# RabbitMQ 文档

## 一 简介

MQ全称为Message Queue, 消息队列（MQ）是一种应用程序对应用程序的通信方法。应用程序通过读写出入队列的消息（针对应用程序的数据）来通信，而无需专用连接来链接它们。消息传递指的是程序之间通过在消息中发送数据进行通信，而不是通过直接调用彼此来通信，直接调用通常是用于诸如远程过程调用的技术。排队指的是应用程序通过 队列来通信。队列的使用除去了接收和发送应用程序同时执行的要求。其中较为成熟的MQ产品有IBM WEBSPHERE MQ等等。

RabbitMQ是一个在AMQP基础上完成的，可复用的企业消息系统。他遵循Mozilla Public License开源协议。

AMQP，即Advanced Message Queuing Protocol,一个提供统一消息服务的应用层标准高级消息队列协议,是应用层协议的一个开放标准,为面向消息的中间件设计。基于此协议的客户端与消息中间件可传递消息，并不受客户端/中间件不同产品，不同的开发语言等条件的限制。Erlang中的实现有RabbitMQ等。

## 二 安装 RabbitMQ

### CentOS 7 安装 RabbitMQ 3.7

#### 安装Erlang

##### 安装依赖

```
sudo yum install -y gcc gcc-c++ glibc-devel make ncurses-devel openssl-devel
autoconf java-1.8.0-openjdk-devel git
```

##### 创建yum源

> 参考：(https://github.com/rabbitmq/erlang-rpm)

```
sudo vi /etc/yum.repos.d/rabbitmq-erlang.repo

#添加内容
[rabbitmq-erlang]
name=rabbitmq-erlang
baseurl=https://dl.bintray.com/rabbitmq/rpm/erlang/20/el/7
gpgcheck=1
gpgkey=https://dl.bintray.com/rabbitmq/Keys/rabbitmq-release-signing-key.asc
repo_gpgcheck=0
enabled=1
```

**安装**

```
sudo yum install -y erlang
```

**进入erlang命令行表示成功**

```
erl
```

## 安装 socat

```
yum install -y socat
```

## RabbitMQ 安装

> 官网下载地址：https://www.rabbitmq.com/install-rpm.html

```
sudo rpm -Uvh https://github.com/rabbitmq/rabbitmq-
server/releases/download/v3.7.4/rabbitmq-server-3.7.4-1.el7.noarch.rpm
```

> 如果遇到erlang已安装且版本正确，但是RabbitMQ检测失败的情况 可以追加参数 —nodeps（不验证软件包依赖）

**systemctl 操作 RabbitMQ服务**

```
systemctl start rabbitmq-server
systemctl status rabbitmq-server
systemctl restart rabbitmq-server
```

**设置为开机启动**

```
systemctl enable rabbitmq-server
```

**开启 允许远程访问(非必须)**

```
vi /etc/rabbitmq/rabbitmq.config
###添加一下内容
[{rabbit, [{loopback_users, []}]}].
```

**开启 web 端管理访问(非必须,如果要开启,需要先开启允许远程访问)**

```
rabbitmq-plugins enable rabbitmq_management
```

**安装消息延迟插件**

```
cd /usr/lib/rabbitmq/lib/rabbitmq_server-3.6.6/plugins

wget https://dl.bintray.com/rabbitmq/community-
plugins/rabbitmq_delayed_message_exchange-0.0.1.ez

rabbitmq-plugins enable rabbitmq_delayed_message_exchange
```

**放行端口(可以直接关闭防火墙)**

```
firewall-cmd --add-port=15672/tcp --permanent

firewall-cmd --add-port=5672/tcp --permanent
```

# 三 添加用户

## 3.1 账号级别

```
1. 超级管理员administrator,可以登录控制台,查看所有信息,可以对用户和策略进行操作
2. 监控者monitoring,可以登录控制台,可以查看节点的相关信息,比如进程数,内存磁盘使用情况
3 策略制定者policymaker ,可以登录控制台,制定策略,但是无法查看节点信息
4 普通管理员 management 仅能登录控制台
5 其他, 无法登录控制台,一般指的是提供者和消费者
```

## 3.2 添加账号

### 3.2.1 命令模式

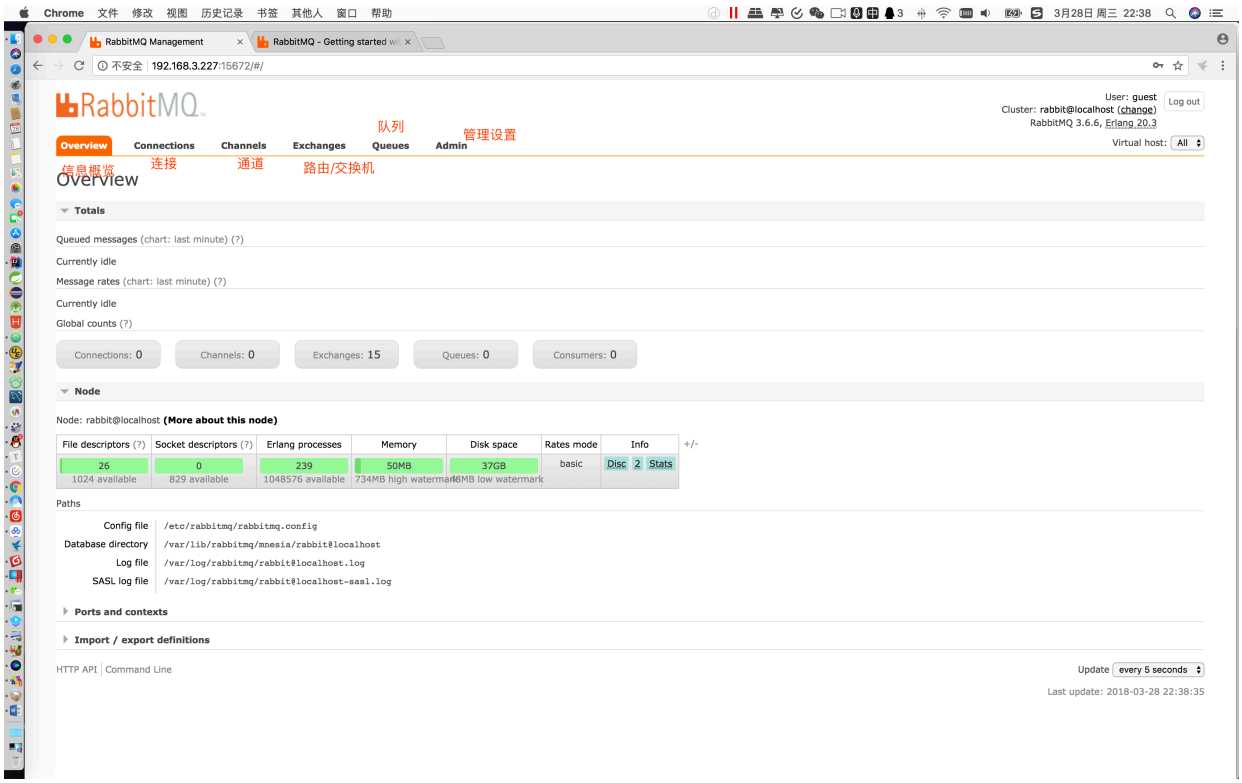
```
rabbitmqctl  add_user  luke luke   #添加账号 luke 密码是 luke

rabbitmqctl  set_user_tags  luke  administrator  #设置 luke 为administrator级别
```

