Day10

1 规则详解

1.1 限流的规则

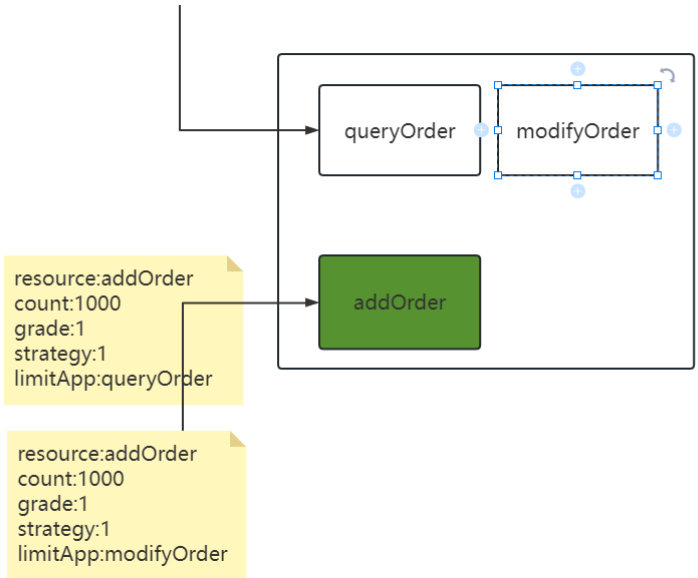
- resource: 定义当前规则绑定限制的资源id 名称
- count: 限流的阈值,grade=1 表示qps上限,grade=0 表示并发上限
- grade: 1 qps类型的限流 0 并发类型限流
- strategy: 限流策略.以哪种方案和逻辑来限流 0直接 1关联 2链路
- limitApp: 流控针对的调用来源,默认default不区分调用来源,配合strategy=1的是后和2的时候使用.
- controlBehavior: 限流效果(0直接拒绝,1Warm up,2排队)

```
[
    {
        "resource":"addOrder",
        "count":"1",
        "grade":"1",
        "strategy":"1",
        "limitApp":"queryOrder",
        "controlBehavior":"0"
    }
]
```

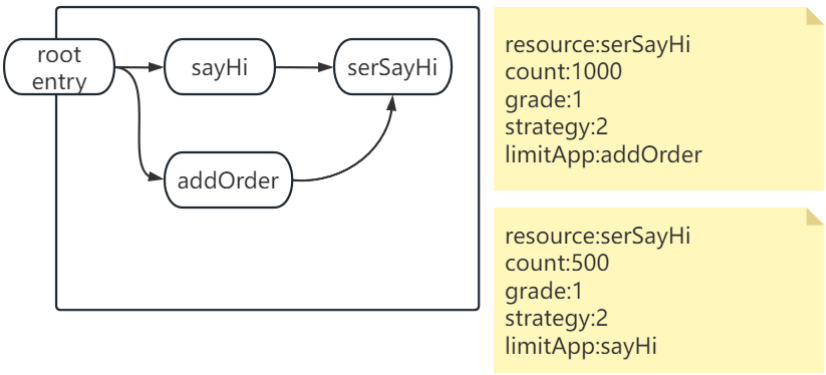
strategy:

0 直接限制,针对当前定义资源,限制访问

1 关联,和limitApp有关系,如果当前资源流量,超过限流规则,限制limitApp定义的资源.



2 链路 决定限制流量的时候,先判断一下链路的入口,和limitApp有关,表示入口的资源



1.2 熔断规则

- 规则示例

```
[
  {
    "resource": "sayHiService",
    "count": 1,
    "grade": 2,
    "timeWindow": 10,
    "minRequestAmount": 1,
    "slowRatioThreshold": 0.5,
    "statIntervalMs": 10000
  }
]
```

和流控规则使用区别在于,流控规则对象FlowRule,读取文件类型flow,熔断加载创建独享DegradeRule,文件规则类型,degrade.分开文件配置熔断规则,程序读取2个文件(2个数据源)

- 提供测试环境

1. demo03 测试 ,对原有资源,流控不要限制
2. 熔断(牺牲局部保存全局),出了毛病之后,对资源做断路访问. 定义一个测试熔断的资源

```
package com.tarena.csmall.sentinel.demo03.service;
@Service
public class HelloService {
    public String sayHi(String name) throws BlockException {
        Entry entry=null;
        try{
            entry= SphU.entry("serviceHi");
            String result="你好啊!"+name;
            return result;
        }catch(DegradeException e){
            //捕获异常之后,编写降级的逻辑
            return "对不起,资源现在断路状态";
        }catch (BlockException e){
            //捕获异常之后,编写降级的逻辑
            return "对不起,您的请求,被blocked";
        }finally {
            //释放资源
            if (entry!=null){
```

```
                entry.exit();
            }
        }
    }
}
```

3. nacos配置一个熔断规则

```
[
  {
    "resource": "serviceHi",
    "count": 1,
    "grade": 0,
    "timeWindow": 10,
    "minRequestAmount": 1,
    "slowRatioThreshold": 0.5,
    "statIntervalMs": 10000
  }
]
```

- count: 熔断触发的阈值(不再调用这个资源,而是访问降级策略),如果grade=0 count表示慢调用临界RT(响应时间单位毫秒),超过这个数字,就记录一次慢调用.grade是1,count值应该是>0小于1的小数,表示异常比例,grade=2 count配置整数,表示异常出现的次数
- slowRatioThreshold: 慢调用比例,在grade=0时生效.当满足count记录成慢调用时,达到这个阈值,触发熔断.
- minRequestAmount: 最少统计的请求数量.没达到最少数量,不会触发熔断
- statIntervalMs: 统计时长,在同一个统计时长之内的数据,才能触发熔断.单位毫秒数.
- timeWindow: 如果触发熔断,持续时间,单位秒
- grade: 熔断类型 0 默认值 慢调用比例 1 异常比例 2异常数

当前熔断规则定义:

在10秒钟之内,最少达到1次请求前提下,超过1毫秒的资源处理时间记录为慢调用,如果所有调用请求的慢调用比例达到50%,则资源会熔断,熔断持续时间10秒,10秒后,断路器半开,尝试访问资源,再次计算熔断规则.

4. 项目配置nacos读取熔断数据源.

```
spring:
  cloud:
    sentinel:
      datasource:
        #定义一个数据源的名称
        key1:
          nacos:
            #数据源具体属性 nacos address namespace group-id 文件名称
            server-addr: localhost:8848
            data-id: flowRules.json
            data-type: json
            #namespace: f033ea8e-15ca-4f37-b112-127edc03de9e
            #每一个数据源的规则类型必须配置
            rule-type: flow
            #如果sentinel版本高于1.7 必须配置nacos用户名密码
            username: nacos
```

```
            password: nacos
        key2:
          nacos:
            #数据源具体属性 nacos address namespace group-id 文件名称
            server-addr: localhost:8848
            data-id: degradeRules.json
            data-type: json
            #namespace: f033ea8e-15ca-4f37-b112-127edc03de9e
            #每一个数据源的规则类型必须配置
            rule-type: degrade
            #如果sentinel版本高于1.7 必须配置nacos用户名密码
            username: nacos
            password: nacos
```

测试一下上述熔断规则中的异常数.

```
[
  {
    "resource": "serviceHi",
    "count": 1,
    "grade": 2,
    "timeWindow": 10,
    "minRequestAmount": 1,
    "slowRatioThreshold": 0.5,
    "statIntervalMs": 10000
  }
]
```

上述表示内容: 10秒内统计异常数的熔断策略,如果最小请求达到1,并且异常数超过1,进入熔断持续时间10秒.

