

NILS HARTMANN

<https://nilshartmann.net>

# GraphQL Subscriptions with Kafka and Debezium

Slides (PDF): <https://graphql.schule/wjax2022-gql>

# NILS HARTMANN

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**Software Developer, Architect and Coach from Hamburg**

**Java, Spring, GraphQL, TypeScript, React**



<https://graphql.schule/video-kurs>



<https://reactbuch.de>

**HTTPS://NILSHARTMANN.NET**

```
type Customer {  
    id: ID!  
    name: String!  
    address: Int  
}
```

```
type Mutation {  
    addCustomer(input: AddCustomerInput!): Customer!  
}
```

```
type Customer {  
    id: ID!  
    name: String!  
    address: Int  
}
```

```
type Mutation {  
    addCustomer(input: AddCustomerInput!): Customer!  
}
```

```
type OnNewCustomer { newCustomer: Customer! }
```

```
type Subscription { onNewCustomer: OnNewCustomer! }
```

# A GraphQL API

Client 1

Client 2

Client 3

```
subscription {  
    onNewCustomer  
    {...}  
}
```

```
subscription {  
    onNewCustomer  
    {...}  
}
```

Service

A simple use-case

Client 1

Client 2

Client 3

```
mutation {  
  addCustomer(...)  
}
```

Service

A simple use-case

Client 1

Client 2

Client 3

```
mutation {  
  addCustomer(...)  
}
```

OnNewCustomer  
{...}

OnNewCustomer  
{...}

Service

A simple use-case

**Service Instance 1**

**Service Instance 2**

**A simple use-case** 🤔

Client 1

Client 2

Client 3

```
subscription {  
    onNewCustomer {...}  
}
```



Service Instance 1

Service Instance 2

A simple use-case 🤔

Client 1

Client 2

Client 3

```
subscription {  
    onNewCustomer {...}  
}
```

```
subscription {  
    onNewCustomer {...}  
}
```

Service Instance 1

Service Instance 2

A simple use-case 🤔

Client 1

Client 2

Client 3

```
mutation {  
  addCustomer(...)  
}
```



Service Instance 1

Service Instance 2

A simple use-case 🤔

Client 1

Client 2

Client 3

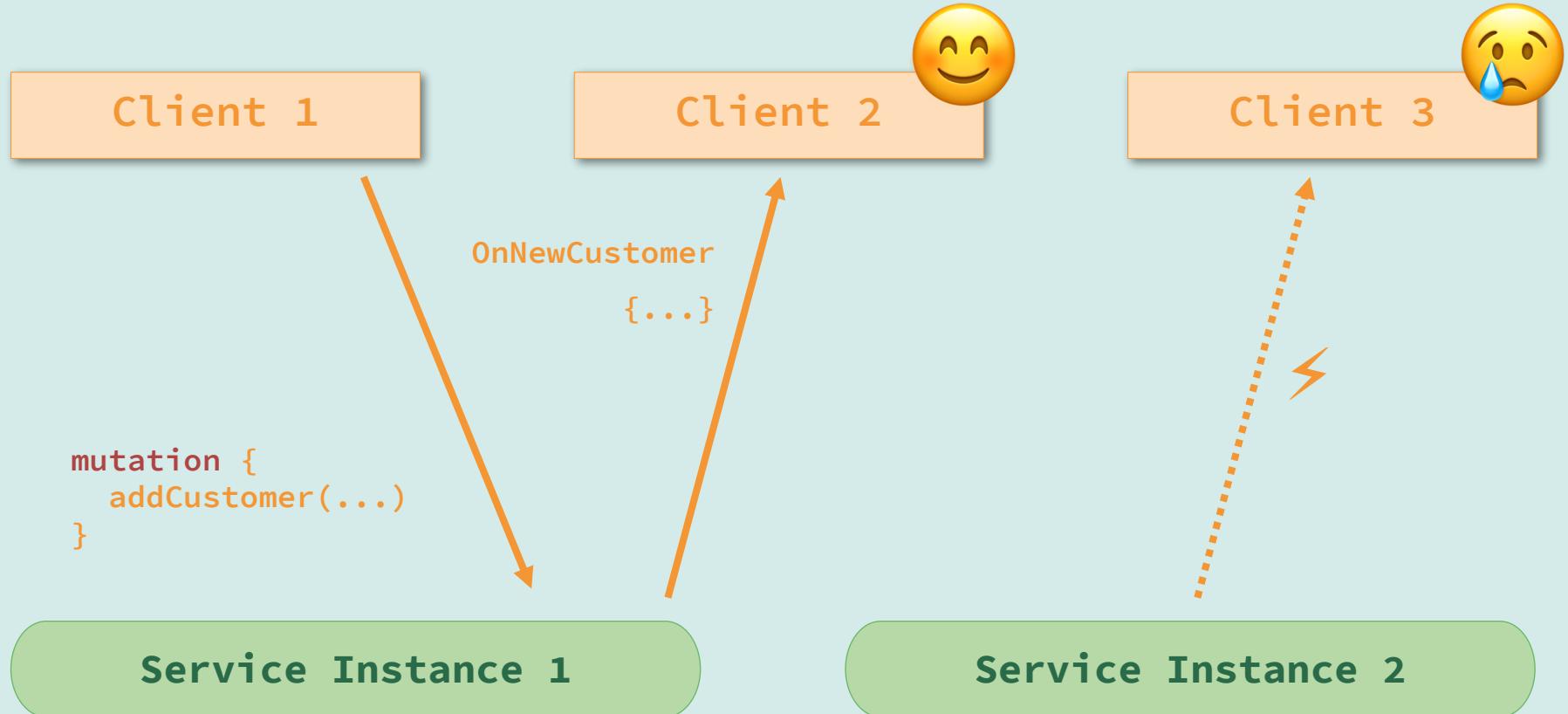
```
mutation {  
  addCustomer(...)  
}
```

