

# DDD—没那么难

滕云

# 自我介绍

- 滕云
- ThoughtWorks 程序员
- Java/Linux/Devops/DDD
- 关注设计/架构/匠艺
- 《实现领域驱动设计》译者



领域



驱动



设计



不知所云



# 面向对象进阶

数据驱动

VS

领域驱动

忘掉你的数据库

## 数据驱动

- 数据库优先
- 算法和数据机械结合
- 技术导向
- 代码不能反映业务
- 业务逻辑分散
- 扩展性差

VS

## 领域驱动

- 领域模型优先
- 算法和数据有机结合
- 业务导向
- 代码即是设计
- 业务逻辑内聚
- 扩展性佳



# 行为饱满的领域对象

## 贫血对象

```
public class Person {  
    private String name;  
    private int age;  
    private String phoneNumber;  
    public String getName() { return name; }  
    public void setName(String name) { this.name = name; }  
    public int getAge() { return age; }  
    public void setAge(int age) { this.age = age; }  
    public String getPhoneNumber() { return phoneNumber; }  
    public void setPhoneNumber(String phoneNumber) { this.pho  
}
```

# 上帝对象

```
public class Order {  
    private Item items;  
    private Date placedDate;  
    addItem();  
    removeItem();  
  
    private double price;  
    private int discount;  
    pay();  
    discount();  
    issueInvoice();  
  
    private String address;  
    private String phoneNumber;  
    private String postCode;  
    private Status currentStatus;  
    getCurrentStatus();  
    changeAddress();  
}
```

选购

付款

物流

怎么办？



# 怎么拆?

## 选购

```
public class Order {  
    private Item item;  
    private Date orderDate;  
    addItem();  
    getOrderDate();  
}
```

限界上下文

## 付款

```
public class Order {  
    private double amount;  
    private int quantity;  
    pay();  
    discount();  
    calculate();  
}
```

限界上下文

## 物流

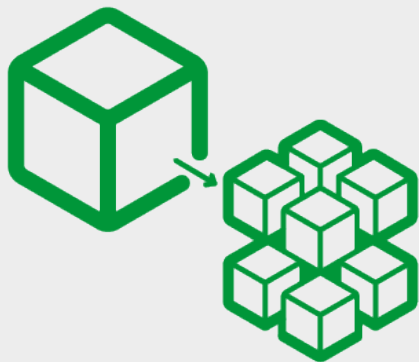
```
public class Order {  
    private String trackingNumber;  
    private String shippingCode;  
    private int currentStatus;  
    getTrackingNumber();  
    getShippingCode();  
    getStatus();  
}
```

