LEARN RABBITMQ WITH C#

VOLUME 1
1ST EDITION

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RabbitMQ Introduction

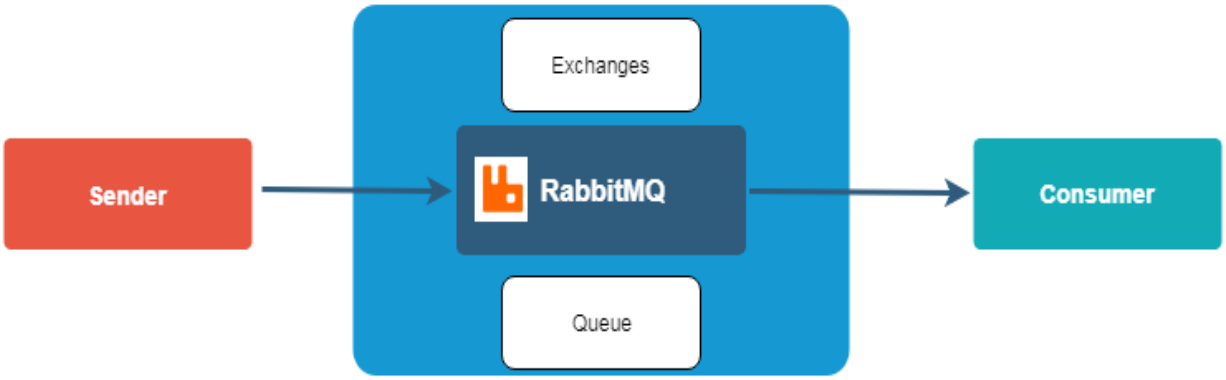
What is RabbitMQ?

RabbitMQ an AMQP message broker is the most popular open source and cross-platform message broker.

It is built on Erlang which is also used by WhatsApp for messaging.

RabbitMQ is also a way to exchange data between applications such as a message sent from.Net application can be read by a Node.js application or Java application.

RabbitMQ is lightweight and easy to deploy on premises and in the cloud. It supports multiple messaging protocols. RabbitMQ can be deployed in distributed and federated configurations to meet high-scale, high-availability requirements.



Why and when should we Use RabbitMQ?

We should use RabbitMQ because it is open source and easy to use with many languages such as .Net, Java, Python, Ruby, Node Js.

We can use RabbitMQ to remove some heavy work from our web application such as sending Reports in Emails in Excel or Pdf format's or sending email, SMS or another task such as a trigger to some other applications to start processing.

Nowadays most people do all this task into single application sending emails or SMS, reports which bit heavy task which is also handled by IIS if you separate this task then IIS will get more space (memory) to serve more request.

After understanding a bit about RabbitMQ next we are going to Install Erlang and RabbitMQ on Windows.

What is AMQP?

The Advanced Message Queuing Protocol (AMQP) is an open standard application layer protocol for message-oriented the defining features of AMQP are message orientation, queuing, routing (including point-to-point and publish-and-subscribe), reliability and security.

It was developed by JPMorgan and iMatix Corporation.

Key Features

AMQP was designed with the following main characteristics as goals:

- Security
- Reliability
- Interoperability
- Standard
- Open

Various Client Libraries

RabbitMQ support various number of operating systems and various language and it's have various clients for different languages.

1. .Net
2. Java
3. Spring Framework
4. Ruby
5. Python
6. PHP
7. Objective-C and Swift
8. JavaScript
9. GO
10. Perl

RabbitMQ Setup

In this part, we are going to learn how to Setup RabbitMQ in step by step way.

1. What is Erlang
2. Downloading Erlang
3. Installing Erlang
4. Downloading RabbitMQ
5. Installing RabbitMQ
6. Starting RabbitMQ Server
7. Enabling web management plugin
8. Web Management plugin
9. Conclusion