OnNewCustomer  
{...}

Service Instance 1

Service Instance 2

A simple use-case 🤔



A simple use-case 🤔

**Client 1**

**Client 2**

**Client 3**

**Service Instance 1**

**Service Instance 2**

**Message Broker (Apache Kafka)**

**Message Broker**

Client 1

Client 2

Client 3

```
mutation {  
  addCustomer(...)  
}
```

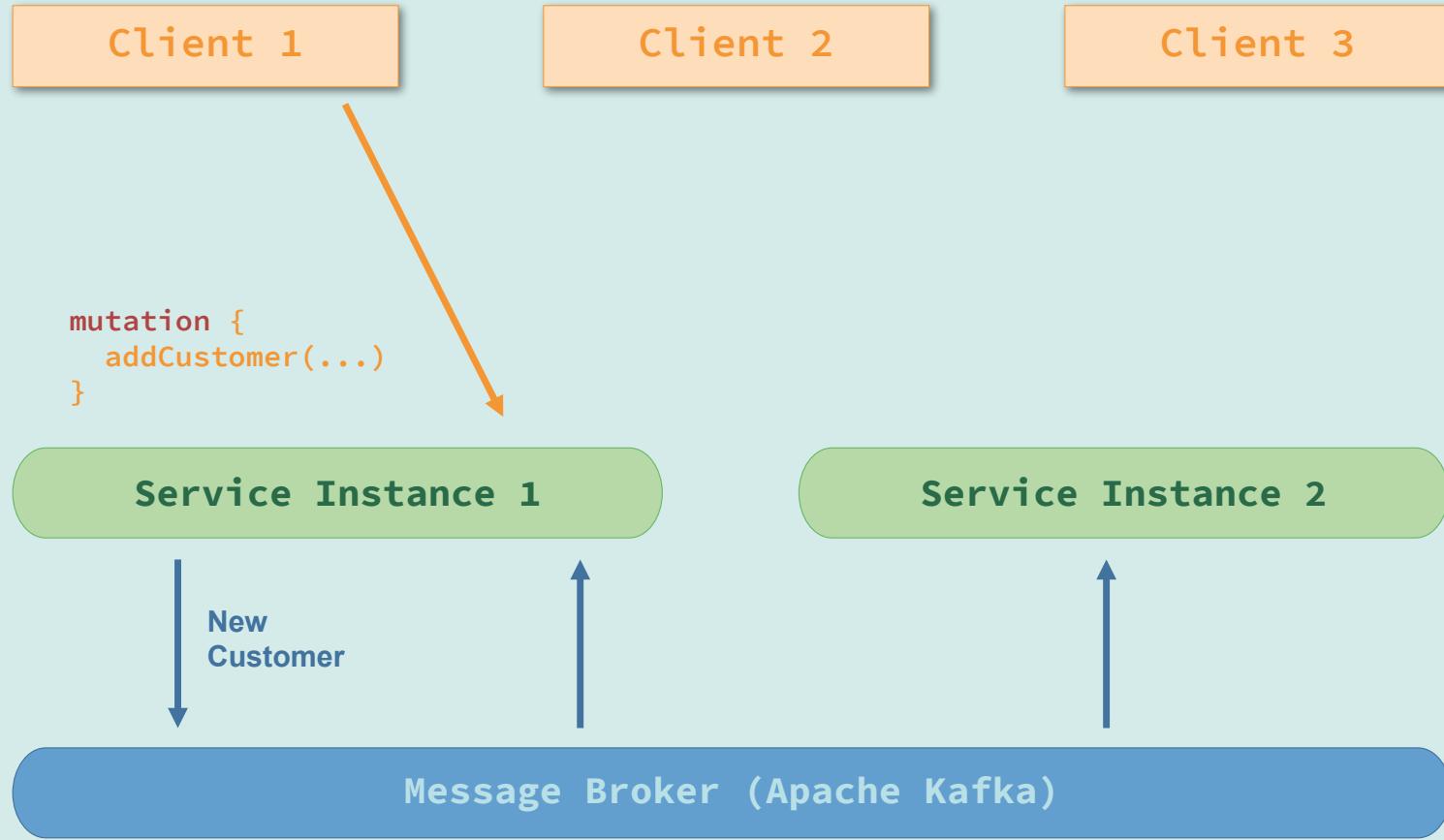
Service Instance 1

Service Instance 2

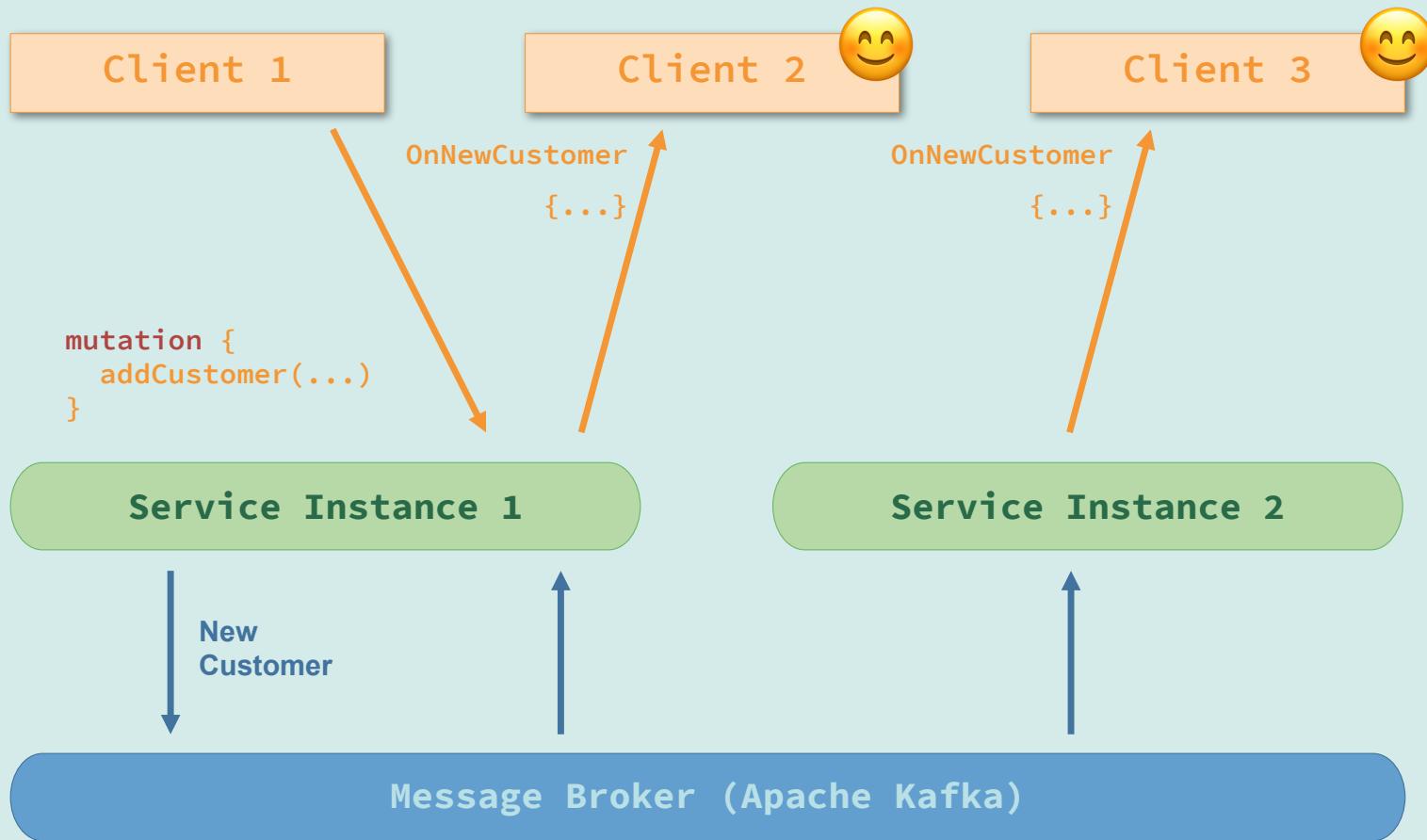
New  
Customer

Message Broker (Apache Kafka)