## 3.2.2 web 方式

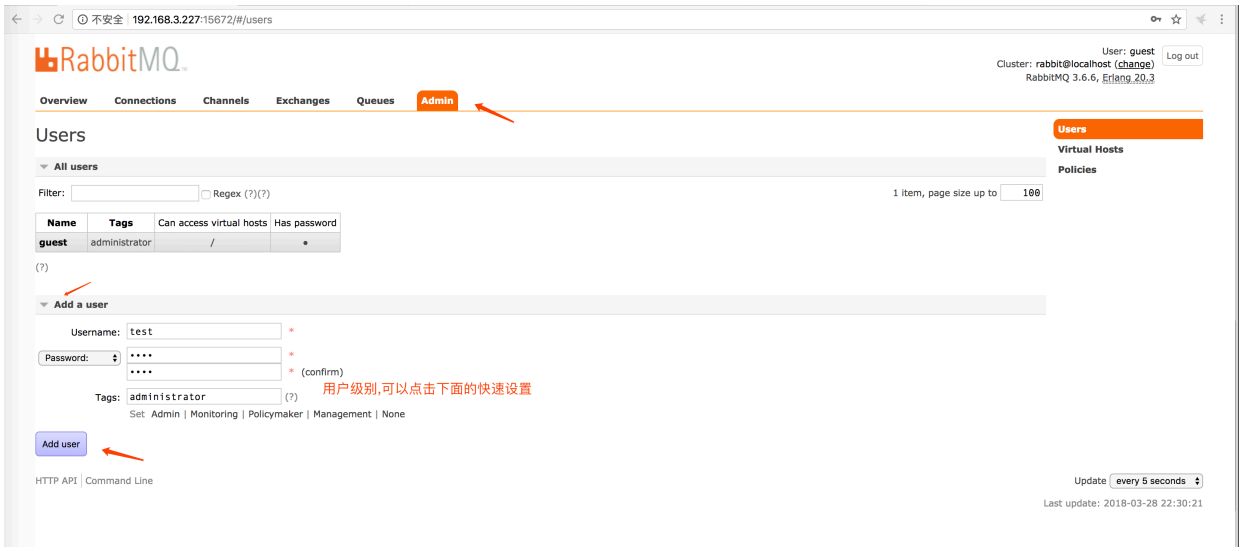
> 此方式需要开启 web 访问

### 3.2.2.1 访问web

> http://192.168.3.227:15672/ 此处 ip 是本人 ip, 实际中请以实际 ip 为准
>
> 使用 guest guest 登录 guest 具有最高权限

