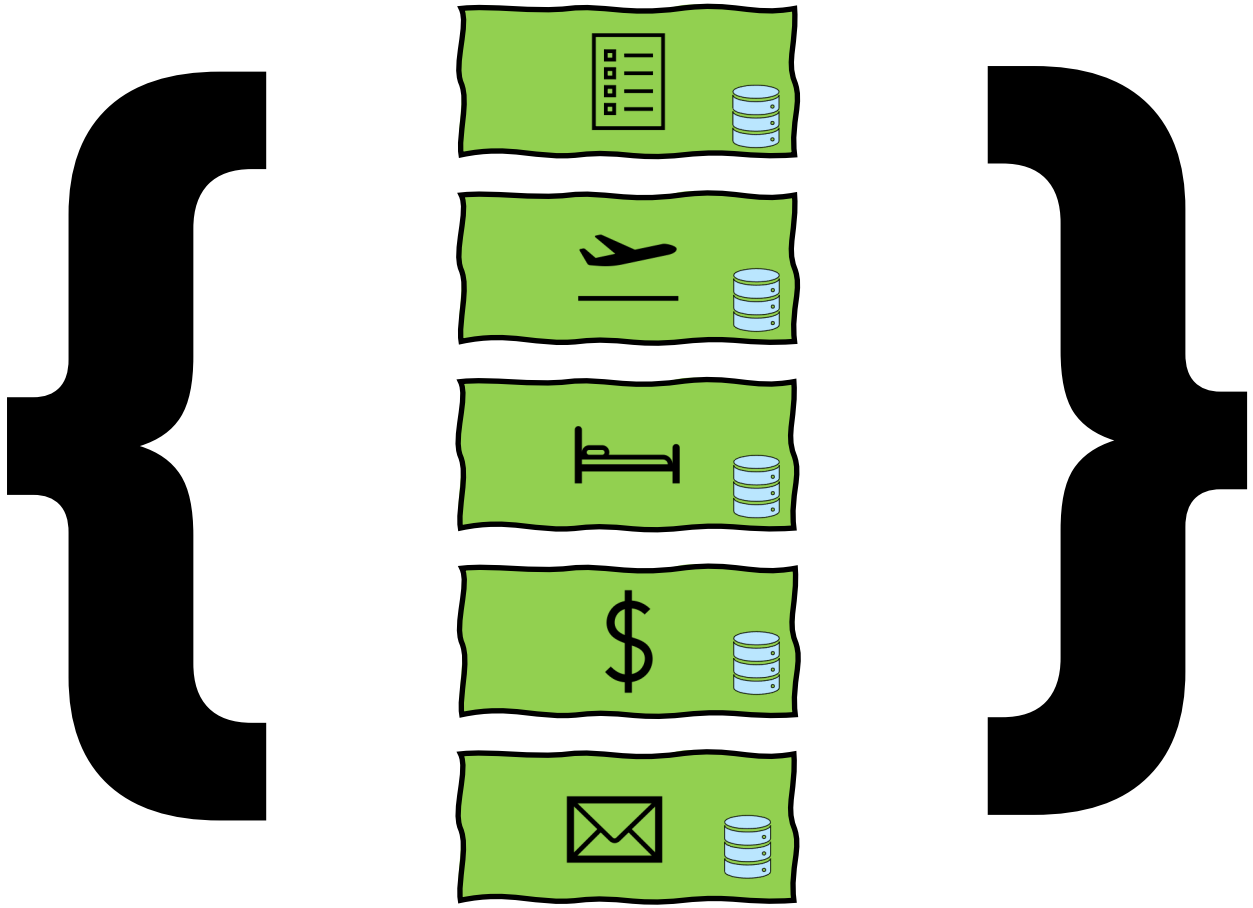
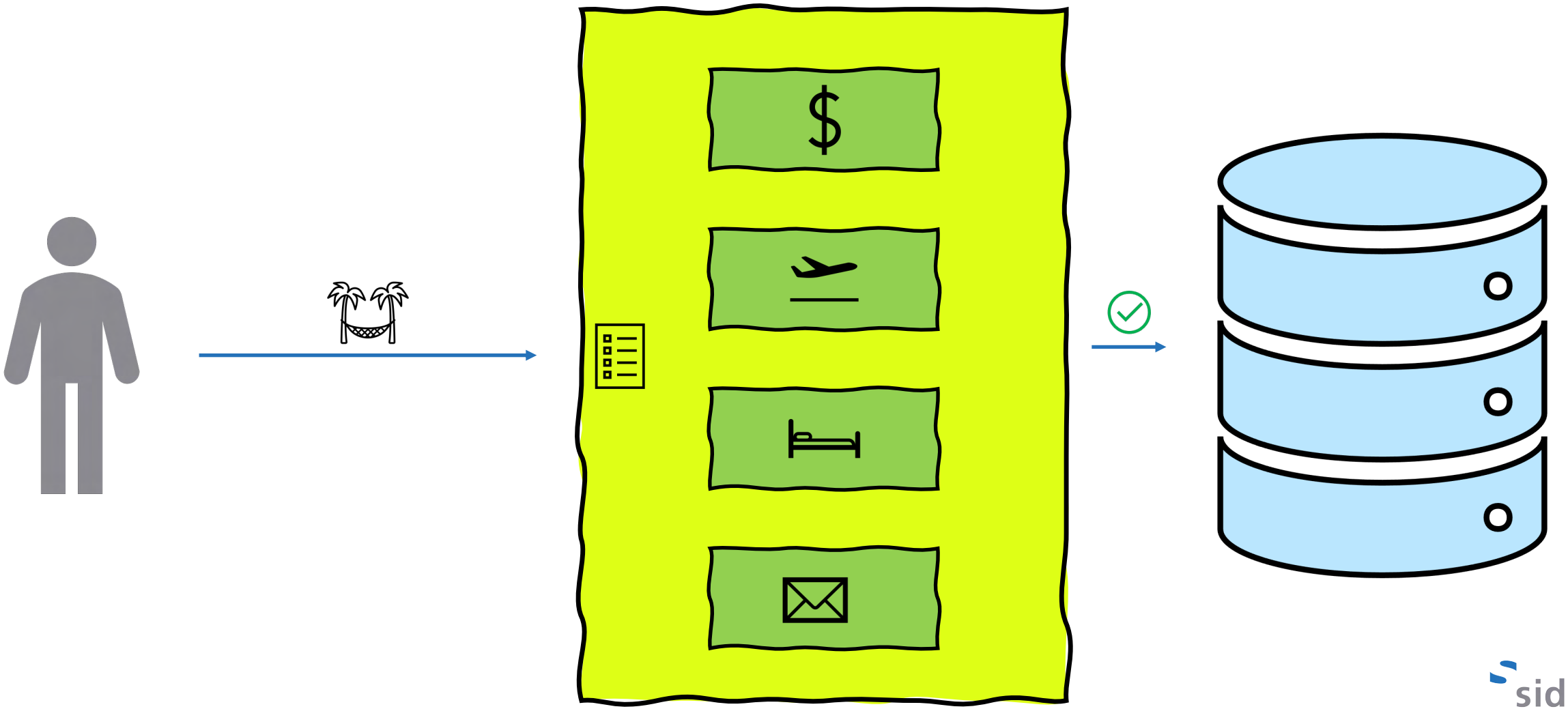
MIT SAGA SERVICE-ÜBERGREIFENDE TRANSAKTIONEN VERWALTEN