# Message Broker



# Message Broker



# Message Broker

**Apache Kafka – <https://kafka.apache.org>**

**Topic**



**Apache Kafka – <https://kafka.apache.org>**

# Producer



# Topic

Apache Kafka – <https://kafka.apache.org>

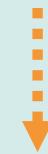
# Producer



# Topic



# Consumer



# Producer

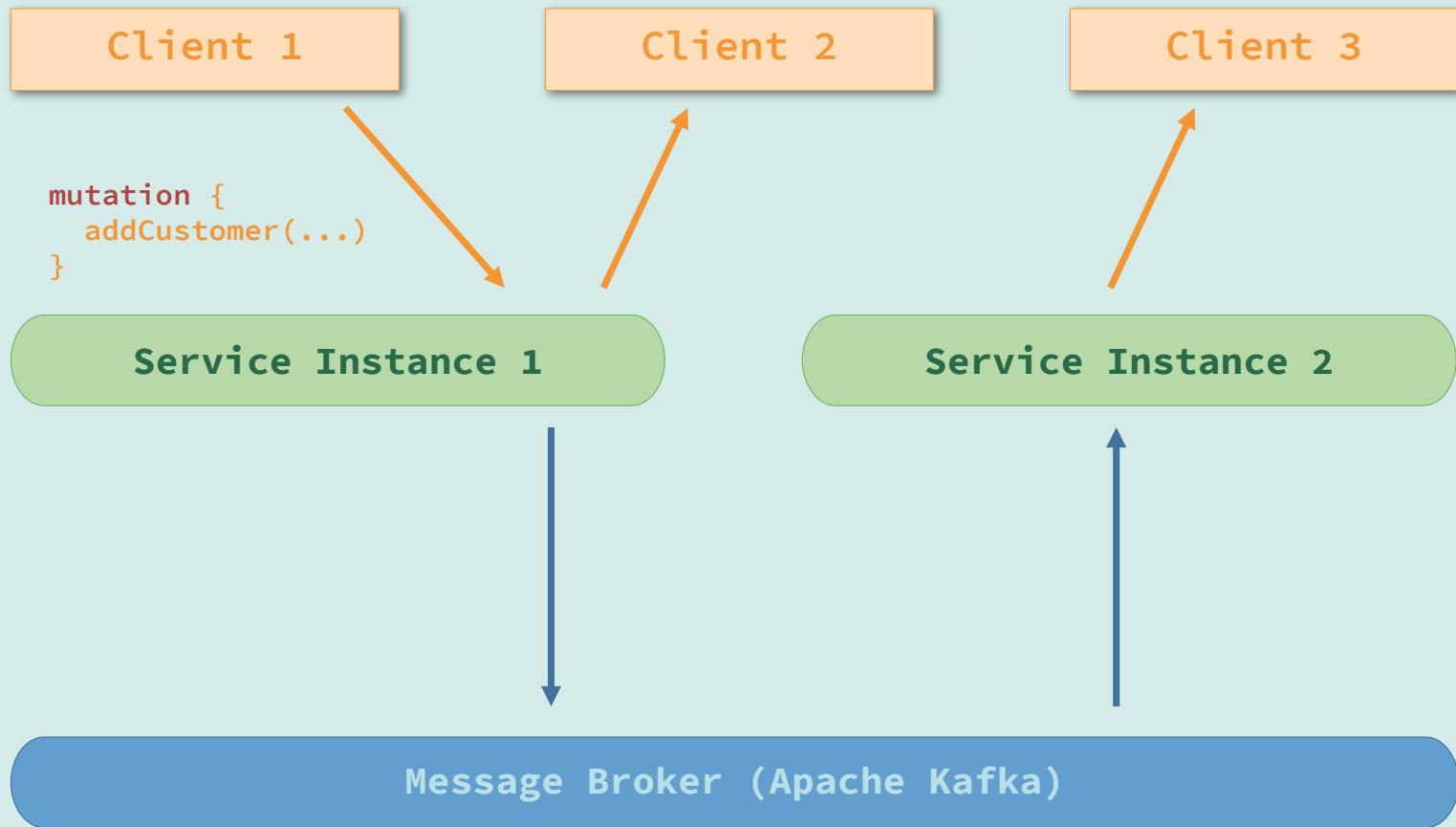


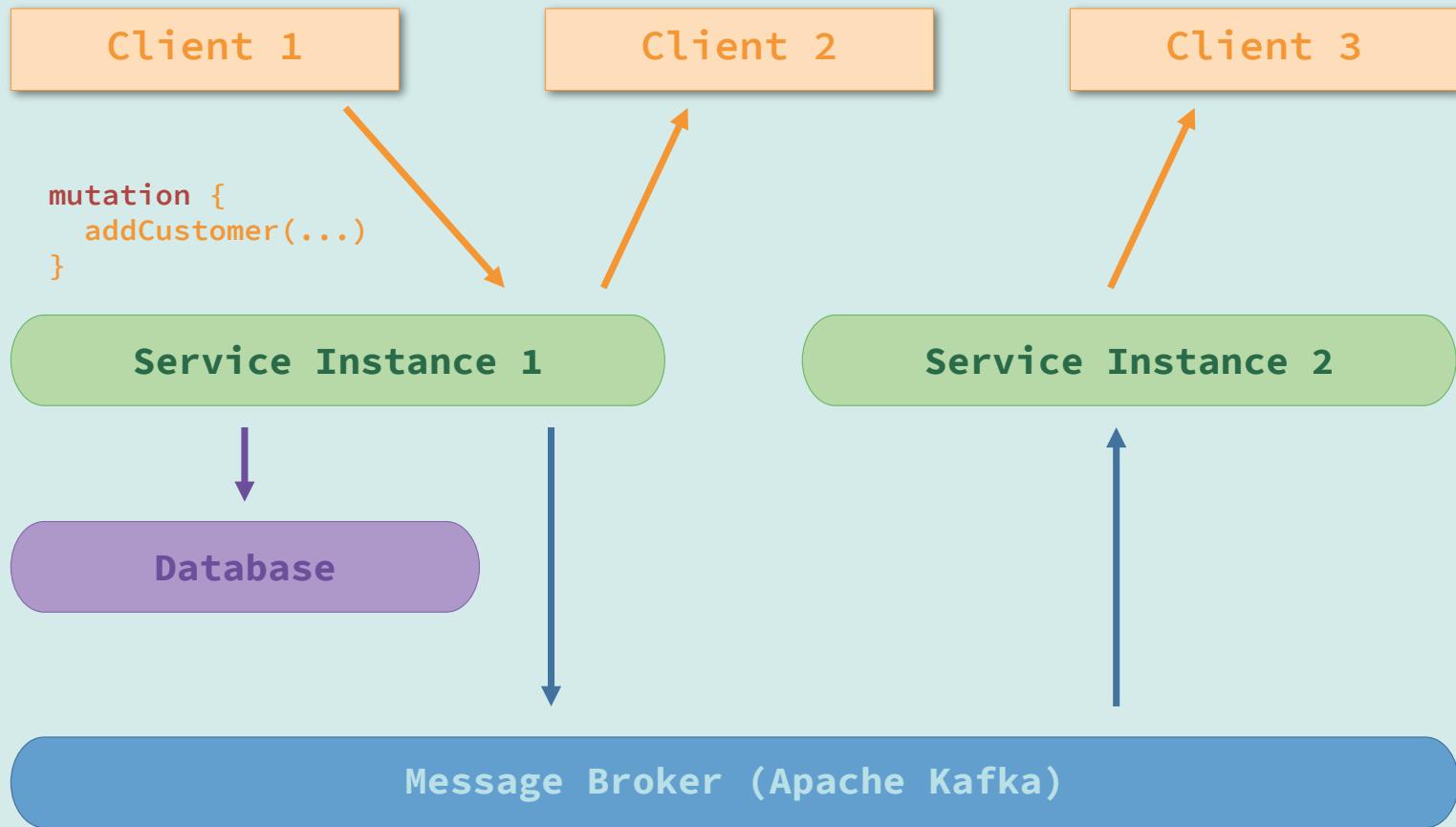
# Topic



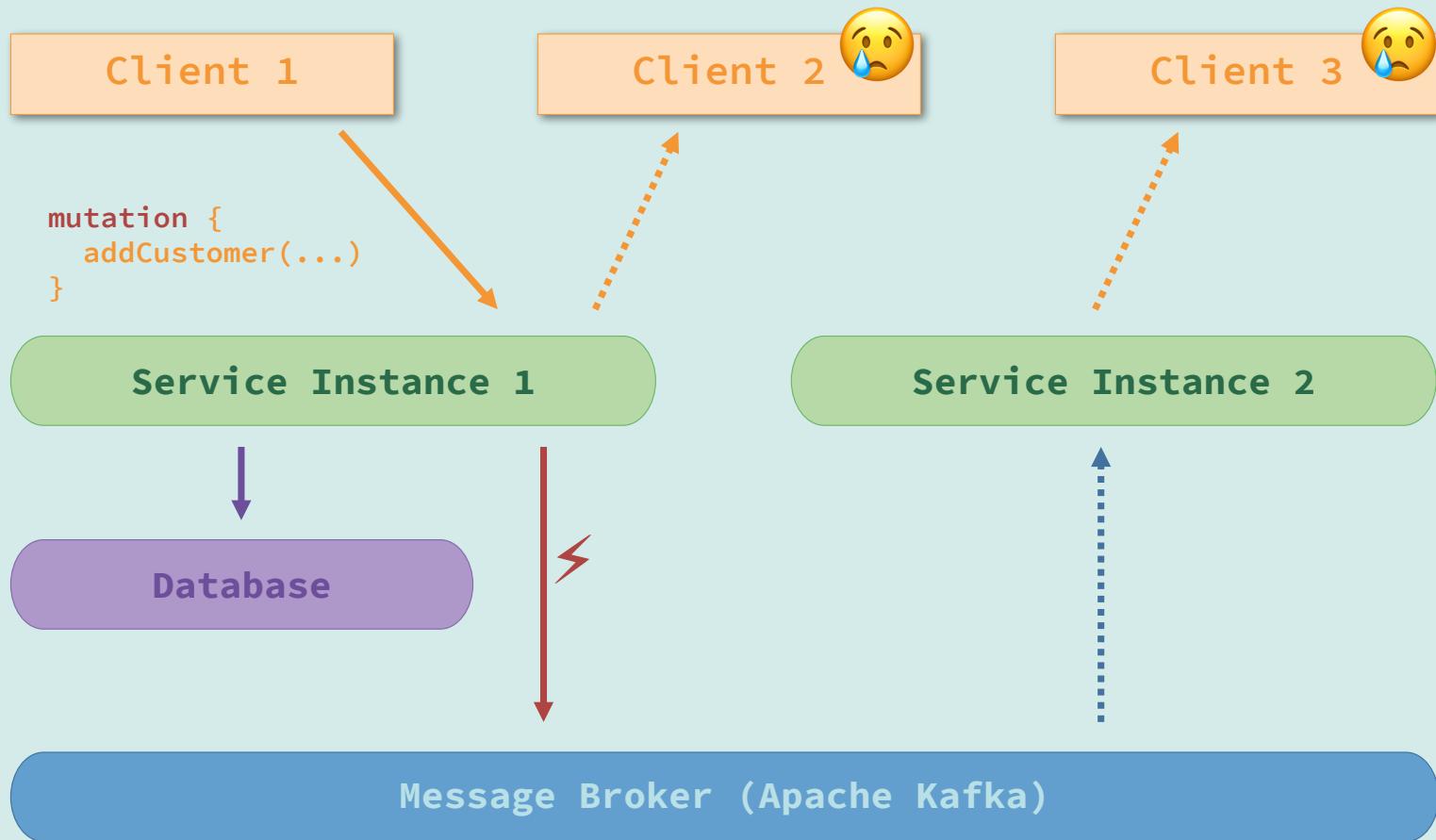
# Consumer







# Adding a database...



**Adding a database...**

**Client 1**

**Client 2**

**Client 3**

**Service Instance 1**

**Service Instance 2**

**Database**

**INSERT  
INTO customers (...)**

**Message Broker (Apache Kafka)**

**Adding a database...**

Client 1

Client 2

Client 3



Service Instance 1

Service Instance 2

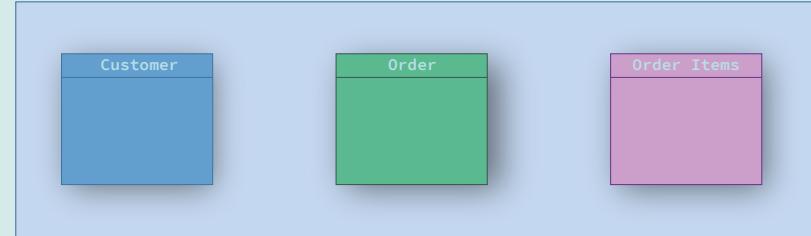
Database

INSERT  
INTO customers (...)