What is Erlang

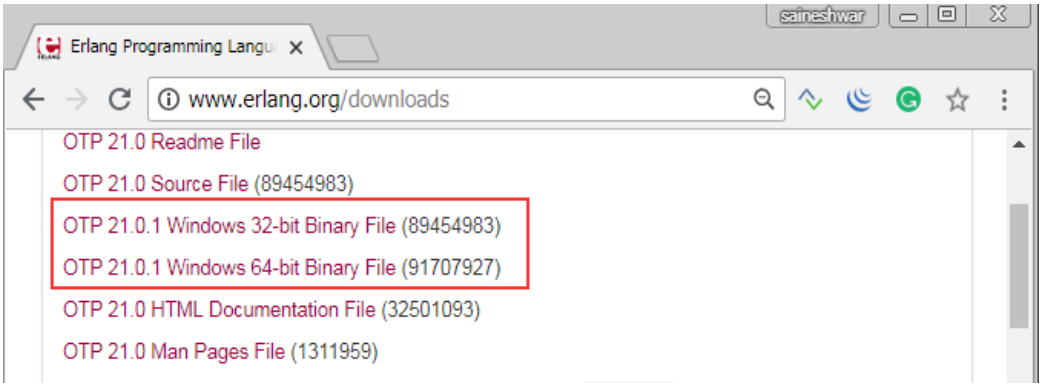
Erlang is a general-purpose programming language and runtime environment.

Erlang has built-in support for concurrency, distribution and fault tolerance. Erlang is used in several large telecommunication systems from Ericsson.

Referred from: - http://erlang.org/faq/introduction.html

Link to download Erlang

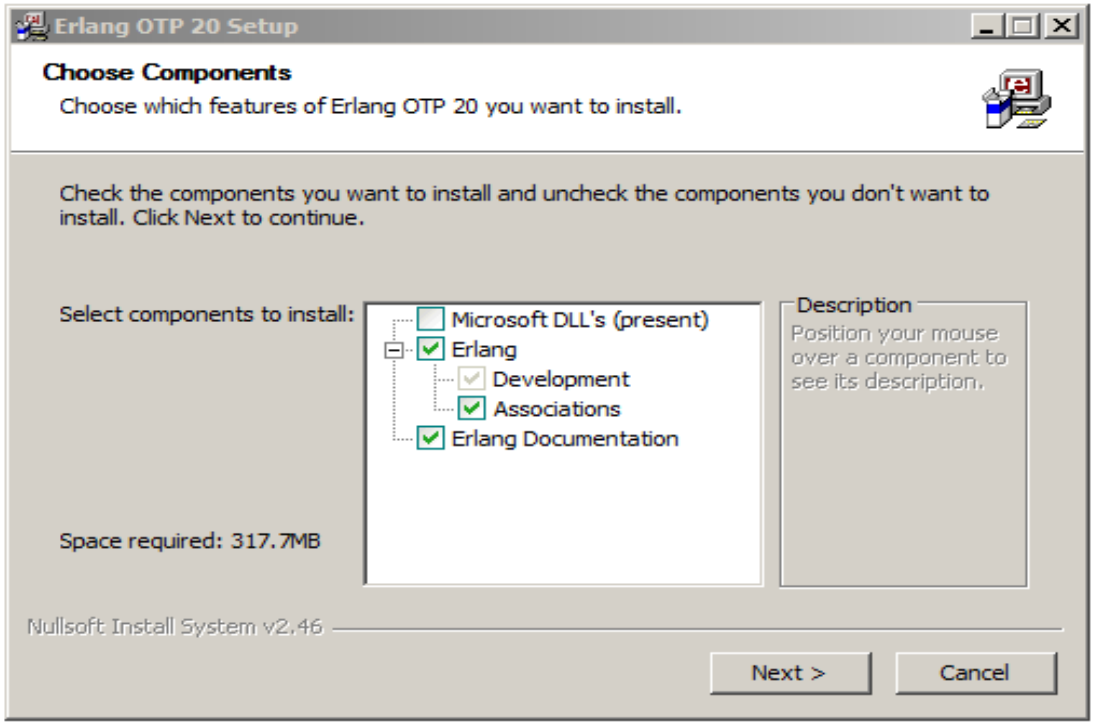
http://www.erlang.org/downloads



After downloading Erlang now, we are going to Installing Erlang.

Installing Erlang

In this part just click on Erlang setup which you have downloaded to install.