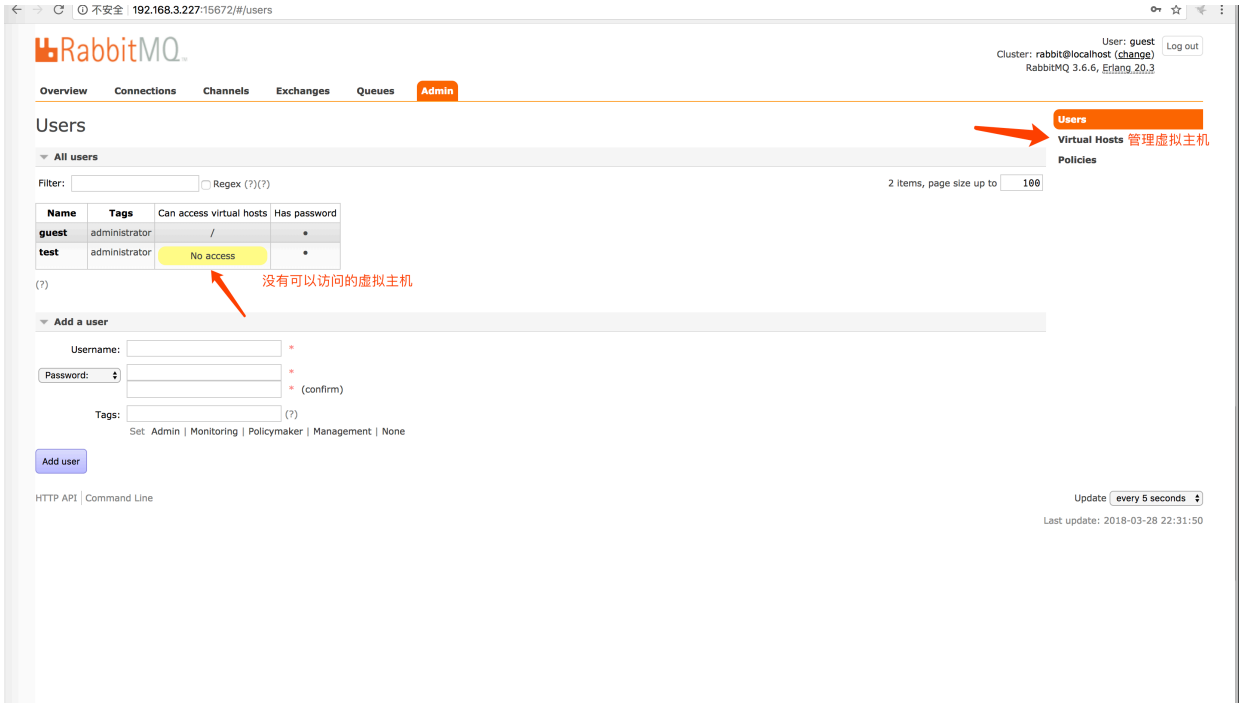



### 3.2.2.2 添加用户

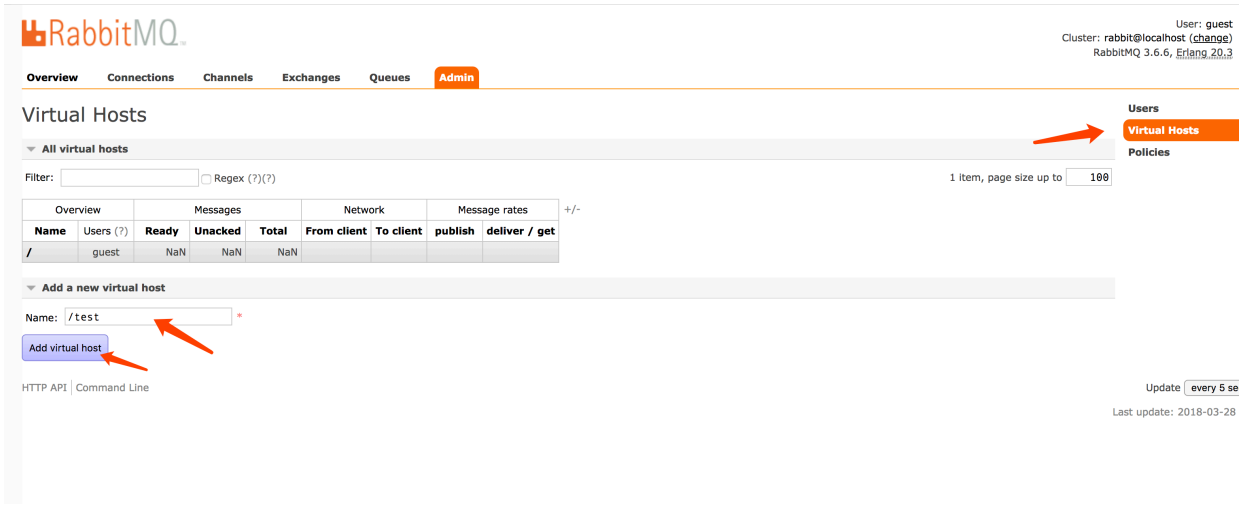



### 3.2.2.3 分配可以访问的虚拟主机

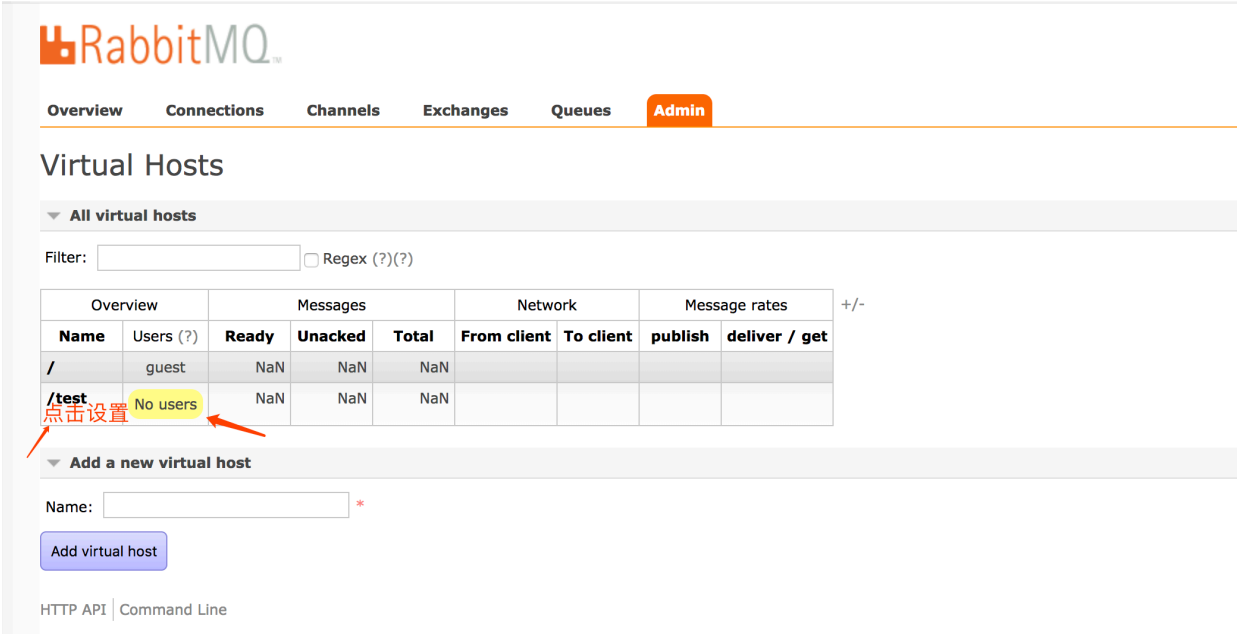
> 默认情况下没有任何可以访问的,我们可以添加一个主机(相当于添加一个数据库),然后分配权限



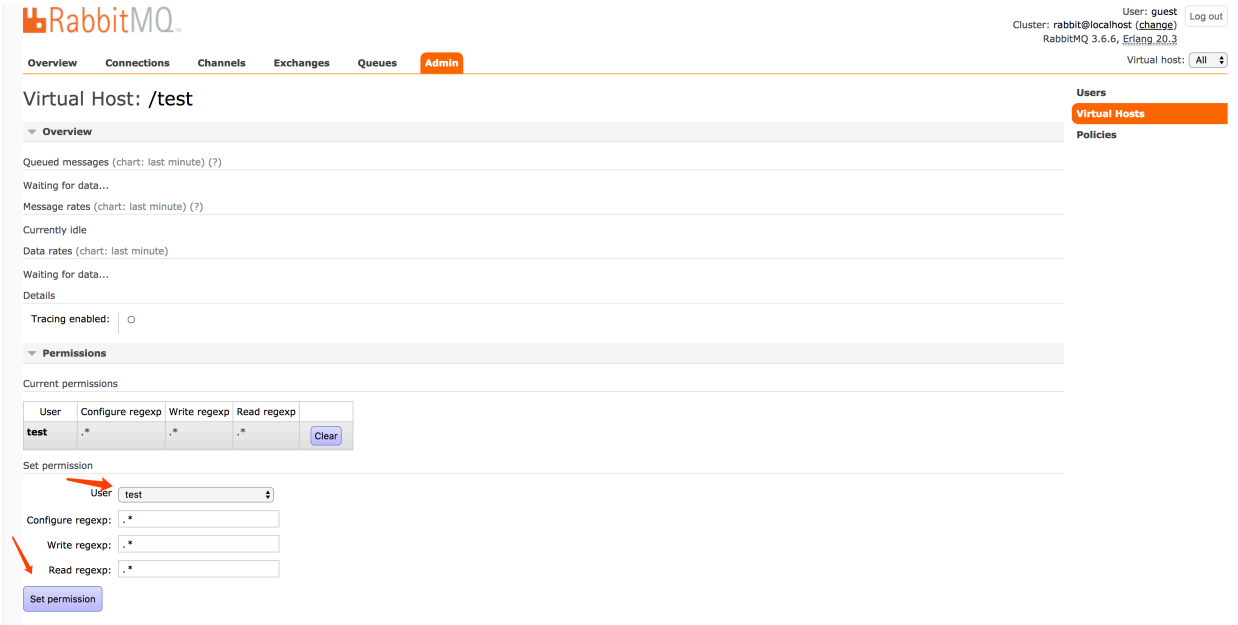

### 3.2.2.4 创建虚拟主机




### 3.2.2.5 给虚拟主机分配权限




### 3.2.2.6 给指定用户分配权限




# 四 消息

> http://www.rabbitmq.com/getstarted.html
>
> 消息测试都在一个项目中,不同包下做测试

## 4.1消息模式种类

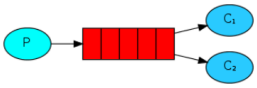
1 "Hello World!"

The simplest thing that does *something*


Python
Java
Ruby
PHP
C#
JavaScript
Go
Elixir
Objective-C
Swift
Spring AMQP

2 Work queues

Distributing tasks among workers (the competing consumers pattern)

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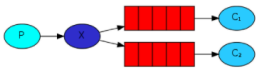
Elixir
Objective-C
Swift
Spring AMQP

3 Publish/Subscribe

Sending messages to many consumers at once

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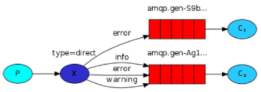
4 Routing

Receiving messages selectively




Python
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PHP
C#
JavaScript
Go
Elixir
Objective-C
Swift
Spring AMQP

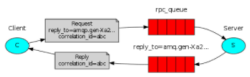
5 Topics

Receiving messages based on a pattern (topics)


Python
Java
Ruby
PHP
C#
JavaScript
Go
Elixir
Objective-C
Swift
Spring AMQP

6 RPC

Request/reply pattern example




Python
Java
Ruby
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C#
JavaScript
Go
Elixir
Spring AMQP

# 4.2 pom&log4j.properties

```
<dependencies>
        <!-- https://mvnrepository.com/artifact/com.rabbitmq/amqp-client -->
        <!-- https://mvnrepository.com/artifact/com.rabbitmq/amqp-client -->
        <dependency>
            <groupId>com.rabbitmq</groupId>
```

```
            <artifactId>amqp-client</artifactId>
            <version>4.5.0</version>
        </dependency>


        <!-- https://mvnrepository.com/artifact/org.slf4j/slf4j-log4j12 -->
    <dependency>
        <groupId>org.slf4j</groupId>
        <artifactId>slf4j-log4j12</artifactId>
        <version>1.7.25</version>
    </dependency>

        <dependency>
            <groupId>org.apache.commons</groupId>
            <artifactId>commons-lang3</artifactId>
            <version>3.3.2</version>
        </dependency>

        <!-- https://mvnrepository.com/artifact/org.springframework.amqp/spring-
rabbit

    整合 spring 时使用,amqp 只对 rabbitmq 做了支持
    -->
        <dependency>
            <groupId>org.springframework.amqp</groupId>
            <artifactId>spring-rabbit</artifactId>
            <version>1.7.6.RELEASE</version>
        </dependency>

        <dependency>
            <groupId>org.springframework</groupId>
            <artifactId>spring-test</artifactId>
            <version>4.3.7.RELEASE</version>
        </dependency>
        <dependency>
            <groupId>junit</groupId>
            <artifactId>junit</artifactId>
            <version>4.12</version>
        </dependency>
    </dependencies>
```

log4j.properties

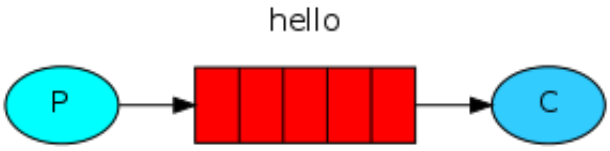
```
log4j.rootLogger=DEBUG,A1
log4j.logger.com.taotao = DEBUG
log4j.logger.org.mybatis = DEBUG

log4j.appender.A1=org.apache.log4j.ConsoleAppender
log4j.appender.A1.layout=org.apache.log4j.PatternLayout
log4j.appender.A1.layout.ConversionPattern=%-d{yyyy-MM-dd HH:mm:ss,SSS} [%t] [%c]-
[%p] %m%n
```