TRANSAKTION

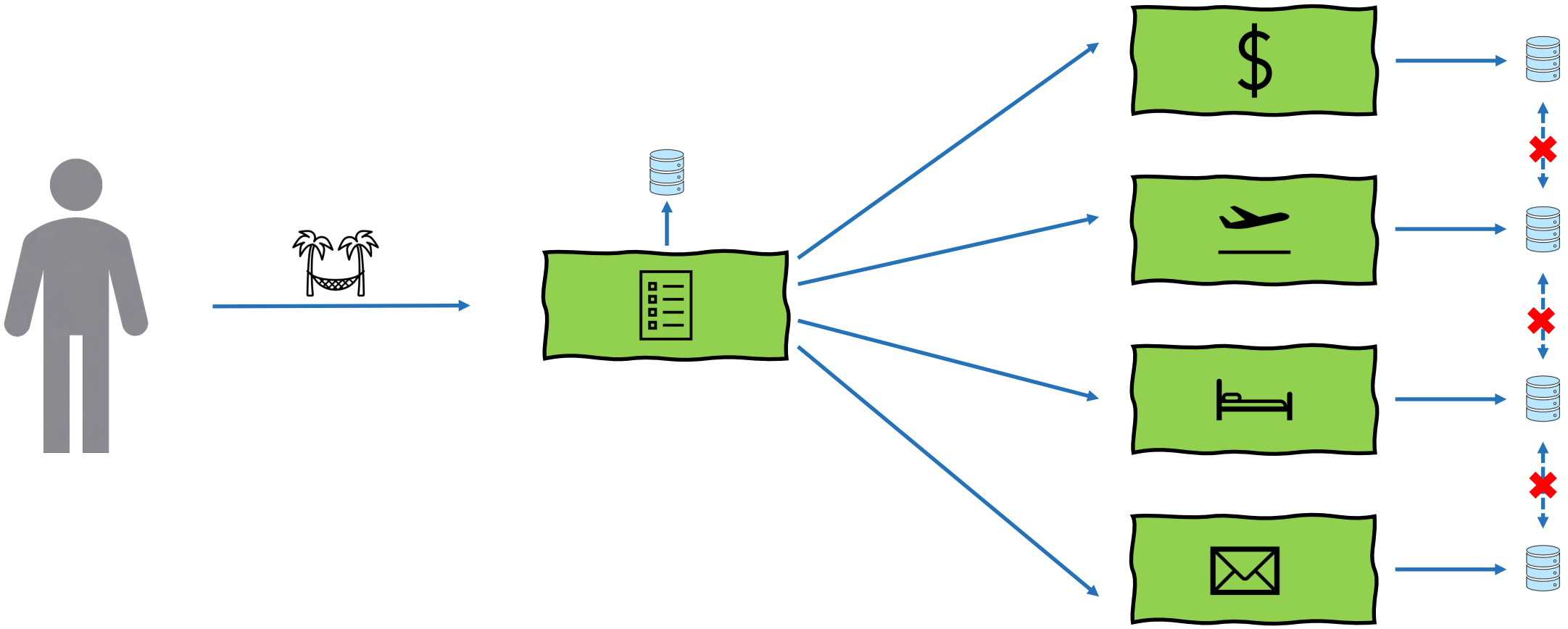


MONOLITH



MIT SAGA SERVICE-ÜBERGREIFENDE TRANSAKTIONEN VERWALTEN

MICROSERVICE-ANSATZ



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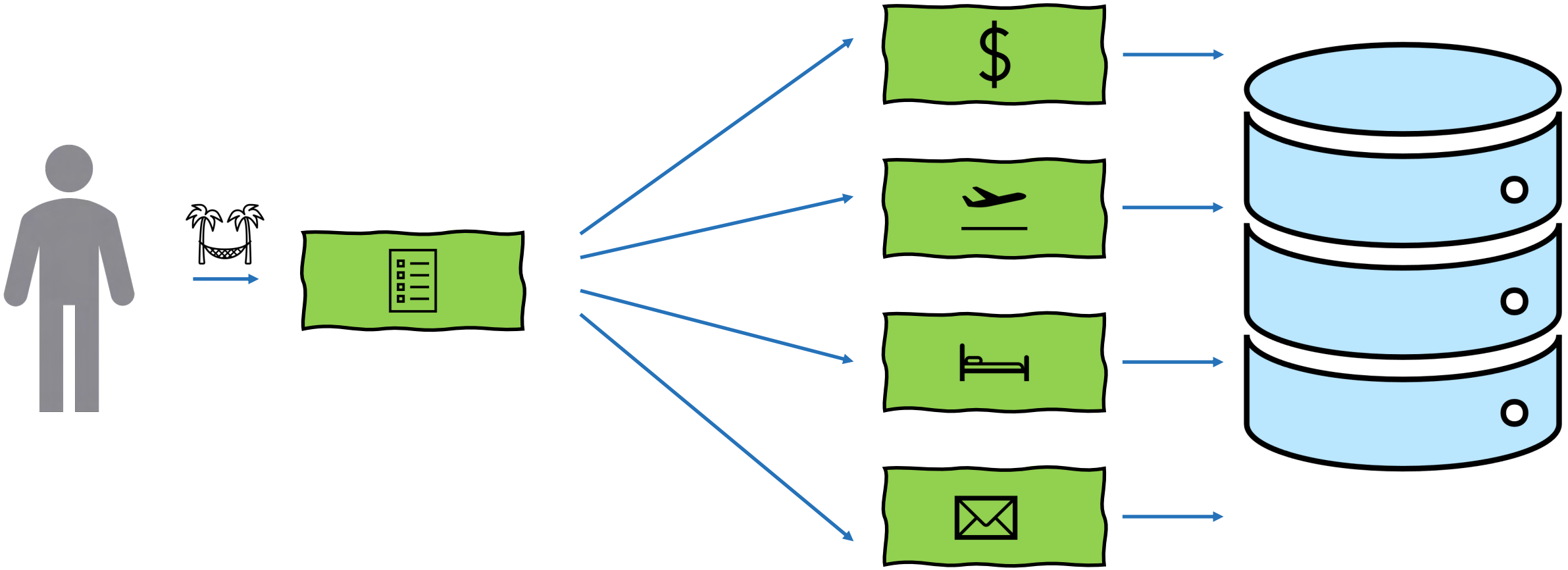
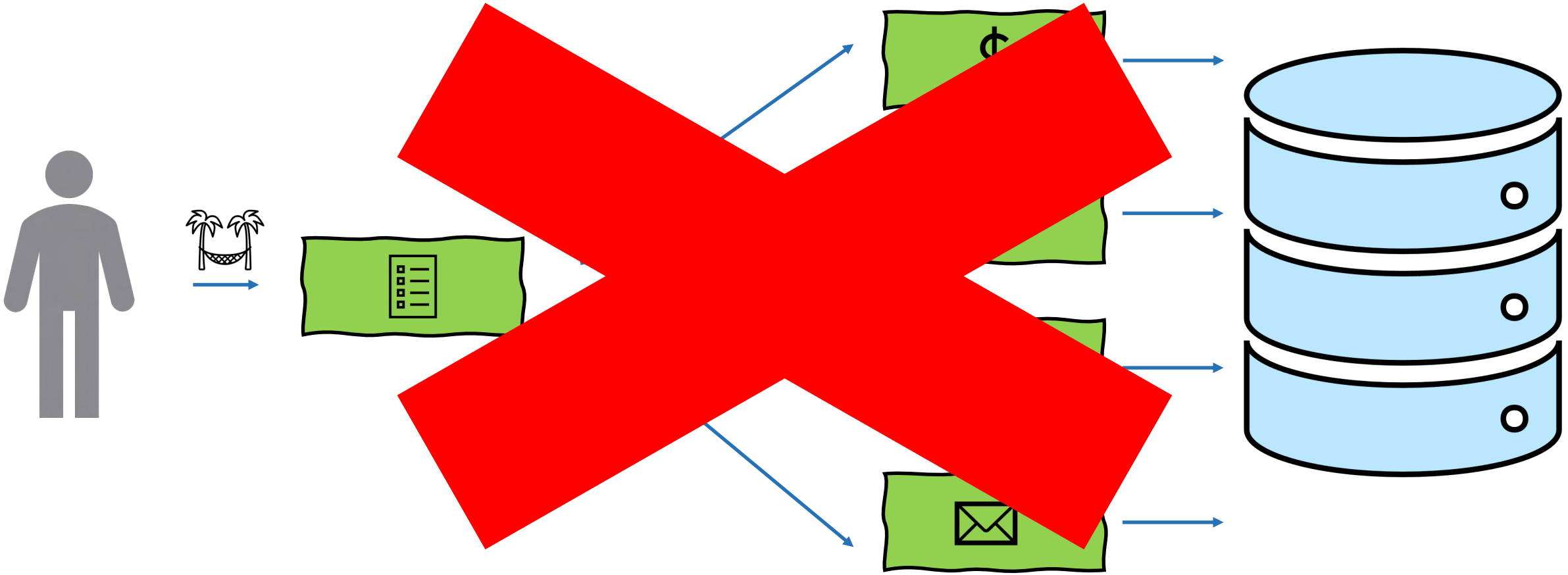
MICROSERVICE-ANSATZ



MIT SAGA SERVICE-ÜBERGREIFENDE TRANSAKTIONEN VERWALTEN

MICROSERVICE-ANSATZ



A – C – I - D

A tomicity

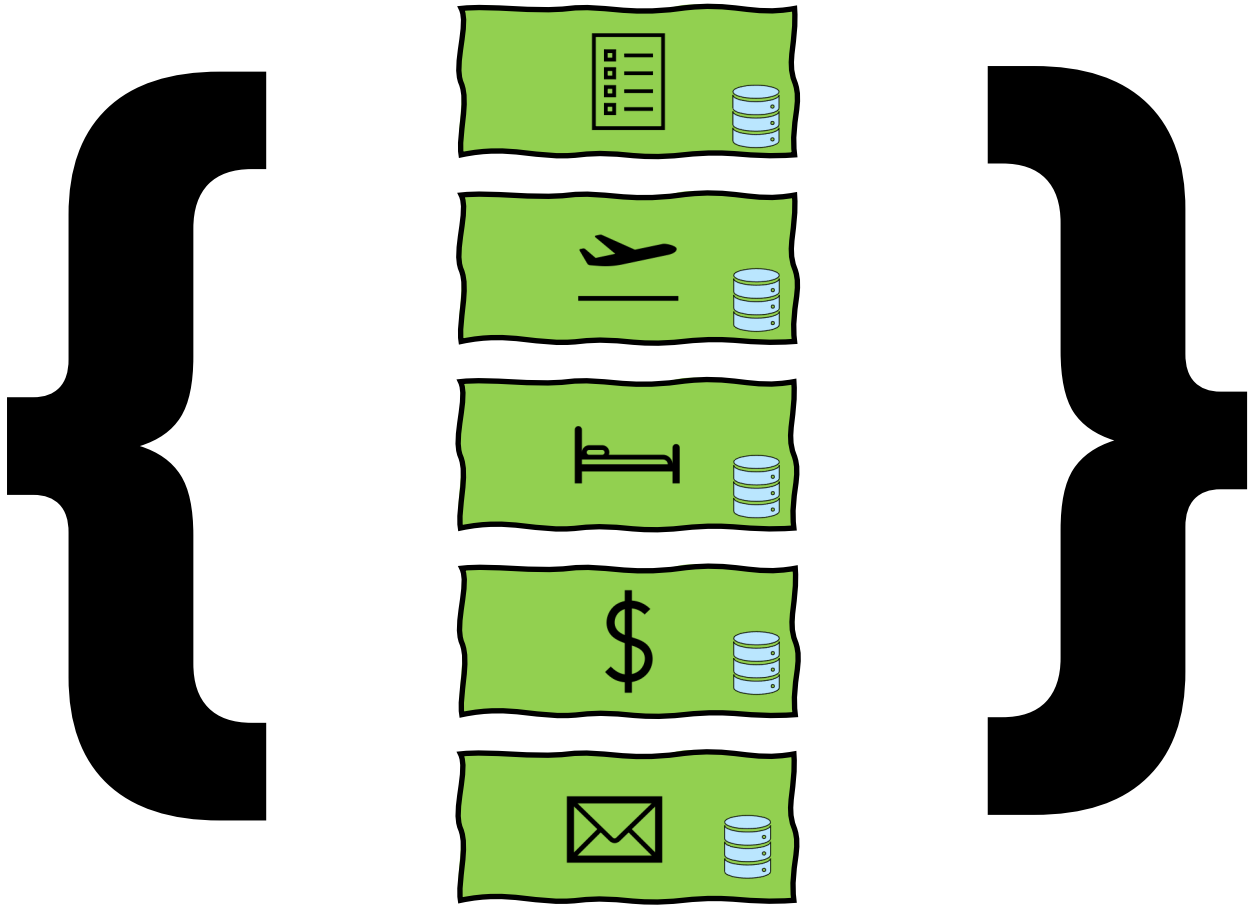
C onsistency

I solation

D urability

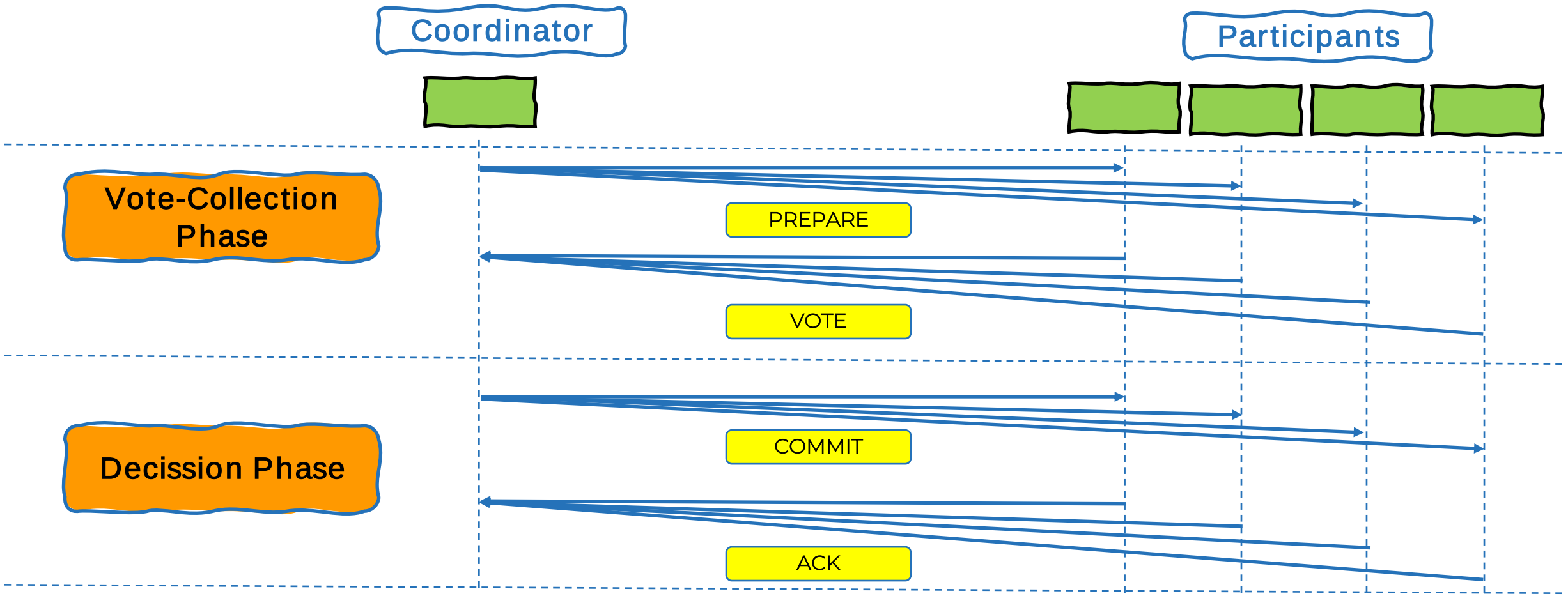
MIT SAGA SERVICE-ÜBERGREIFENDE TRANSAKTIONEN VERWALTEN

TRANSAKTION



DISTRIBUTED TRANSACTIONS

2-PHASE-COMMIT (2PC)



