4-15 | 延迟双删功能实现

本章节我们主要讲解如何通过使用 RocketMQ 的延迟消息去实现延迟双删功能。

相关依赖引入：

```
Java
<rocketmq.client.version>4.8.0</rocketmq.client.version>


<dependency>
    <groupId>org.apache.rocketmq</groupId>
    <artifactId>rocketmq-client</artifactId>
    <version>${rocketmq.client.version}</version>
</dependency>
```

首先是我们的 RocketMQ 配置类，定义我们的消费者配置类和生产者配置类：

生产者配置类：

```
Java
package org.qiyu.live.user.provider.config;

import
org.springframework.boot.context.properties.ConfigurationPropertie
s;
import org.springframework.context.annotation.Configuration;

/**
 * 生产者的配置信息
 *
 * @Author idea
 * @Date: Created in 16:39 2023/5/21
 * @Description
 */
@ConfigurationProperties(prefix="qiyu.rmq.producer")
@Configuration
public class RocketMQProducerProperties {

    //rocketmq 的 nameSever 地址
```

```
    private String nameSrv;
    //分组名称
    private String groupName;
    //消息重发次数
    private int retryTimes;
    //发送超时时间
    private int sendTimeOut;

    public String getNameSrv() {
        return nameSrv;
    }

    public void setNameSrv(String nameSrv) {
        this.nameSrv = nameSrv;
    }

    public String getGroupName() {
        return groupName;
    }

    public void setGroupName(String groupName) {
        this.groupName = groupName;
    }

    public int getRetryTimes() {
        return retryTimes;
    }

    public void setRetryTimes(int retryTimes) {
        this.retryTimes = retryTimes;
    }

    public int getSendTimeOut() {
        return sendTimeOut;
    }

    public void setSendTimeOut(int sendTimeOut) {
        this.sendTimeOut = sendTimeOut;
    }

    @Override
    public String toString() {
        return "RocketMQProducerProperties{" +
                "nameSrv='" + nameSrv + '\'' +
```

```
                ", groupName='" + groupName + '\'' +
                ", retryTimes=" + retryTimes +
                ", sendTimeOut=" + sendTimeOut +
                '}';
    }
}
```

消费者配置类：

```
Java
package org.qiyu.live.user.provider.config;

import
org.springframework.boot.context.properties.ConfigurationPropertie
s;
import org.springframework.context.annotation.Configuration;

/**
 * @Author idea
 * @Date: Created in 16:48 2023/5/21
 * @Description
 */
@ConfigurationProperties(prefix = "qiyu.rmq.consumer")
@Configuration
public class RocketMQConsumerProperties {

    //rocketmq 的 nameSever 地址
    private String nameSrv;
    //分组名称
    private String groupName;

    public String getNameSrv() {
        return nameSrv;
    }

    public void setNameSrv(String nameSrv) {
        this.nameSrv = nameSrv;
    }

    public String getGroupName() {
        return groupName;
    }

    public void setGroupName(String groupName) {
```

```
        this.groupName = groupName;
    }

    @Override
    public String toString() {
        return "RocketMQConsumerProperties{" +
                "nameSrv='" + nameSrv + '\'' +
                ", groupName='" + groupName + '\'' +
                '}';
    }
}
```