2 注解形式定义资源

try{}catch{}finally{} 硬编码组织管理生成resource资源.只能做代码片段的管理.

对业务侵入性比较强.sentinel提供了注解的形式,并且实现底层aop切面来完成资源的定义.

2.1 修改当前serviceHi案例为注解

- 修改HelloService

```
@SentinelResource(value = "serviceHi")
public String sayHi(String name){
    String result="你好啊!"+name;
    try {
        Thread.sleep(100);
    } catch (InterruptedException e) {
        e.printStackTrace();
    }
    //int a=1/0;
    return result;
}
```

- 修改HelloController

```
@GetMapping("/hello")
@SentinelResource(value="sayHi")
public String sayHi(String name){
    String result=helloService.sayHi(name);
    return result;
}
```

测试思路:

针对限流和熔断,不同的规则配置,测试的两个资源方法 HelloController.sayHi

HelloService.sayHi.

无论是限流还是熔断,现在保护的都是方法的调用,出现其中任意一种规则的限制,都会在调用方法时,不进入方法,直接抛对应异常.

2.2 blockhandler

blockhandler在**本类**,准备一个自定义名字的方法,来处理sentinel抛出的BlockException异常,包含各种类型规则的异常.

保证方法的特点:

1.入参和资源方法一致

2.出参合资源方法一致

3.参数多一个异常参数BlockException

```
package com.tarena.csmall.sentinel.demo03.service;

import com.alibaba.csp.sentinel.Entry;
import com.alibaba.csp.sentinel.SphU;
import com.alibaba.csp.sentinel.annotation.SentinelResource;
import com.alibaba.csp.sentinel.slots.block.BlockException;
import com.alibaba.csp.sentinel.slots.block.degrade.DegradeException;
import com.alibaba.csp.sentinel.slots.block.flow.FlowException;
import org.springframework.stereotype.Service;

import java.io.IOException;

/**
 * @author java@tedu.cn
 * @version 1.0
 */
@Service
public class HelloService {
    //定义一个方法为sentinel资源使用的注解
    //value 定义资源名称
    //blockhandler 会在本类中,寻找一个同名的方法,做降级的处理 要求
    //方法参数和方法返回值要和当前目标方法一致,并且要求添加一个异常对象的参数
    //fallback
    public String blockError(String name,BlockException e){
        //异常 BlockException 有可能是所有不同规则对应的异常类型
        //DegradeException
        return "sorry,sayHi方法熔断了,"+name;
    }
```

```
    @SentinelResource(value = "serviceHi",blockHandler="blockError")
    public String sayHi(String name){
        System.out.println("进入到service的saiHi");
        String result="你好啊!"+name;
        try {
            Thread.sleep(100);
        } catch (InterruptedException e) {
            e.printStackTrace();
        }
        int a=1/0;
        return result;
    }
}
```

2.3 fallback

注解的另一个属性,处理逻辑和blockHanlder逻辑完全相同.

不同点在于,他可以管理blockHanlder不处理的异常.

```
package com.tarena.csmall.sentinel.demo03.service;

import com.alibaba.csp.sentinel.Entry;
import com.alibaba.csp.sentinel.SphU;
import com.alibaba.csp.sentinel.annotation.SentinelResource;
import com.alibaba.csp.sentinel.slots.block.BlockException;
import com.alibaba.csp.sentinel.slots.block.degrade.DegradeException;
import com.alibaba.csp.sentinel.slots.block.flow.FlowException;
import org.springframework.stereotype.Service;

import java.io.IOException;

/**
 * @author java@tedu.cn
 * @version 1.0
 */
@Service
public class HelloService {
    //定义一个方法为sentinel资源使用的注解
    //value 定义资源名称
    //blockhandler 会在本类中,寻找一个同名的方法,做降级的处理 要求
    //方法参数和方法返回值要和当前目标方法一致,并且要求添加一个异常对象的参数
    //fallback
    public String aaa(String name,BlockException e){
        //异常 BlockException 有可能是所有不同规则对应的异常类型
        //DegradeException
        return "sorry,sayHi方法熔断了,"+name;
    }
    public String bbb(String name,Throwable e){
        return "sorry,sayHi出现了异常,"+name;
    }
    @SentinelResource(
            value = "serviceHi",
            blockHandler="aaa",
            fallback = "bbb")
```

```
    public String sayHi(String name){
        System.out.println("进入到service的saiHi");
        String result="你好啊!"+name;
        try {
            Thread.sleep(100);
        } catch (InterruptedException e) {
            e.printStackTrace();
        }
        int a=1/0;
        return result;
    }
}
```

```
    //方法参数和方法返回值要和当前目标方法一致,并且要求添加一个异常对象的参数
    //fallback
    public String aaa(String name,BlockException e){
        //异常 BlockException 有可能是所有不同规则对应的异常类型
        //DegradeException
        return "sorry,sayHi方法熔断了,"+name;
    }
    public String bbb(String name,Throwable e){
        return "sorry,sayHi出现了异常,"+name;
    }
    @SentinelResource(
            value = "serviceHi",
            blockHandler="aaa",
            fallback = "bbb")
    public String sayHi(String name){
        System.out.println("进入到service的saiHi");
        String result="你好啊!"+name;
```