SAGA-PATTERN

MIT SAGA SERVICE-ÜBERGREIFENDE TRANSAKTIONEN VERWALTEN

SAGA PATTERN

- SAGA is a sequence of local transactions that are coordinate using messaging
- Each local transaction updates data in a single service
- On failure due to the violation of a business rule, it must execute compensation transactions to explicitly undo changes

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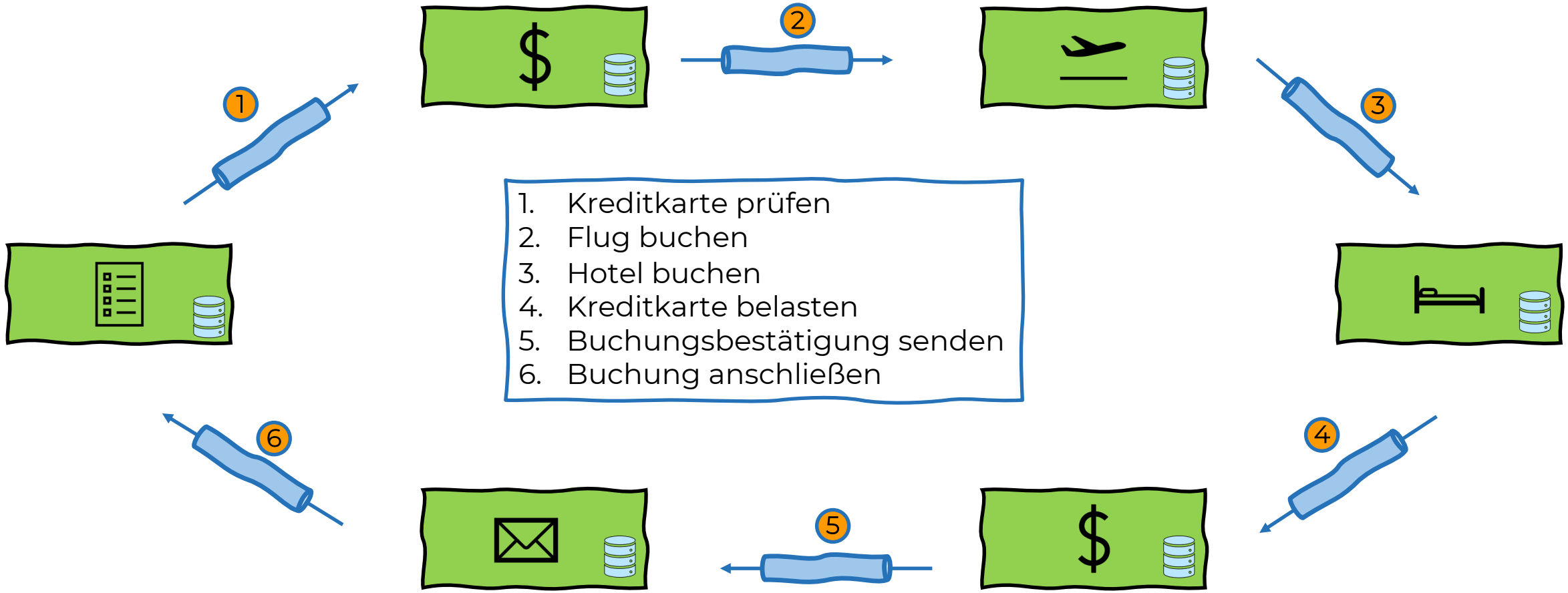
MIT SAGA SERVICE-ÜBERGREIFENDE TRANSAKTIONEN VERWALTEN

SAGA PATTERN



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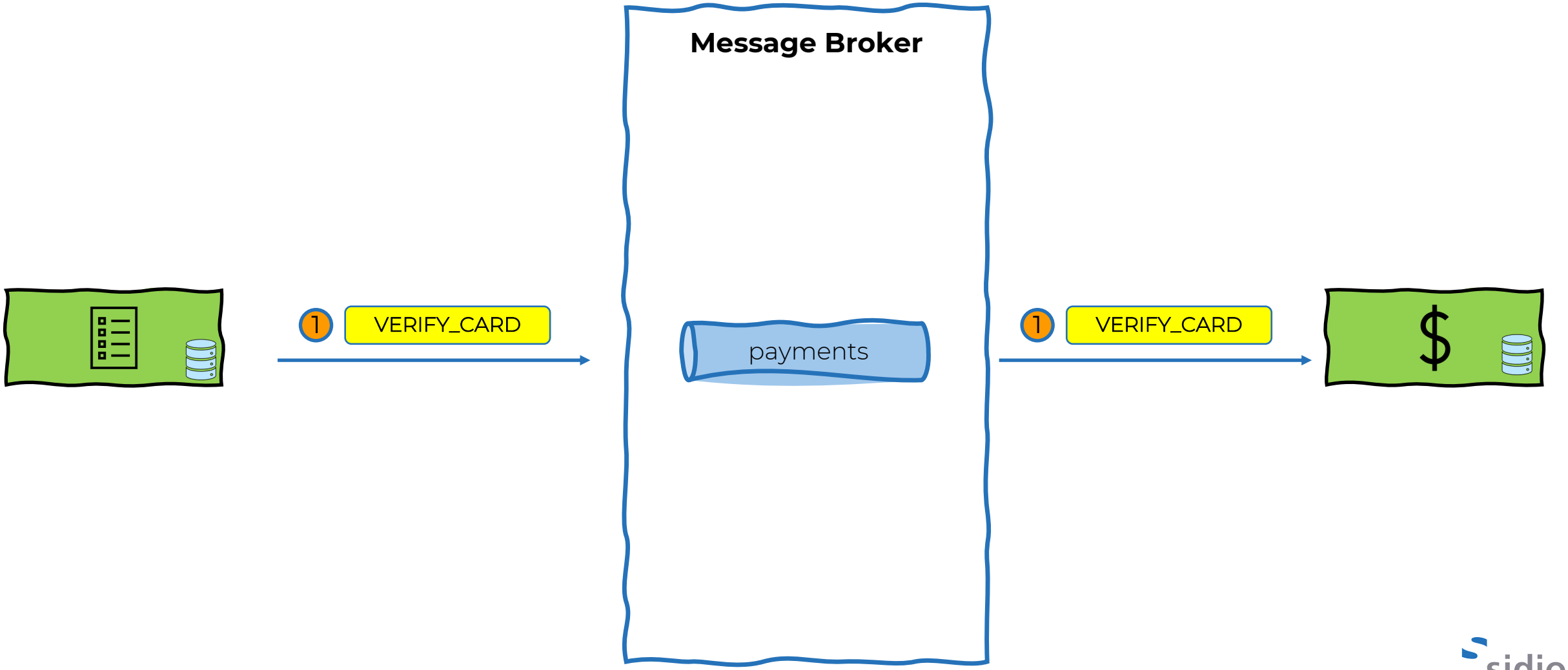
CHOREOGRAPHY BASED SAGA

CHOREOGRAPHY-BASED SAGA

1. VERIFY_CARD



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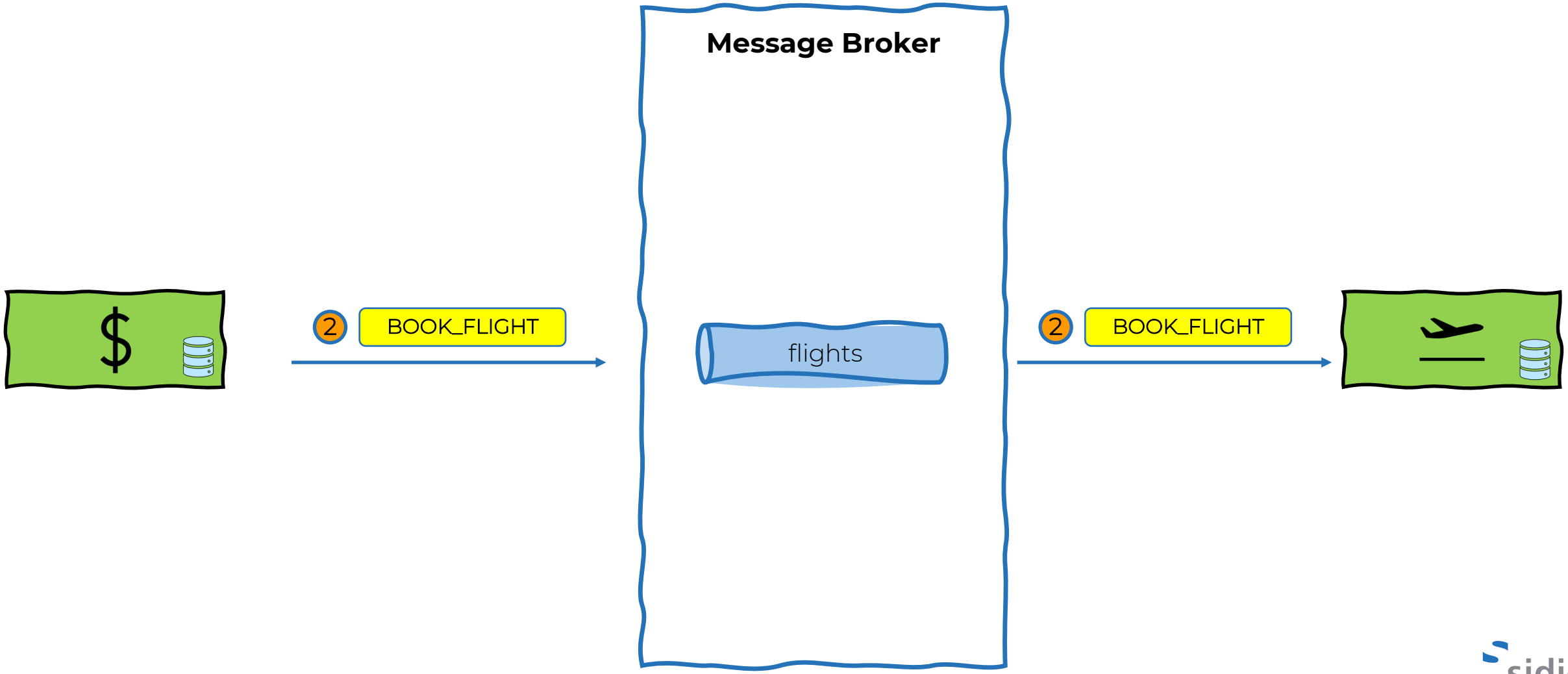
CHOREOGRAPHY-BASED SAGA