## 4.3 工具类ConnectionUtil

```
public class ConnectionUtil {

    public static Connection getConnection() throws Exception {
        //定义连接工厂
        ConnectionFactory factory = new ConnectionFactory();
        //设置服务地址
        factory.setHost("192.168.3.227");
        //端口
        factory.setPort(5672);
        //设置账号信息，用户名、密码、vhost
        factory.setVirtualHost("/test");
        factory.setUsername("test");
        factory.setPassword("test");
        // 通过工程获取连接
        Connection connection = factory.newConnection();
        return connection;
    }

}
```

## 4.2 简单模式

> http://www.rabbitmq.com/tutorials/tutorial-one-python.html
>
> 简单模式就是我们的生产者将消息发到队列,消费者从队列中取消息
>
> 一条消息对应一个消费者



### 4.2.1 生产者

```
public class Send {

    private final static String QUEUE_NAME = "test_queue";

    public static void main(String[] argv) throws Exception {
        // 获取到连接以及mq通道
        Connection connection = ConnectionUtil.getConnection();//相当于数据库中的创建连接
        // 从连接中创建通道
        Channel channel = connection.createChannel();//相当于数据库中的 statement

        // 声明（创建）队列,如果存在就不创建,不存在就创建
        //参数1 队列名,
        //参数2 durable:  是否持久化，队列的声明默认是存放到内存中的，如果rabbitmq重启会丢失，如果想重启之后还存在就要使队列持久化，保存到Erlang自带的Mnesia数据库中，当rabbitmq重启之后会读取该数据库
        //exclusive：是否排外的，有两个作用，一：当连接关闭时connection.close()该队列是否会自动删除；二：该队列是否是私有的private，如果不是排外的，可以使用两个消费者都访问同一个队列，没有任何问题，如果是排外的，会对当前队列加锁，其他通道channel是不能访问的，如果强制访问会报异常：com.rabbitmq.client.ShutdownSignalException: channel error; protocol method: #method<channel.close>(reply-code=405, reply-text=RESOURCE_LOCKED - cannot obtain exclusive access to locked queue 'queue_name' in vhost '/', class-id=50, method-id=20)一般等于true的话用于一个队列只能有一个消费者来消费的场景
        //autoDelete：是否自动删除，当最后一个消费者断开连接之后队列是否自动被删除，可以通过RabbitMQ Management，查看某个队列的消费者数量，当consumers = 0时队列就会自动删除
        //arguments:   参数


        channel.queueDeclare(QUEUE_NAME, false, false, false, null);//

        // 消息内容
        String message = "Hello World!";
        //参数1 交换机,此处无  参数2 发送到哪个队列  ,参数3 属性 参数4 内容
        channel.basicPublish("", QUEUE_NAME, null, message.getBytes());//将消息发动到数据库
        System.out.println(" 发送数据 '" + message + "'");

        //关闭通道和连接
        channel.close();
        connection.close();
    }
}
```

### 4.2.2 消费者

```
public class Recv {
```

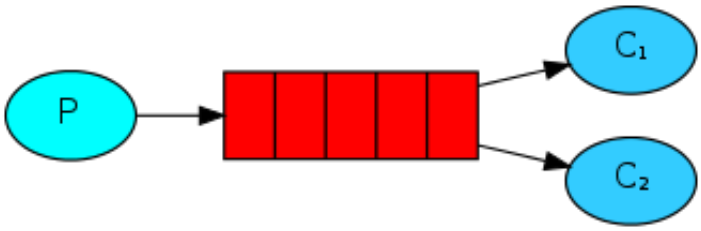
```
    private final static String QUEUE_NAME = "test_queue";

    public static void main(String[] argv) throws Exception {

        // 获取到连接以及mq通道
        Connection connection = ConnectionUtil.getConnection();
        Channel channel = connection.createChannel();

        // 声明队列
        channel.queueDeclare(QUEUE_NAME, false, false, false, null);

        // 定义队列的消费者
        QueueingConsumer consumer = new QueueingConsumer(channel);
        // 监听队列,第二个参数,自动确认消息模式
        channel.basicConsume(QUEUE_NAME, true, consumer);

        // 获取消息
        while (true) {// 循环获取消息
            QueueingConsumer.Delivery delivery = consumer.nextDelivery();//消息获取完后就销毁了,如果没有消息会阻塞等待
            String message = new String(delivery.getBody());
            System.out.println(" 收到消息 '" + message + "'");
        }
    }
}
```

### 4.2.3 测试

> 运行 send, 和 recv 测试可以收发消息

## 4.3 work 模式

> 一条消息可以被多个消费者尝试接收,但是最终只能有一个消费者能获取
>
> http://www.rabbitmq.com/tutorials/tutorial-two-python.html




### 4.3.1 发送者

```
public class Send {

    private final static String QUEUE_NAME = "test_queue_work";
```

```
    public static void main(String[] argv) throws Exception {
        // 获取到连接以及mq通道
        Connection connection = ConnectionUtil.getConnection();
        Channel channel = connection.createChannel();

        // 声明队列
        channel.queueDeclare(QUEUE_NAME, false, false, false, null);

        for (int i = 0; i < 100; i++) {//循环发送消息,但是每条消息的时间间隔越来越长
            // 消息内容
            String message = "" + i;
            channel.basicPublish("", QUEUE_NAME, null, message.getBytes());
            System.out.println(" 发送消息 '" + message + "'");

            Thread.sleep(i * 10);//休眠
        }

        channel.close();
        connection.close();
    }
}
```

### 4.3.2 消费者1

```
public class Recv {

    private final static String QUEUE_NAME = "test_queue_work";

    public static void main(String[] argv) throws Exception {

        // 获取到连接以及mq通道
        Connection connection = ConnectionUtil.getConnection();
        Channel channel = connection.createChannel();

        // 声明队列
        channel.queueDeclare(QUEUE_NAME, false, false, false, null);

        // 同一时刻服务器只会发一条消息给消费者,只有当前消费者将消息处理完成后才会获取到下一条消息
        channel.basicQos(1);//注释掉后可以获取多条消息,但是会一条一条处理

        // 定义队列的消费者
        QueueingConsumer consumer = new QueueingConsumer(channel);
        // 监听队列，手动返回完成,参数2手动确认模式
        channel.basicConsume(QUEUE_NAME, false, consumer);

        // 获取消息
```

```
        while (true) {
            QueueingConsumer.Delivery delivery = consumer.nextDelivery();
            String message = new String(delivery.getBody());
            System.out.println(" 消费者1收到 '" + message + "'");
            //休眠
            Thread.sleep(10);
            // 返回确认状态,手动确认模式 ,true 代表拒绝消息
            channel.basicAck(delivery.getEnvelope().getDeliveryTag(), false);
        }
    }
}
```

### 4.3.3 消费者2

```
public class Recv2 {

    private final static String QUEUE_NAME = "test_queue_work";

    public static void main(String[] argv) throws Exception {

        // 获取到连接以及mq通道
        Connection connection = ConnectionUtil.getConnection();
        Channel channel = connection.createChannel();

        // 声明队列
        channel.queueDeclare(QUEUE_NAME, false, false, false, null);

         // 同一时刻服务器只会发一条消息给消费者,只有当前消费者将消息处理完成后才会获取到下一条消息
        channel.basicQos(1);//注释掉后可以获取多条消息,但是会一条一条处理

        // 定义队列的消费者
        QueueingConsumer consumer = new QueueingConsumer(channel);
        // 监听队列，手动返回完成状态 ,参数2代表手动确认消息
        channel.basicConsume(QUEUE_NAME, false, consumer);

        // 获取消息
        while (true) {
            QueueingConsumer.Delivery delivery = consumer.nextDelivery();
            String message = new String(delivery.getBody());
            System.out.println(" 消费者2收到 '" + message + "'");
            // 休眠1秒
            Thread.sleep(1000);

            channel.basicAck(delivery.getEnvelope().getDeliveryTag(), false);//告诉服务器消息我消费成功了,true 代表拒绝消息
        }
    }
```

```
}
```