资源被限制了 原因限流 熔断 系统保护

目标方法调用,或者资源限制,抛出的如果在BlockeExcetion以外,交给fallback处理

执行的目标方法,也是资源

2.4 类的静态方法

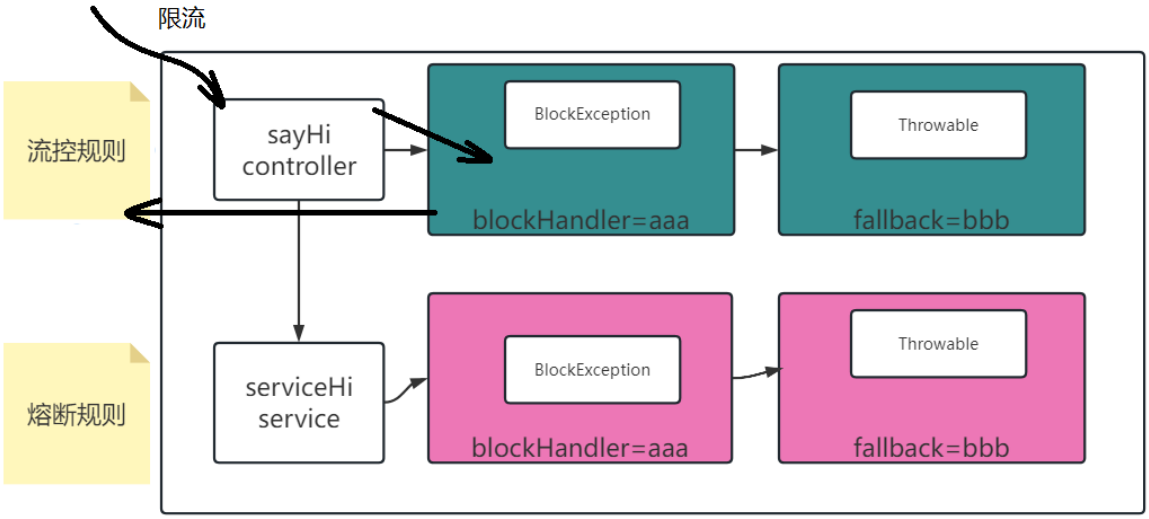
上述两种降级,都是在本类中实现的,如果降级逻辑相同的,比如不中的业务降级,只处理日志的记录.

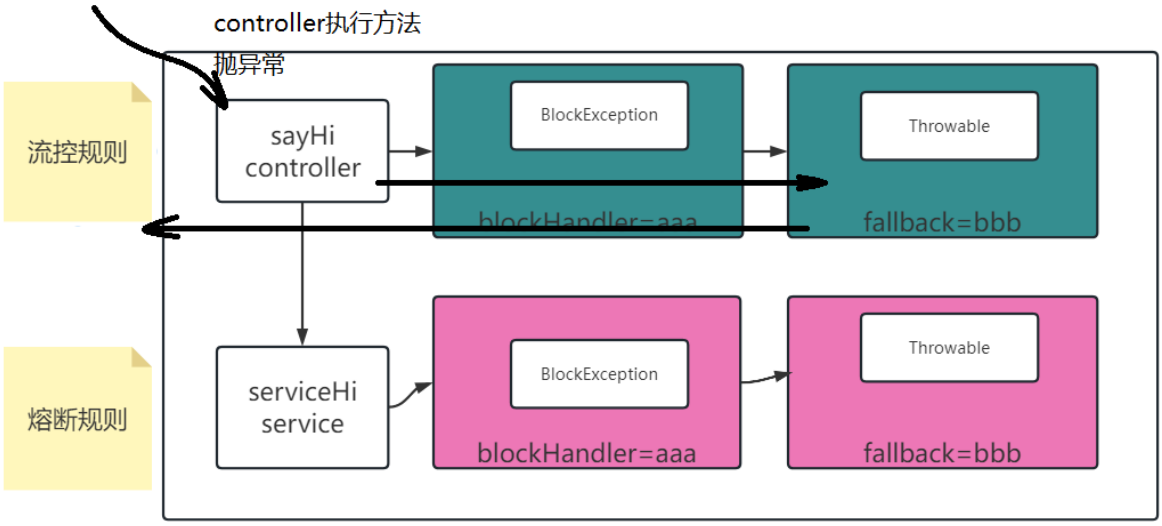
为了减少业务代码类中,降级处理逻辑的代码繁杂,提供了简化,静态方法提取.

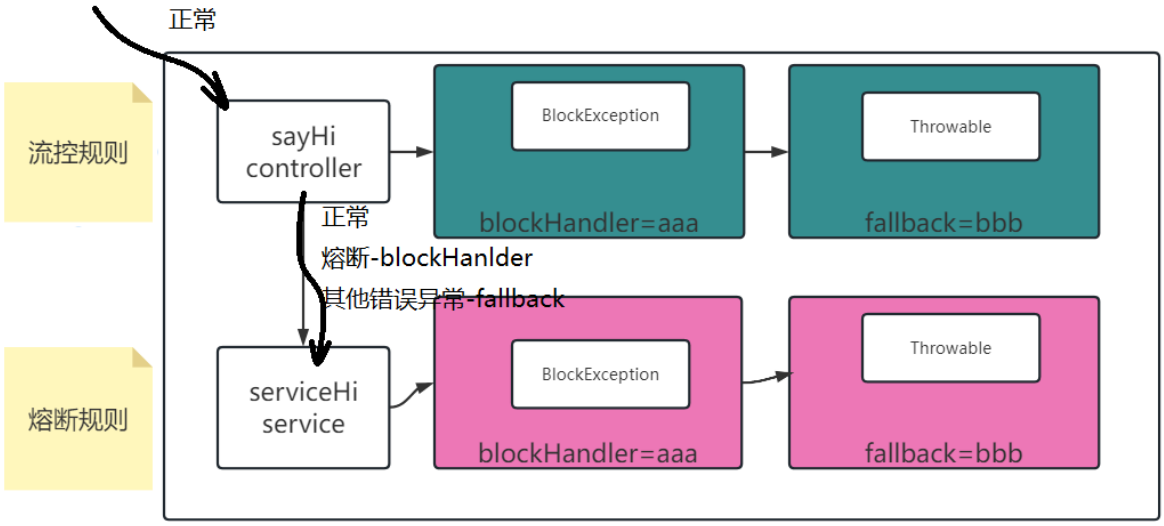
```
 */
@Service
public class HelloService {

    @SentinelResource(
            value = "serviceHi",
            blockHandler="aaa",blockHandlerClass = HelloServiceBlockHanlder.class
            fallback = "bbb",fallbackClass = HelloServiceBlockHandler.class)
    public String sayHi(String name){
        System.out.println("进入到service的saiHi");
        String result="你好啊!"+name;
        try {
            Thread.sleep( millis: 100);
        } catch (InterruptedException e) {
            e.printStackTrace();
```

sentinel允许我们将降级逻辑的代码方法,放到指定的类中,提供静态方法调用.

节省本类代码,看起来更整洁.