2. BOOK_FLIGHT



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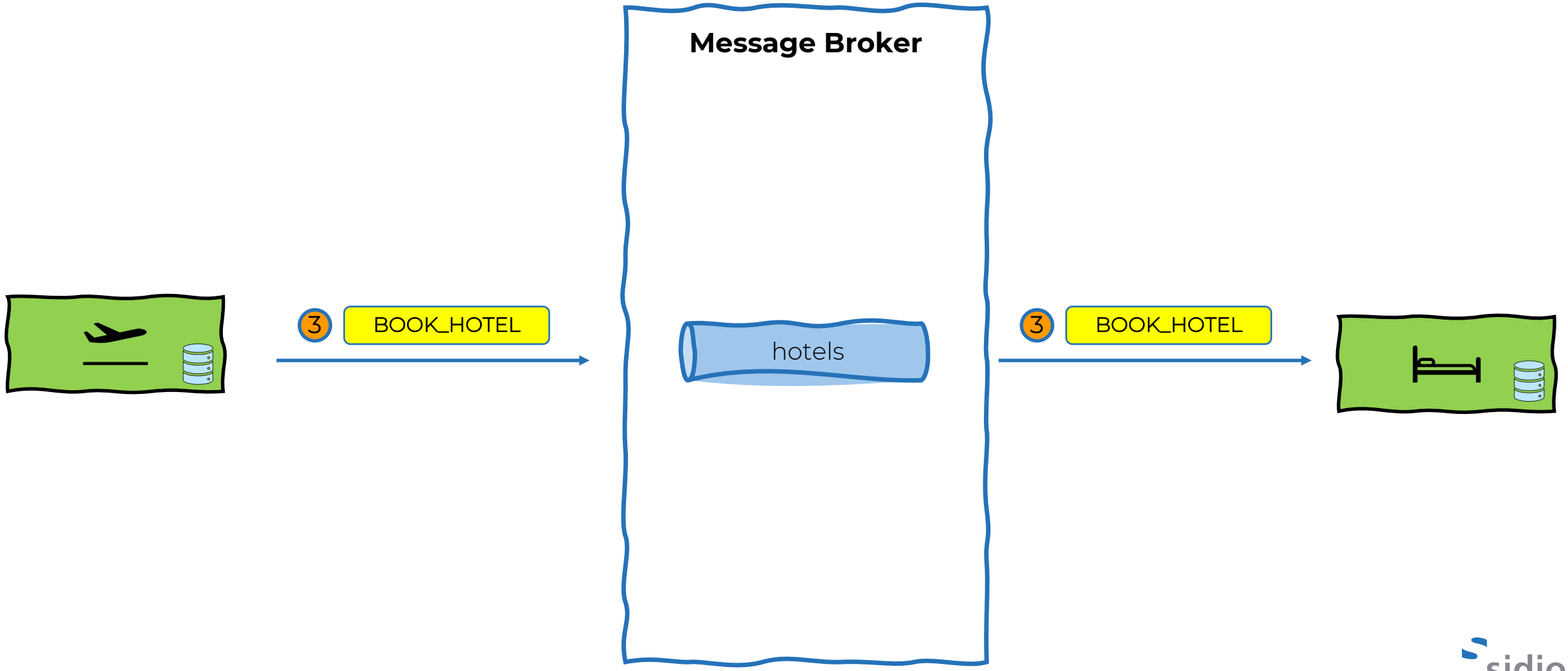
CHOREOGRAPHY-BASED SAGA

3. BOOK_HOTEL



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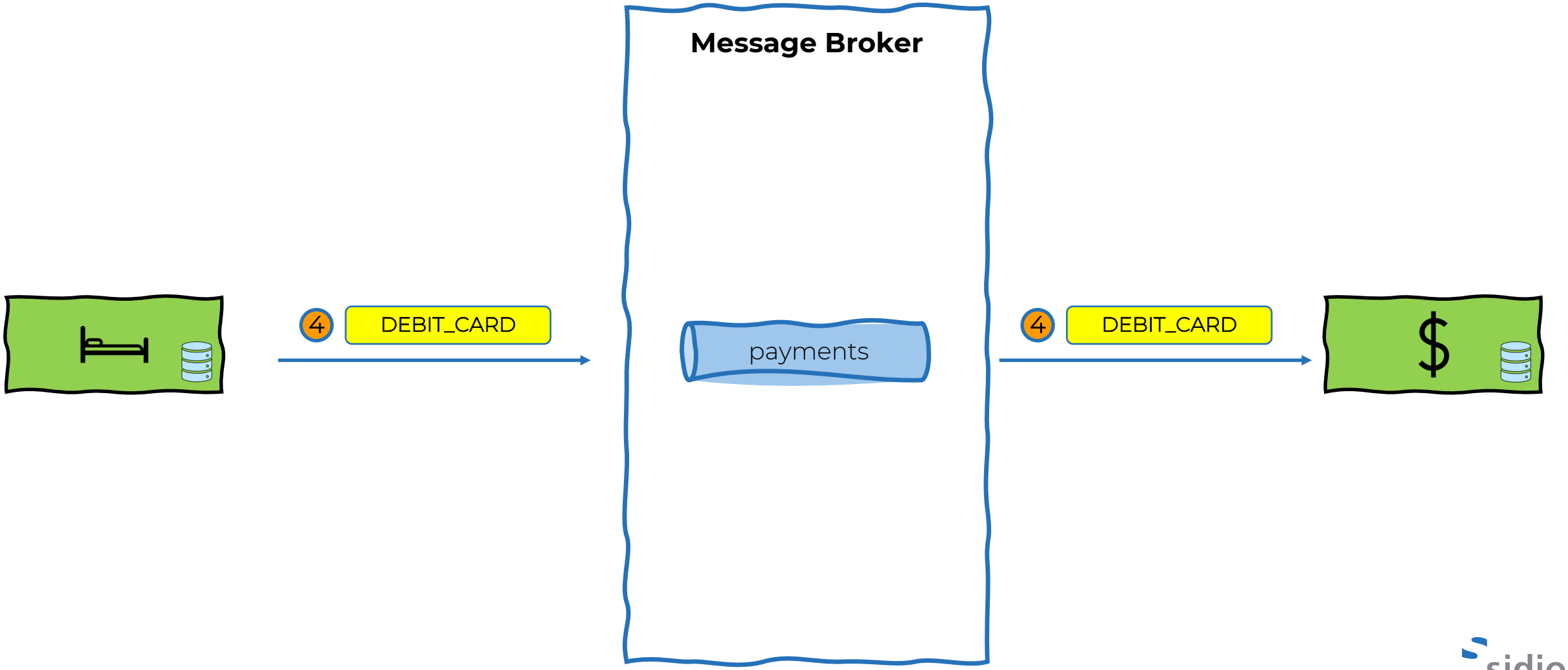
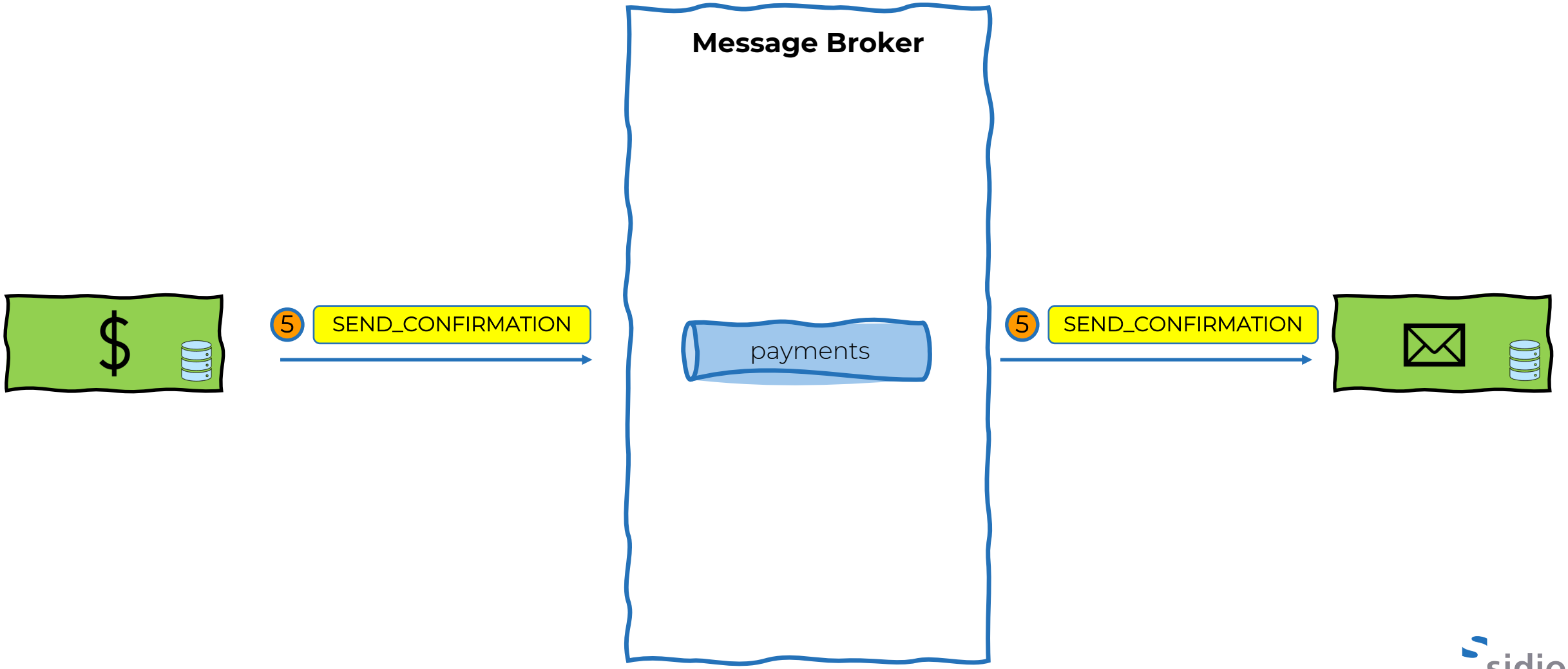
CHOREOGRAPHY-BASED SAGA

