Spring framework -- boot

Managing the dependencies

starter projects

Spring Initializr

```
>mvn <options>
>mvnw <options>
```

starter-parent

Spring boot config

1. through dependency in pom.xml
   certain default config is auto activated
2. activates the key-value (properties) based config
   application.properties
   application.yml
3. std folder structure
4. Exposes specially curated Annotations

JSP-jstl view template

ViewMArker

Tiles

Velocity

Thymeleaf

Mustache

@component

$$\begin{tikzcd}
& \text{@Component} \arrow[dl, dashed] \arrow[d, dashed] \\
\text{@Controller} & \text{@RestController}
\end{tikzcd}$$

Response is treated as data (Response Data)

supports auto conversion of POJO & JSON (jackson-databind project)

devtools

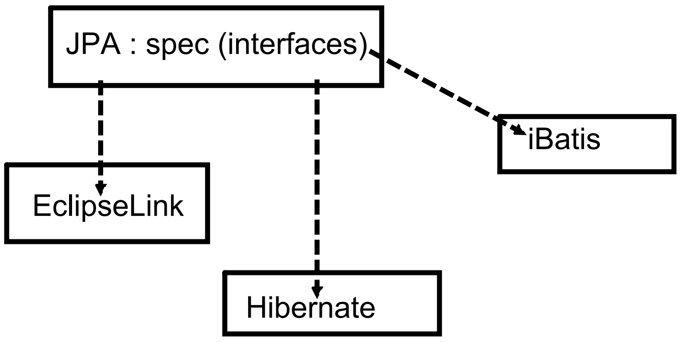
Actuator

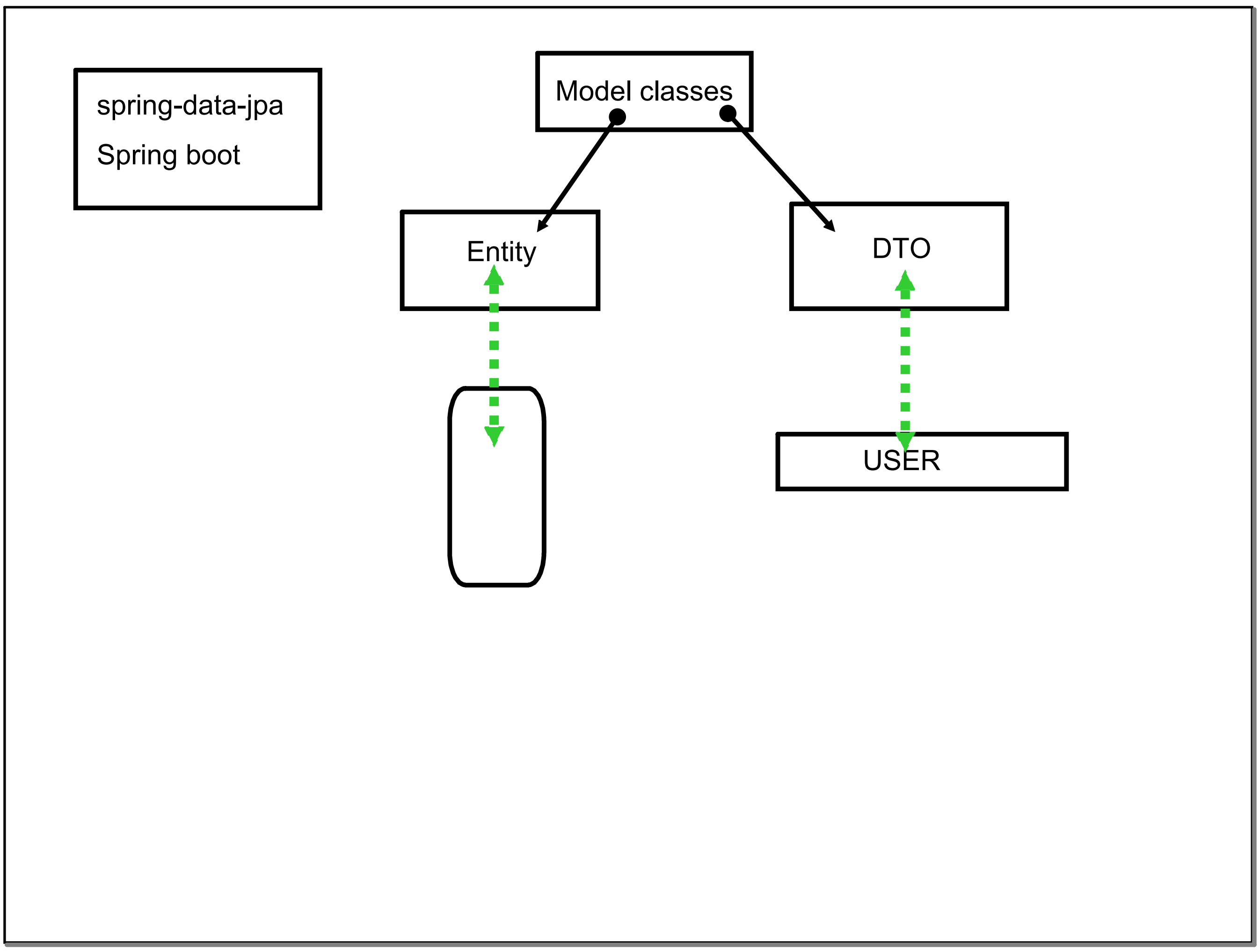
spring data jpa :

Traditional Way : JDBC (core)

Spring Way : spring-jdbc (abstract)

JPA : ORM based




spring-data-jpa
Spring boot
Model classes
Entity
DTO
USER

Any DB interaction needs JDBC config

- db name
- location
- user name
- password
- driver (auto detect the driver based on URI)

JPA

- custom config for JPA

Hibernate

- custom config for Hibernate

SQL : dialect

DataSource
(interface)

JPA--> Repository : Entity

Interfaces containing basic CRUD functionalities pre-coded

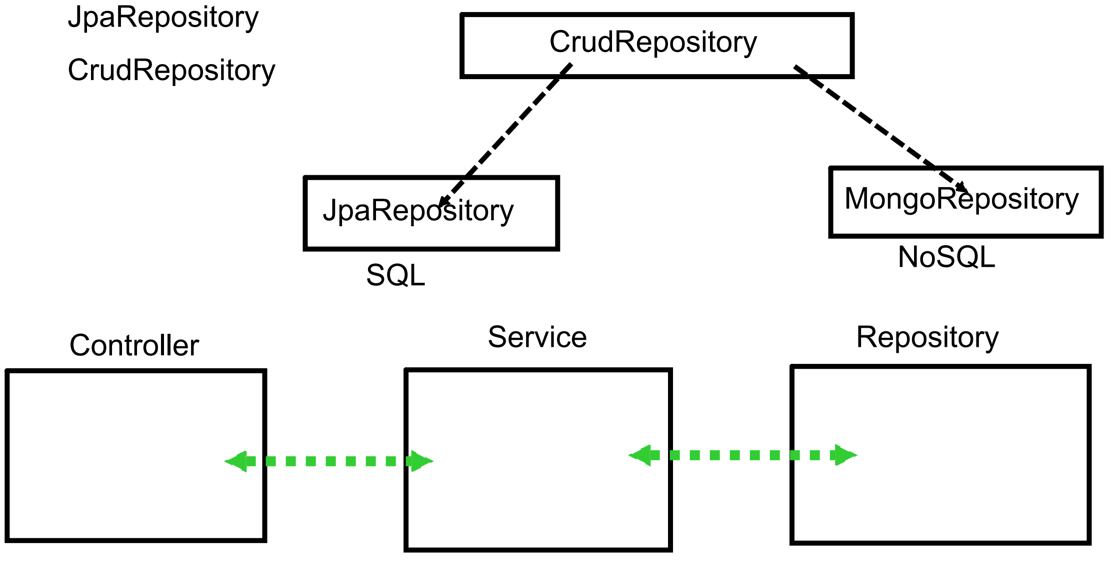
Custom Interface and inherit Repository interface