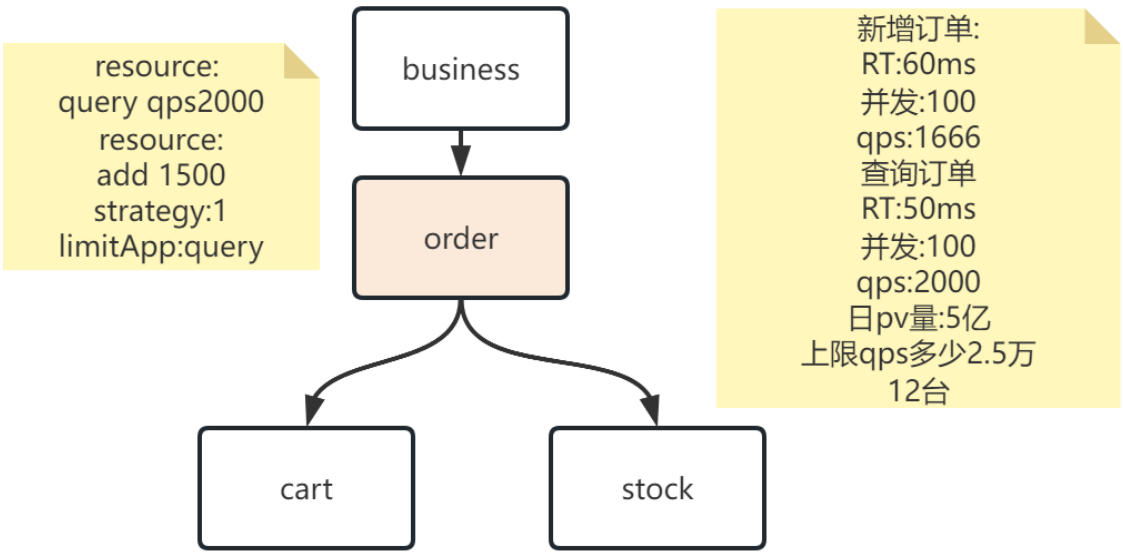






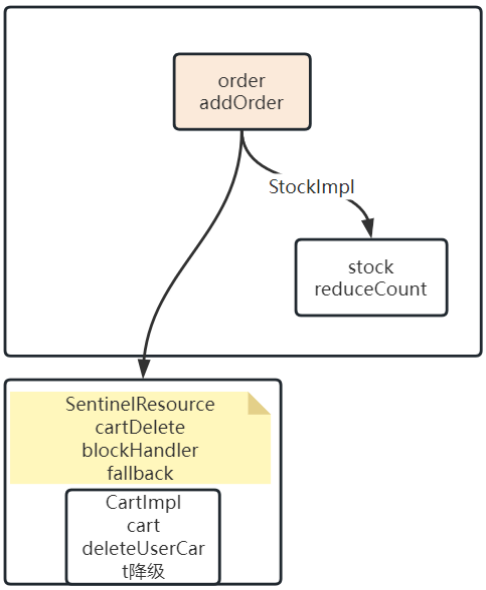
2.5 订单新增中应用sentinel应用

限流目的: 根据预估/压测的数据 实现并发或者qps设置,保护服务器



熔断目的: 在保证主要业务功能成功实现前提下,附属,不重要的业务,可以做降级处理,避免他们问题影响主要业务功能.

结合业务实现降级策略:



第一步: order-adapter中实现熔断降级sentinel整合. sentinel 依赖

```
<!--整合熔断策略-->
<dependency>
    <groupId>com.alibaba.cloud</groupId>
    <artifactId>spring-cloud-starter-alibaba-sentinel</artifactId>
</dependency>
<!--sentinel整合nacos的数据源-->
<dependency>
    <groupId>com.alibaba.csp</groupId>
    <artifactId>sentinel-datasource-nacos</artifactId>
</dependency>
```

第二步: 修改代码 准备调用的类

```
package cn.tedu.csmall.all.adapter.service.impl;
```

```
import cn.tedu.csmall.all.service.ICartService;
import cn.tedu.csmall.commons.pojo.order.dto.OrderAddDTO;
import com.alibaba.csp.sentinel.annotation.SentinelResource;
import com.alibaba.csp.sentinel.slots.block.BlockException;
import lombok.extern.slf4j.Slf4j;
import org.apache.dubbo.config.annotation.DubboReference;
import org.springframework.stereotype.Component;

/**
远程调用时,和cart购物车有关的方法
 单独封装一个bean对象
 */
@Component
@Slf4j
public class DubboCartService {
    @DubboReference
    private ICartService cartService;

    /**
     * 熔断降级的资源方法
     * @param orderAddDTO
     */
    @SentinelResource(
            value="cartDelete",
            blockHandler ="cartDeleteBlock" ,
            fallback = "cartDeleteFallback")
    public void cartDelete(OrderAddDTO orderAddDTO){
        cartService.deleteUserCart(orderAddDTO.getUserId(),
orderAddDTO.getCommodityCode());
    }
    public void cartDeleteBlock(OrderAddDTO orderAddDTO, BlockException e){
        log.error("熔断规则生效,断路器打开状态,orderAddDTO:{},异常信息e:
{}",orderAddDTO,e.getMessage());
    }
    public void cartDeleteFallback(OrderAddDTO orderAddDTO,Throwable e){
        log.error("业务调用异常,orderAddDTO:{},异常信息e:
{}",orderAddDTO,e.getMessage());
    }
}
```

第三步: OrderServiceImpl代码修改

```
@Autowired
private DubboCartService cartService;
@Override
public void orderAdd(OrderAddDTO orderAddDTO) {
    // 1.先减去订单中商品的库存数(调用Stock模块减少库存的方法)
    // 库存减少方法需要参数类型是StockReduceCountDTO,我们需要先实例化它
    StockReduceCountDTO countDTO=new StockReduceCountDTO();
    countDTO.setCommodityCode(orderAddDTO.getCommodityCode());
    countDTO.setReduceCount(orderAddDTO.getCount());
    // 利用Dubbo调用stock模块减少库存的业务逻辑层方法实现功能
    stockService.reduceCommodityCount(countDTO);
    // 2.从购物车中删除用户选中的商品(调用Cart模块删除购物车中商品的方法)
    // 利用dubbo调用cart模块删除购物车中商品的方法实现功能
```

```
    Order order=new Order();
    BeanUtils.copyProperties(orderAddDTO,order);
    // 下面执行新增
    orderMapper.insertOrder(order);
    log.info("新增订单信息为:{}",order);
    cartService.cartDelete(orderAddDTO);
}
```

第四步: 针对cartDelete资源形成熔断规则创建(nacos远程配置文件)