### 4.3.4 测试

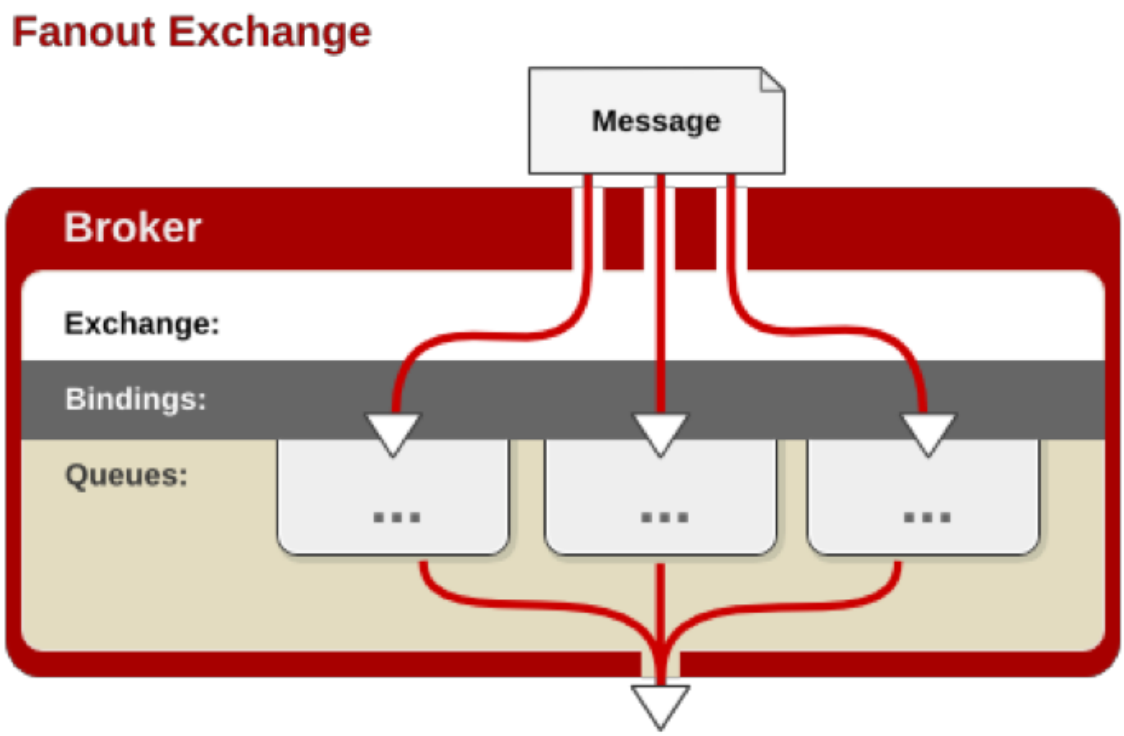
> 启动消费者1,消费者2, 发送者
>
> 在channel.basicQos(1);代码注释掉的情况下, 我们发现两个消费者获取到的消息数量是一致的,会轮流从队列取消息
>
> channel.basicQos(1);代码打开后,发现消费者1可以获取到更多数据,因为消费者的处理时间端,处理快,所以可以获取到更多的消息

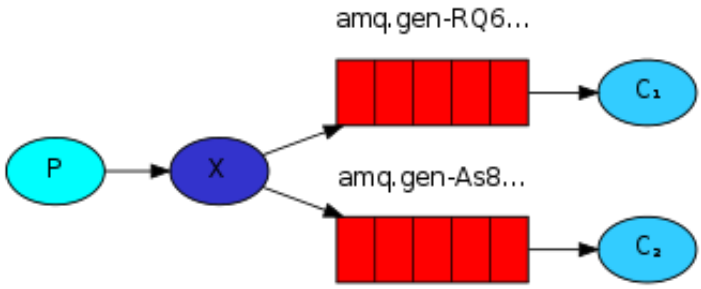
## 4.4 消息的确认模式

> 当我们发送消息后,服务端如何知道消息已经被消费
>
> 模式1:自动模式,不管消费者获取到消息后是否是成功处理消息,服务端都认为是成功的
>
> 模式2:手动模式,消费者获取到消息后,服务器会将消息标记为不可用,等待消费者反馈,如果不反馈,则一直标记为不可用

## 4.5 订阅模式

> http://www.rabbitmq.com/tutorials/tutorial-three-python.html
>
> 一条消息可以被多个消费者同时获取
>
> 生产者将消息发送到交换机
>
> 消费者将自己对应的队列注册到交换机
>
> 当发送消息后 所有注册的队列的消费者都可以收到消息






### 4.5.1 生产者

```
public class Send {

    private final static String EXCHANGE_NAME = "test_exchange_fanout";

    public static void main(String[] argv) throws Exception {
        // 获取到连接以及mq通道
        Connection connection = ConnectionUtil.getConnection();
        Channel channel = connection.createChannel();

        // 声明exchange
        channel.exchangeDeclare(EXCHANGE_NAME, "fanout");

        // 消息内容
        String message = "Hello World!";
        //将消息发送到交换机,如果此时没有队列绑定,则消息会丢失,因为交换机没有存储消息的
能力
        channel.basicPublish(EXCHANGE_NAME, "", null, message.getBytes());
        System.out.println(" 发送消息 '" + message + "'");

        channel.close();
        connection.close();
    }
}
```

### 4.5.2 消费者1

```
public class Recv {

    private final static String QUEUE_NAME = "test_queue_work";//本消息的队列

    private final static String EXCHANGE_NAME = "test_exchange_fanout";//交换机

    public static void main(String[] argv) throws Exception {

        // 获取到连接以及mq通道
        Connection connection = ConnectionUtil.getConnection();
```

```
        Channel channel = connection.createChannel();

        // 声明队列
        channel.queueDeclare(QUEUE_NAME, false, false, false, null);

        // 绑定队列到交换机
        channel.queueBind(QUEUE_NAME, EXCHANGE_NAME, "");

        // 同一时刻服务器只会发一条消息给消费者
        channel.basicQos(1);

        // 定义队列的消费者
        QueueingConsumer consumer = new QueueingConsumer(channel);
        // 监听队列，手动返回完成
        channel.basicConsume(QUEUE_NAME, false, consumer);

        // 获取消息
        while (true) {
            QueueingConsumer.Delivery delivery = consumer.nextDelivery();
            String message = new String(delivery.getBody());
            System.out.println(" 消费者1收到消息 '" + message + "'");
            Thread.sleep(10);

            channel.basicAck(delivery.getEnvelope().getDeliveryTag(), false);//手
动应答
        }
    }
}
```

### 4.5.3 消费者2

```
public class Recv2 {

    private final static String QUEUE_NAME = "test_queue_work2";

    private final static String EXCHANGE_NAME = "test_exchange_fanout";

    public static void main(String[] argv) throws Exception {

        // 获取到连接以及mq通道
        Connection connection = ConnectionUtil.getConnection();
        Channel channel = connection.createChannel();

        // 声明队列
        channel.queueDeclare(QUEUE_NAME, false, false, false, null);

        // 绑定队列到交换机
        channel.queueBind(QUEUE_NAME, EXCHANGE_NAME, "");
```