#associate with entity

# platform for custom implementation

JpaRepository

CrudRepository



Field Based : Mocking or Testing

Constructor

Setter

Product Controller

CRUD functionality

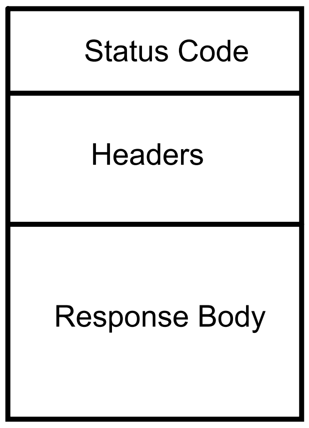
/products : GET : fetch all records

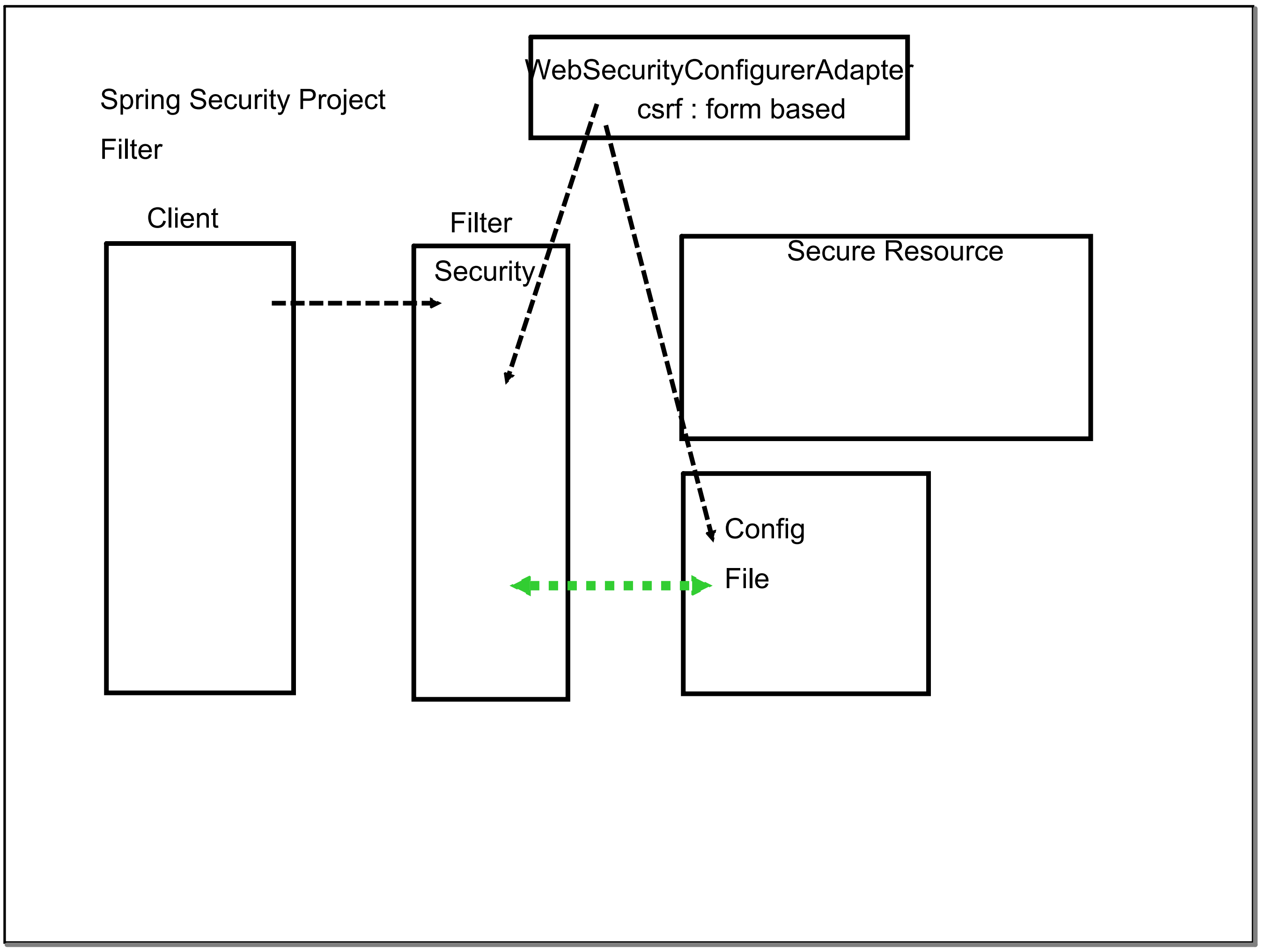