上述的两个配置类，主要是用于映射我们在 SpringBoot 的配置文件中编写的配置项，下边两个类是对于的启动配置：

首先是我们的消费者启动配置：

```
Java
package org.qiyu.live.user.provider.config;

import com.alibaba.fastjson.JSON;
import jakarta.annotation.Resource;
import org.apache.rocketmq.client.consumer.DefaultMQPushConsumer;
import
org.apache.rocketmq.client.consumer.listener.ConsumeConcurrentlyCo
ntext;
import
org.apache.rocketmq.client.consumer.listener.ConsumeConcurrentlySt
atus;
import
org.apache.rocketmq.client.consumer.listener.MessageListenerConcur
rently;
import org.apache.rocketmq.client.exception.MQClientException;
import org.apache.rocketmq.common.consumer.ConsumeFromWhere;
import org.apache.rocketmq.common.message.MessageExt;
import
org.idea.qiyu.live.framework.redis.starter.key.UserProviderCacheKe
yBuilder;
import org.qiyu.live.user.dto.UserDTO;
import org.slf4j.Logger;
import org.slf4j.LoggerFactory;
```

```
import org.springframework.beans.factory.InitializingBean;
import org.springframework.context.annotation.Configuration;
import org.springframework.data.redis.core.RedisTemplate;

import java.util.List;

/**
 * RocketMQ 的消费者 bean 配置类
 *
 * @Author idea
 * @Date: Created in 16:50 2023/5/21
 * @Description
 */
@Configuration
public class RocketMQConsumerConfig implements InitializingBean {

    private static final Logger LOGGER =
LoggerFactory.getLogger(RocketMQConsumerConfig.class);

    @Resource
    private RocketMQConsumerProperties consumerProperties;
    @Resource
    private RedisTemplate<String, Object> redisTemplate;
    @Resource
    private UserProviderCacheKeyBuilder
userProviderCacheKeyBuilder;

    @Override
    public void afterPropertiesSet() throws Exception {
        initConsumer();
    }

    public void initConsumer() {
        try {
            //初始化我们的 RocketMQ 消费者
            DefaultMQPushConsumer defaultMQPushConsumer = new
DefaultMQPushConsumer();

defaultMQPushConsumer.setNamesrvAddr(consumerProperties.getNameSrv
());

defaultMQPushConsumer.setConsumerGroup(consumerProperties.getGroup
Name());
```

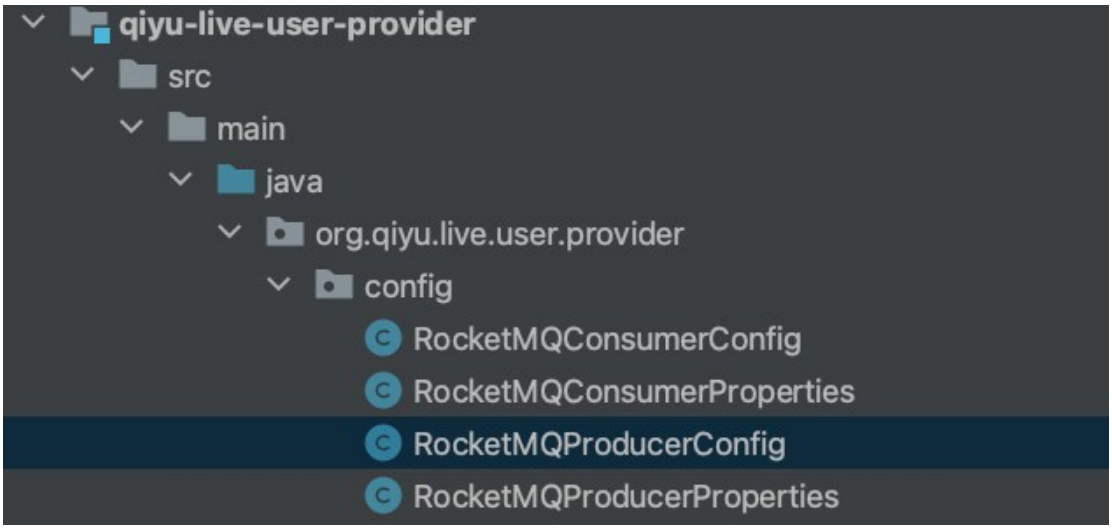
```
defaultMQPushConsumer.setConsumeMessageBatchMaxSize(1);

defaultMQPushConsumer.setConsumeFromWhere(ConsumeFromWhere.CONSUME
_FROM_FIRST_OFFSET);
            defaultMQPushConsumer.subscribe("user-update-cache",
"*");
            defaultMQPushConsumer.setMessageListener(new
MessageListenerConcurrently() {
                @Override
                public ConsumeConcurrentlyStatus
consumeMessage(List<MessageExt> msgs, ConsumeConcurrentlyContext
context) {
                    String msgStr = new
String(msgs.get(0).getBody());
                    UserDTO userDTO = JSON.parseObject(msgStr,
UserDTO.class);
                    if (userDTO == null || userDTO.getUserId() ==
null) {
                        LOGGER.error("用户 id 为空，参数异常，内容:
{}", msgStr);
                        return
ConsumeConcurrentlyStatus.CONSUME_SUCCESS;
                    }
                    //延迟消息的回调，处理相关的缓存二次删除

redisTemplate.delete(userProviderCacheKeyBuilder.buildUserInfoKey(
userDTO.getUserId()));
                    LOGGER.error("延迟删除处理，userDTO is {}",
userDTO);
                    return
ConsumeConcurrentlyStatus.CONSUME_SUCCESS;
                }
            });
            defaultMQPushConsumer.start();
            LOGGER.info("mq 消费者启动成功,nameSrv is {}",
consumerProperties.getNameSrv());
        } catch (MQClientException e) {
            throw new RuntimeException(e);
        }
    }

}
```