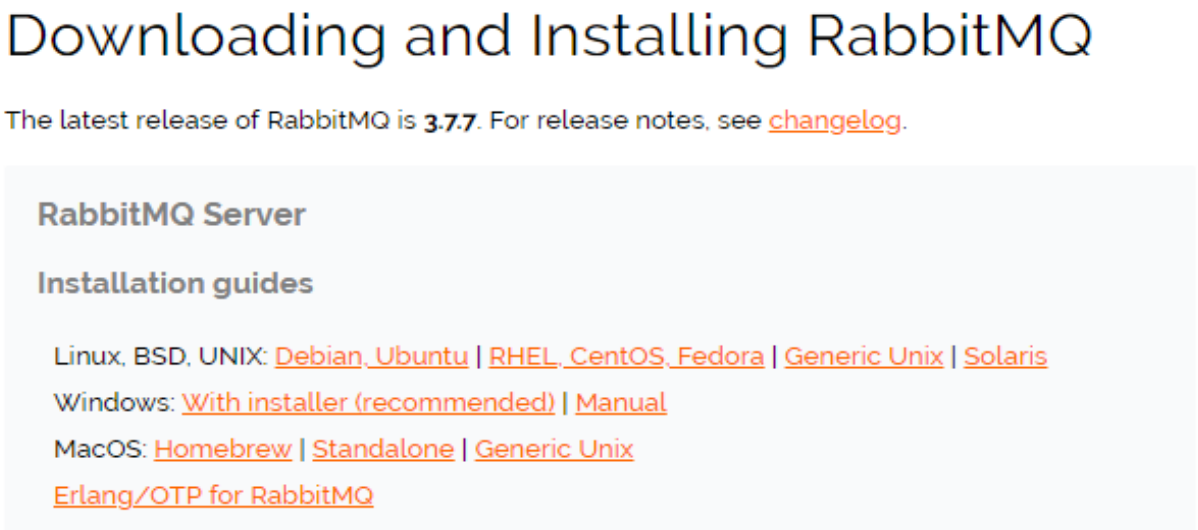


After downloading Erlang setup just install it, after installing next we are going to Download RabbitMQ.