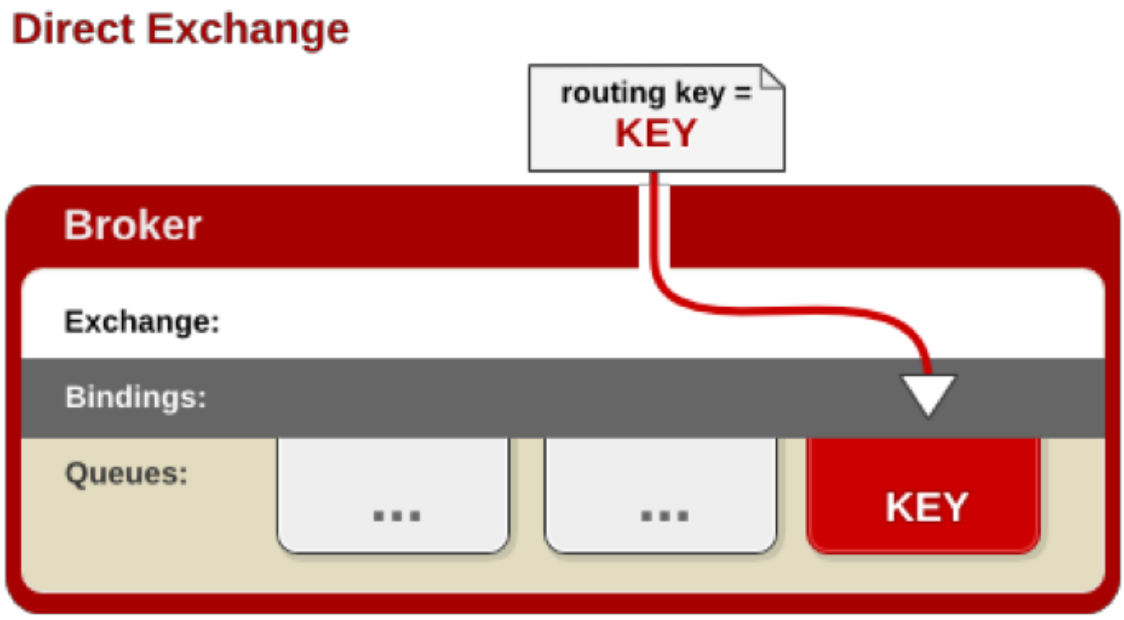
```
        // 同一时刻服务器只会发一条消息给消费者
        channel.basicQos(1);

        // 定义队列的消费者
        QueueingConsumer consumer = new QueueingConsumer(channel);
        // 监听队列，手动返回完成
        channel.basicConsume(QUEUE_NAME, false, consumer);

        // 获取消息
        while (true) {
            QueueingConsumer.Delivery delivery = consumer.nextDelivery();
            String message = new String(delivery.getBody());
            System.out.println(" 消费者2收到 '" + message + "'");
            Thread.sleep(10);

            channel.basicAck(delivery.getEnvelope().getDeliveryTag(), false);//手
动应答
        }
    }
}
```

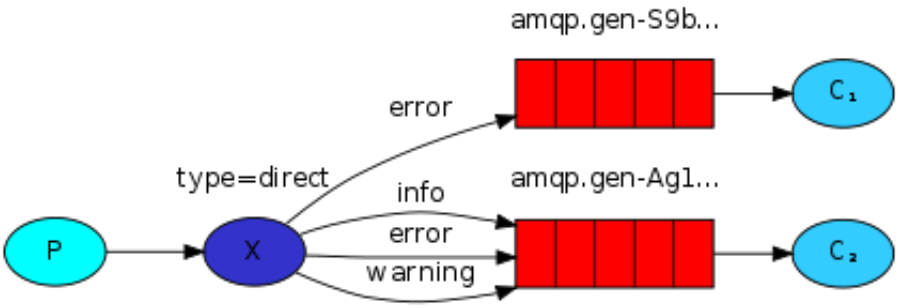
### 4.5.4 测试

> 启动消费者1,2 生产者测试

## 4.6 路由模式

> http://www.rabbitmq.com/tutorials/tutorial-four-python.html
>
> 生产者将消息发送到了 type 为 direct 模式的交换机
>
> 消费者的队列在将自己绑定到路由的时候会给自己绑定一个 key
>
> 只有消费者发送对应 key 格式的消息时候 队列才会收到消息




### 4.6.1 生产者

```
public class Send {

    private final static String EXCHANGE_NAME = "test_exchange_direct";//路由名字

    public static void main(String[] argv) throws Exception {
        // 获取到连接以及mq通道
        Connection connection = ConnectionUtil.getConnection();
        Channel channel = connection.createChannel();

        // 声明exchange, type 是direct
        channel.exchangeDeclare(EXCHANGE_NAME, "direct");

        // 消息内容
        String message = "Hello World!";
        channel.basicPublish(EXCHANGE_NAME, "key2", null, message.getBytes()); //
发送 key 为 key2的消息
        System.out.println(" 发送消息'" + message + "'");

        channel.close();
        connection.close();
```

```
    }
}
```

### 4.6.2 消费者1

```
public class Recv {

    private final static String QUEUE_NAME = "test_queue_work";

    private final static String EXCHANGE_NAME = "test_exchange_direct";//路由名字

    public static void main(String[] argv) throws Exception {

        // 获取到连接以及mq通道
        Connection connection = ConnectionUtil.getConnection();
        Channel channel = connection.createChannel();

        // 声明队列
        channel.queueDeclare(QUEUE_NAME, false, false, false, null);

        // 绑定队列到交换机,绑定自己的关键字 key 为key,注意在绑定到指定路由(交换机)的时候,该路由必须存在,也就是我们必须先由发送者创建一个路由才可以
        channel.queueBind(QUEUE_NAME, EXCHANGE_NAME, "key");
        //如果要绑定多个 key 多次执行即可
        //  channel.queueBind(QUEUE_NAME, EXCHANGE_NAME, "key");

        // 同一时刻服务器只会发一条消息给消费者
        channel.basicQos(1);

        // 定义队列的消费者
        QueueingConsumer consumer = new QueueingConsumer(channel);
        // 监听队列，手动返回完成
        channel.basicConsume(QUEUE_NAME, false, consumer);

        // 获取消息
        while (true) {
            QueueingConsumer.Delivery delivery = consumer.nextDelivery();
            String message = new String(delivery.getBody());
            System.out.println(" 消费者1'" + message + "'");
            Thread.sleep(10);

            channel.basicAck(delivery.getEnvelope().getDeliveryTag(), false);
        }
    }
}
```

### 4.6.3 消费者2

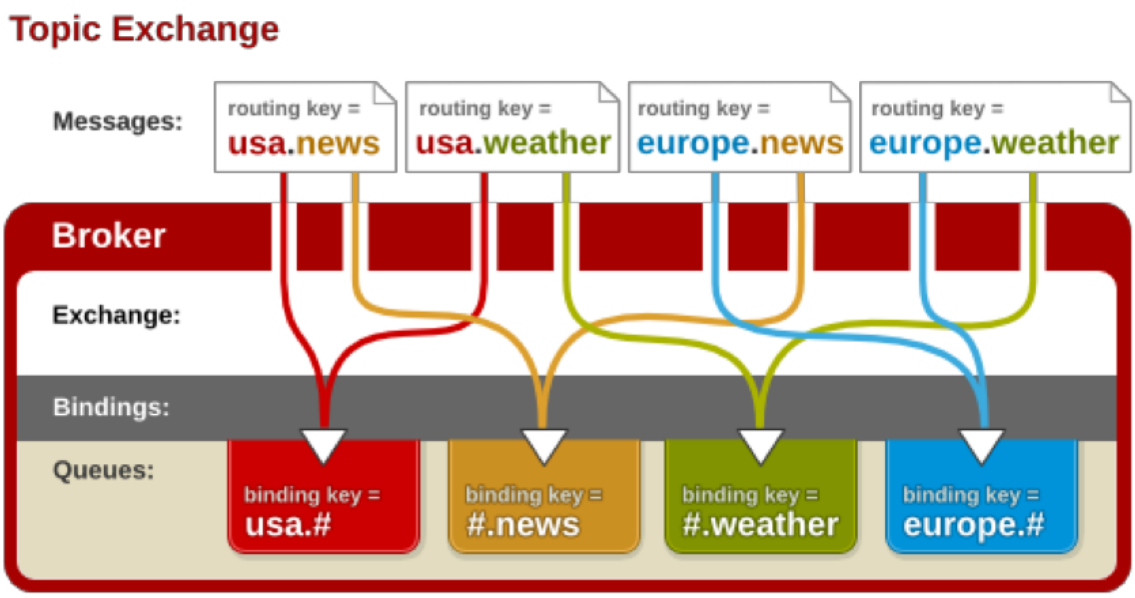
```
public class Recv2 {

    private final static String QUEUE_NAME = "test_queue_work2";

    private final static String EXCHANGE_NAME = "test_exchange_direct";//路由名字

    public static void main(String[] argv) throws Exception {

        // 获取到连接以及mq通道
        Connection connection = ConnectionUtil.getConnection();
        Channel channel = connection.createChannel();

        // 声明队列
        channel.queueDeclare(QUEUE_NAME, false, false, false, null);

        // 绑定队列到交换机,绑定自己的关键字 key 为key2,注意在绑定到指定路由(交换机)的时候,该路由必须存在,也就是我们必须先由发送者创建一个路由才可以
        channel.queueBind(QUEUE_NAME, EXCHANGE_NAME, "key2");
        //如果要绑定多个 key 多次执行即可
      //  channel.queueBind(QUEUE_NAME, EXCHANGE_NAME, "key2");

        // 同一时刻服务器只会发一条消息给消费者
        channel.basicQos(1);

        // 定义队列的消费者
        QueueingConsumer consumer = new QueueingConsumer(channel);
        // 监听队列，手动返回完成
        channel.basicConsume(QUEUE_NAME, false, consumer);

        // 获取消息
        while (true) {
            QueueingConsumer.Delivery delivery = consumer.nextDelivery();
            String message = new String(delivery.getBody());
            System.out.println(" 消费者2'" + message + "'");
            Thread.sleep(10);

            channel.basicAck(delivery.getEnvelope().getDeliveryTag(), false);
        }
    }
}
```