4. DEBIT_CARD



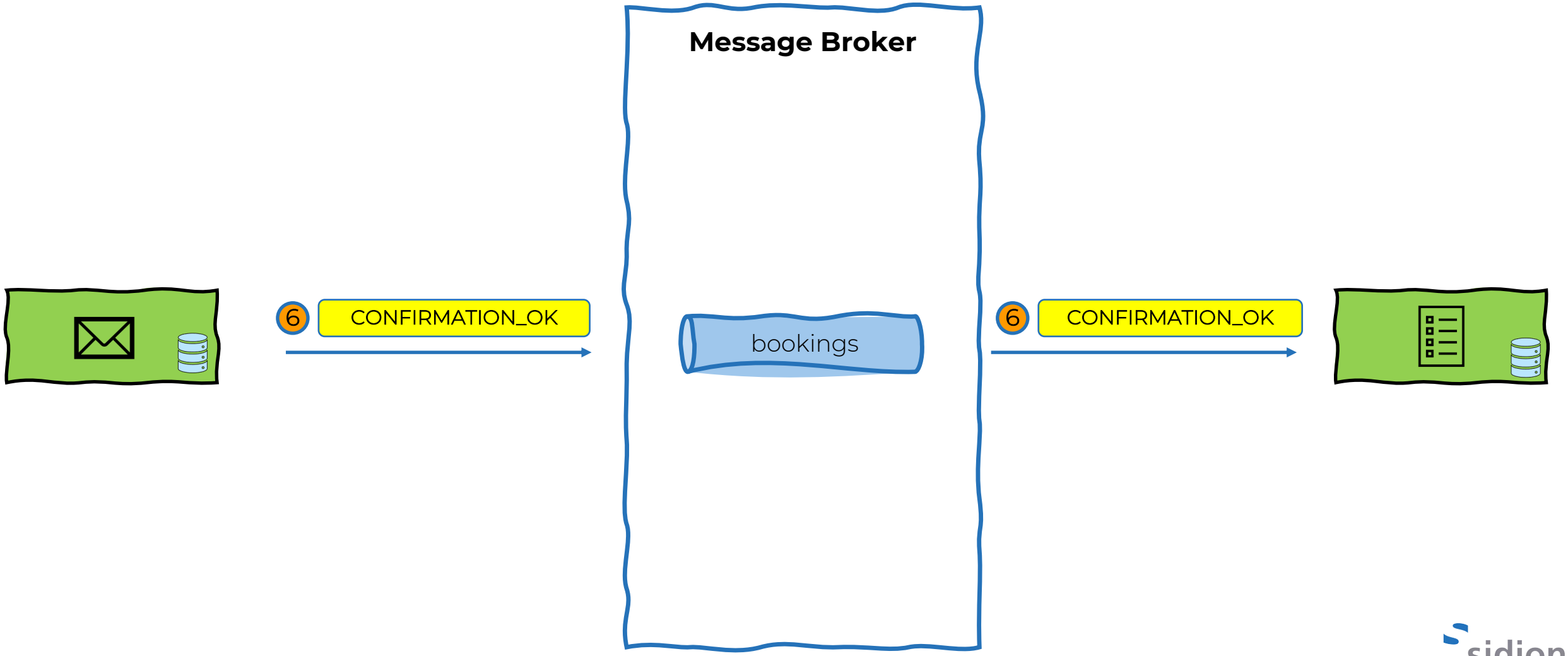
CHOREOGRAPHY-BASED SAGA

5. SEND_CONFIRMATION



CHOREOGRAPHY-BASED SAGA

6. CONFIRMATION_OK



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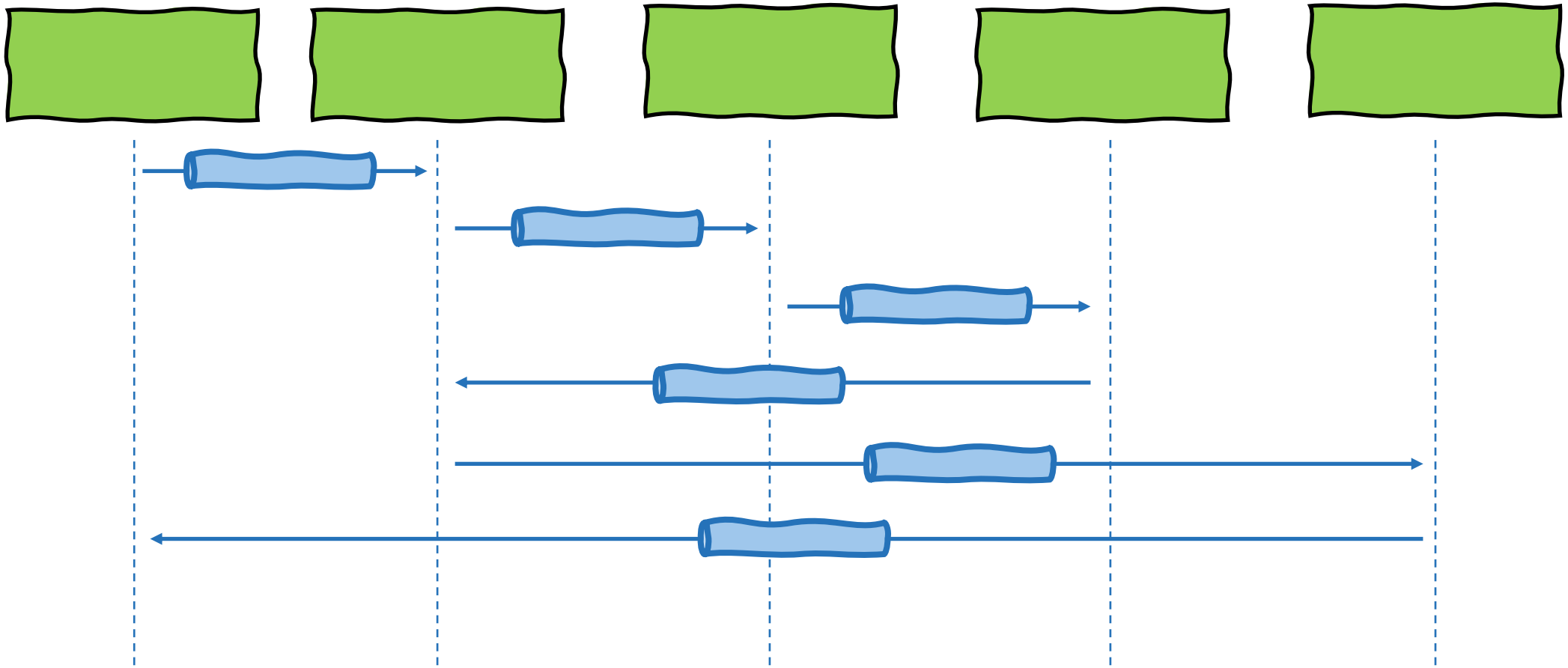
MIT SAGA SERVICE-ÜBERGREIFENDE TRANSAKTIONEN VERWALTEN

CHOREOGRAPHY-BASED SAGA



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SAGA PATTERN

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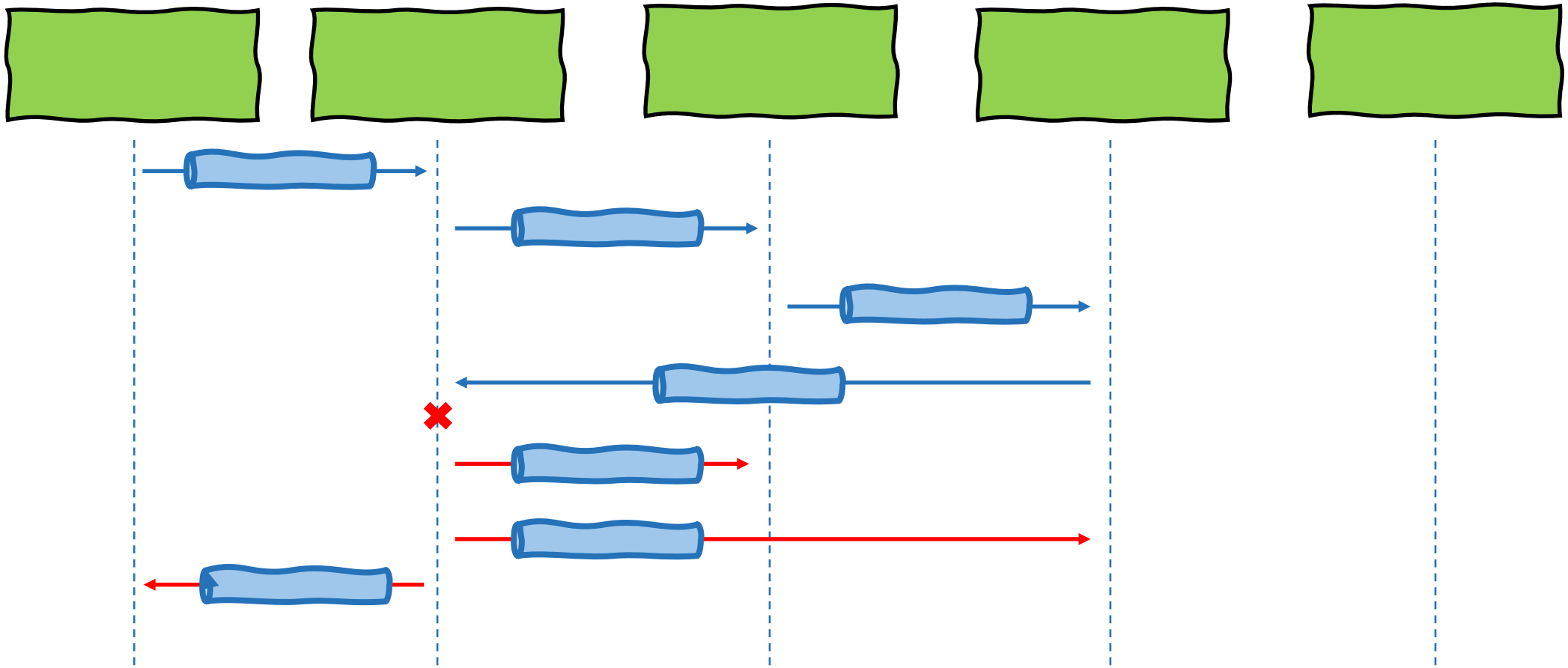
MIT SAGA SERVICE-ÜBERGREIFENDE TRANSAKTIONEN VERWALTEN

CHOREOGRAPHY-BASED SAGA



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CHOREOGRAPHY-BASED SAGA

VORTEILE / NACHTEILE

Einfachheit

Loose Koppelung

Schwieriger zu verstehen

Zyklische Abhängigkeiten zwischen den Services

Risiko der zu engen Koppelung

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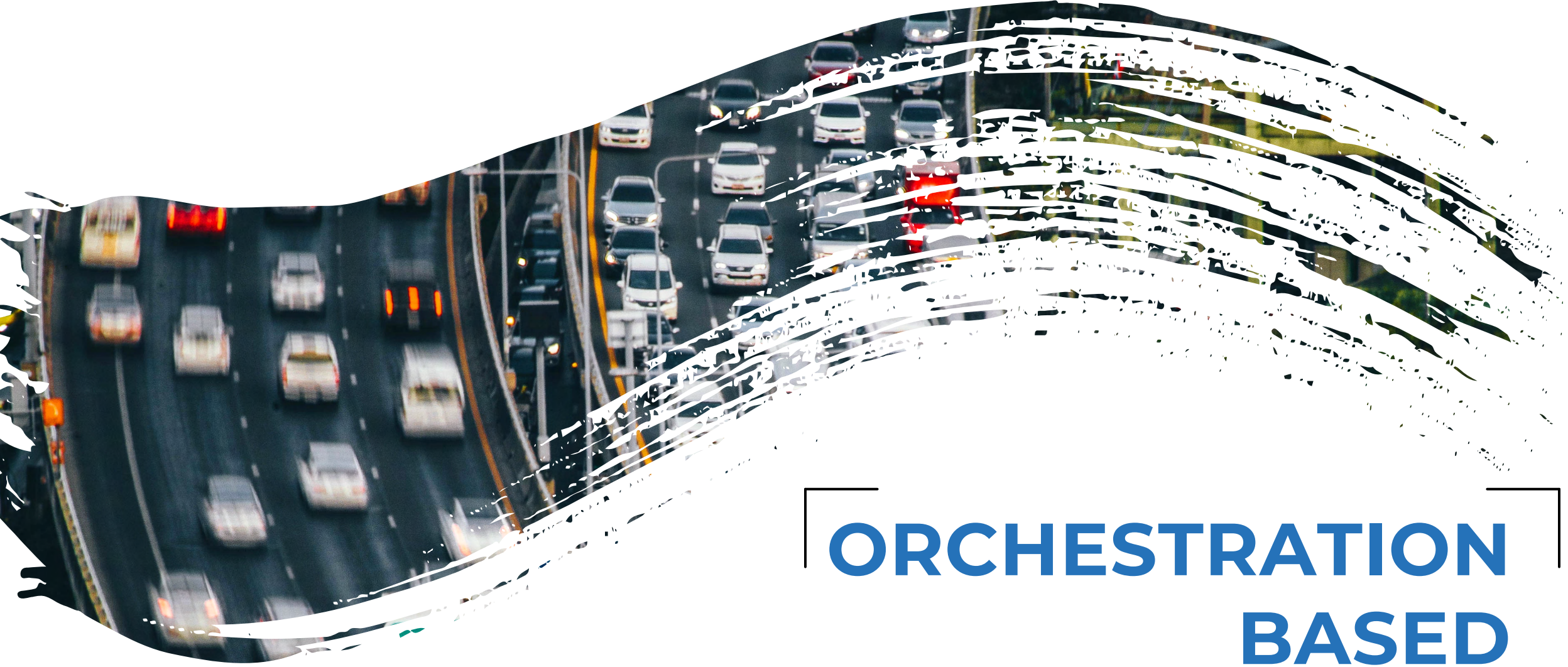