限界上下文

一个领域概念在一个限界上下文中不应有二义性

再往前走一点点

微服务



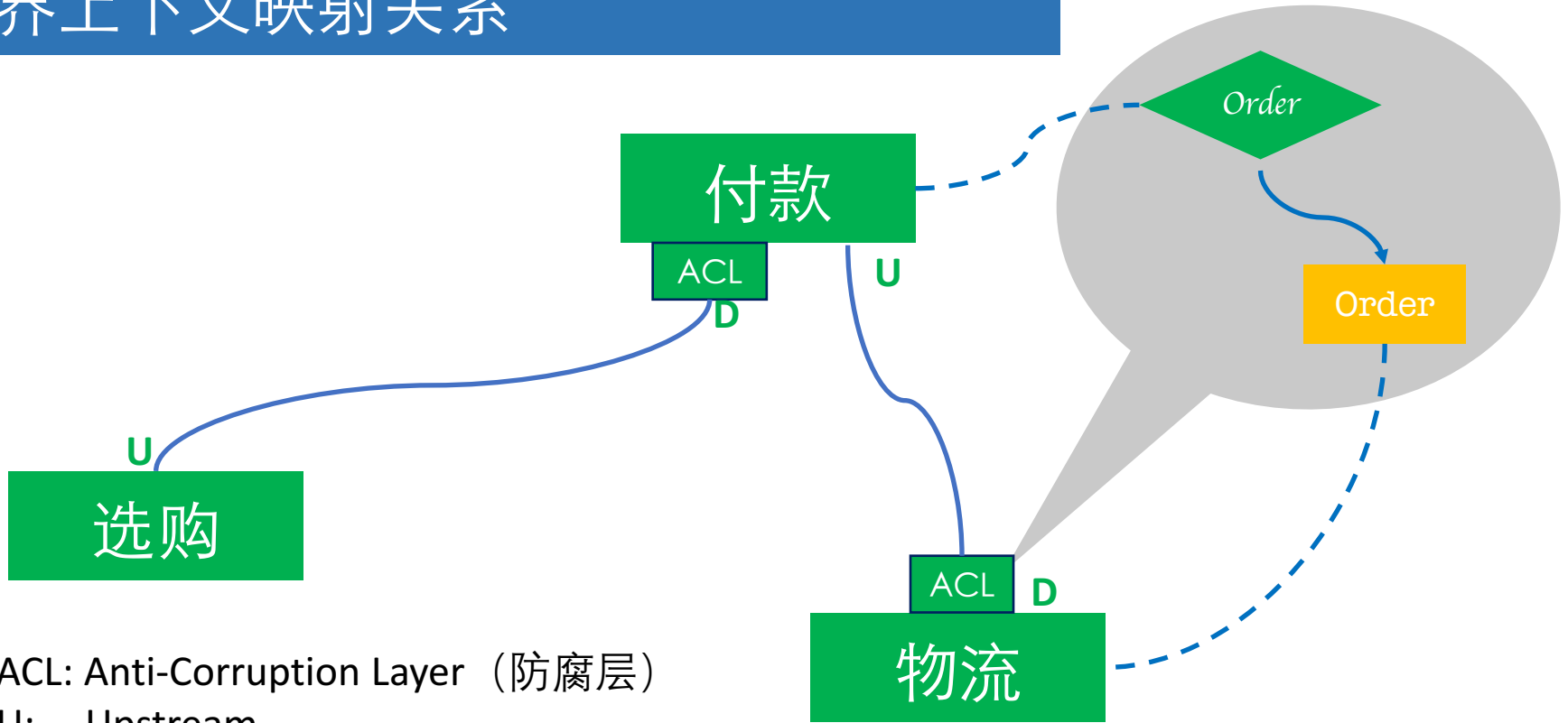
DDD

## 通过限界上下文拆分微服务





# 限界上下文映射关系



ACL: Anti-Corruption Layer (防腐层)