Downloading RabbitMQ

First, we are going to download RabbitMQ setup for windows from link

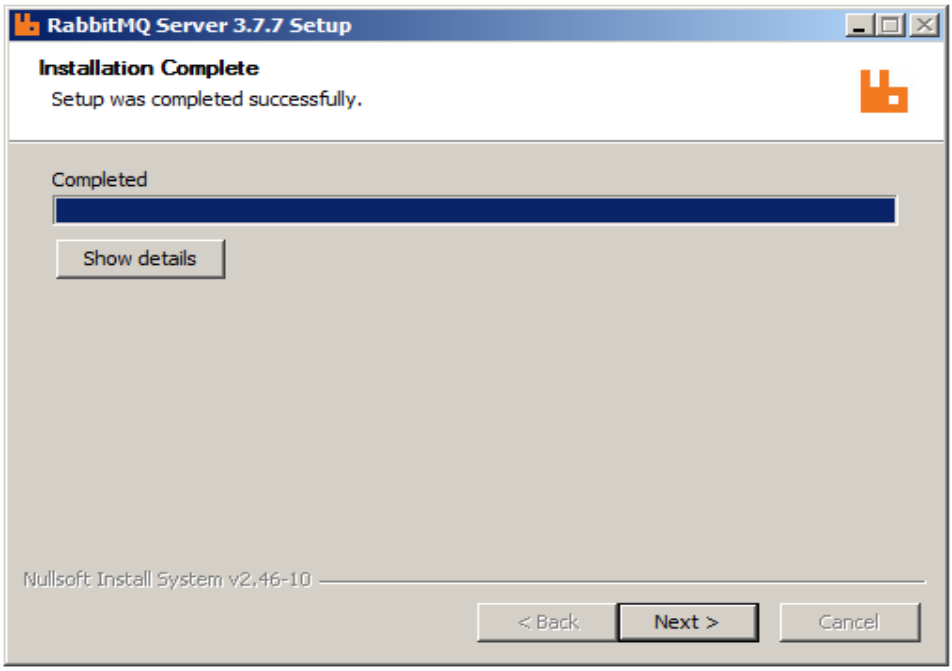
https://www.rabbitmq.com/download.html



After downloading RabbitMQ now we are going to Installing RabbitMQ

Installing RabbitMQ

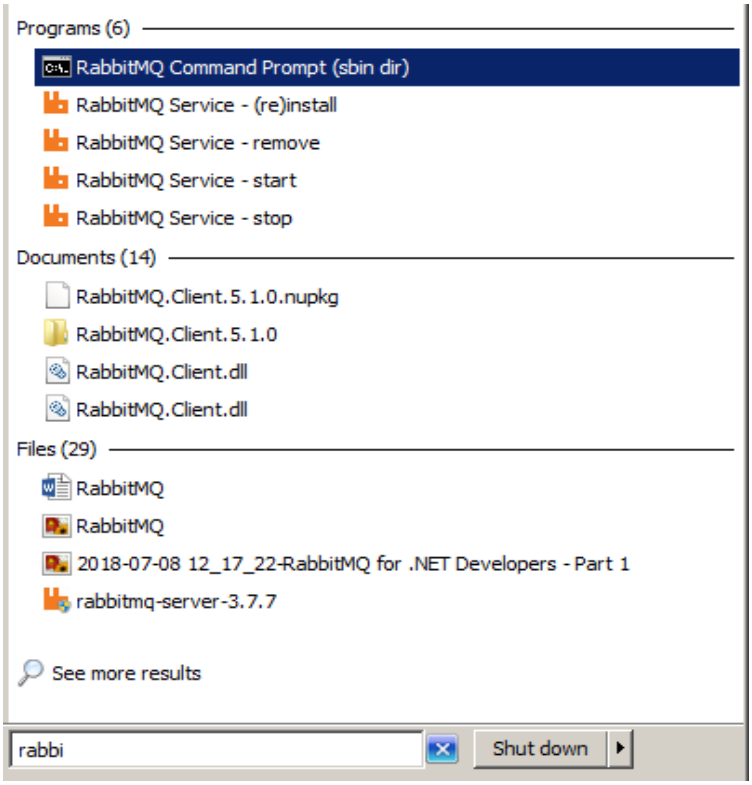
In this part just click on RabbitMQ setup which you have downloaded to install.



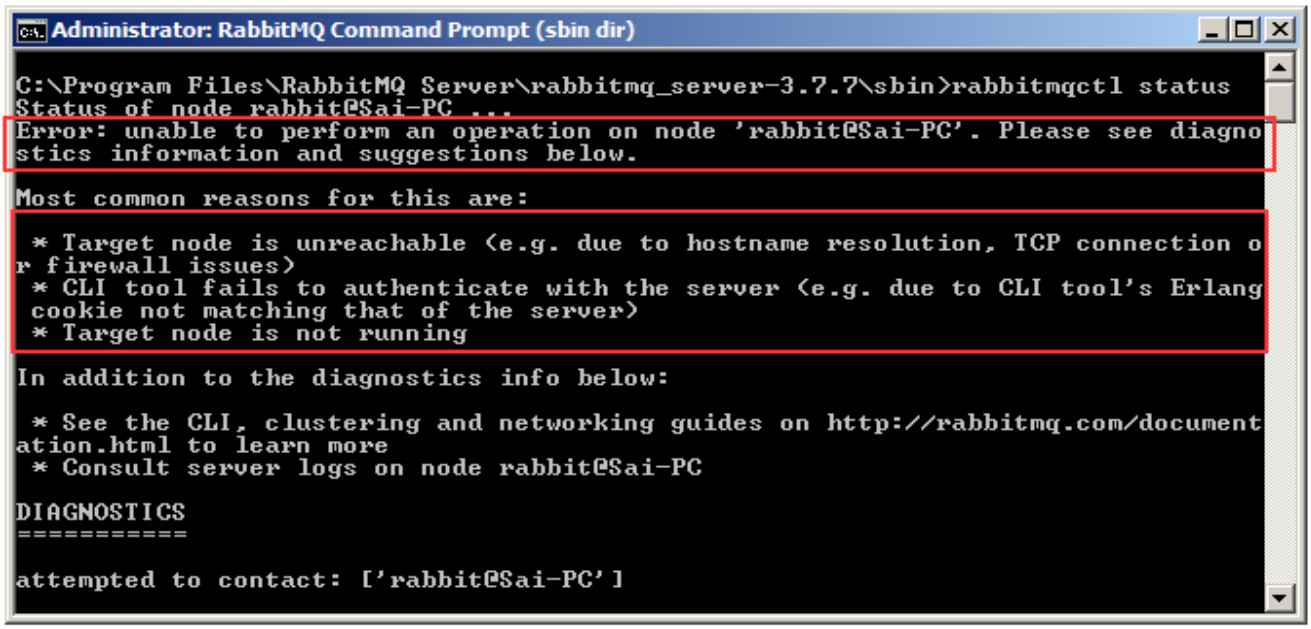
After installing Rabbit MQ Next, search RabbitMQ Command Prompt and open it with admin privilege.

Starting RabbitMQ Server

In this part we are going to open RabbitMQ Command Prompt with admin privileges for checking status of RabbitMQ server.