ORCHESTRATION BASED SAGA

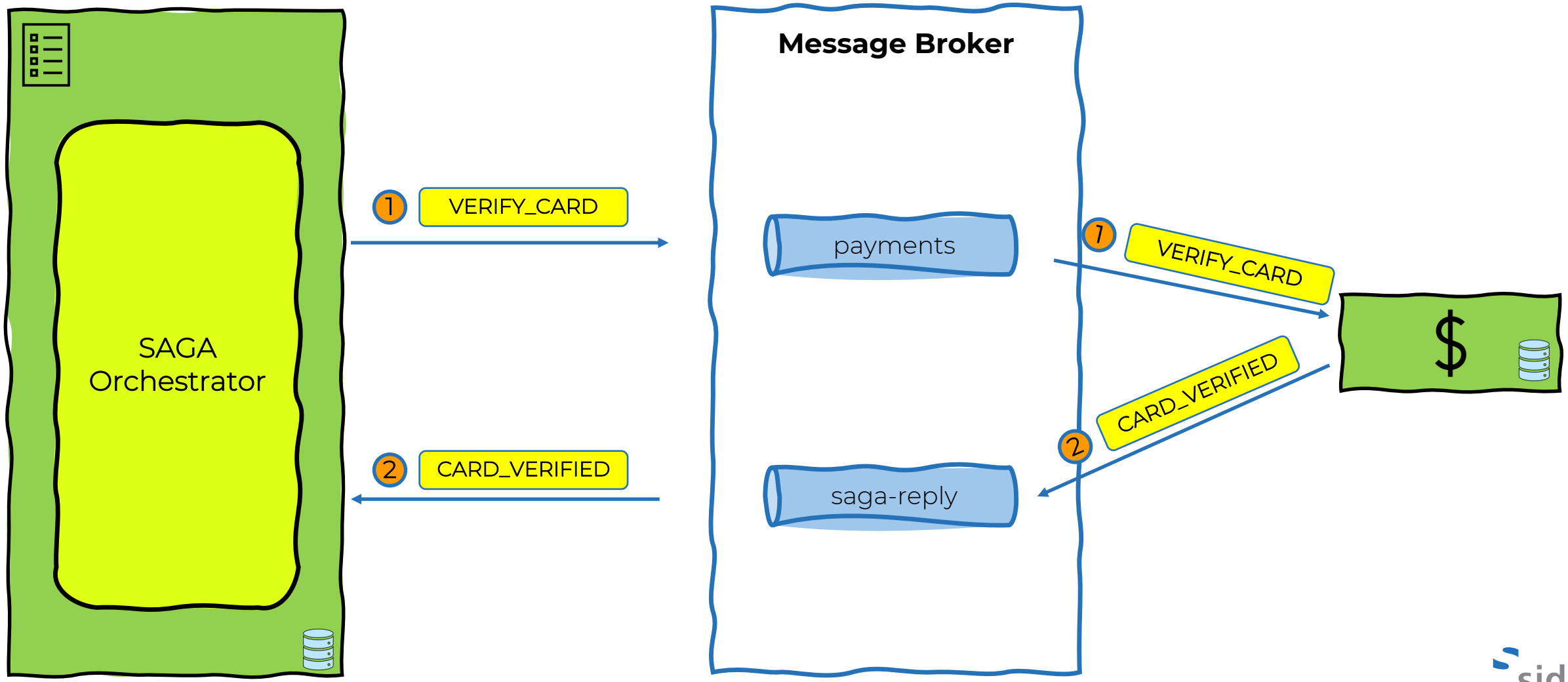
MIT SAGA SERVICE-ÜBERGREIFENDE TRANSAKTIONEN VERWALTEN

ORCHESTRATION-BASED SAGA

- eigenständige Orchestrator-Klasse mit der einzigen Verantwortung die Saga-Teilnehmer ihre Aufgaben zuzuweisen
- Command / Async-Reply-Style-Interaction

ORCHESTRATION-BASED SAGA

1. VERIFY_CARD



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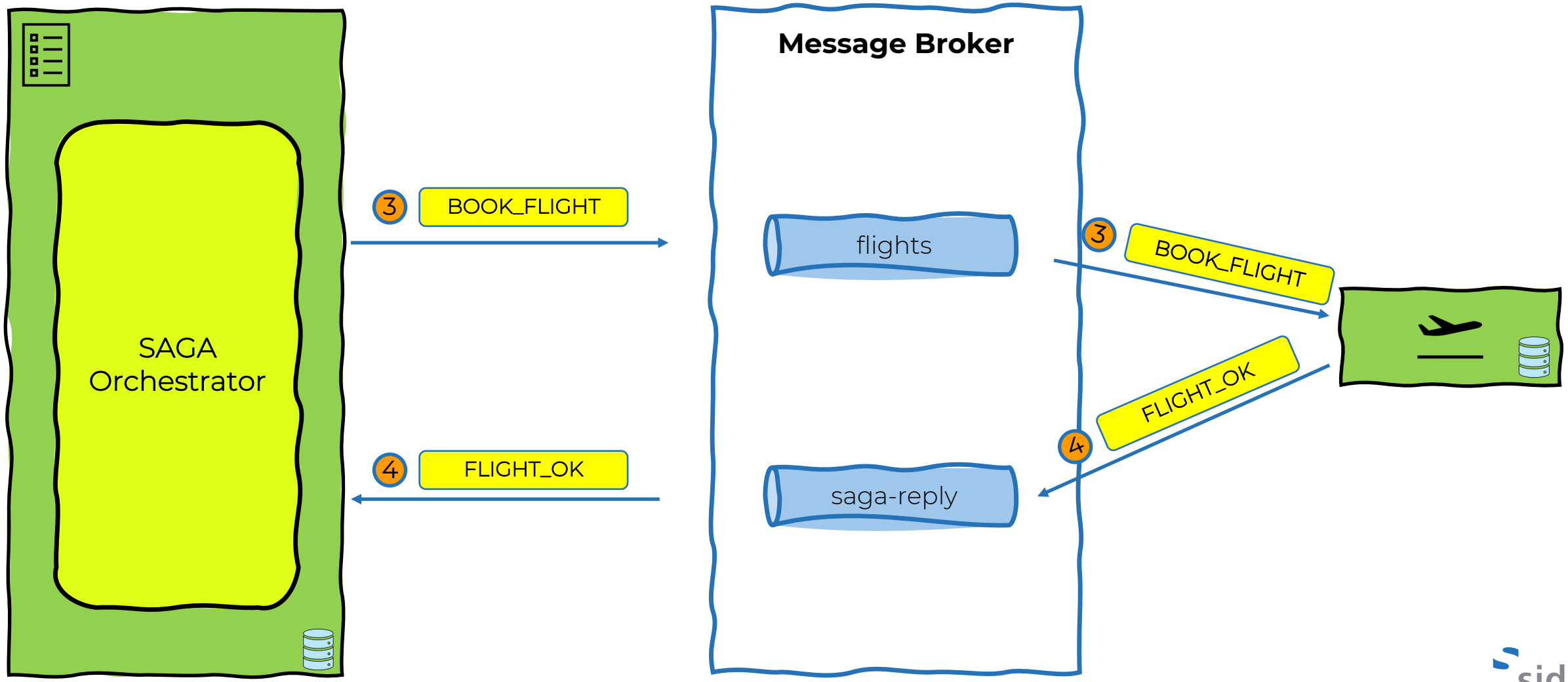
ORCHESTRATION-BASED SAGA

2. BOOK_FLIGHT



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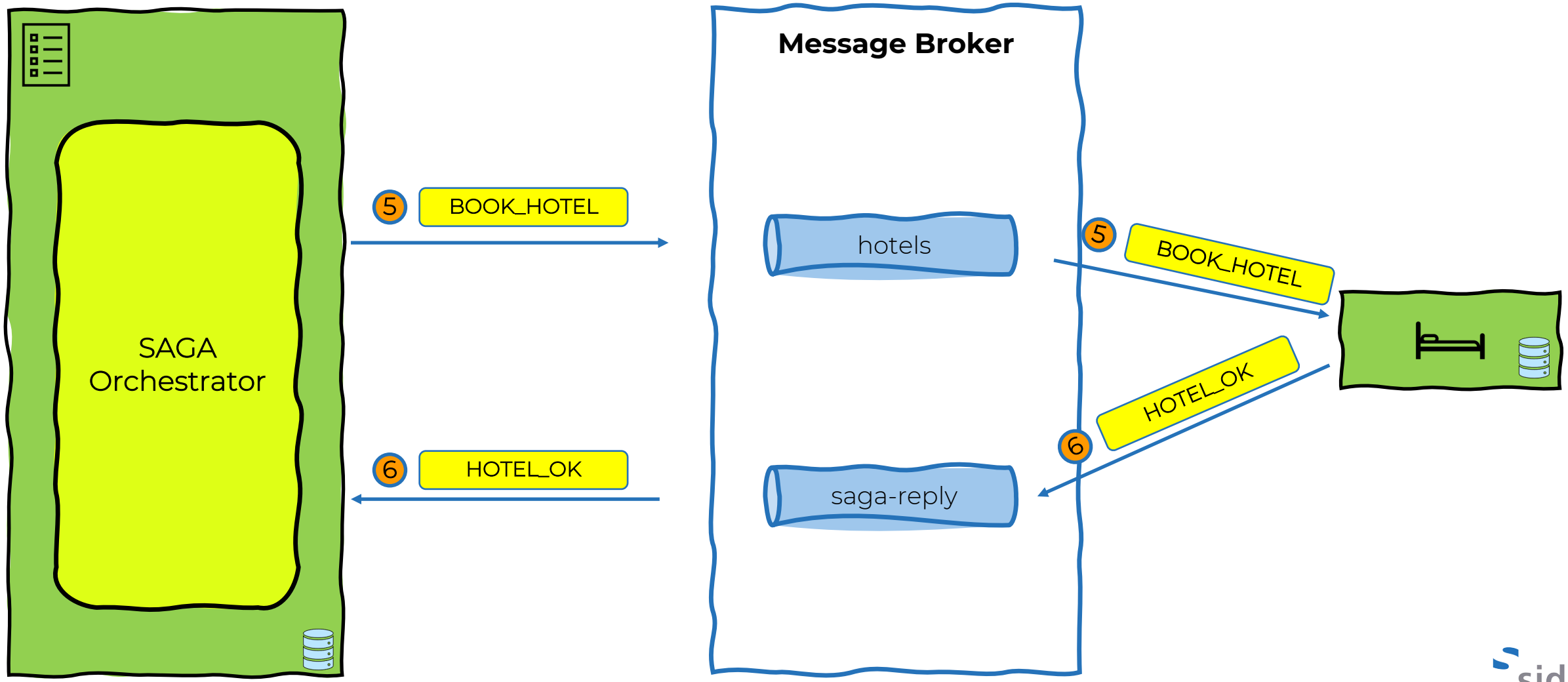
ORCHESTRATION-BASED SAGA