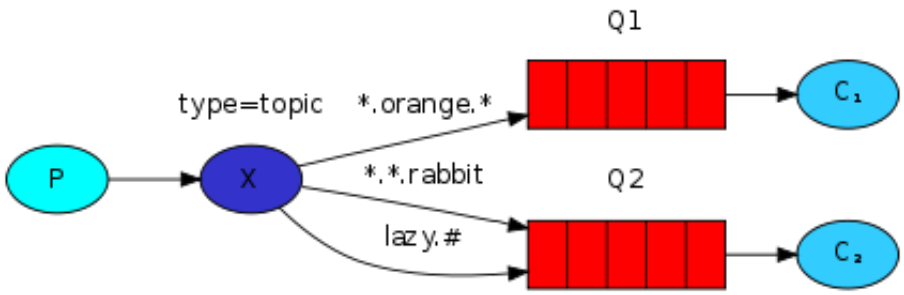
### 4.6.4 测试

> 启动发送者创建路由,启动消费者1,消费者2
>
> 通过修改发送者代码中的 key 来多次执行测试,发现可以分别收到不同消息,如果监听了相同的 key 可以一起收到消息

# 4.7 通配符模式

> http://www.rabbitmq.com/tutorials/tutorial-five-python.html




- *(star) can substitute for exactly one word.
- # (hash) can substitute for zero or more words.
- 将路由键和某模式进行匹配。此时队列需要绑定要一个模式上。符号“#”匹配一个或多个词，符号“*”匹配不多不少一个词。因此“audit.#”能够匹配到“audit.irs.corporate”，但是“audit.” 只会匹配到“audit.irs”

## 4.7.1 生产者

```
public class Send {

    private final static String EXCHANGE_NAME = "test_exchange_topic";

    public static void main(String[] argv) throws Exception {
        // 获取到连接以及mq通道
        Connection connection = ConnectionUtil.getConnection();
        Channel channel = connection.createChannel();

        // 声明exchange,声明为 topic 也就是通配符类型
        channel.exchangeDeclare(EXCHANGE_NAME, "topic");
```

```
        // 消息内容
        String message = "Hello World!";
        //发送 key.1 数据,凡是能匹配到这个关键词的都会收到
        channel.basicPublish(EXCHANGE_NAME, "key.1", null, message.getBytes());
        System.out.println(" 发送消息 '" + message + "'");

        channel.close();
        connection.close();
    }
}
```

### 4.7.2消费者1

```
public class Recv {

    private final static String QUEUE_NAME = "test_queue_topic_work";

    private final static String EXCHANGE_NAME = "test_exchange_topic";

    public static void main(String[] argv) throws Exception {

        // 获取到连接以及mq通道
        Connection connection = ConnectionUtil.getConnection();
        Channel channel = connection.createChannel();

        // 声明队列
        channel.queueDeclare(QUEUE_NAME, false, false, false, null);

        // 绑定队列到交换机,key 为以 key开头的内容,后面只能由一个单词或者字符
        channel.queueBind(QUEUE_NAME, EXCHANGE_NAME, "key.*");

        // 同一时刻服务器只会发一条消息给消费者
        channel.basicQos(1);

        // 定义队列的消费者
        QueueingConsumer consumer = new QueueingConsumer(channel);
        // 监听队列，手动返回完成
        channel.basicConsume(QUEUE_NAME, false, consumer);

        // 获取消息
        while (true) {
            QueueingConsumer.Delivery delivery = consumer.nextDelivery();
            String message = new String(delivery.getBody());
            System.out.println(" 消费者1 '" + message + "'");
            Thread.sleep(10);

            channel.basicAck(delivery.getEnvelope().getDeliveryTag(), false);
        }
```

```
    }
}
```

### 4.7.3

```
public class Recv2 {

    private final static String QUEUE_NAME = "test_queue_topic_work2";

    private final static String EXCHANGE_NAME = "test_exchange_topic";

    public static void main(String[] argv) throws Exception {

        // 获取到连接以及mq通道
        Connection connection = ConnectionUtil.getConnection();
        Channel channel = connection.createChannel();

        // 声明队列
        channel.queueDeclare(QUEUE_NAME, false, false, false, null);

        // 绑定队列到交换机,监听任意消息
        channel.queueBind(QUEUE_NAME, EXCHANGE_NAME, "*.*");

        // 同一时刻服务器只会发一条消息给消费者
        channel.basicQos(1);

        // 定义队列的消费者
        QueueingConsumer consumer = new QueueingConsumer(channel);
        // 监听队列，手动返回完成
        channel.basicConsume(QUEUE_NAME, false, consumer);

        // 获取消息
        while (true) {
            QueueingConsumer.Delivery delivery = consumer.nextDelivery();
            String message = new String(delivery.getBody());
            System.out.println(" 消费者2 '" + message + "'");
            Thread.sleep(10);

            channel.basicAck(delivery.getEnvelope().getDeliveryTag(), false);
        }
    }
}
```