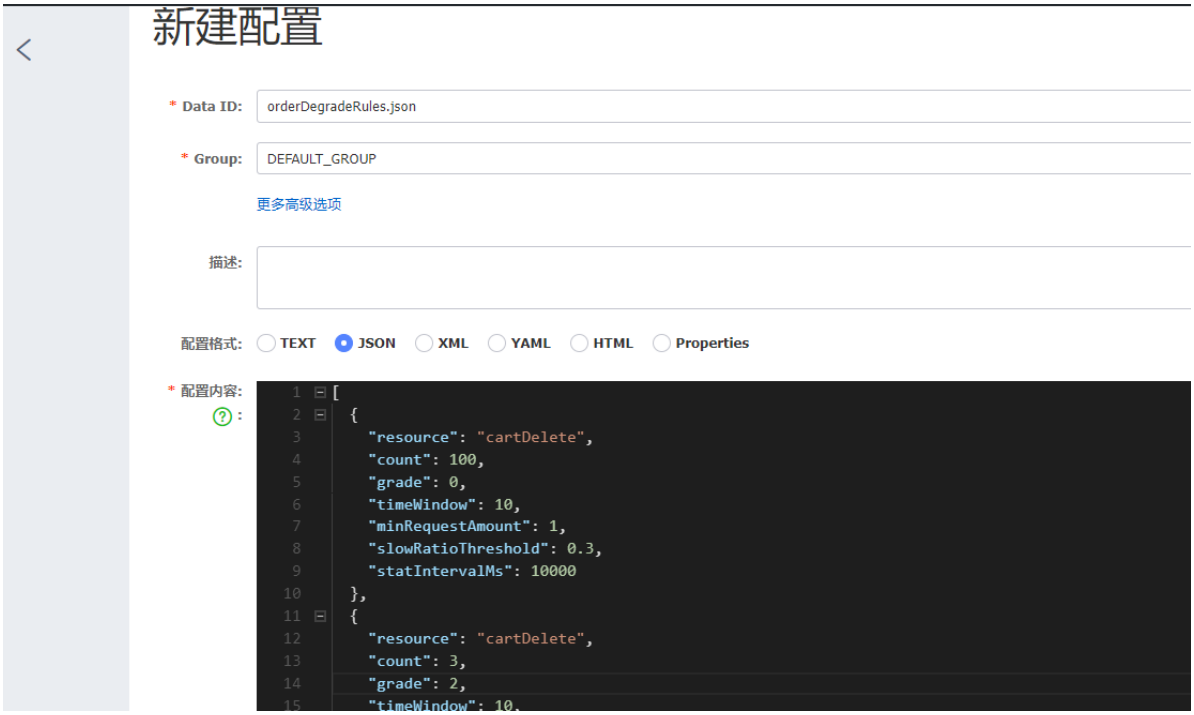
- 准备好远程nacos配置文件

```
[
  {
    "resource": "cartDelete",
    "count": 100,
    "grade": 0,
    "timeWindow": 10,
    "minRequestAmount": 1,
    "slowRatioThreshold": 0.3,
    "statIntervalMs": 10000
  },
  {
    "resource": "cartDelete",
    "count": 3,
    "grade": 2,
    "timeWindow": 10,
    "minRequestAmount": 1,
    "statIntervalMs": 10000
  }
]
```

- YAML配置

```
spring:
  application:
    name: csmall-order
  cloud:
    sentinel:
      datasource:
        orderdb:
          nacos:
            server-addr: localhost:8848
            data-id: orderDegradeRules.json
            rule-type: degrade
            #1.7以上sentinel必须配置的
            username: nacos
            password: nacos
```

- nacos对应位置准备好文件



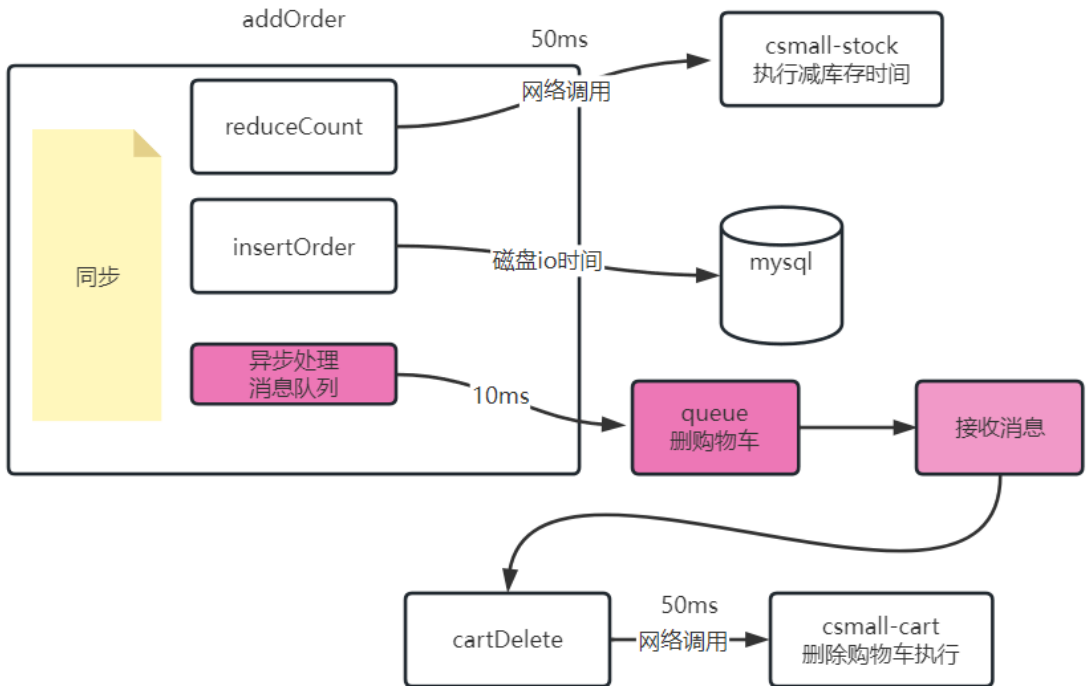
- 启动测试

启动order 启动 stock **cart 暂时不启动**

结论: 访问调用新增订单,库存能够扣减成功,订单可以新增成功,购物车调用每次都失败,抛出异常,异常到达熔断规则限制条件,删除购物车不在调用.

2.6 业务场景分析

新增订单案例. 在哪里实现性能,RT时间缩短的优化.



需要学习MQ消息队列技术--RocketMQ(rabbitmqMQ kafka)