3. BOOK_HOTEL



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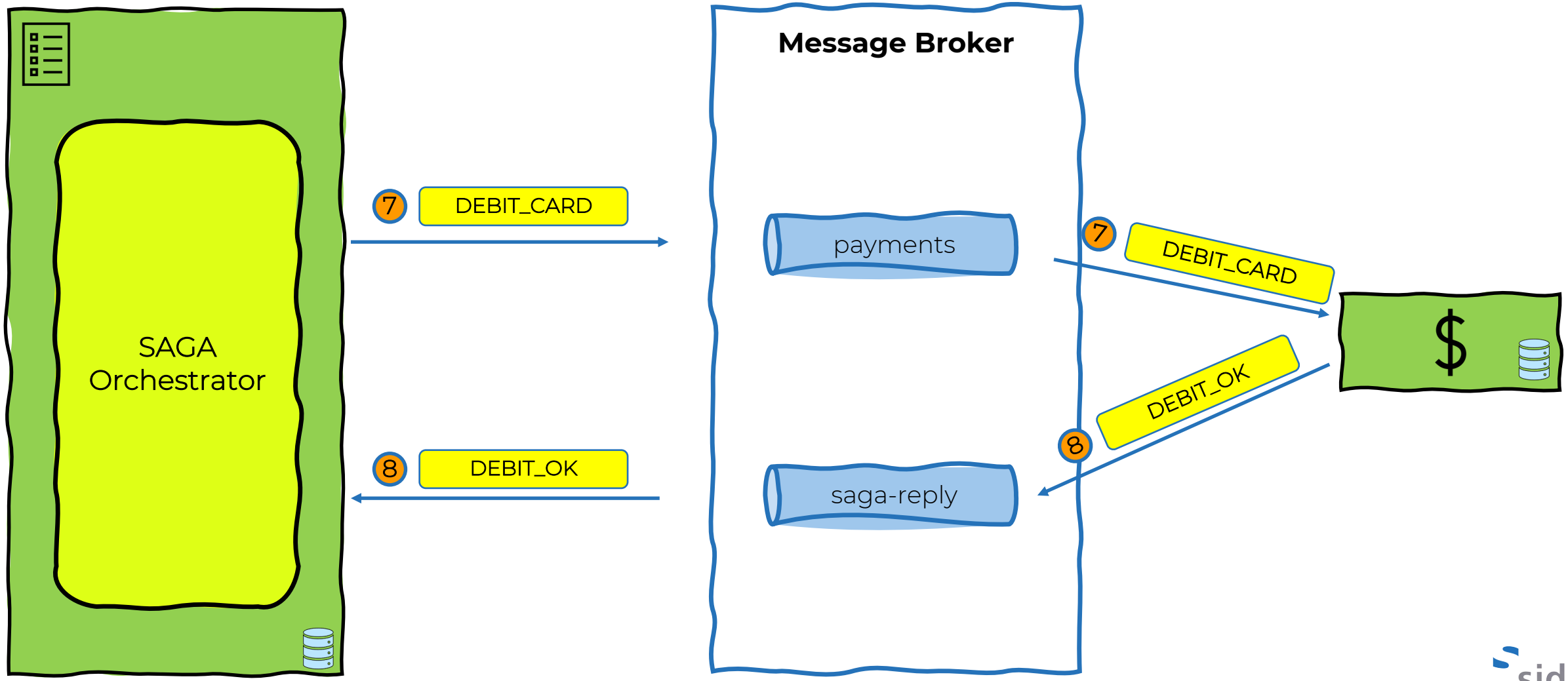
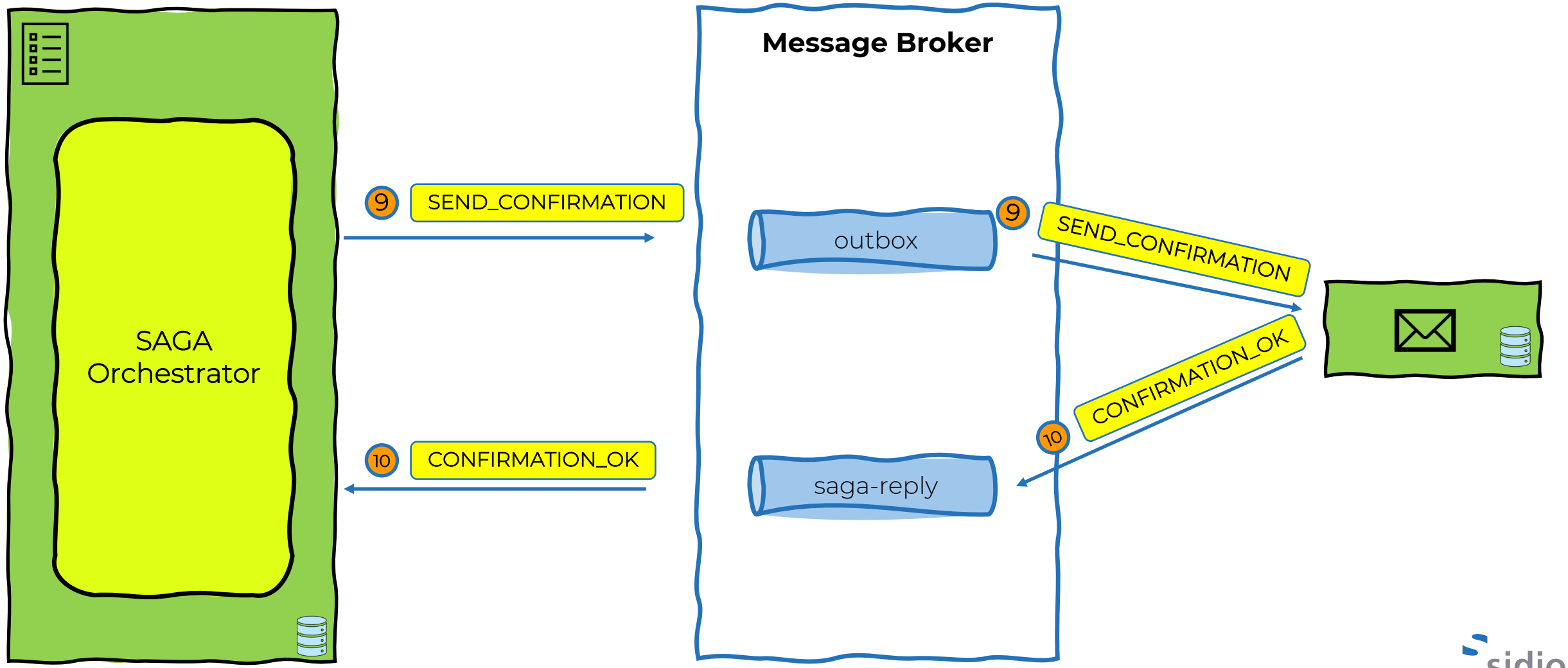
4. DEBIT_CARD

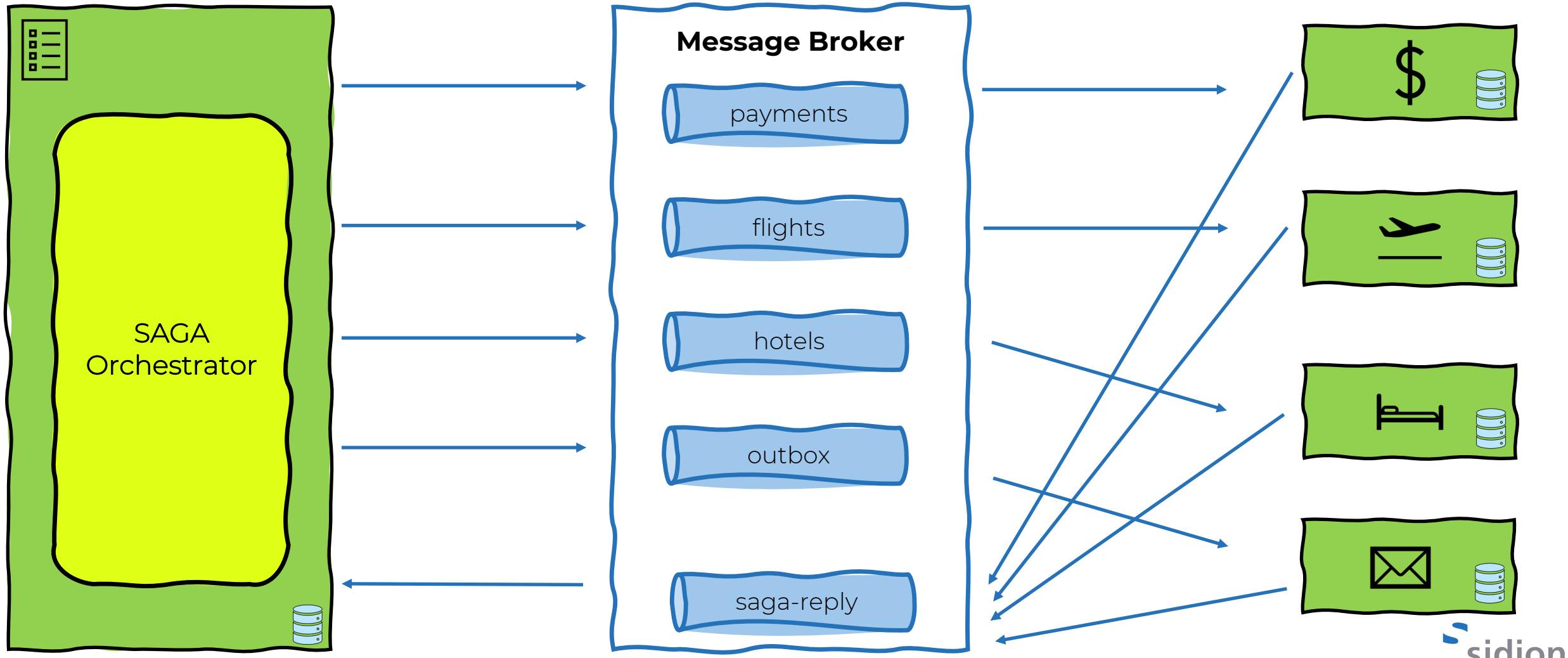

SAGA
Orchestrator
7
DEBIT_CARD
8
DEBIT_OK
Message Broker
payments
saga-reply
7
DEBIT_CARD
DEBIT_OK
8
$

5. SEND_CONFIRMATION



MIT SAGA SERVICE-ÜBERGREIFENDE TRANSAKTIONEN VERWALTEN

ORCHESTRATION-BASED SAGA



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MIT SAGA SERVICE-ÜBERGREIFENDE TRANSAKTIONEN VERWALTEN

ORCHESTRATION-BASED SAGA

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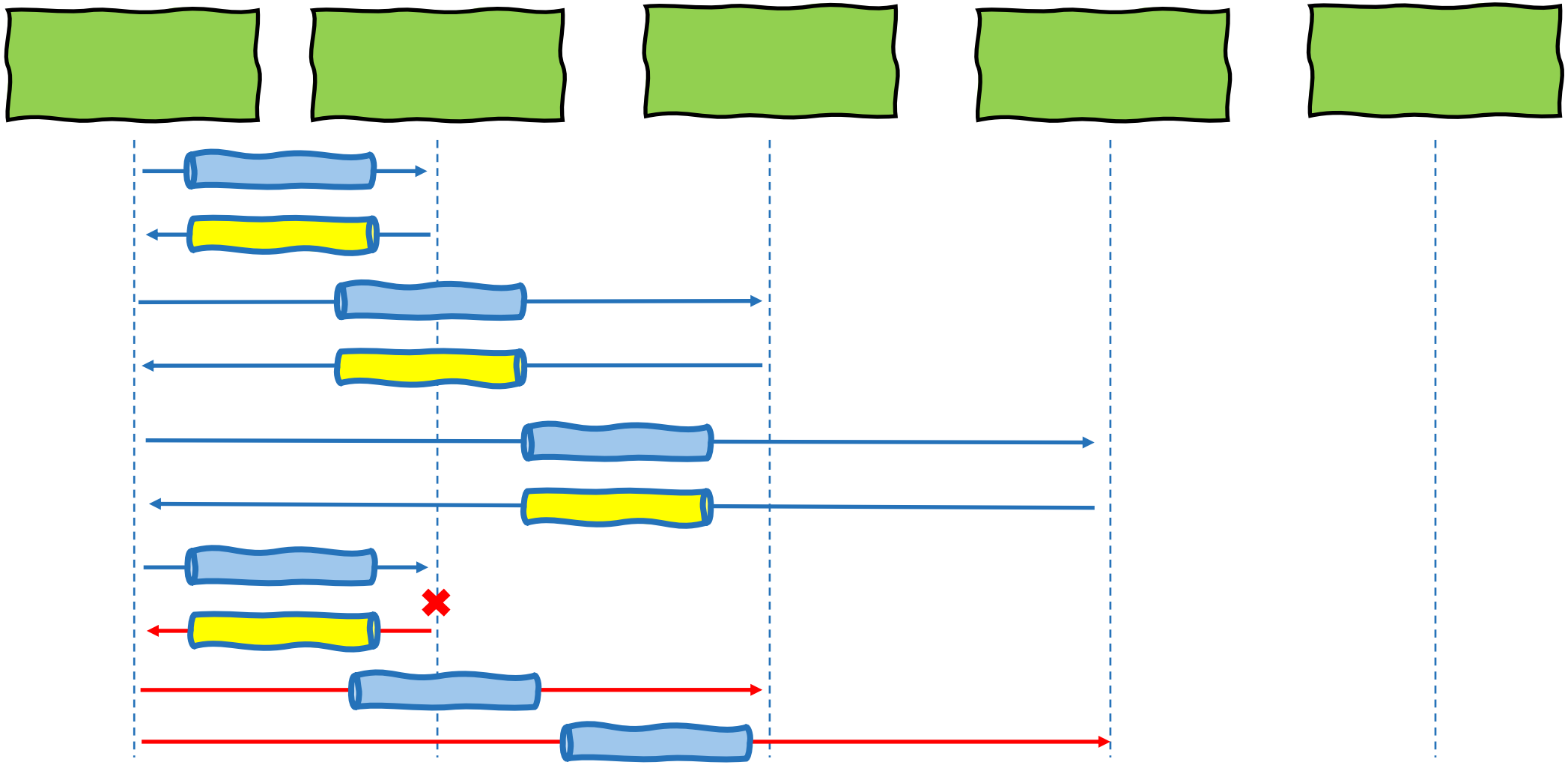
MIT SAGA SERVICE-ÜBERGREIFENDE TRANSAKTIONEN VERWALTEN