### 4.7.4 测试

> 通过发送不同的 key 的数据测试发现消费者可能会在不同情况下分别收到数据

# 五 整合 spring

> spring 对 amqp 做了支持,但是当前只实现了 rabbitmq

# 5.1 spring 自动模式

## 5.1.1 spring 配置文件

```
<beans xmlns="http://www.springframework.org/schema/beans"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:rabbit="http://www.springframework.org/schema/rabbit"
    xsi:schemaLocation="http://www.springframework.org/schema/rabbit
    http://www.springframework.org/schema/rabbit/spring-rabbit-1.7.xsd
    http://www.springframework.org/schema/beans
    http://www.springframework.org/schema/beans/spring-beans-4.3.xsd">

    <!-- 定义RabbitMQ的连接工厂 -->
    <rabbit:connection-factory id="connectionFactory"
        host="192.168.3.227" port="5672" username="test" password="test"
        virtual-host="/test" />

    <!-- 定义Rabbit模板，指定连接工厂以及定义exchange
     如果要将消息发送到队列而不是交换机,则声明queue="" 而不是exchange=""
     -->
    <rabbit:template id="amqpTemplate" connection-factory="connectionFactory"
exchange="fanoutExchange"  />
    <!-- <rabbit:template id="amqpTemplate" connection-factory="connectionFactory"
        exchange="fanoutExchange" routing-key="foo.bar" /> -->

    <!-- MQ的管理，包括队列、交换器等 -->
    <rabbit:admin connection-factory="connectionFactory" />

    <!-- 定义队列，自动声明 -->
    <rabbit:queue name="myQueue" auto-declare="true"/>

    <!-- 定义交换器，自动声明 -->
    <rabbit:fanout-exchange name="fanoutExchange" auto-declare="true" >
        <rabbit:bindings>
            <!--将下列队列绑定到当前交换机-->
            <rabbit:binding queue="myQueue"/>
        </rabbit:bindings>
    </rabbit:fanout-exchange>
    <!--
    通配符模式
    -->
<!--

    <rabbit:topic-exchange name="myExchange">
        <rabbit:bindings>
            <rabbit:binding queue="myQueue" pattern="foo.*" />
        </rabbit:bindings>
```

```
    </rabbit:topic-exchange>

-->


    <!--路由设置 将队列绑定，属于direct类型
    <rabbit:direct-exchange id="directExchange"
                            name="directExchange" durable="true" auto-
delete="false">
        <rabbit:bindings>
            <rabbit:binding queue="myQueue"
key="${rabbitmq.system.out.log.error.mail}" />
        </rabbit:bindings>
    </rabbit:direct-exchange>
-->


    <!-- 队列监听
    acknowledeg = "manual" 属性为手动应答
    -->
    <rabbit:listener-container connection-factory="connectionFactory">
        <!--指定对应队列myQueue的监听为 foo 中的 listen 方法-->
        <rabbit:listener ref="foo" method="listen" queue-names="myQueue" />
    </rabbit:listener-container>

    <bean id="foo" class="com.qianfeng.rabbitmq.spring.Foo" />

</beans>
```

### 5.1.2 接收者

```
/**
 * 消费者类,任意类都可以
 */
public class Foo {

    //具体执行业务的方法
    public void listen(String foo) {
        System.out.println("消费者:  " + foo);
    }
}
```

### 5.1.3 测试类

```
public class TestMain {
    public static void main(final String... args) throws Exception {
```

```
        AbstractApplicationContext ctx = new ClassPathXmlApplicationContext(
                "classpath:spring/rabbitmq-context.xml");
        //RabbitMQ模板
        RabbitTemplate template = ctx.getBean(RabbitTemplate.class);
        //发送消息
        template.convertAndSend("Hello, world!");
        Thread.sleep(1000);// 休眠1秒
        ctx.destroy(); //容器销毁
    }
}
```

### 5.1.4 启动测试

## 5.2 spring 手动模式

### 5.2.1 配置文件

> 主要介绍template 和 listener 的不同,其他同上

```
<beans xmlns="http://www.springframework.org/schema/beans"
       xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
       xmlns:rabbit="http://www.springframework.org/schema/rabbit"
       xmlns:context="http://www.springframework.org/schema/context"
       xsi:schemaLocation="http://www.springframework.org/schema/rabbit
    http://www.springframework.org/schema/rabbit/spring-rabbit-1.7.xsd
    http://www.springframework.org/schema/beans
    http://www.springframework.org/schema/beans/spring-beans-4.3.xsd
    http://www.springframework.org/schema/context
http://www.springframework.org/schema/context/spring-context-4.3.xsd">



<context:component-scan base-package="com.qianfeng.rabbitmq"/>
    <bean id="jsonMessageConverter"
class="org.springframework.amqp.support.converter.Jackson2JsonMessageConverter" />

    <!-- 定义RabbitMQ的连接工厂 -->
    <rabbit:connection-factory id="connectionFactory"
                               host="192.168.3.227" port="5672" username="test"
password="test"
                               virtual-host="/test" />

    <rabbit:admin connection-factory="connectionFactory" />

    <!-- 给模板指定转换器 --><!-- mandatory必须设置true,return callback才生效 -->
    <rabbit:template id="amqpTemplate"   connection-factory="connectionFactory"
```

```
                    confirm-callback="confirmCallBackListener"
                    return-callback="returnCallBackListener"
                    mandatory="true"
    />

    <rabbit:queue name="CONFIRM_TEST" />

    <rabbit:direct-exchange name="DIRECT_EX" id="DIRECT_EX" >
        <rabbit:bindings>
            <rabbit:binding queue="CONFIRM_TEST" />
        </rabbit:bindings>
    </rabbit:direct-exchange>

    <!-- 配置consumer, 监听的类和queue的对应关系 -->
    <rabbit:listener-container
            connection-factory="connectionFactory" acknowledge="manual" >
        <rabbit:listener queues="CONFIRM_TEST" ref="receiveConfirmTestListener" />
    </rabbit:listener-container>
</beans>
```

### 5.2.2 消费者

```
/**
 * Created by jackiechan on 2018/3/29/上午12:51
 */
@Service("receiveConfirmTestListener")
public class ReceiveConfirmTestListener implements ChannelAwareMessageListener {
    @Override
    public void onMessage(Message message, Channel channel) throws Exception {
        try{
            System.err.println("消费者收到消息--
:"+message.getMessageProperties()+":"+new String(message.getBody()));
            channel.basicAck(message.getMessageProperties().getDeliveryTag(),
false);  //手动应答
        }catch(Exception e){
            e.printStackTrace();//TODO 业务处理
            channel.basicNack(message.getMessageProperties().getDeliveryTag(),
false,false);
        }
    }
}
```

### 5.2.3 确认后回调

```
/**
 * Created by jackiechan on 2018/3/29/上午12:51
 */
@Service("confirmCallBackListener")
public class ConfirmCallBackListener implements RabbitTemplate.ConfirmCallback {
    @Override
    public void confirm(CorrelationData correlationData, boolean ack, String
cause) {
        System.err.println("确认--
:correlationData:"+correlationData+",ack:"+ack+",cause:"+cause);
    }
}
```

### 5.2.3 失败回滚

```
/**
 * Created by jackiechan on 2018/3/29/上午12:51
 */
@Service("returnCallBackListener")
public class ReturnCallBackListener implements RabbitTemplate.ReturnCallback {
    @Override
    public void returnedMessage(Message message, int replyCode, String replyText,
String exchange, String routingKey) {
        System.err.println("失败--message:"+new
String(message.getBody())+",replyCode:"+replyCode+",replyText:"+replyText+",exchan
ge:"+exchange+",routingKey:"+routingKey);
    }
}
```

### 5.2.3 生产者

```
@Service("publishService")
public class PublishService {
    @Autowired
    private AmqpTemplate amqpTemplate;

    public void send(String exchange, String routingKey, Object message) {
        amqpTemplate.convertAndSend(exchange, routingKey, message);
    }
}
```

### 5.2.4 消费者

```
@RunWith(SpringJUnit4ClassRunner.class)
@ContextConfiguration(locations = {"classpath:spring/application-context.xml"})
```

```
public class TestConfirm {
    @Autowired
    private PublishService publishService;

    private static String exChange = "DIRECT_EX";

    @Test
    public void test1() throws InterruptedException{
        String message = "currentTime:"+System.currentTimeMillis();
        System.out.println("test1---message:"+message);
        //exchange,queue 都正确,confirm被回调, ack=true
        publishService.send(exChange,"CONFIRM_TEST",message);
        Thread.sleep(1000);
    }

    @Test
    public void test2() throws InterruptedException{
        String message = "currentTime:"+System.currentTimeMillis();
        System.out.println("test2---message:"+message);
        //exchange 错误,queue 正确,confirm被回调, ack=false
        publishService.send(exChange+"NO","CONFIRM_TEST",message);
        Thread.sleep(1000);
    }

    @Test
    public void test3() throws InterruptedException{
        String message = "currentTime:"+System.currentTimeMillis();
        System.out.println("test3---message:"+message);
        //exchange 正确,queue 错误 ,confirm被回调, ack=true; return被回调
replyText:NO_ROUTE
        publishService.send(exChange,"",message);
//        Thread.sleep(1000);
    }

    @Test
    public void test4() throws InterruptedException{
        String message = "currentTime:"+System.currentTimeMillis();
        System.out.println("test4---message:"+message);
        //exchange 错误,queue 错误,confirm被回调, ack=false
        publishService.send(exChange+"NO","CONFIRM_TEST",message);
        Thread.sleep(1000);
    }
}
```

### 5.2.5 启动测试