3 RocketMQ

3.1 介绍

- 官网

https://rocketmq.apache.org/zh/

3.2 运行rocketmq的进程

核心进程2个：

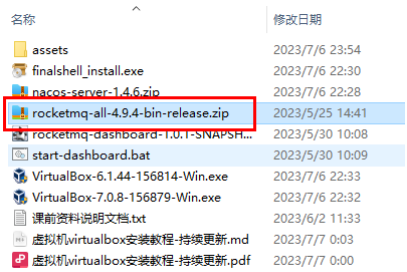
- nameserver
- broker

视图进程1个：

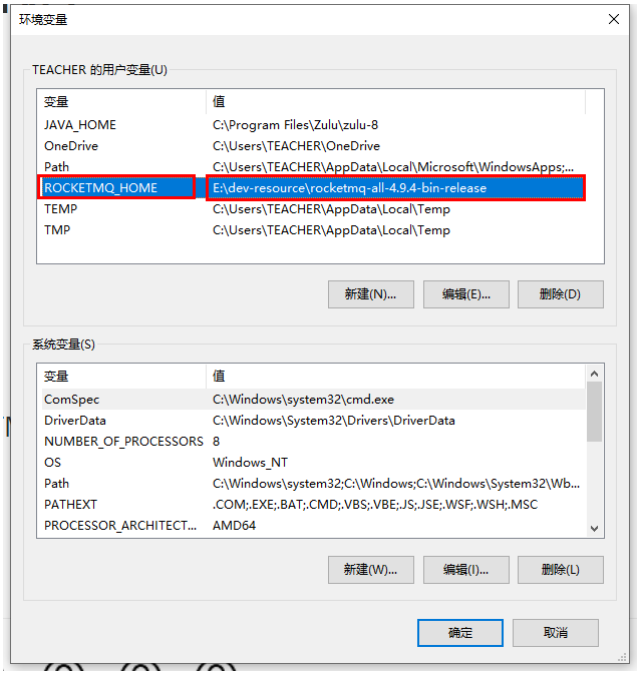
- rocketmq-dashboard

3.3 启动nameserver

- 解压压缩包



- 环境变量配置ROCKETMQ_HOME



- 运行启动nameserver

rocketmq家目录中bin文件夹,打开cmd,

```
mqnamesrv.cmd
```

mac系统

```
mqnamesrv.sh
```

- 启动问题

```
E:\soft\rocketmq-all-4.9.4-bin-release\bin>mqnamesrv.cmd
OpenJDK 64-Bit Server VM warning: Using the DefNew young collector with the CMS collector is deprecated and will likely
be removed in a future release
OpenJDK 64-Bit Server VM warning: UseCMSCompactAtFullCollection is deprecated and will likely be removed in a future rel
ease.
java.net.BindException: Address already in use: bind
        at sun.nio.ch.Net.bind0(Native Method)
        at sun.nio.ch.Net.bind(Net.java:461)
        at sun.nio.ch.Net.bind(Net.java:453)
        at sun.nio.ch.ServerSocketChannelImpl.bind(ServerSocketChannelImpl.java:222)
        at io.netty.channel.socket.nio.NioServerSocketChannel.doBind(NioServerSocketChannel.java:134)
        at io.netty.channel.AbstractChannel$AbstractUnsafe.bind(AbstractChannel.java:562)
        at io.netty.channel.DefaultChannelPipeline$HeadContext.bind(DefaultChannelPipeline.java:1334)
        at io.netty.channel.AbstractChannelHandlerContext.invokeBind(AbstractChannelHandlerContext.java:506)
        at io.netty.channel.AbstractChannelHandlerContext.bind(AbstractChannelHandlerContext.java:491)
        at io.netty.channel.DefaultChannelPipeline.bind(DefaultChannelPipeline.java:973)
        at io.netty.channel.AbstractChannel.bind(AbstractChannel.java:260)
        at io.netty.bootstrap.AbstractBootstrap$2.run(AbstractBootstrap.java:356)
        at io.netty.util.concurrent.AbstractEventExecutor.safeExecute(AbstractEventExecutor.java:164)
        at io.netty.util.concurrent.SingleThreadEventExecutor.runAllTasks(SingleThreadEventExecutor.java:472)
        at io.netty.channel.nio.NioEventLoop.run(NioEventLoop.java:500)
        at io.netty.util.concurrent.SingleThreadEventExecutor$4.run(SingleThreadEventExecutor.java:989)
        at io.netty.util.internal.ThreadExecutorMap$2.run(ThreadExecutorMap.java:74)
        at java.lang.Thread.run(Thread.java:748)

E:\soft\rocketmq-all-4.9.4-bin-release\bin>
```

原因: nameserver占用默认端口9876 已经被占用了

解决方法: 查询出占用9876的端口进程pid号,直接taskkill杀死

- 启动成功

```
E:\soft\rocketmq-all-4.9.4-bin-release\bin>mqnamesrv.cmd
OpenJDK 64-Bit Server VM warning: Using the DefNew young collector with the CMS collecto
d in a future release
OpenJDK 64-Bit Server VM warning: UseCMSCompactAtFullCollection is deprecated and will l
The Name Server boot success. serializeType=JSON
```

3.4 启动broker

- 启动命令

bin文件夹,打开cmd

```
mqbroker.cmd -n localhost:9876
```

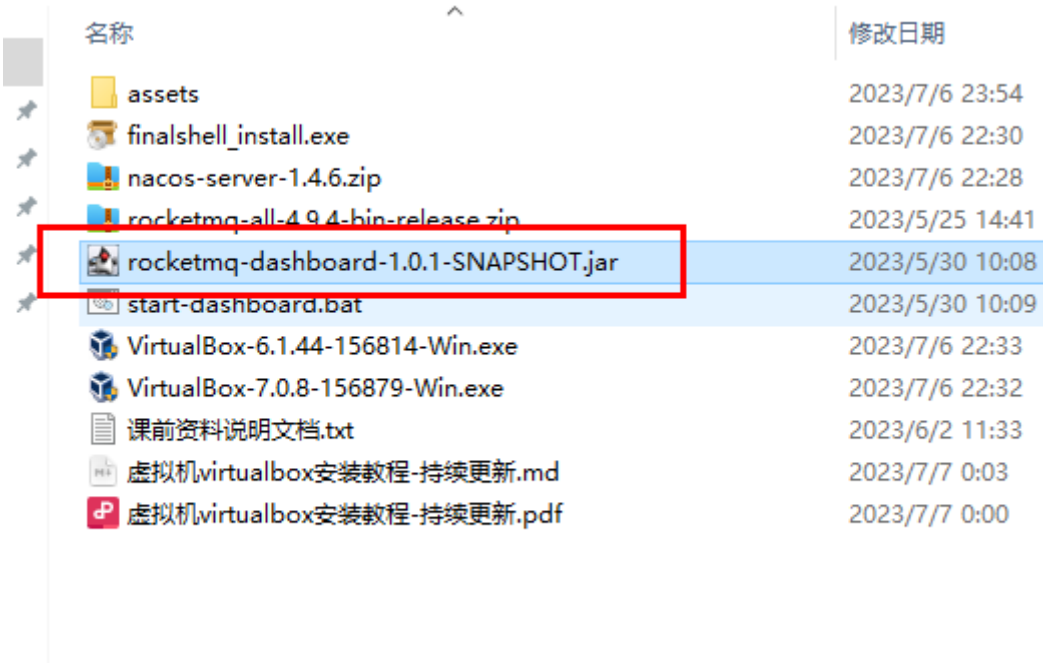
- 启动成功

```
E:\soft\rocketmq-all-4.9.4-bin-release\bin>mqbroker.cmd -n localhost:9876
The broker[DESKTOP-VM4JLMC, 10.1.6.134:10911] boot success. serializeType=JSON and name server is localho
```

3.5 rocket-dashboard

rocketmq团队提供了一个查询rocket状态数据的仪表盘系统.