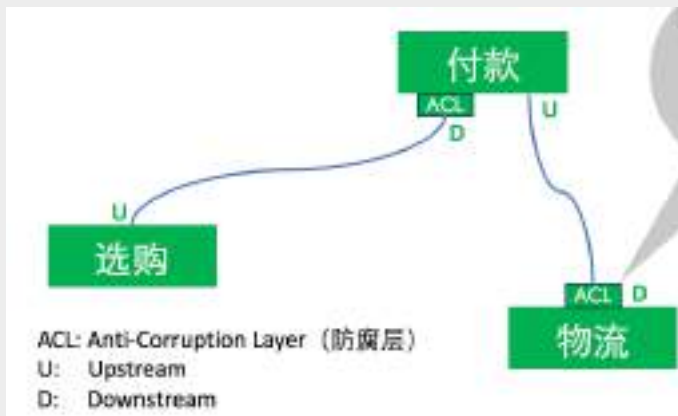
U: Upstream

D: Downstream

战略设计

战术设计

## 战略设计



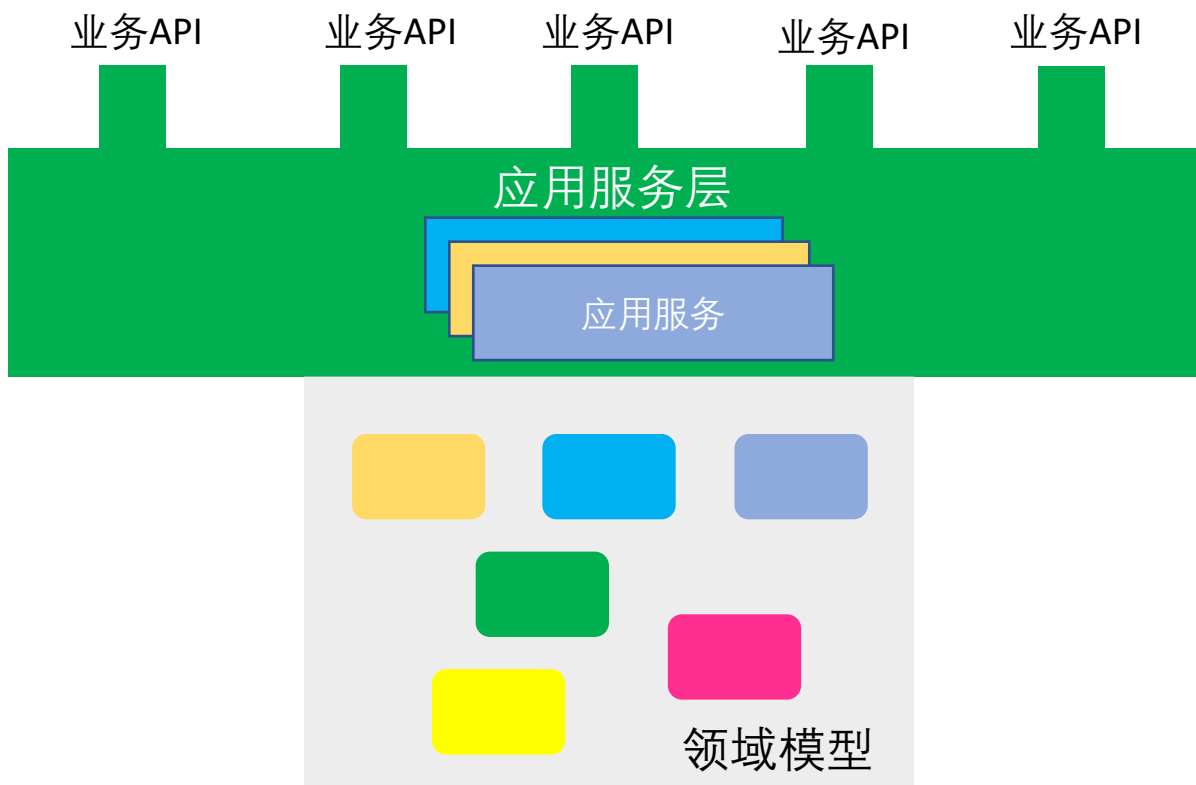
## 战术设计



# 战术设计

- 指导我们编码的
- 着眼于单个限界上下文

# 业务门面——应用服务 (Application Service)



## 例子：更改订单物流地址

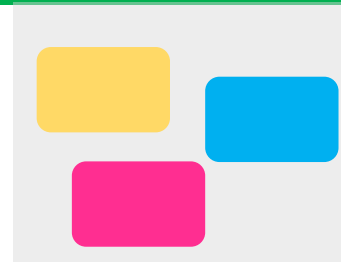
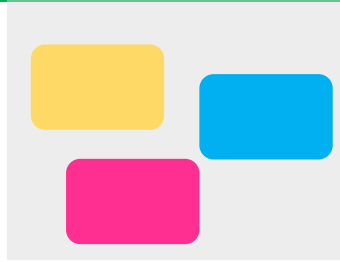
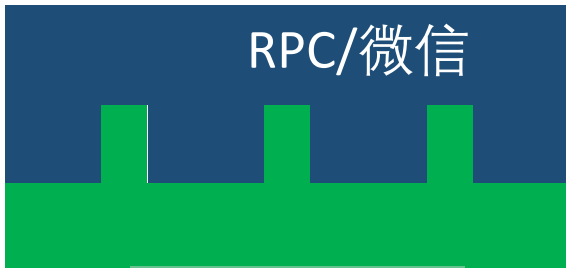
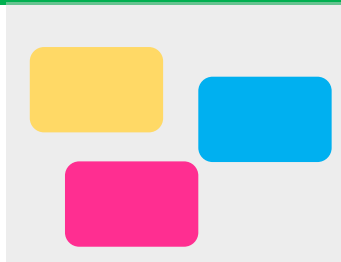
```
public class OrderApplicationService {  
    @Transactional  
    public void changeAddress(String orderId, String newAddress) {  
        Order order = orderRepository.byId(orderId);  
        order.changeAddress(newAddress);  
        orderRepository.save(order);  
    }  
}
```

# 业务门面——应用服务 (Application Service)

- ❑ 语言级别API
- ❑ 与UI/通信协议无关
- ❑ API与业务用例一一对应
- ❑ 很薄的一层
- ❑ 起协调代理作用
- ❑ 本身并不包含业务逻辑
- ❑ 事务边界

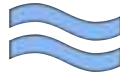
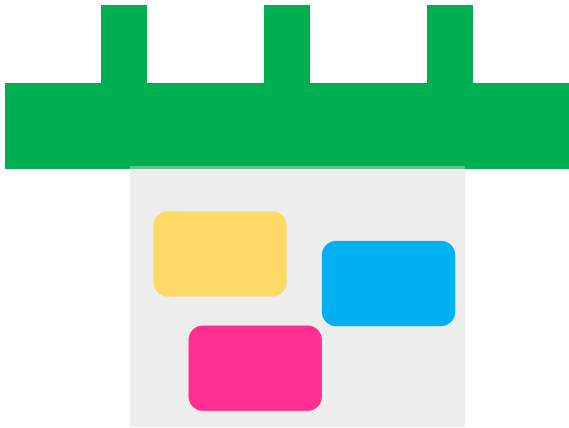


# 业务门面——应用服务 (Application Service)





# 业务门面——应用服务(Application Service)



# 业务逻辑到底放在什么地方？



## 业务逻辑到底放在什么地方？

- ❑ 核心领域对象
- ❑ 高度内聚
- ❑ 一致性边界

聚合根(Aggregate Root)

## 应用服务直接调用聚合根

```
public class OrderApplicationService {  
    @Transactional  
    public void changeAddress(String orderId, String newAddress) {  
        Order order = orderRepository.byId(orderId);  
        order.changeAddress(newAddress);  
        orderRepository.save(order);  
    }  
}
```