/products/id : GET

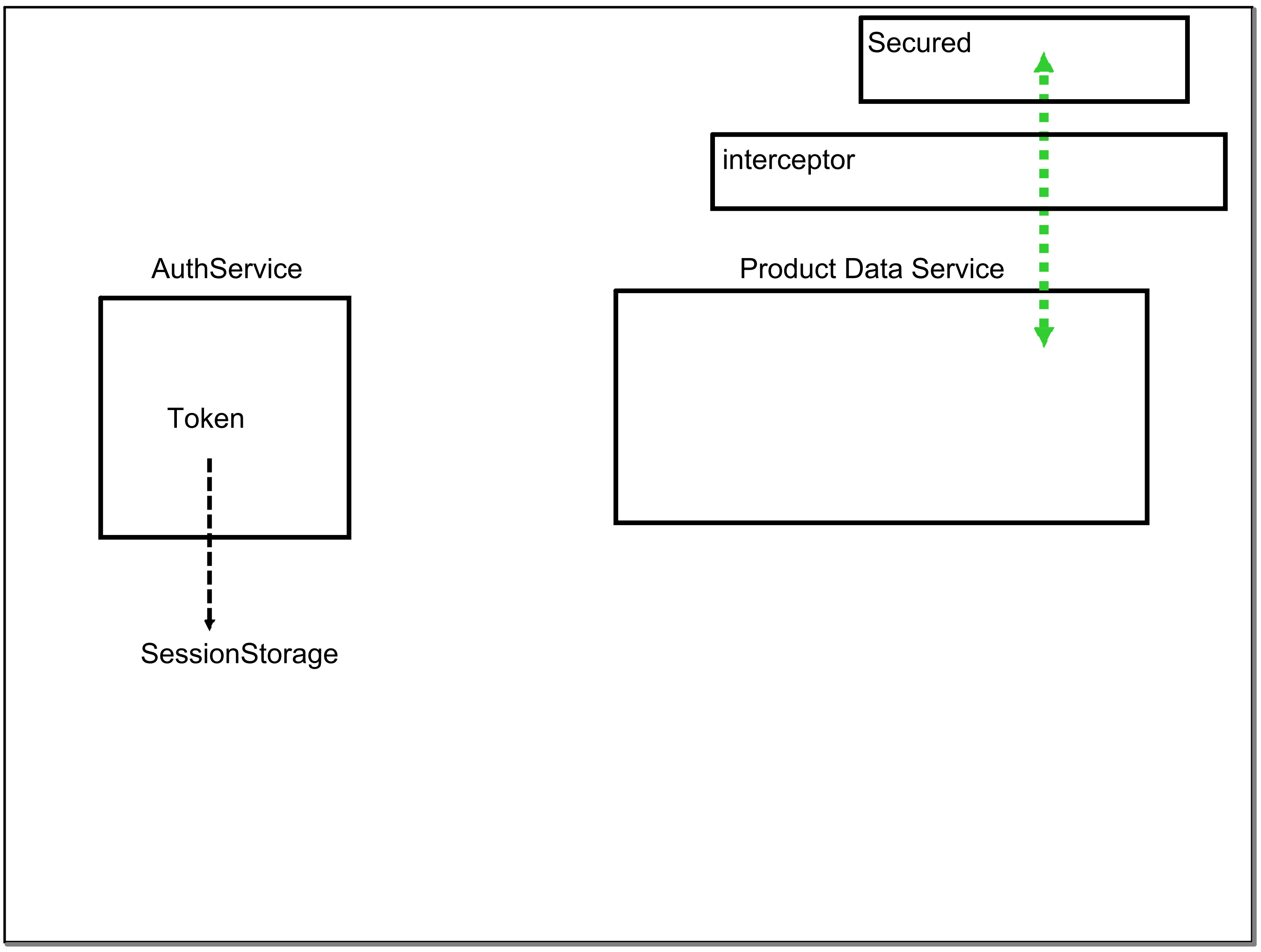
/products : POST

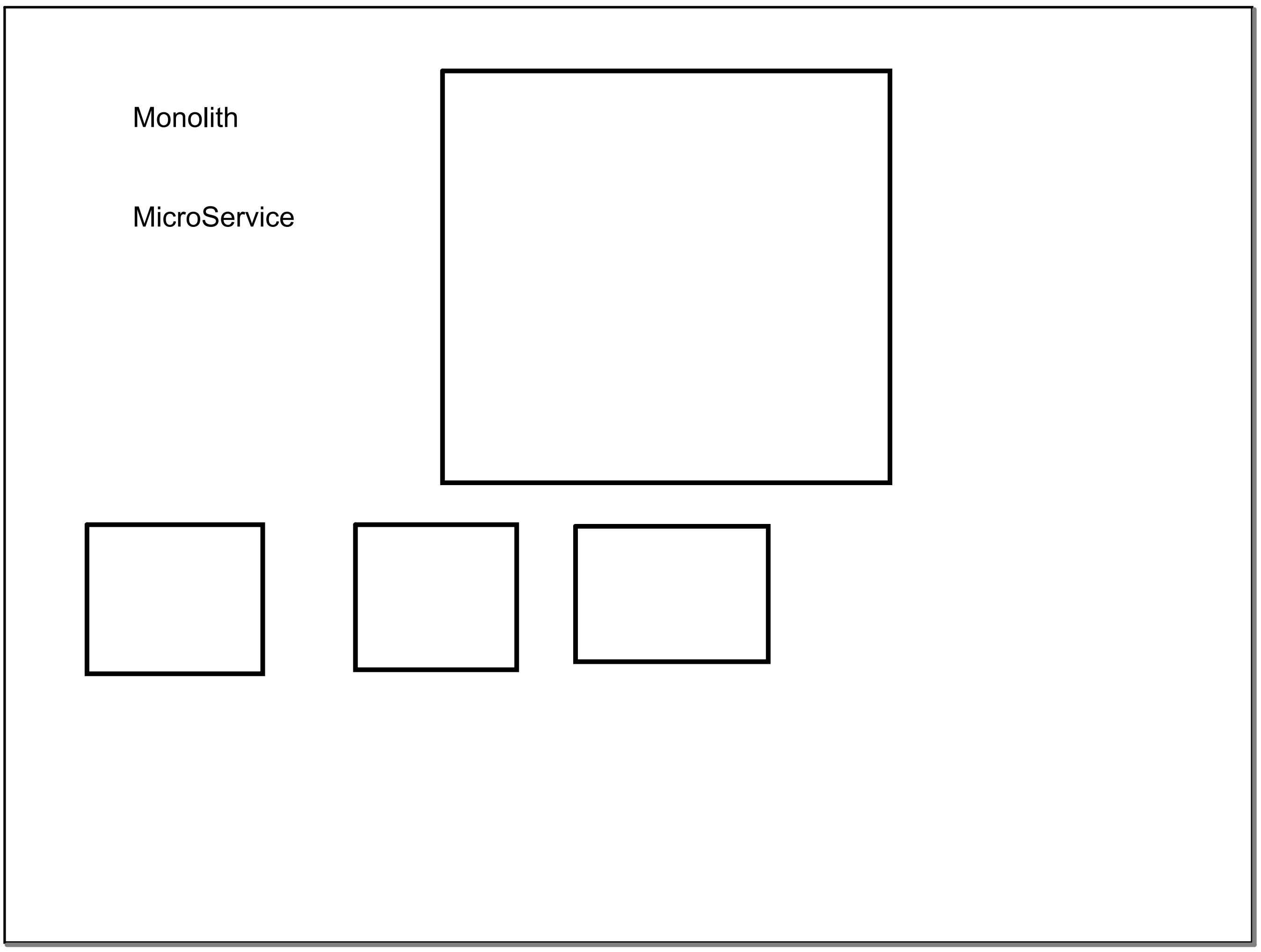
/products : PUT

/products/id : DELETE




Spring Security Project
Filter
WebSecurityConfigurerAdapter
csrf : form based
Client
Filter
Security
Secure Resource
Config
File