接着是生产者的启动配置：

```Java
package org.qiyu.live.user.provider.config;

import jakarta.annotation.Resource;
import org.apache.rocketmq.client.exception.MQClientException;
import org.apache.rocketmq.client.producer.DefaultMQProducer;
import org.apache.rocketmq.client.producer.MQProducer;
import org.slf4j.Logger;
import org.slf4j.LoggerFactory;
import org.springframework.beans.factory.annotation.Value;
import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.Configuration;

import java.util.concurrent.*;

/**
 * RocketMQ 的生产者 bean 配置类
 *
 * @Author idea
 * @Date: Created in 16:42 2023/5/21
 * @Description
 */
@Configuration
public class RocketMQProducerConfig {

    private final static Logger LOGGER =
LoggerFactory.getLogger(RocketMQProducerConfig.class);

    @Resource
    private RocketMQProducerProperties producerProperties;
    @Value("${spring.application.name}")
    private String applicationName;

    @Bean
    public MQProducer mqProducer() {
        ThreadPoolExecutor asyncThreadPoolExecutor = new
ThreadPoolExecutor(100, 150, 3, TimeUnit.MINUTES,
                new ArrayBlockingQueue<>(1000), new
ThreadFactory() {
            @Override
            public Thread newThread(Runnable r) {
                Thread thread = new Thread(r);
                thread.setName(applicationName + ":rmq-producer:"
+ ThreadLocalRandom.current().nextInt(1000));
```