# 聚合根



# 聚合根

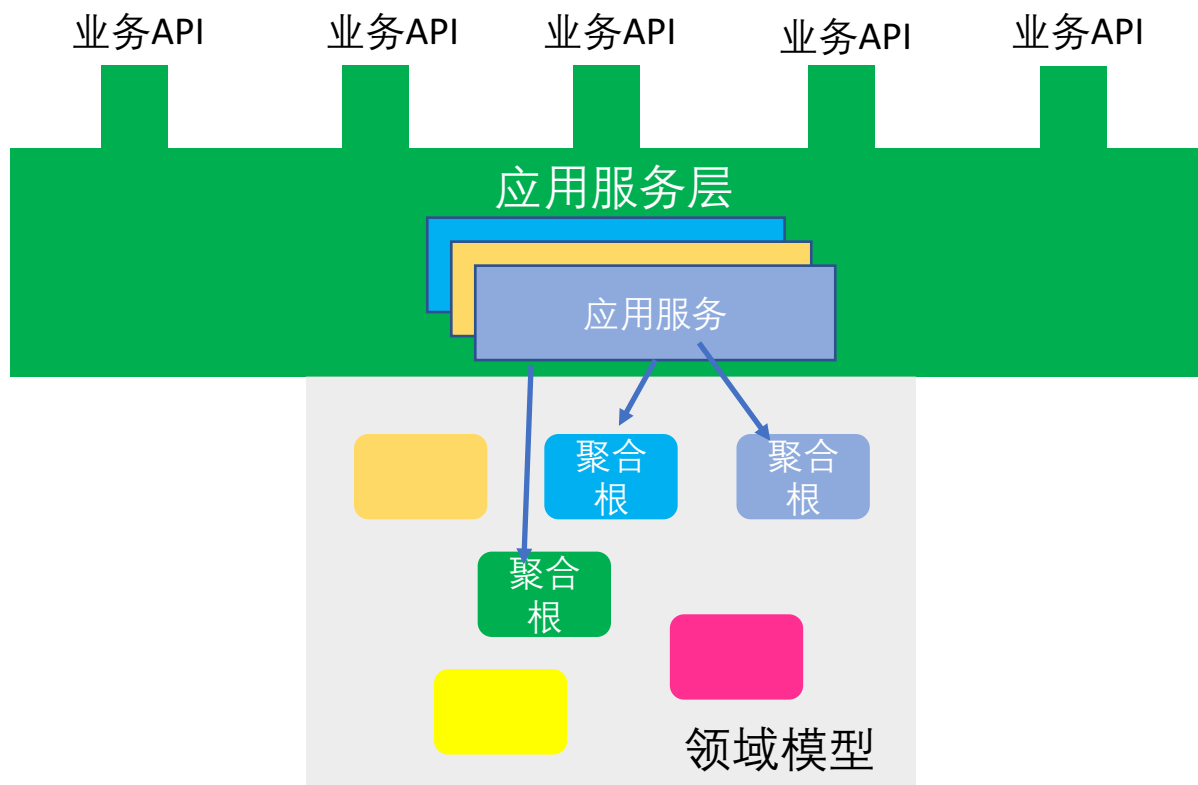
- ❑ 对外边界
- ❑ 其内部的所有业务操作都必须经过聚合根
- ❑ 一次业务用例对应一次事务对应一个聚合根
- ❑ 聚合根之间的数据一致性通过最终一致性完成

## 聚合根

```
//Good  
order.removeItem(item);
```

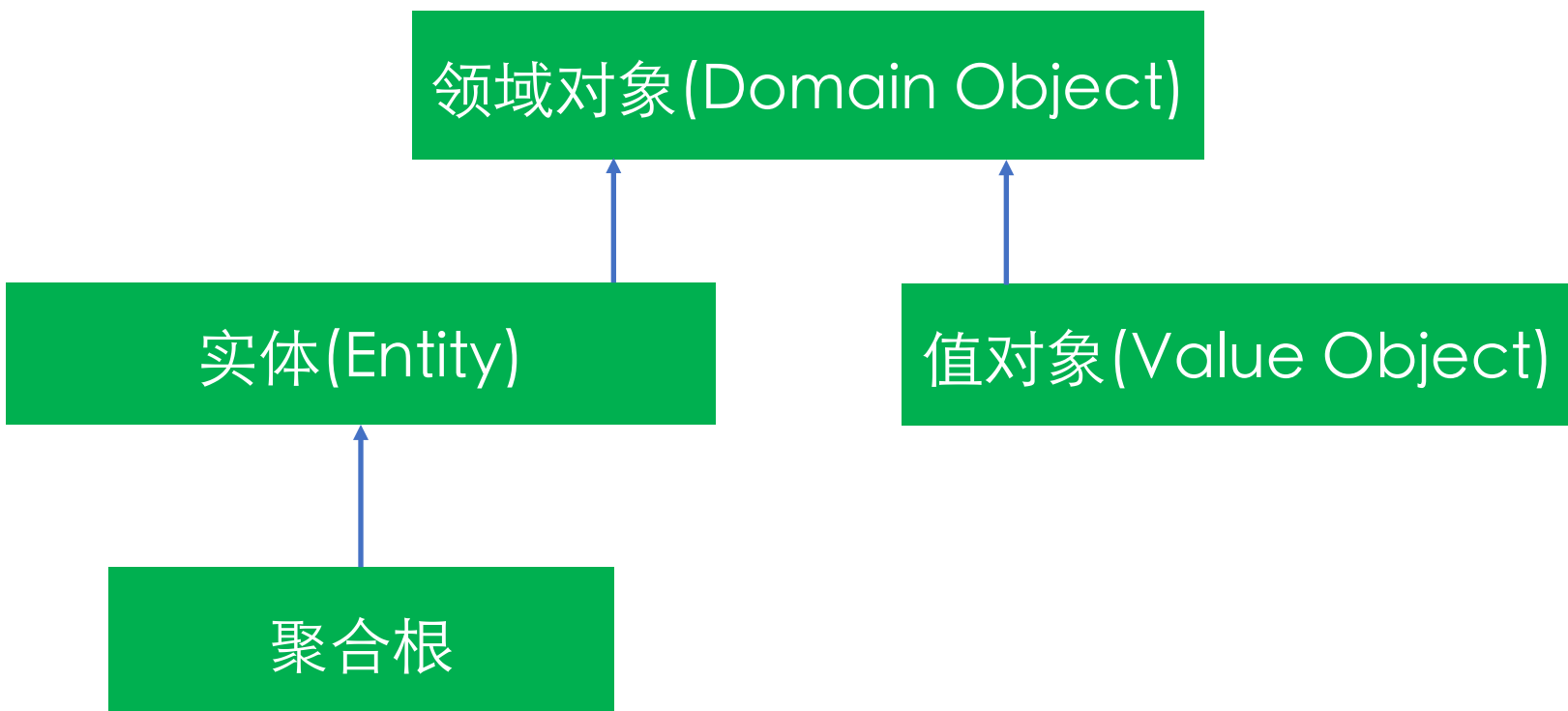
```
//Bad  
List<Item> items = order.getItems();  
items.remove(item);
```