After opening command prompt enter command **"rabbitmqctl status"** for checking status of RabbitMQ server. If it shows you an error as below snapshot then you need to follow some step given below.



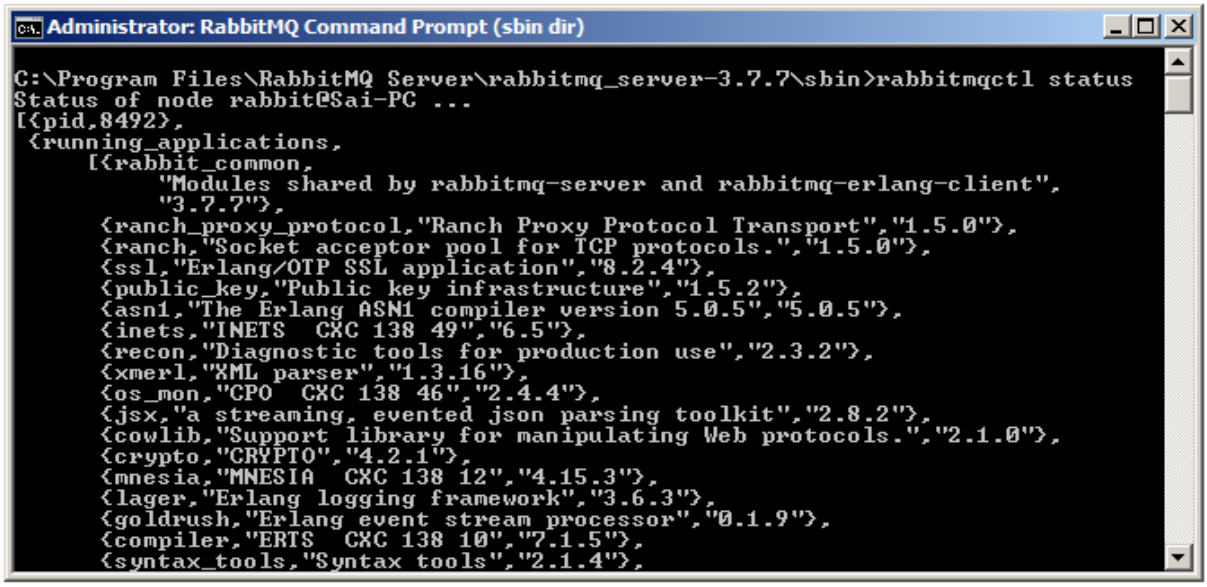
Steps if you get Error (Authentication failed (rejected by the remote node), check the Erlang cookie)

1. In File Explorer navigate to your user directory. (Paste %userprofile% in the address bar.)
2. If you already have the file .erlang.cookie in there, delete it. If not, just go to the next step.
3. In a second File Explorer, navigate to C:\Windows\System32\config\systemprofile.
4. Find the file. erlang.cookie and copy it to your user directory.
5. Now your rabbitmqctl should be able to authenticate.

Links for Solution

- https://stackoverflow.com/questions/47893899/authentication-failed-rejected-by-the-remote-node-please-check-the-erlang-coo?rq=1
- https://stackoverflow.com/questions/28258392/rabbitmq-has-nodedown-error

After you completed steps again if you running the same command **"rabbitmqctl status"** then below screen should appear.

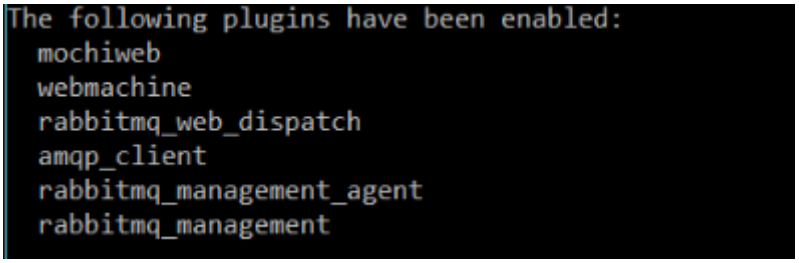


Now we have started Server next we are going to enable web management plugin of RabbitMQ.