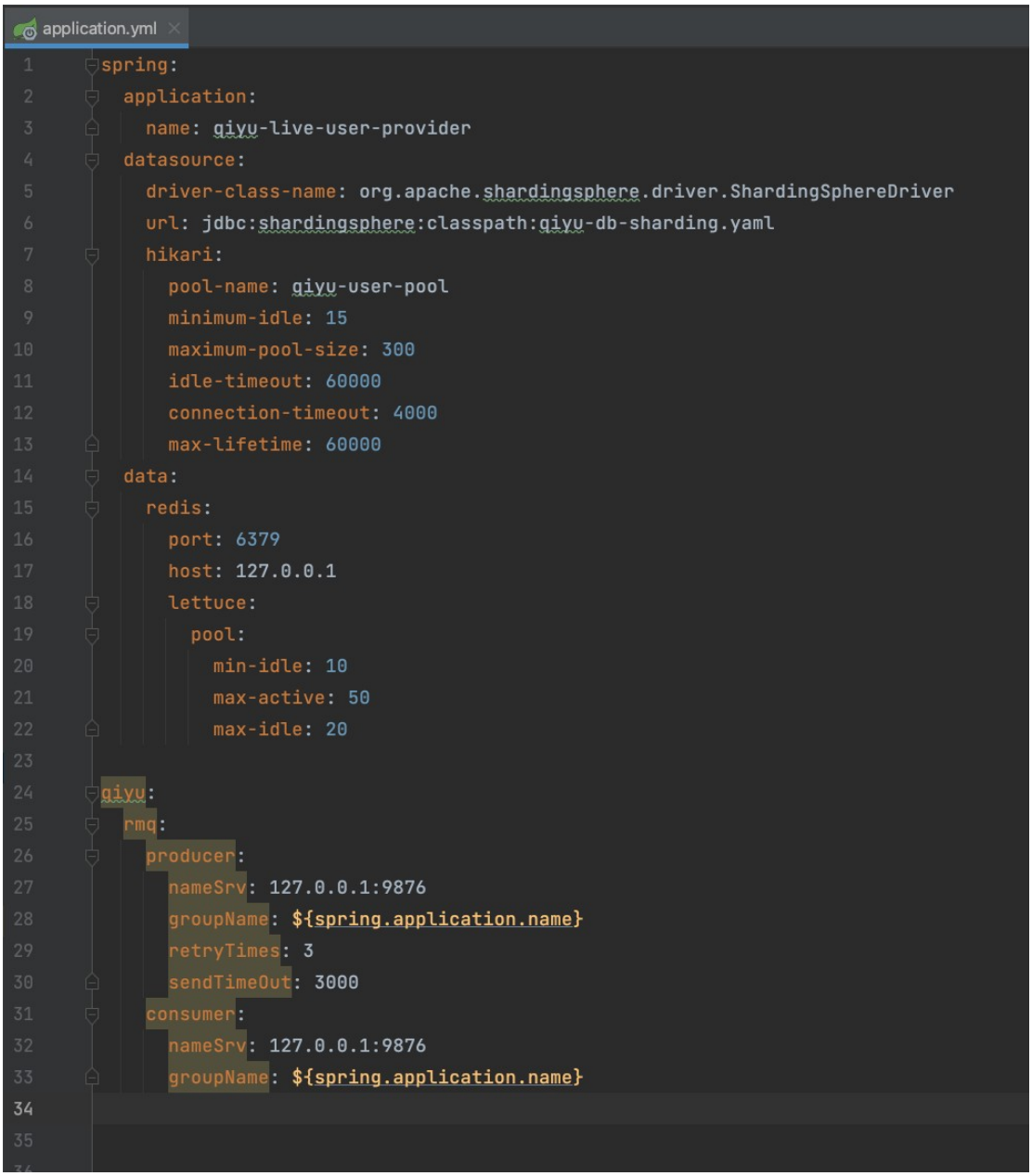
```
                return thread;
            }
        });
        //初始化 rocketmq 的生产者
        DefaultMQProducer defaultMQProducer = new
DefaultMQProducer();
        try {

defaultMQProducer.setNamesrvAddr(producerProperties.getNameSrv());

defaultMQProducer.setProducerGroup(producerProperties.getGroupName
());

defaultMQProducer.setRetryTimesWhenSendFailed(producerProperties.g
etRetryTimes());

defaultMQProducer.setRetryTimesWhenSendAsyncFailed(producerPropert
ies.getRetryTimes());

defaultMQProducer.setRetryAnotherBrokerWhenNotStoreOK(true);
            //设置异步发送的线程池

defaultMQProducer.setAsyncSenderExecutor(asyncThreadPoolExecutor);
            defaultMQProducer.start();
            LOGGER.info("mq 生产者启动成功,nameSrv is {}",
producerProperties.getNameSrv());
        } catch (MQClientException e) {
            throw new RuntimeException(e);
        }
        return defaultMQProducer;
    }
}
```

上述的四个类，全部都放在 qiyu-live-user-provider 模块的 org.qiyu.live.user.provider.config 包里面。



最后启动的时候要设置好相关的 application.yml 配置：

```
Java
qiyu:
  rmq:
    producer:
      nameSrv: 127.0.0.1:9876
      groupName: ${spring.application.name}
      retryTimes: 3
      sendTimeOut: 3000
    consumer:
      nameSrv: 127.0.0.1:9876
      groupName: ${spring.application.name}
```



当我们进行缓存更新的时候，要进行缓存的及时删除，然后再发送 mq 的延迟消息，重点见 org.qiyu.live.user.provider.service.impl.UserServiceImpl#updateUserInfo 方法，修改如下：

```
Java
@Override
public boolean updateUserInfo(UserDTO userDTO) {
    if (userDTO == null || userDTO.getUserId() == null) {
        return false;
    }
    userMapper.updateById(ConvertBeanUtils.convert(userDTO,
UserPO.class));
    String key =
```

```
userProviderCacheKeyBuilder.buildUserInfoKey(userDTO.getUserId());
    //立即删除缓存
    redisTemplate.delete(key);
    try {
       //发送延迟消息，触发二次删除缓存操作
        Message message = new Message();
        message.setBody(JSON.toJSONString(userDTO).getBytes());
        message.setTopic("user-update-cache");
        //延迟级别，1代表延迟一秒发送
        message.setDelayTimeLevel(1);
        mqProducer.send(message);
    } catch (Exception e) {
        throw new RuntimeException(e);
    }
    return true;
}
```