# 应用服务直接调用聚合根





# 领域对象



## 实体

- 具有生命周期
- 有唯一标识
- 通过Id判断相等性
- 增删改查/持久化
- 可变
- 比如Order/Car

**VS**

## 值对象

- 起描述性作用
- 无唯一标识
- 通过属性判断相等性
- 实现Equals()方法
- 即时创建/用完即扔
- 不可变(Immutable)
- 比如Address/Color

尽量将领域概念建模成值对象



商品交易



VS

货币追踪

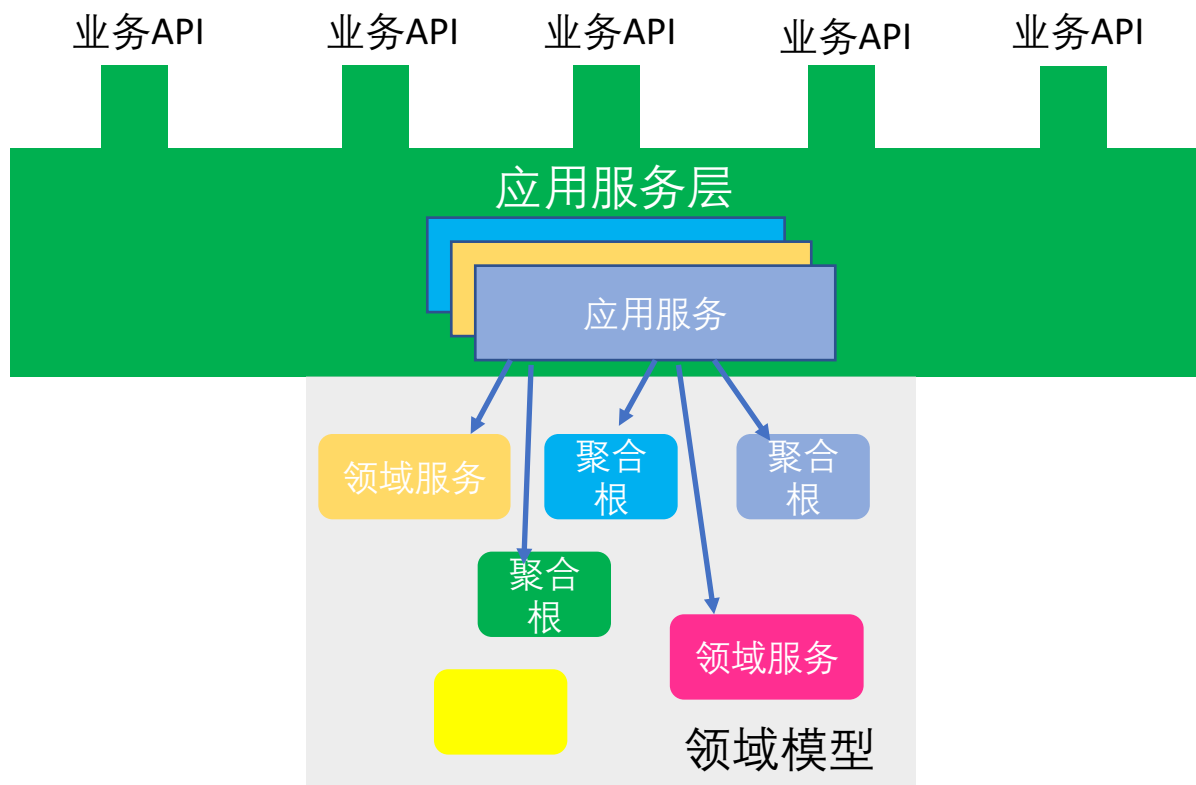


有时领域逻辑放在领域对象上不合适



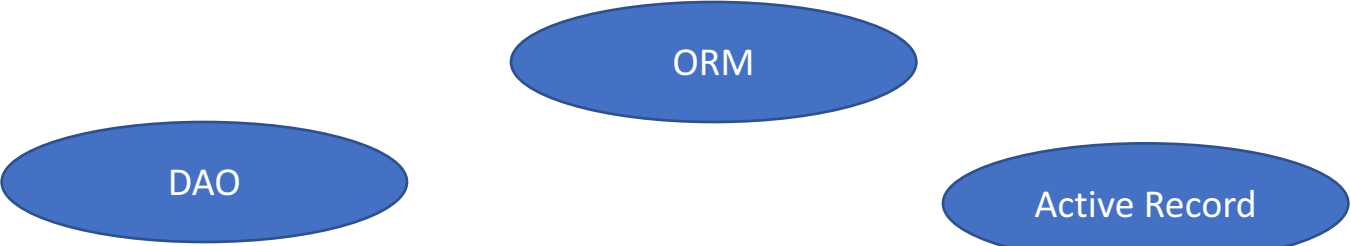
# 领域服务(Domain Service)