Secured
interceptor
AuthService
Product Data Service
Token
SessionStorage


Monolith
MicroService

High possibility of bugs

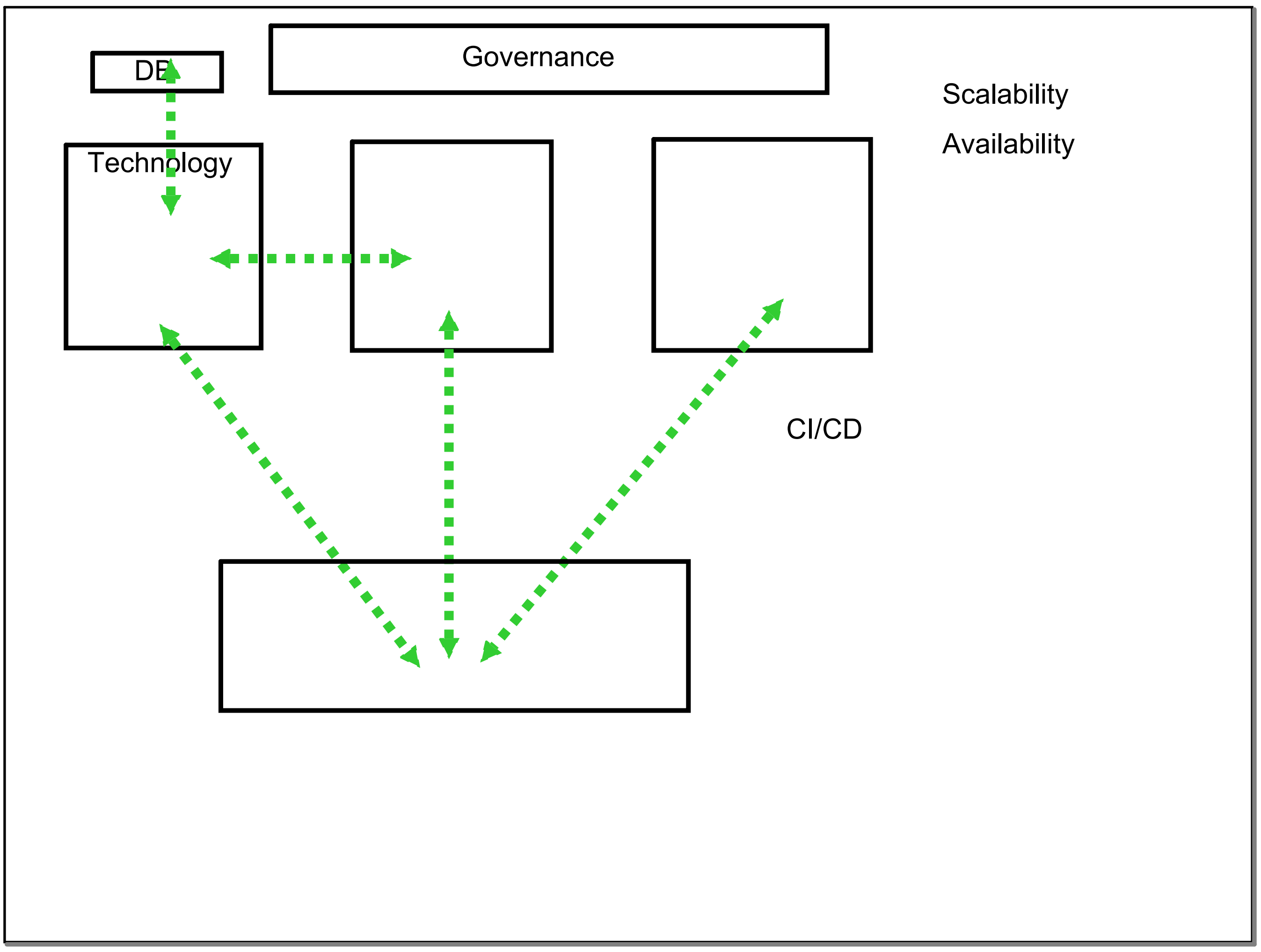
Tight coupling

Huge in size

May result into complete crash

Scaling

Technology bound


DB
Governance
Scalability
Availability
Technology
CI/CD

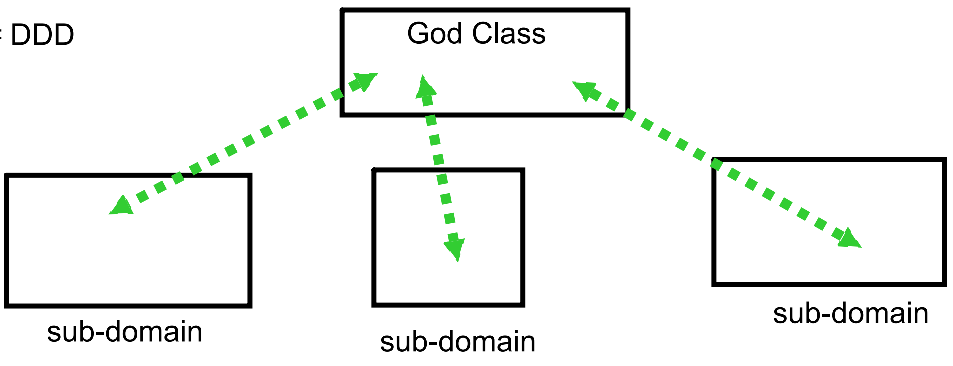
Decomposition

# based business capabilities : business oriented rather than technical

"God Classes" :