Message Broker (Apache Kafka)

Adding a database...

# Database

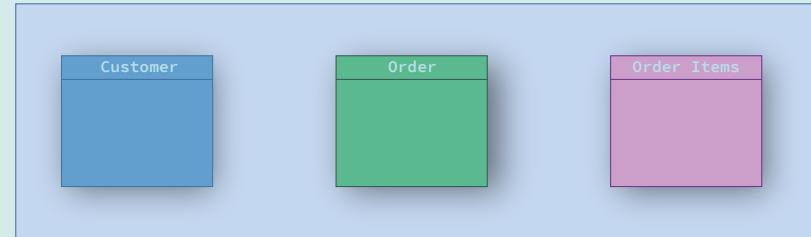


# Transaction Log

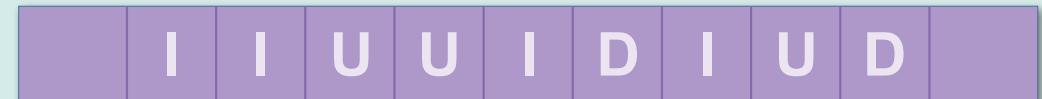


# Change Data Capture (CDC)

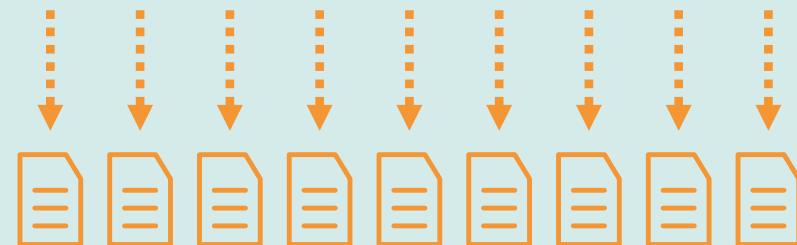
# Database



# Transaction Log

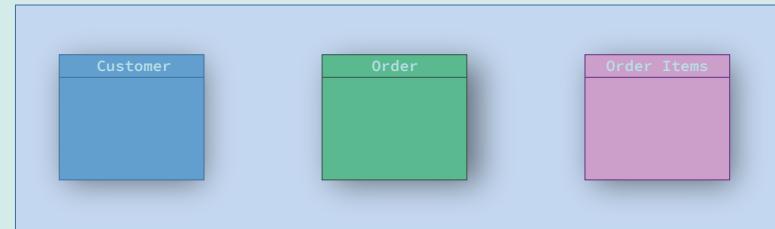