# 领域服务 vs 应用服务





最后，数据库



# 资源库(Repository)

DAO

VS

资源库

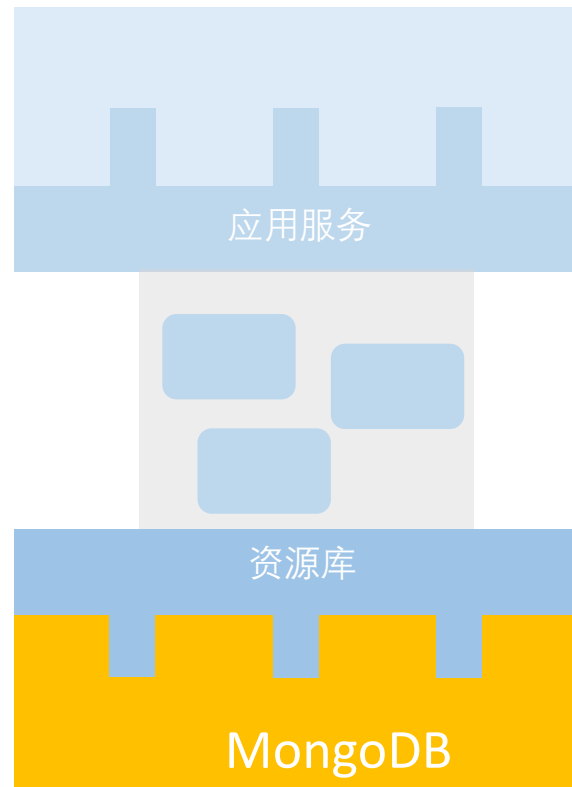
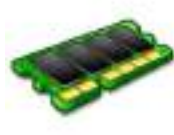
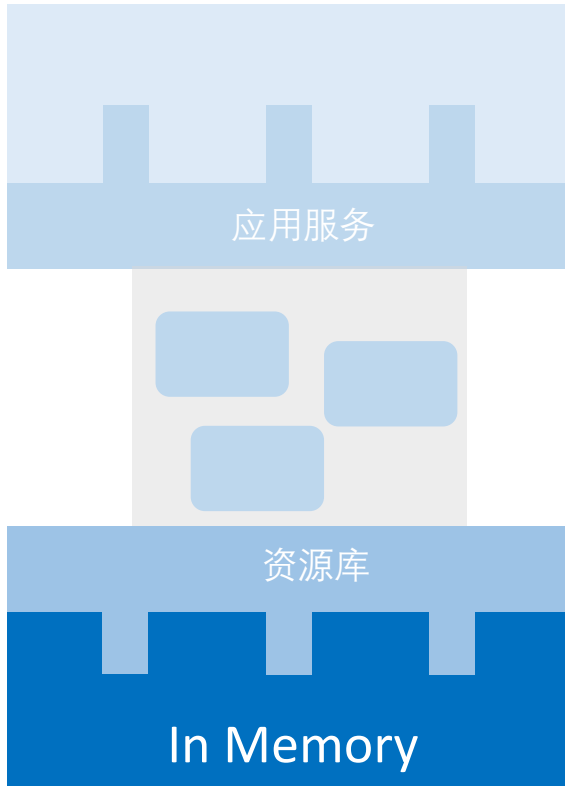
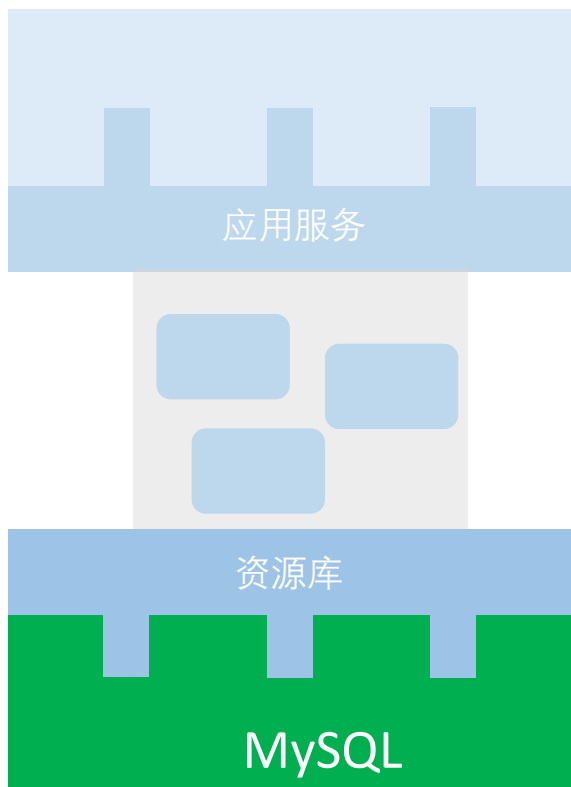
# 资源库