Order class

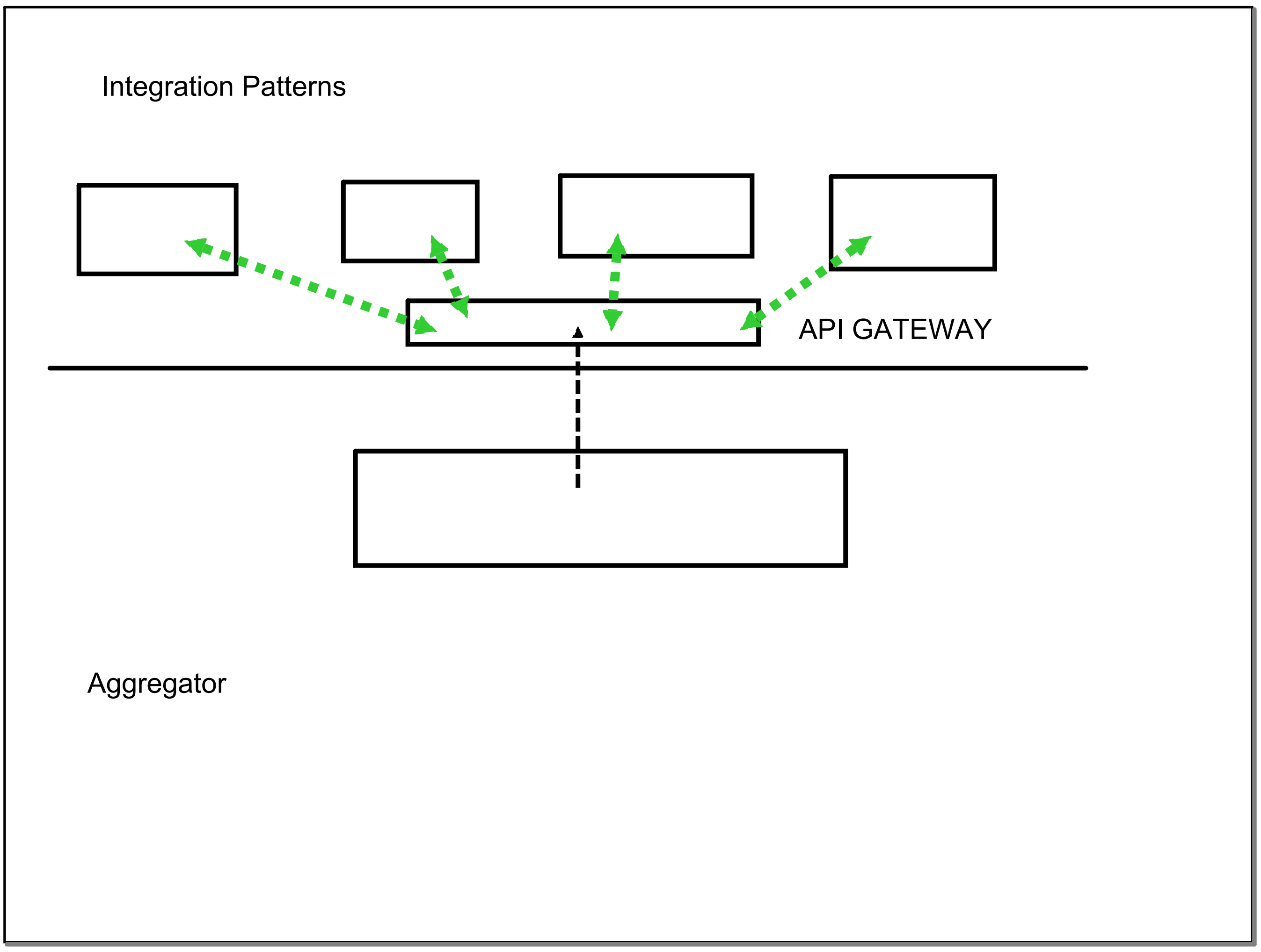
# DDD

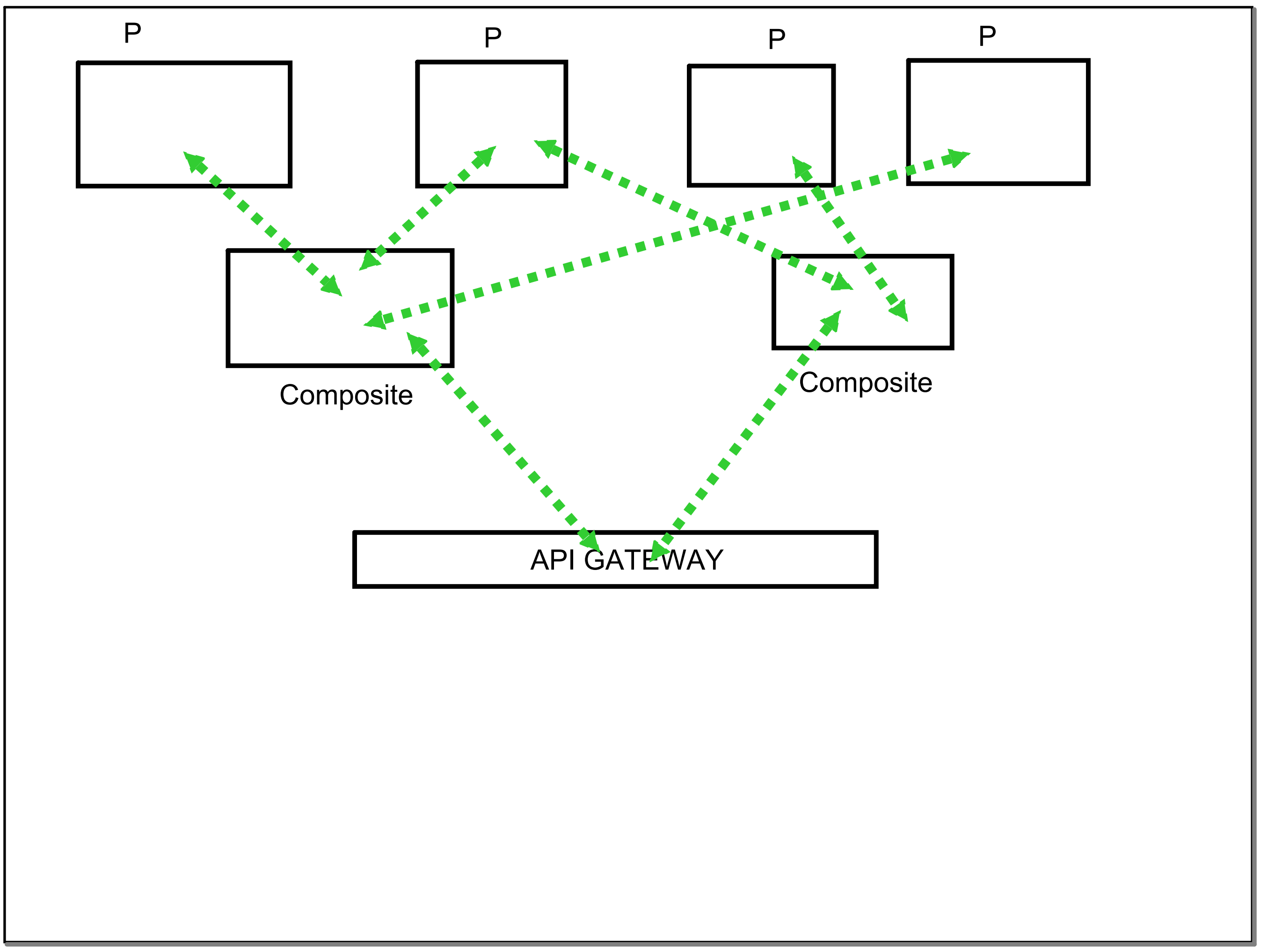


greenfield

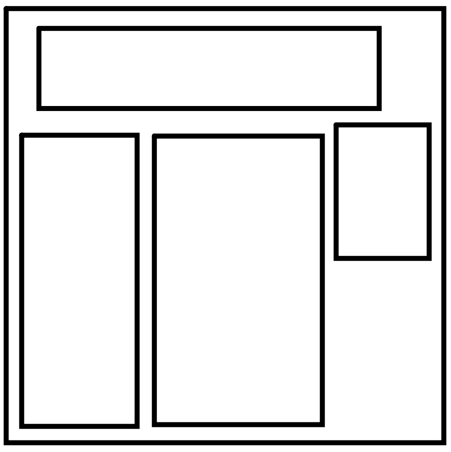
brownfield application

#Strangler pattern


Integration Patterns
API GATEWAY
Aggregator


P
P
P
P
Composite
Composite
API GATEWAY

Client-Side UI Composition Pattern



SPA : Angular/React

Database Pattern

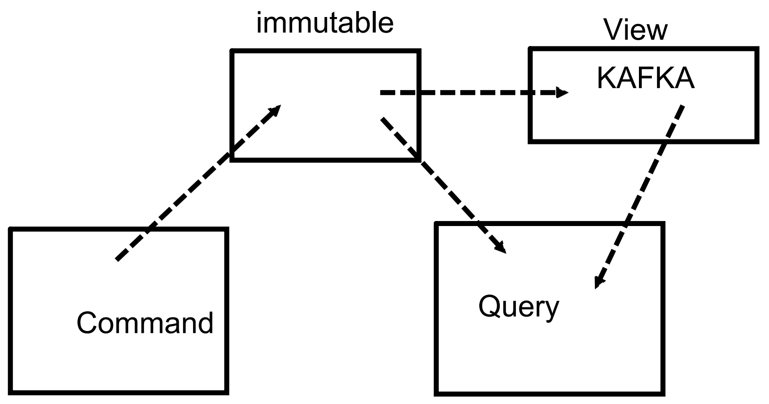
a) One DB per service

b) Shared DB per service

2-3 microservice

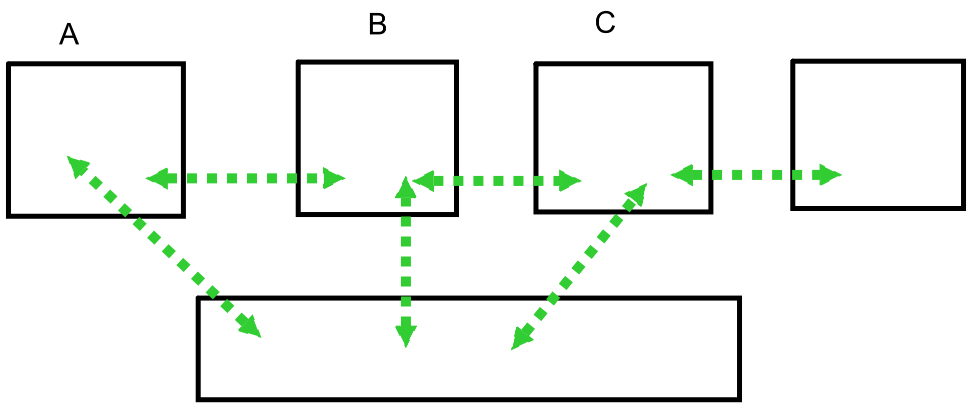
c) CQRS (Command Query Responsibility Segregation)