# Capture Events



# Change Data Capture (CDC)

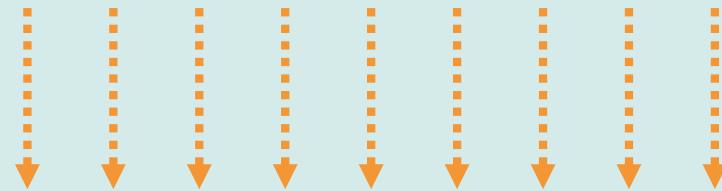
# Database



# Transaction Log



# Debezium CDC



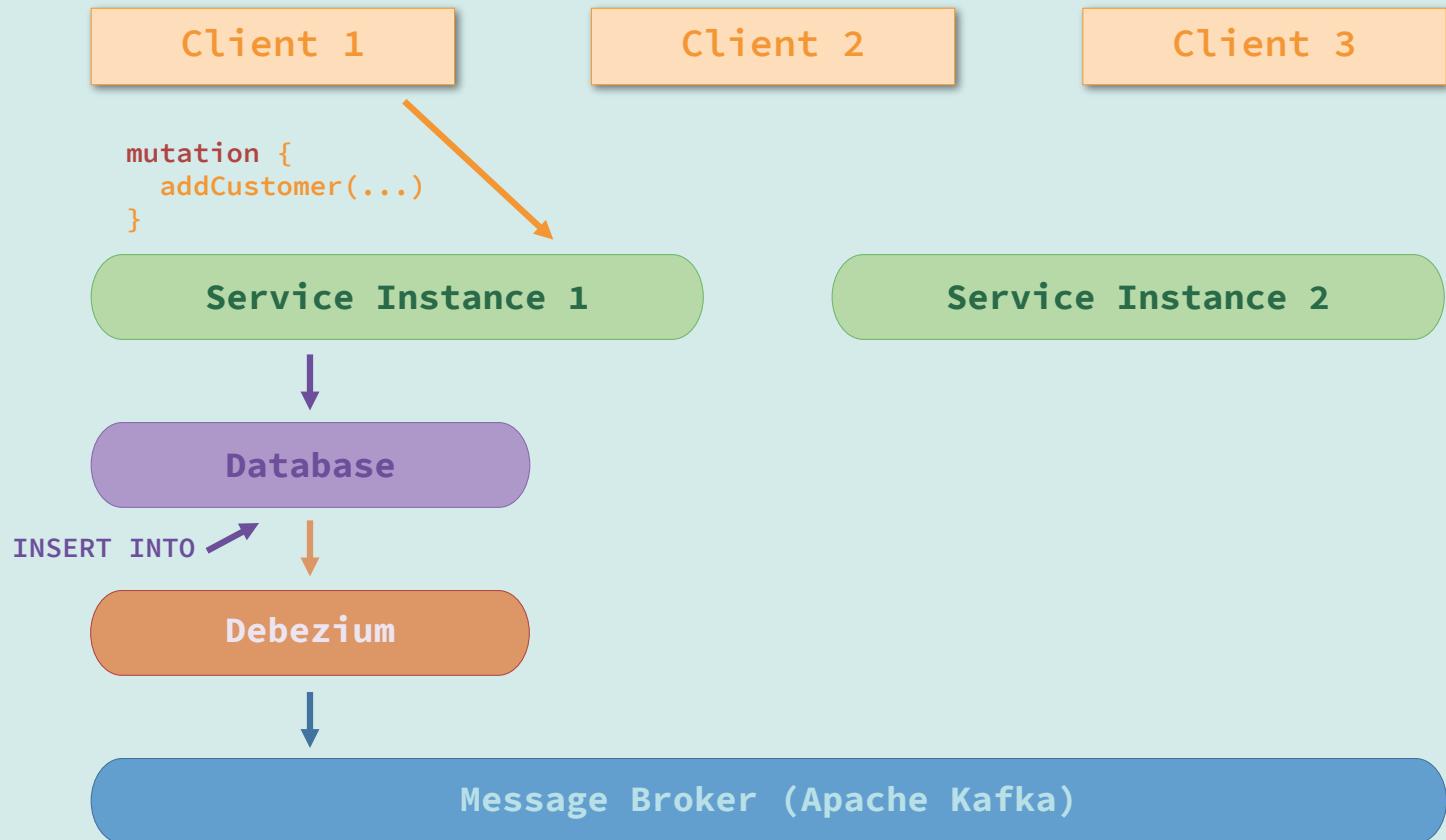
# Apache Kafka



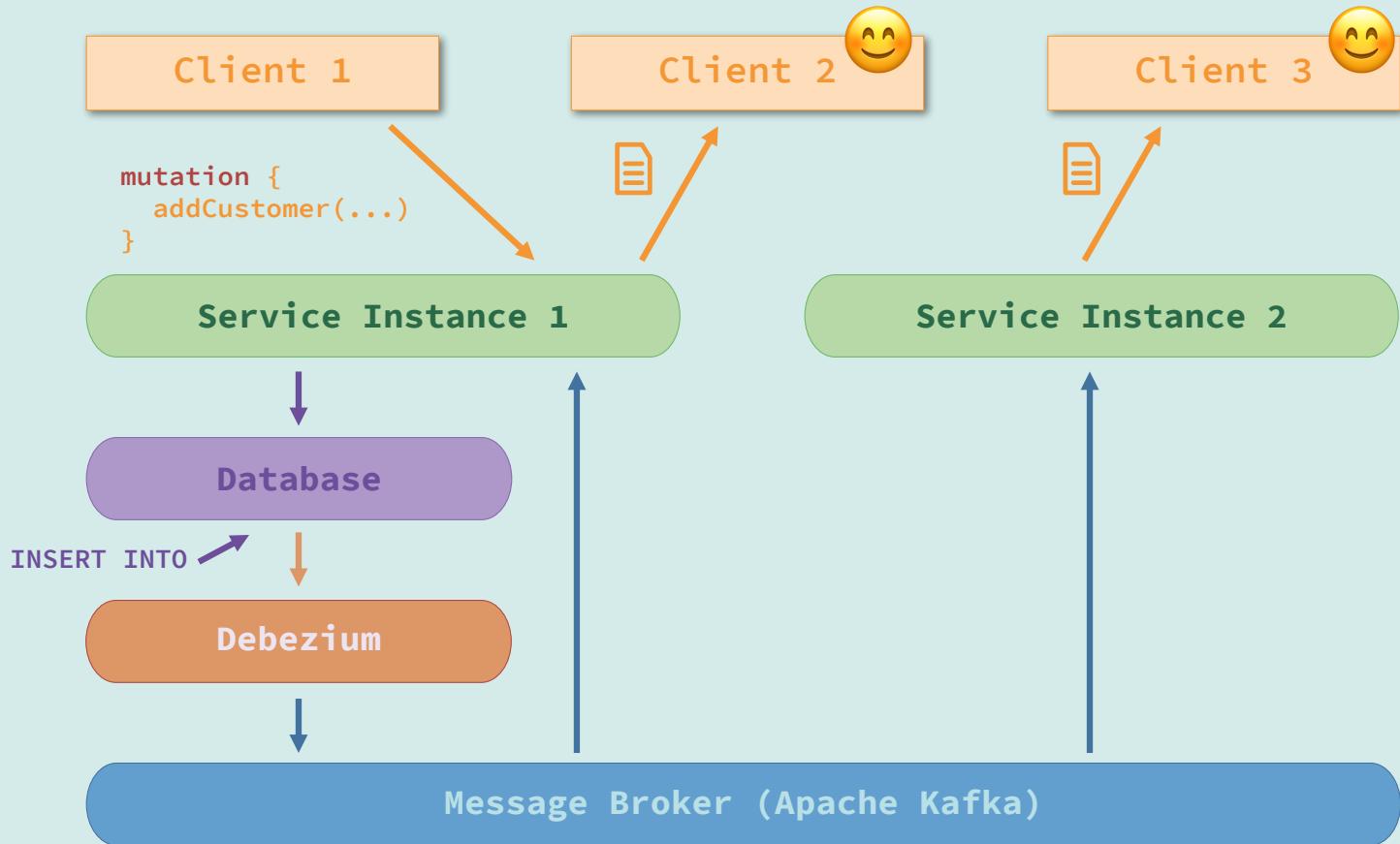
**Debezium – <https://debezium.io>**

# **CHANGE EVENT IM DETAIL**

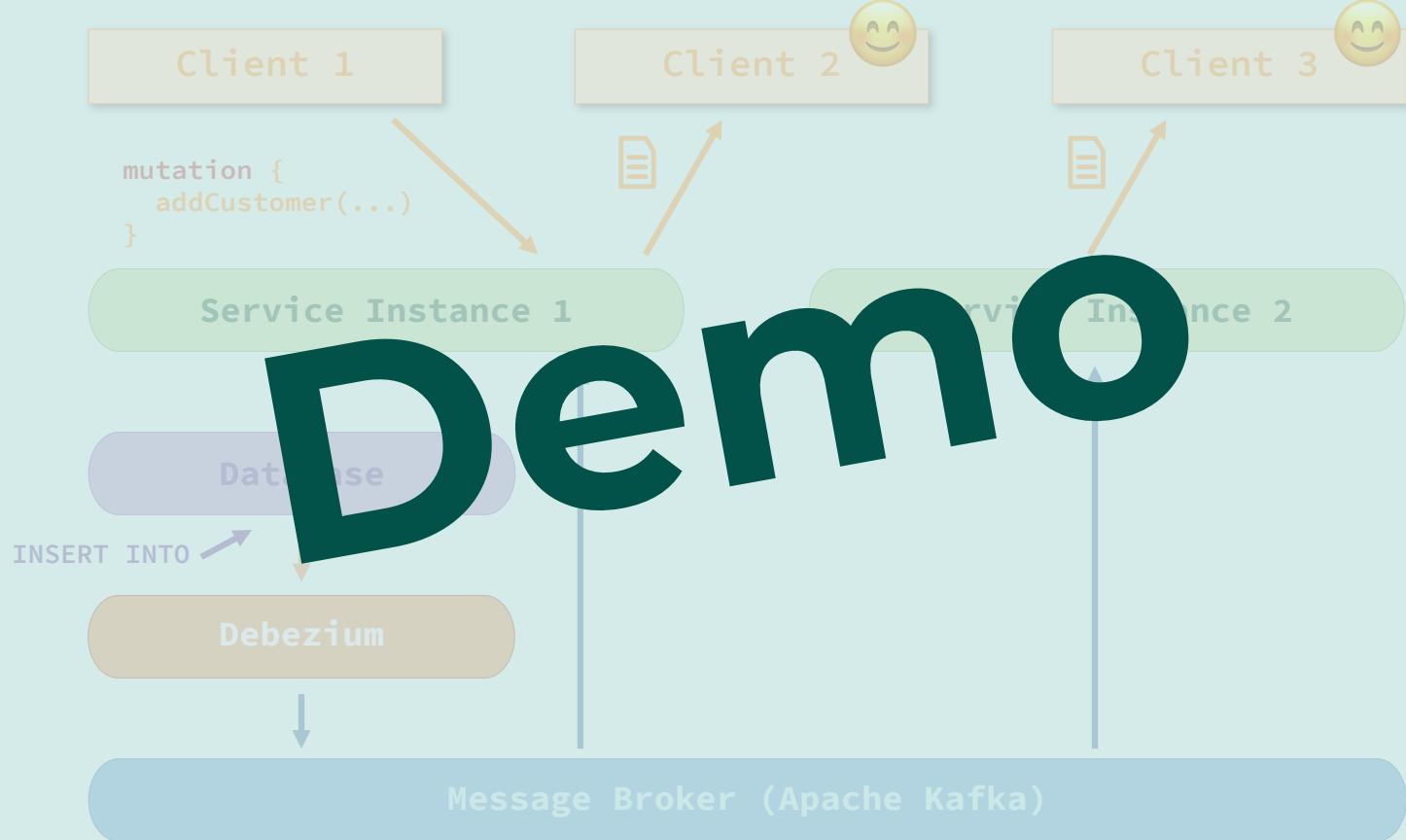
**Debezium**



# Debezium



# Debezium



<https://graphql.schule/galaxy-example>

# **Summary mit Ausblick: K + DBZ für DB Read Model**

**Debezium**

# Thanks a lot!

Slides: <https://graphql.schule/galaxy-2022> (PDF)

Source-Code: <https://graphql.schule/galaxy-example>

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