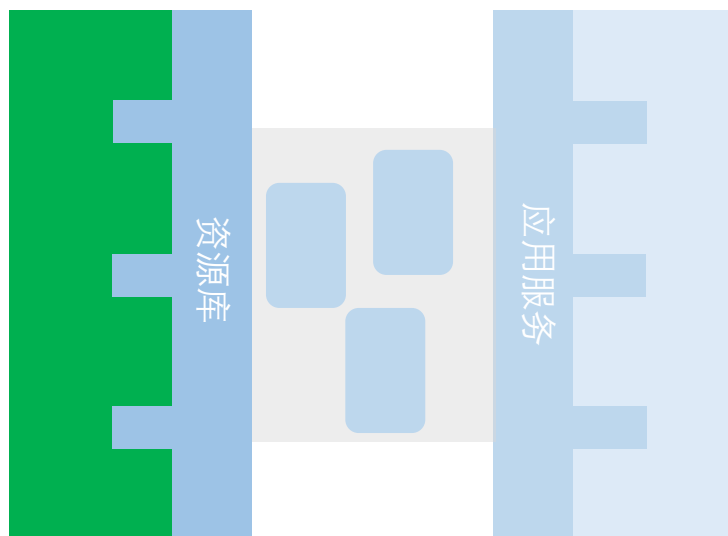
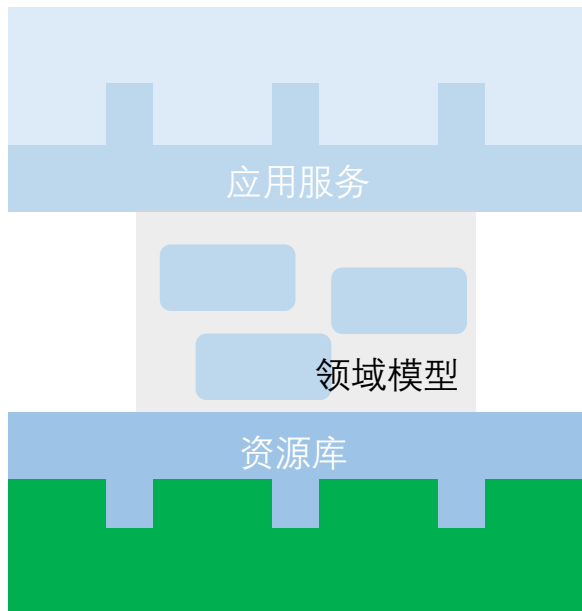
□可插拔性

□聚合根的集合

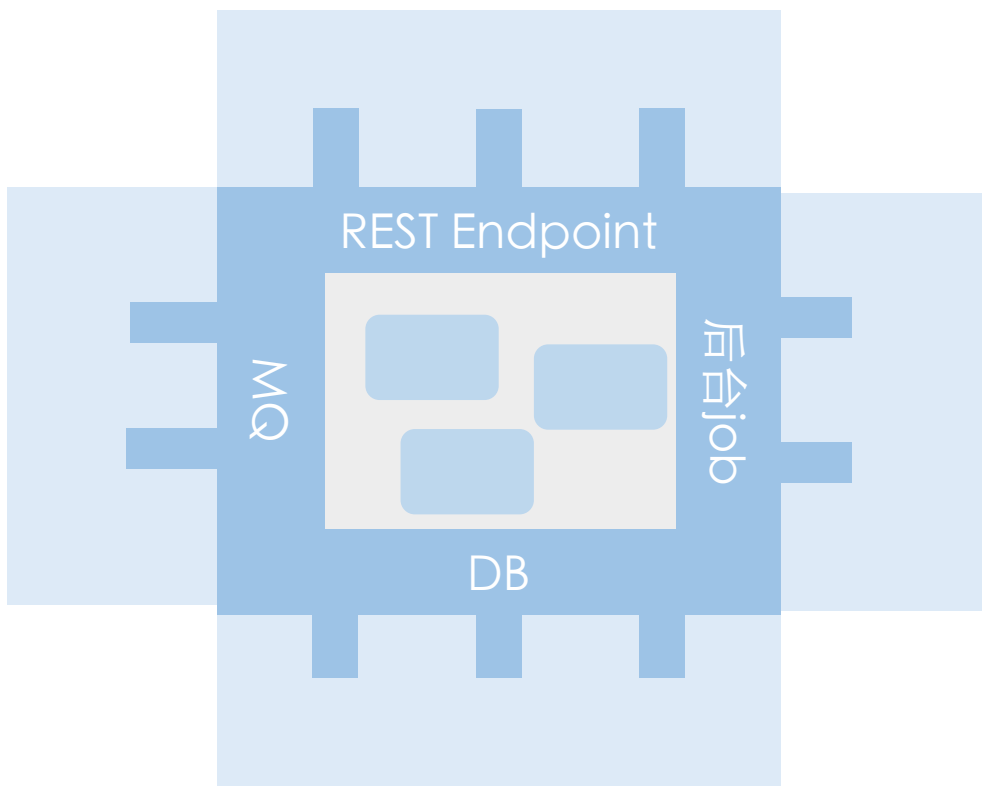
## 应用服务直接调用资源库(Repository)

```
public class OrderApplicationService {  
    @Transactional  
    public void changeAddress(String orderId, String newAddress) {  
        Order order = orderRepository.byId(orderId);  
        order.changeAddress(newAddress);  
        orderRepository.save(order);  
    }  
}
```