Event Sourcing



d) SAGA Pattern

1. Choreography



2. Orchestration

Observability Patterns

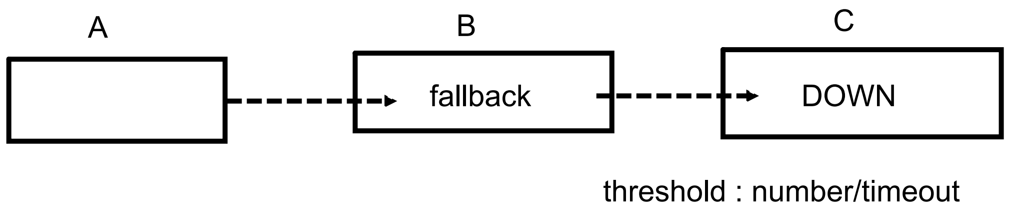
a) Log Aggregation

b) Performance Metrics

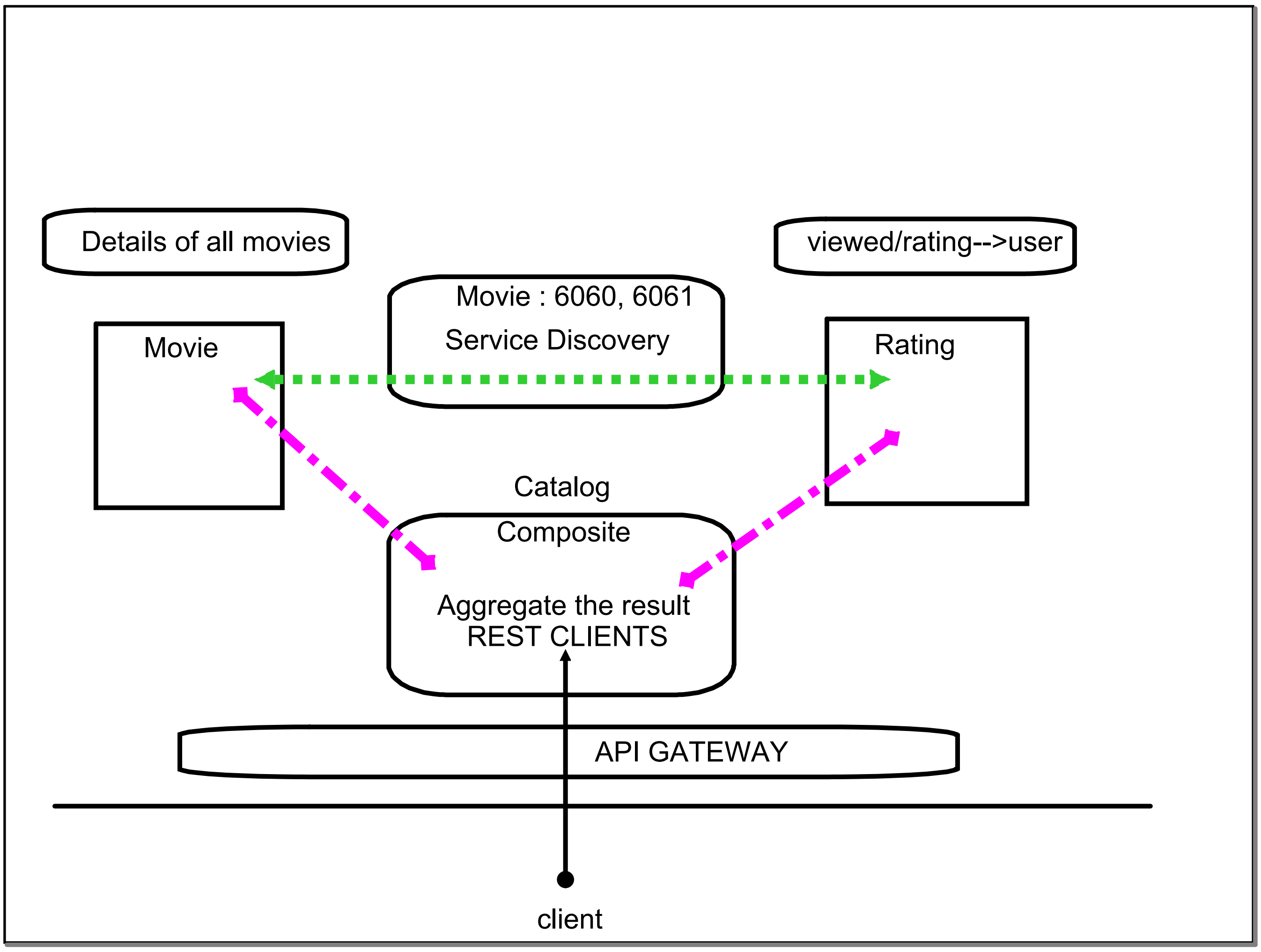
c) Distributed Tracing

d) Health Check

Cross-Cutting



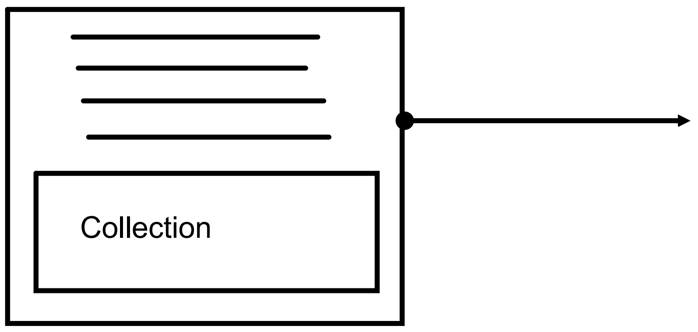
1. External Congifuration
2. Service Discovery Pattern
3. Circuit Breaker Pattern
4. Blue-Green Deployment