ORCHESTRATION-BASED SAGA



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ORCHESTRATION-BASED SAGA

VORTEILE / NACHTEILE

Einfache Abhängigkeiten

Loose Koppelung

Trennung der Verantwortlichkeit

Risiko der Zentralisierung

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SAGA-STRUKTUR

	Step	Service	Transaction	Compensation Transaction
A	1	PaymentService	verifyCard()	---
A	2	FlightBookingService	bookFlight()	rejectFlight()
A	3	HotelBookingService	bookHotel()	rejectHotel()
B	4	PaymentService	debitCard()	---
C	5	ConfirmationService	sendConfirmation()	---

A Compensatable transactions

B Pivot transactions

C Retriable transactions

EDGE CASES

ACID IN SAGA

- ✓ **A** tomicity
- ✓ **C** onsistency
- ✗ **I** solation → Lack Of Isolation
- ✓ **D** urability

ANOMALIEN IN SAGA

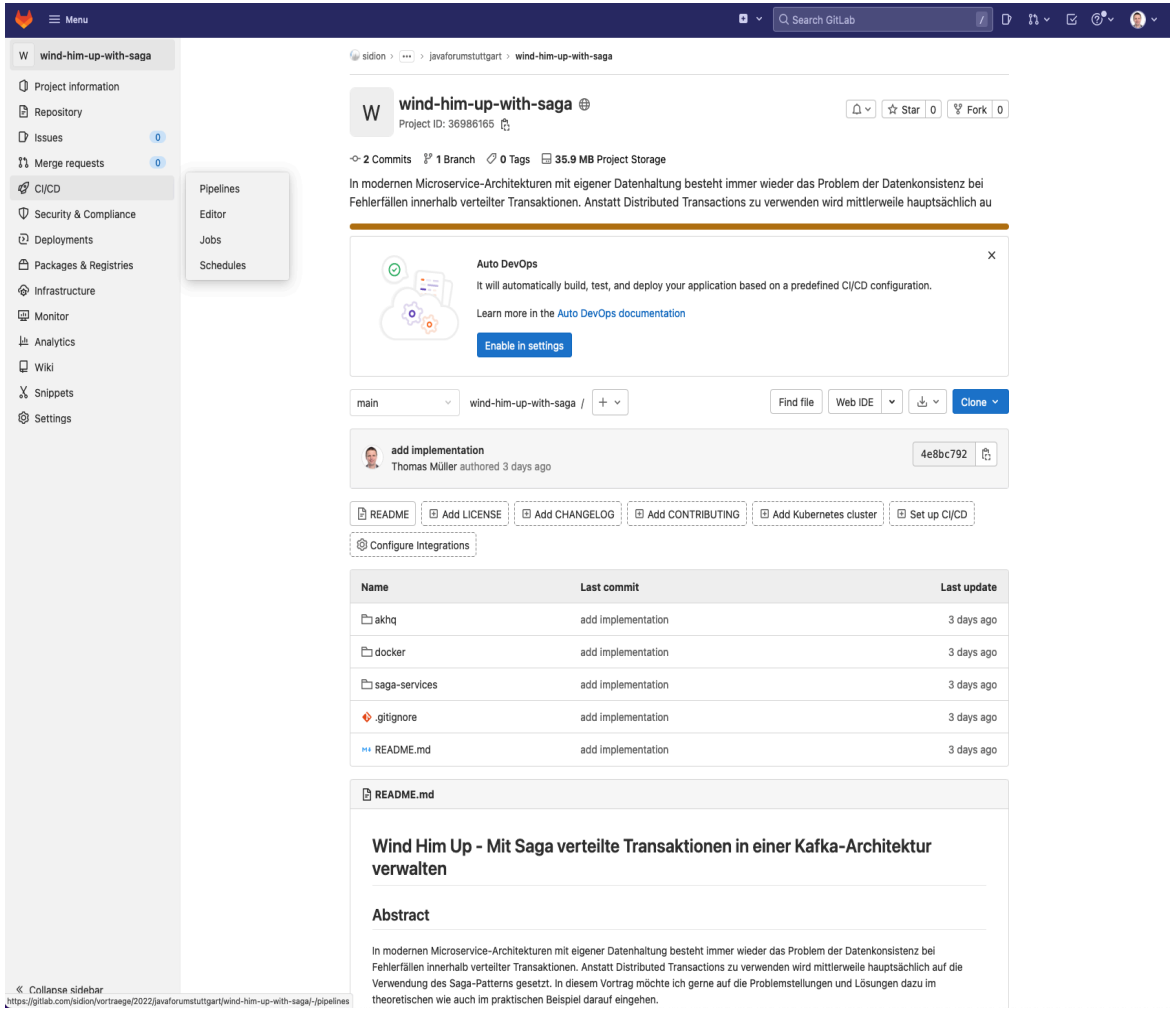
- Lost Updates
- Dirty Reads
- Fuzy / Nonerepeatable Reads

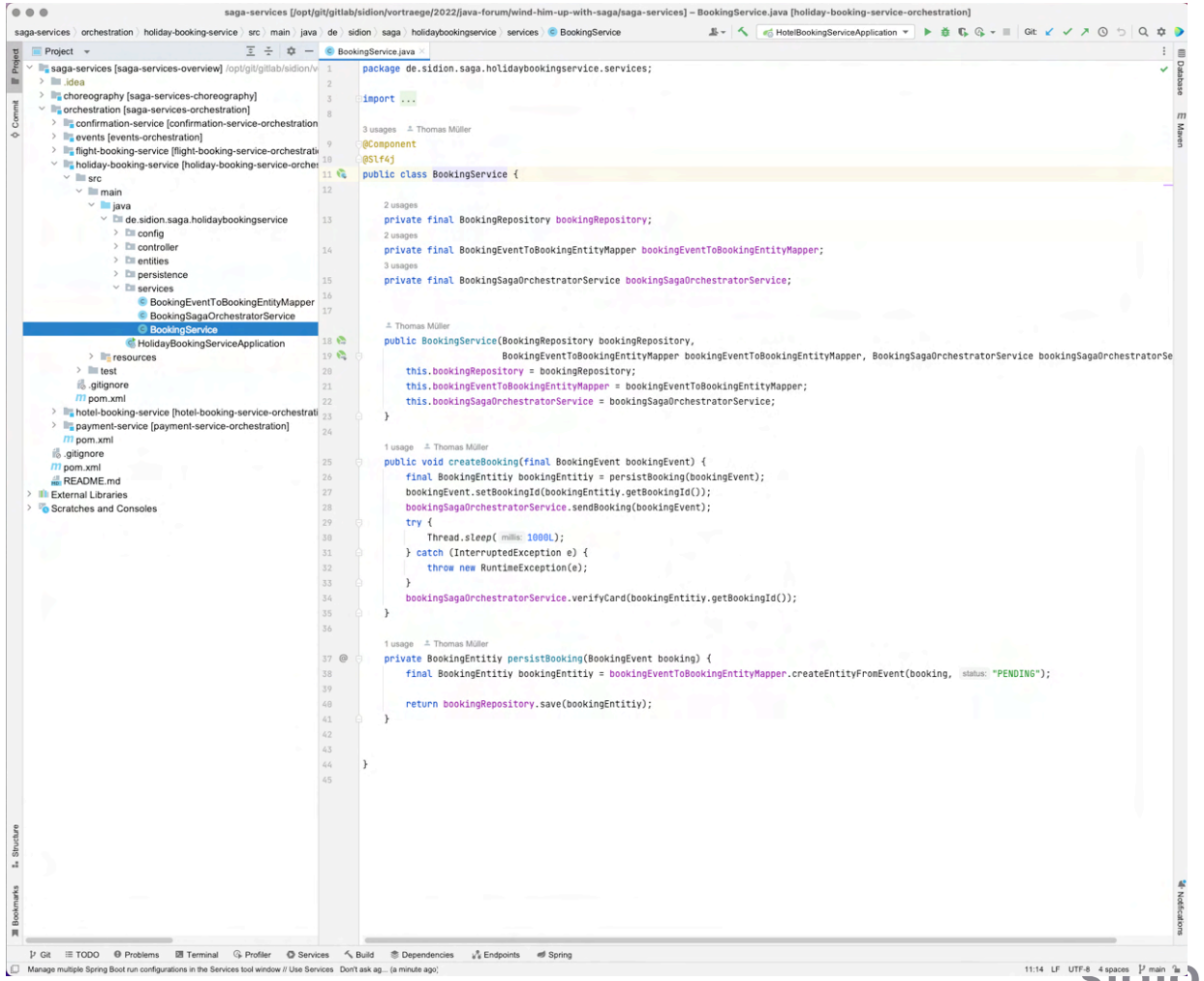
COUNTERMEASURES

- Semantic Lock
- Commutative Updates
- Pessimistic View
- Reread Value

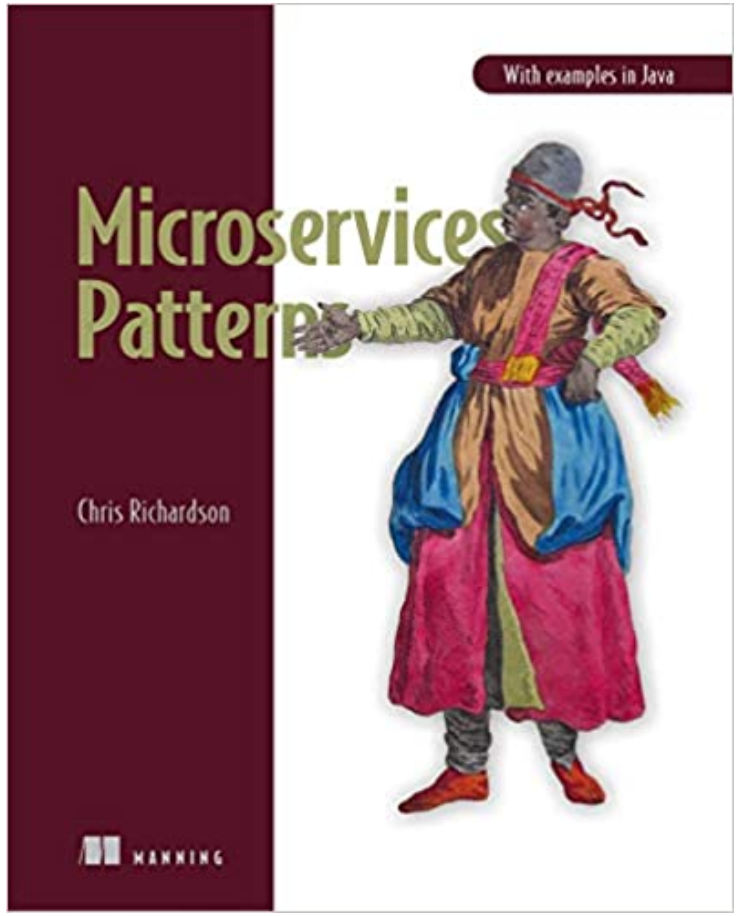
MIT SAGA SERVICE-ÜBERGREIFENDE TRANSAKTIONEN VERWALTEN

CODING





BUCHVORSCHLAG



Microservices Patterns

von Chris Richardson

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CODE

Die ausführlichen Codebeispiele findet Ihr unter:

https://gitlab.com/sidion/vortraege/2022/javaforumstuttgart/wind-him-up-with-saga


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Zuhören. Analysieren. Beraten.