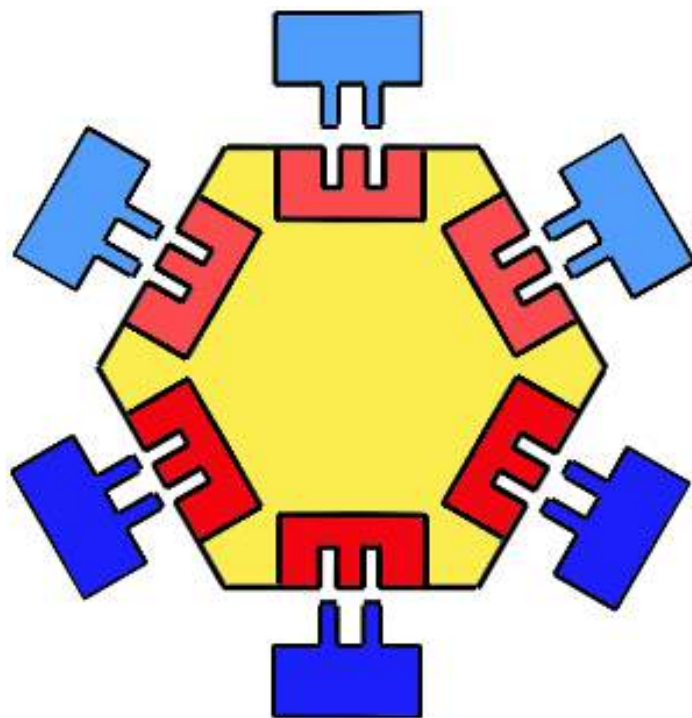


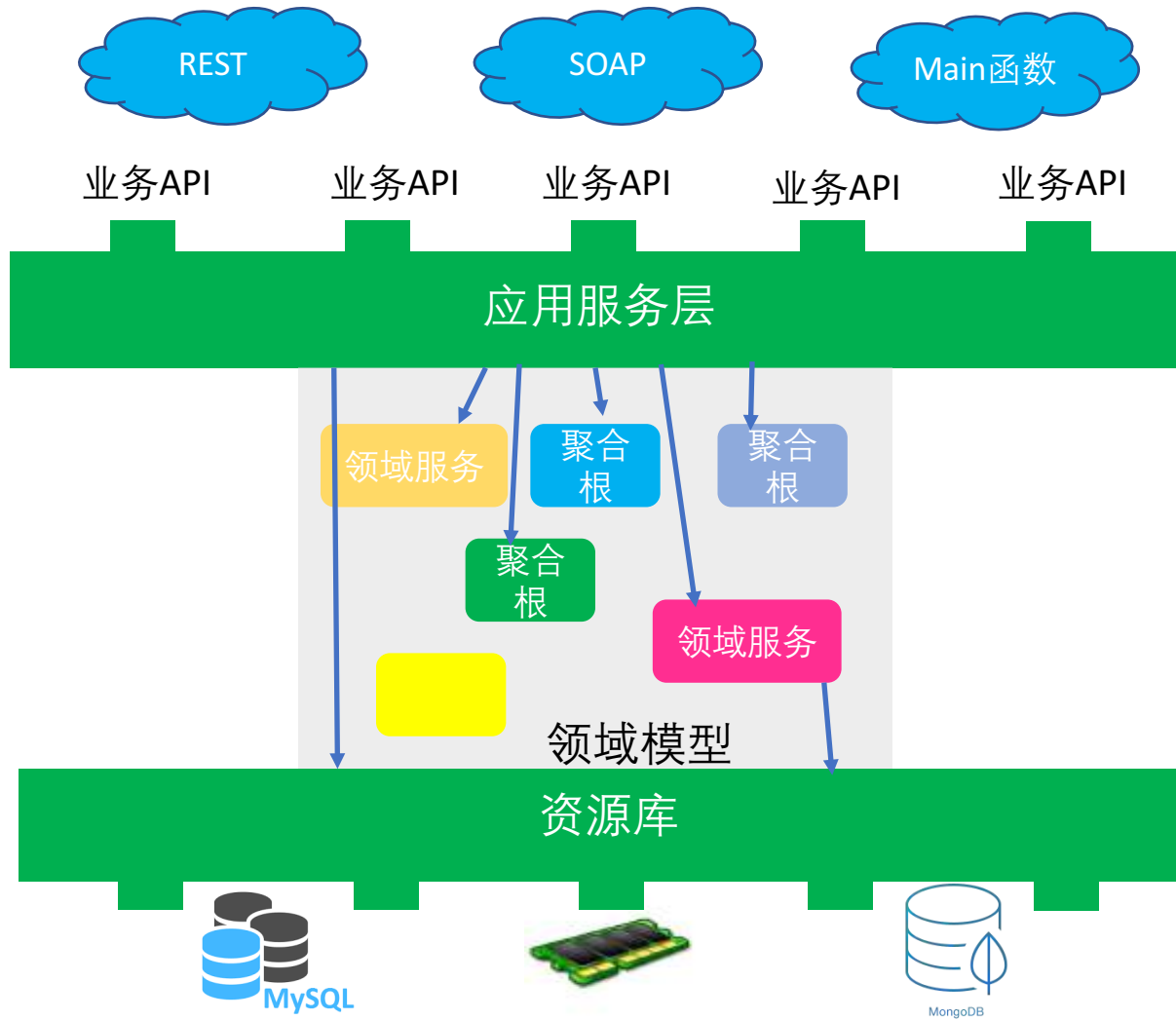






# 六边形架构





谢谢