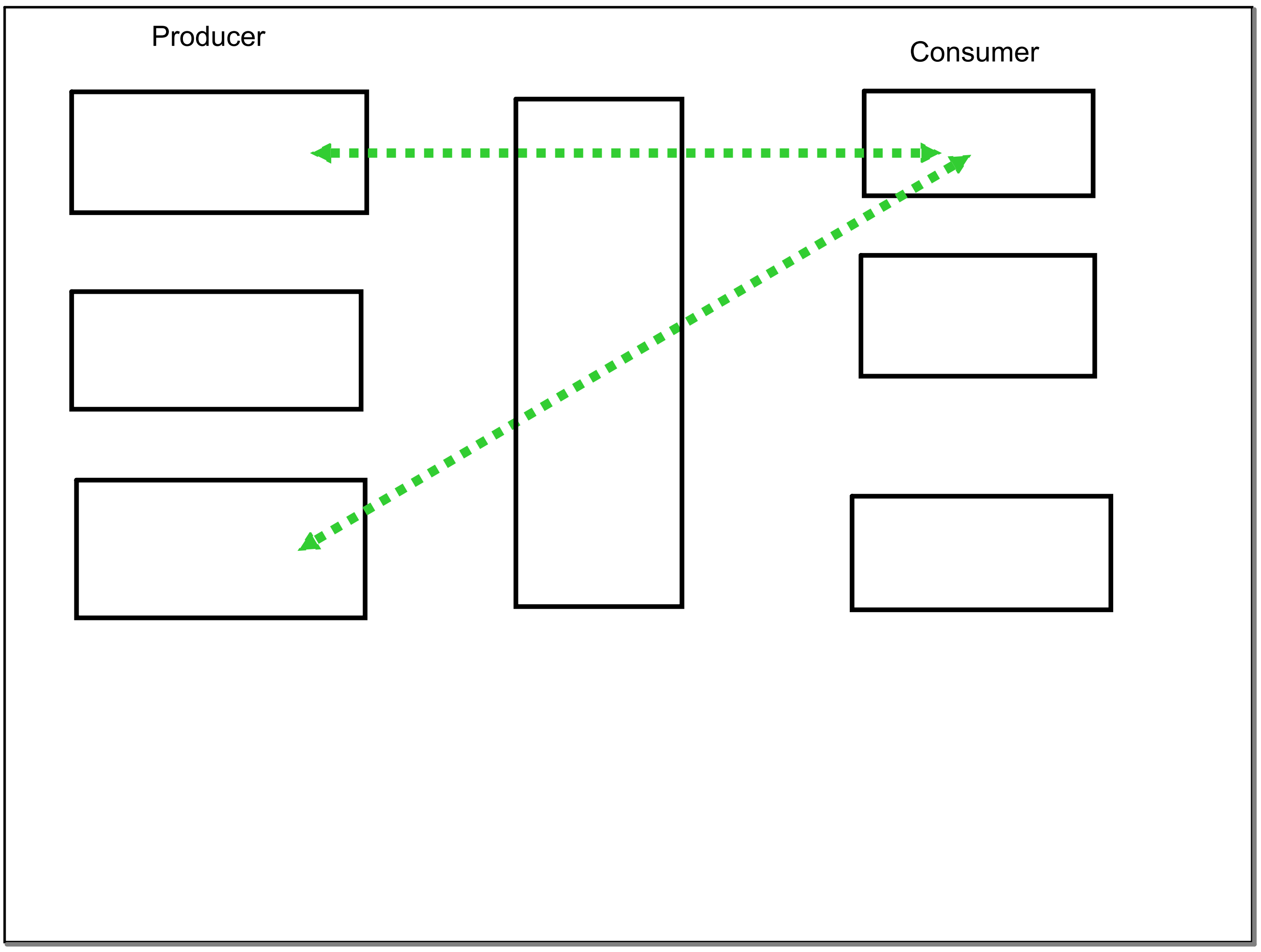

Details of all movies
viewed/rating-->user
Movie : 6060, 6061
Service Discovery
Movie
Rating
Catalog
Composite
Aggregate the result
REST CLIENTS
API GATEWAY
client

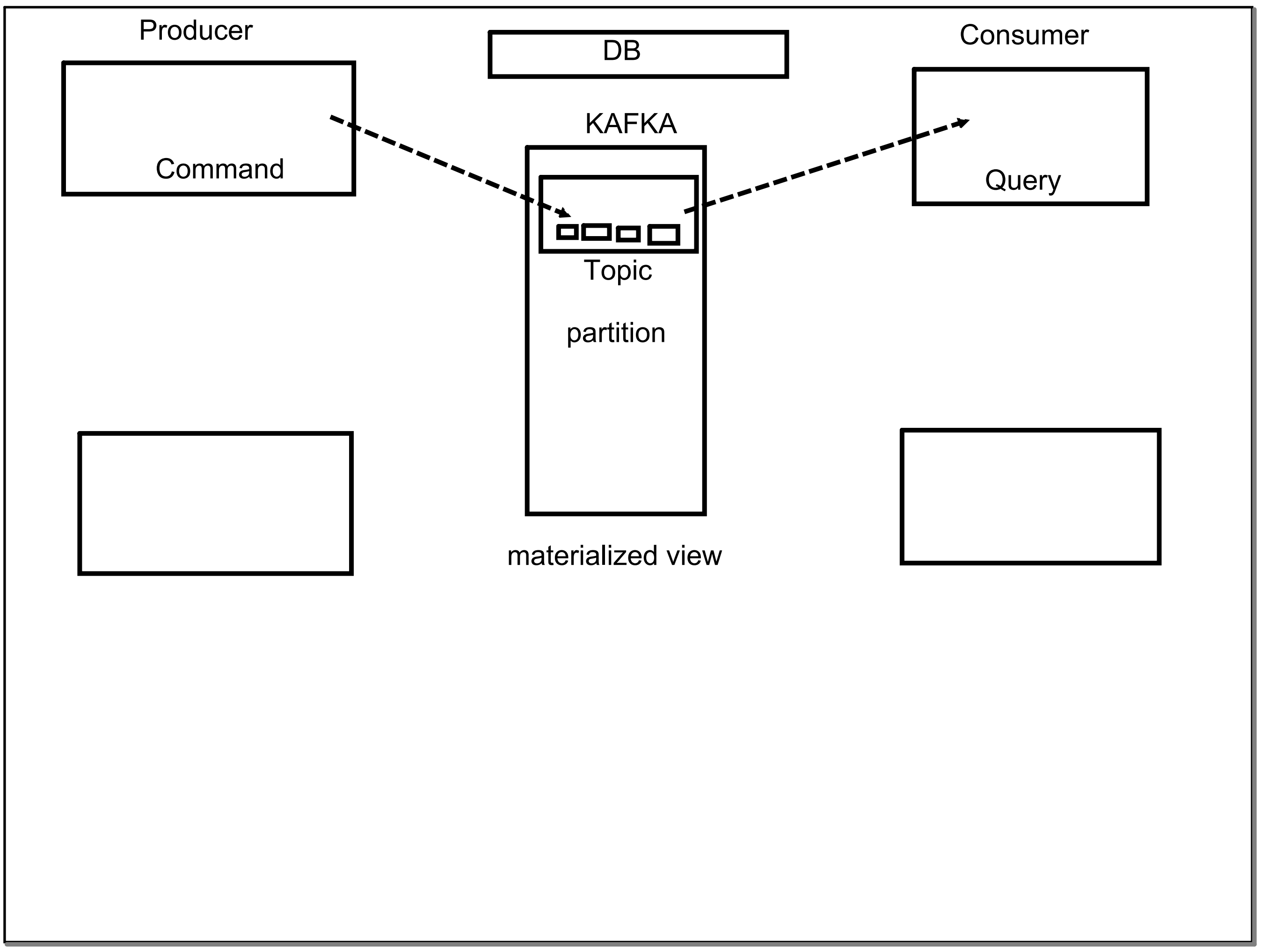
/movie-service/api/movies/{id} => Details/Record of movie of that id