- 找到jar包



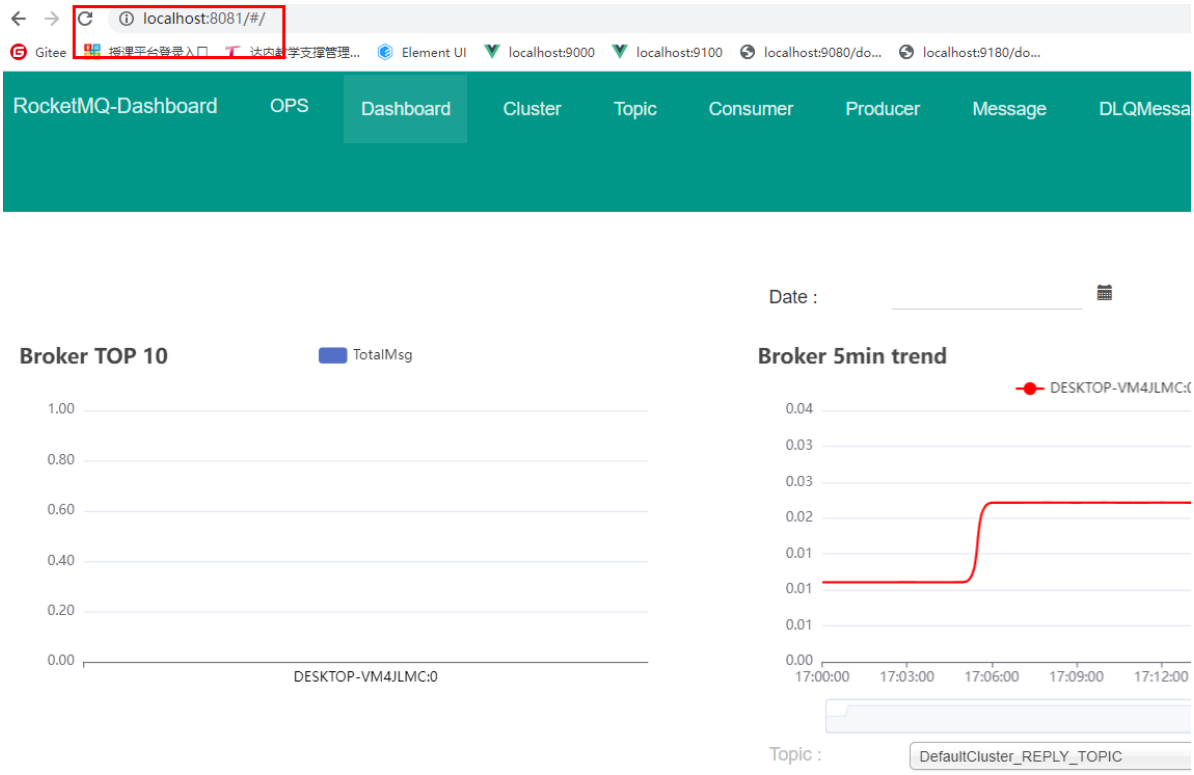
- 打开cmd

提示: 最好将jar包移动到没有空格,没有中文的路径,再运行cmd 粘贴命令

```
java -jar rocketmq-dashboard-1.0.1-SNAPSHOT.jar --server.port=8080 --
rocketmq.config.namesrvAddr=localhost:9876
```

```
选择 C:\Windows\System32\cmd.exe - java  -jar rocketmq-dashboard-1.0.1-SNAPSHOT.jar --server.port=8081 --rocketmq.config.namesrvAddr=localhost:9876
  .   ____          _            __ _ _
 /\\ / ___'_ __ _ _(_)_ __  __ _ \ \ \ \
( ( )\___ | '_ | '_| | '_ \/ _` | \ \ \ \
 \\/  ___)| |_)| | | | | || (_| |  ) ) ) )
  '  |____| .__|_| |_|_| |_\__, | / / / /
 =========|_|==============|___/=/_/_/_/
 :: Spring Boot ::        (v2.2.2.RELEASE)

[2023-07-20 17:17:43.581]  INFO Starting App v1.0.1-SNAPSHOT on DESKTOP-VM4JLMC with PID 15356 (C:\U
y TEACHER in C:\Users\TEACHER\Desktop\课前资料)
[2023-07-20 17:17:43.584]  INFO No active profile set, falling back to default profiles: default
[2023-07-20 17:17:44.915]  INFO setNameSrvAddrByProperty nameSrvAddr=localhost:9876
[2023-07-20 17:17:45.440]  INFO Tomcat initialized with port(s): 8081 (http)
[2023-07-20 17:17:45.449]  INFO Initializing ProtocolHandler ["http-nio-0.0.0.0-8081"]
[2023-07-20 17:17:45.450]  INFO Starting service [Tomcat]
[2023-07-20 17:17:45.450]  INFO Starting Servlet engine: [Apache Tomcat/9.0.29]
[2023-07-20 17:17:45.515]  INFO Initializing Spring embedded WebApplicationContext
[2023-07-20 17:17:45.515]  INFO Root WebApplicationContext: initialization completed in 1879 ms
[2023-07-20 17:17:46.514]  INFO Initializing ExecutorService 'applicationTaskExecutor'
[2023-07-20 17:17:46.614]  INFO Adding welcome page: class path resource [static/index.html]
[2023-07-20 17:17:46.768]  INFO Initializing ExecutorService 'taskScheduler'
[2023-07-20 17:17:46.782]  INFO Exposing 2 endpoint(s) beneath base path '/actuator'
[2023-07-20 17:17:46.832]  INFO Starting ProtocolHandler ["http-nio-0.0.0.0-8081"]
[2023-07-20 17:17:46.867]  INFO Tomcat started on port(s): 8081 (http) with context path ''
[2023-07-20 17:17:46.870]  INFO Started App in 3.653 seconds (JVM running for 4.216)
```

- 访问仪表盘

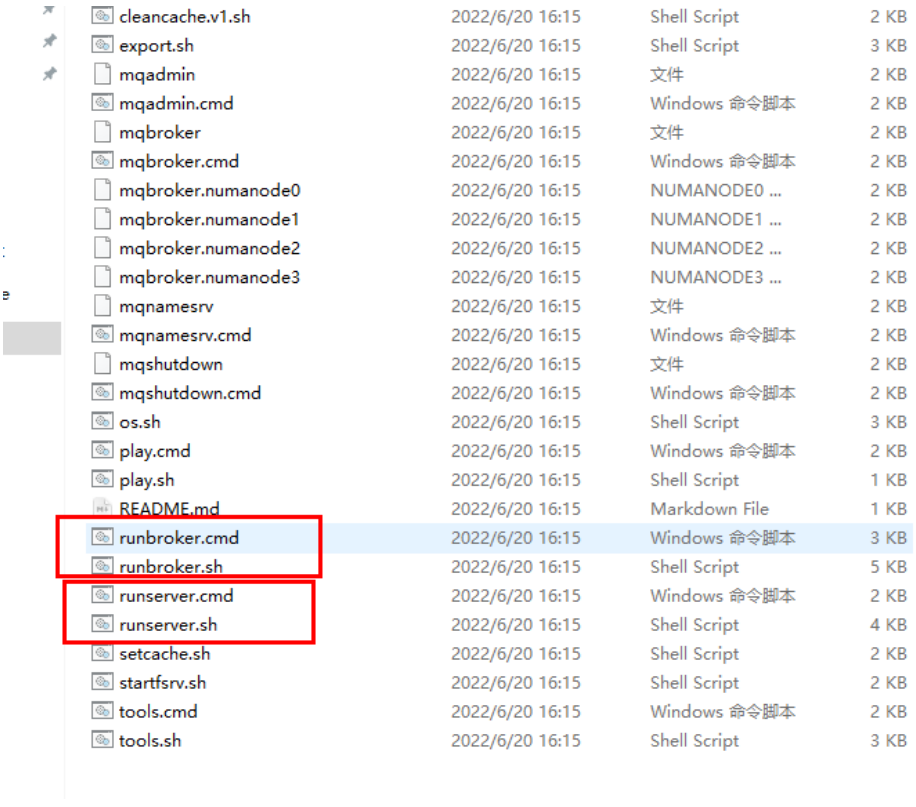


3.6 修改rocketmq启动占用内存的问题

默认占2G,如果因为内存问题,需要修改调小.