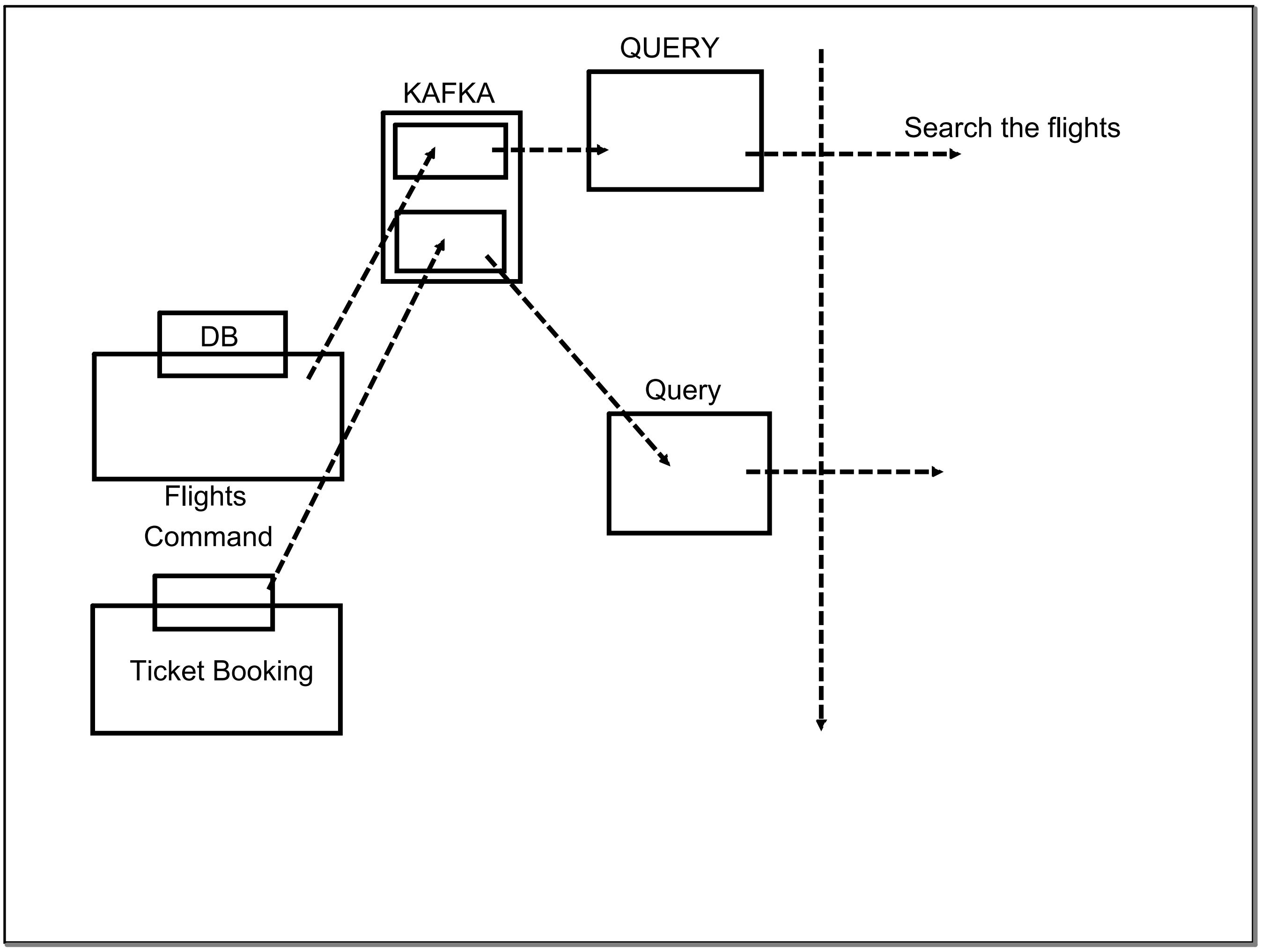
/rating-service/api/ratings/{userId} => List of Movies(Id) and rating of that userId

/catalog-service/api/catalog/{userId} => List of Movies(Details) and ratings of that userd




Producer
Consumer


Producer
DB
Consumer
KAFKA
Command
Query
Topic
partition
materialized view


QUERY
KAFKA
Search the flights
DB
Query
Flights
Command
Ticket Booking

1. Download and unzip the Kafka
2. Set the system path to batch file location
3. root of kafka folder, create a folder data
4. inside the data folder , create zookeeper and kafka
5. config zookeeper and kafka properties file to refer to data folder

Creating a topic

```
kafka-topics.bat --bootstrap-server localhost:9092 --create --topic <name> --partitions 1 --
replication-factor 1
```

Listing all topics :

```
kafka-topics.bat --bootstrap-server localhost:9092 --list
```

Details about a topic

```
kafka-topics.bat --bootstrap-server localhost:9092 --describe --topics <name>
```

Delete a topic

```
kafka-topics.bat --bootstrap-server localhost:9092 --delete --topic <name>
```

JDBC Authentication

password :

Eg : abc

{<encryption type>}encrypted password value

Plain text

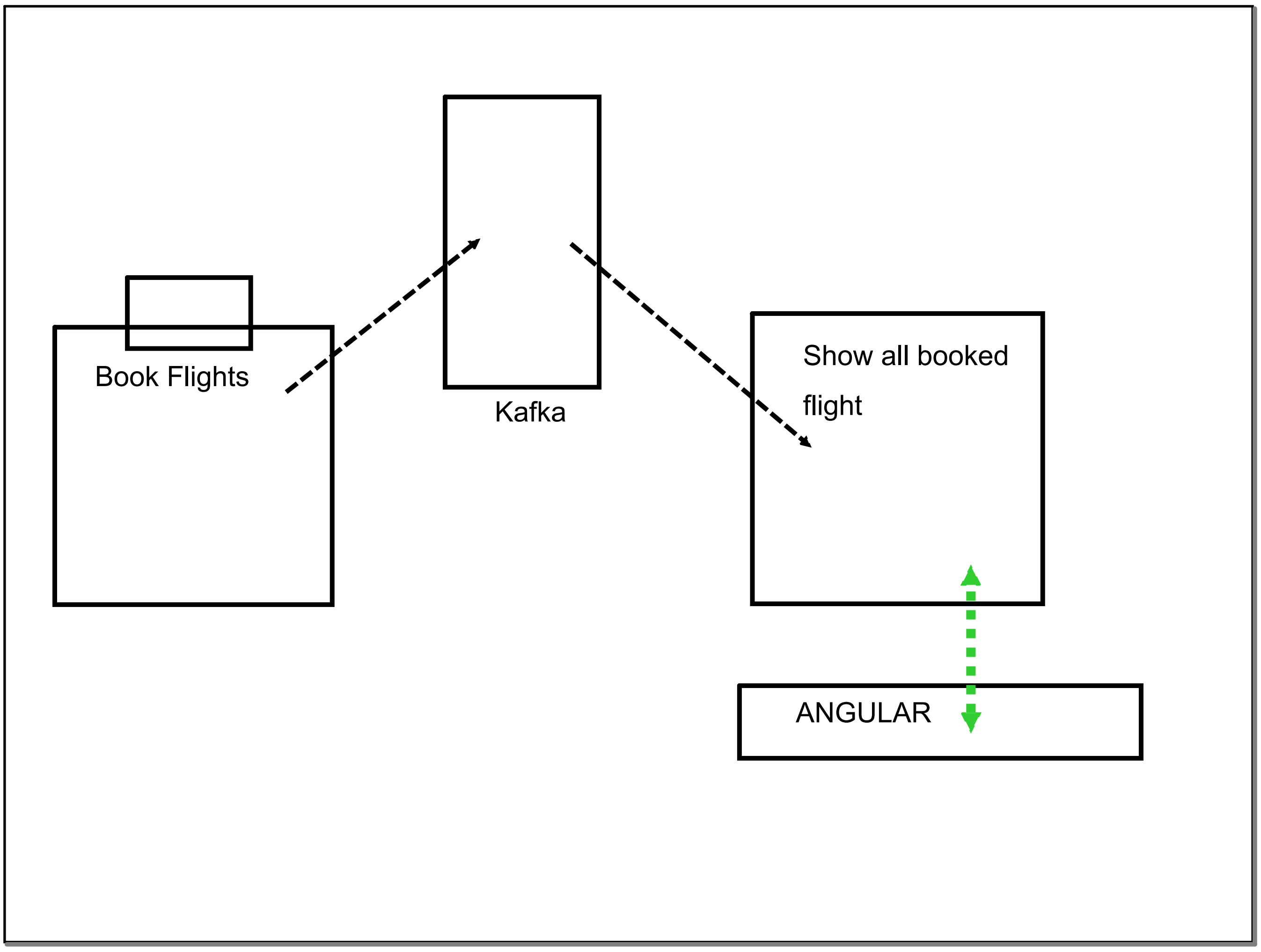
{noop}abc

Bcrypt

{bcrypt}$2a--------------------------------

Streaming model : request -response

Traditional : Data loss / may not be able to maintain order


Book Flights
Kafka
Show all booked flight
ANGULAR