nameserver对应runserver.cmd

broker对应runbroker.cmd



```
set BASE_DIR=%~dp0
set BASE_DIR=%BASE_DIR:~0,-1%
for %%d in (%BASE_DIR%) do set BASE_DIR=%%~dpd

set CLASSPATH=.;%BASE_DIR%conf;%BASE_DIR%lib\*;%CLASSPATH%

rem ===========================================================
rem  JVM Configuration
rem ===========================================================
set "JAVA_OPT=%JAVA_OPT% -server -Xms2g -Xmx2g"
set "JAVA_OPT=%JAVA_OPT% -XX:+UseG1GC -XX:G1HeapRegionSize=16
set "JAVA_OPT=%JAVA_OPT% -verbose:gc -Xloggc:%USERPROFILE%\mq
set "JAVA_OPT=%JAVA_OPT% -XX:+UseGCLogFileRotation -XX:Number
set "JAVA_OPT=%JAVA_OPT% -XX:-OmitStackTraceInFastThrow"
set "JAVA_OPT=%JAVA_OPT% -XX:+AlwaysPreTouch"
set "JAVA_OPT=%JAVA_OPT% -XX:MaxDirectMemorySize=15g"
set "JAVA_OPT=%JAVA_OPT% -XX:-UseLargePages -XX:-UseBiasedLoc
set "JAVA_OPT=%JAVA_OPT% -cp %CLASSPATH%"

"%JAVA%" %JAVA_OPT% %*
```

```
set "JAVA=%JAVA_HOME%\bin\java.exe"

setlocal

set BASE_DIR=%~dp0                                    -Xms256m -Xmx256m -Xmn128m
set BASE_DIR=%BASE_DIR:~0,-1%
for %%d in (%BASE_DIR%) do set BASE_DIR=%%~dpd

set CLASSPATH=.;%BASE_DIR%conf;%BASE_DIR%lib\*;%CLASSPATH%

set "JAVA_OPT=%JAVA_OPT% -server -Xms2g -Xmx2g -Xmn1g -XX:MetaspaceSize=12
set "JAVA_OPT=%JAVA_OPT% -XX:+UseConcMarkSweepGC -XX:+UseCMSCompactAtFullC
set "JAVA_OPT=%JAVA_OPT% -verbose:gc -Xloggc:"%USERPROFILE%\rmq_srv_gc.log
set "JAVA_OPT=%JAVA_OPT% -XX:-OmitStackTraceInFastThrow"
set "JAVA_OPT=%JAVA_OPT% -XX:-UseLargePages"
set "JAVA_OPT=%JAVA_OPT% -cp "%CLASSPATH%""

"%JAVA%" %JAVA_OPT% %*
```

3.7 JAVA_HOME

当前系统的JAVA_HOME环境变量,保证是1.8

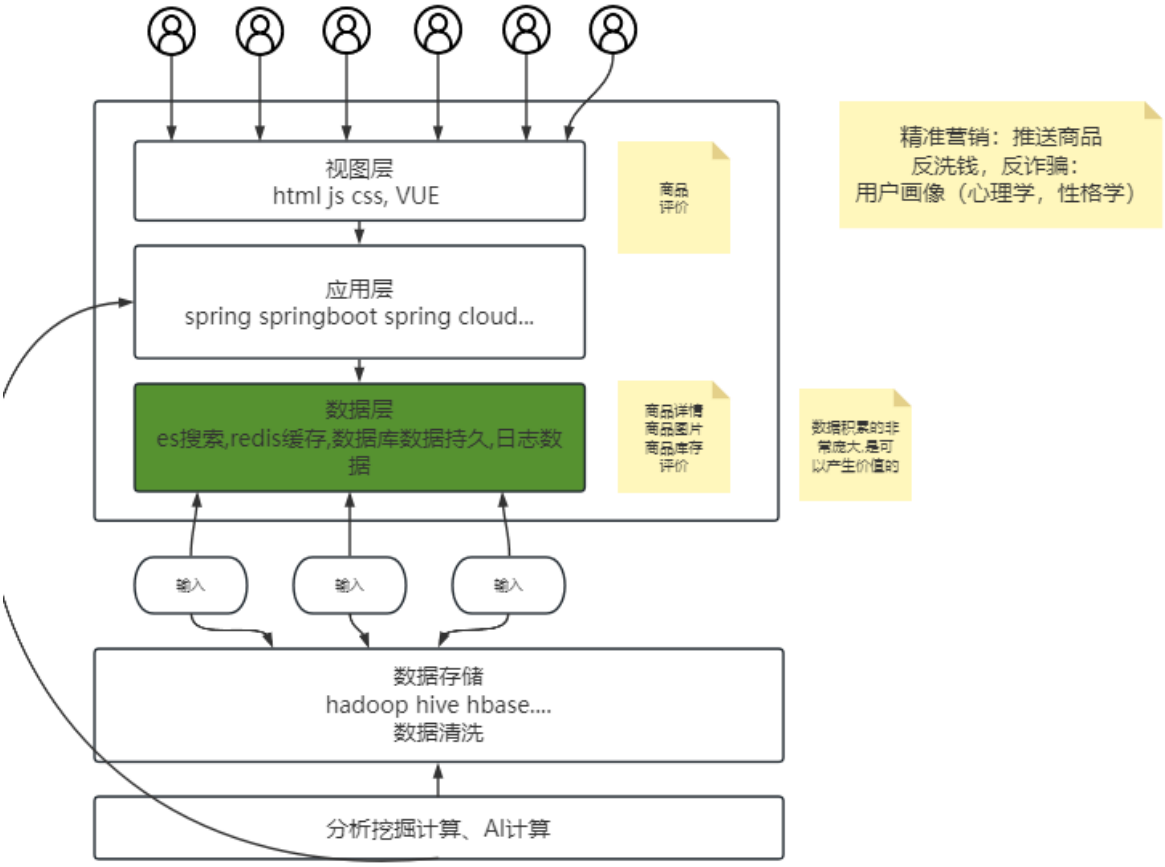
java -version 版本提示,和JAVA_HOME 是不是1.8没有太大关系.

课堂作业:

请在business中,提供sentinel 对buy方法资源的熔断

考虑远程调用orderService 需要不需要组织成新资源.

附录


视图层
html js css, VUE
应用层
spring springboot spring cloud...
数据层
es搜索,redis缓存,数据库数据持久,日志数据
商品评价
商品详情
商品图片
商品库存
评价
数据积累的非常庞大,是可以产生价值的
精准营销：推送商品
反洗钱，反诈骗：
用户画像（心理学，性格学）
输入
输入
输入
数据存储
hadoop hive hbase....
数据清洗
分析挖掘计算、AI计算