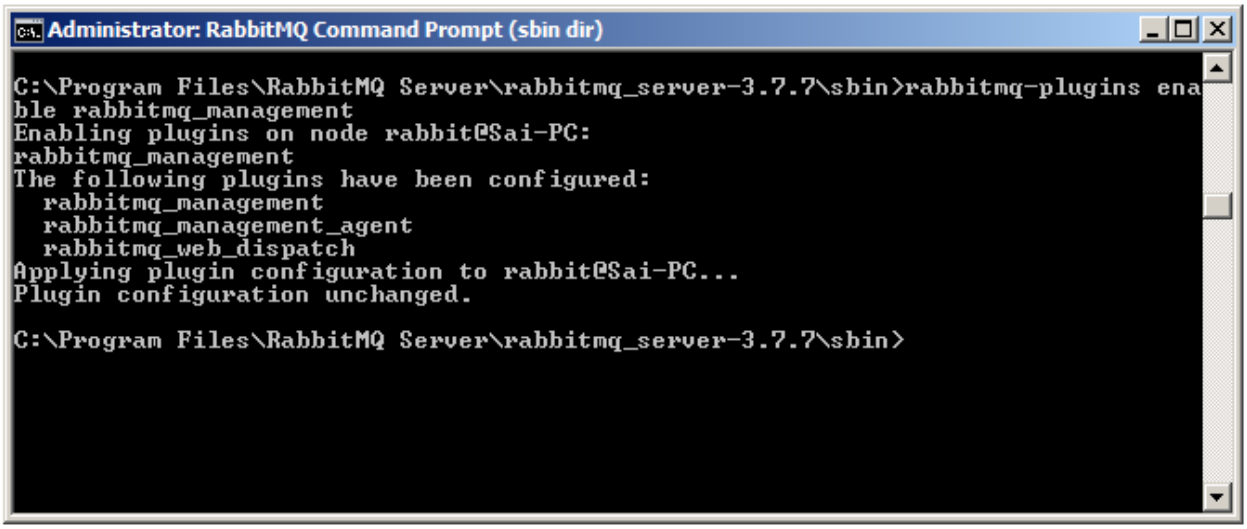
Enabling web management plugin

For enabling web management plugin, you need to start RabbitMQ command prompt with administrator privilege and enter the command "**rabbitmq-plugins enable rabbitmq_management**".

After executing this command, you will see below plugins will be enabled.



This screen is same but I have already enabled plugin that's why it is should different messages.



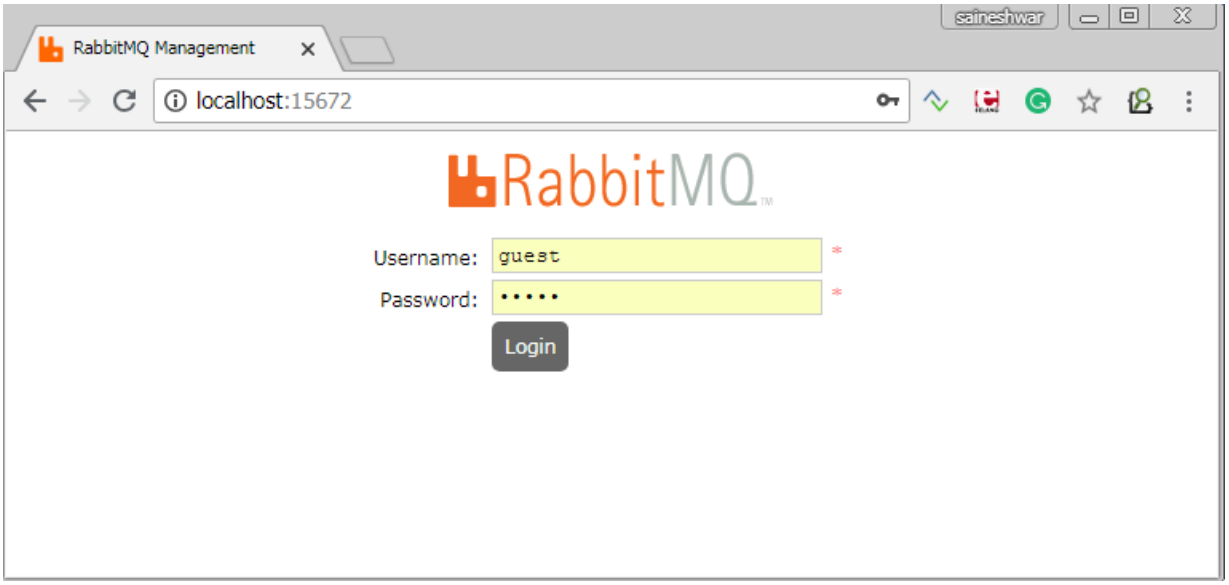
Now you can open web management plugin in the browser.

Web Management plugin

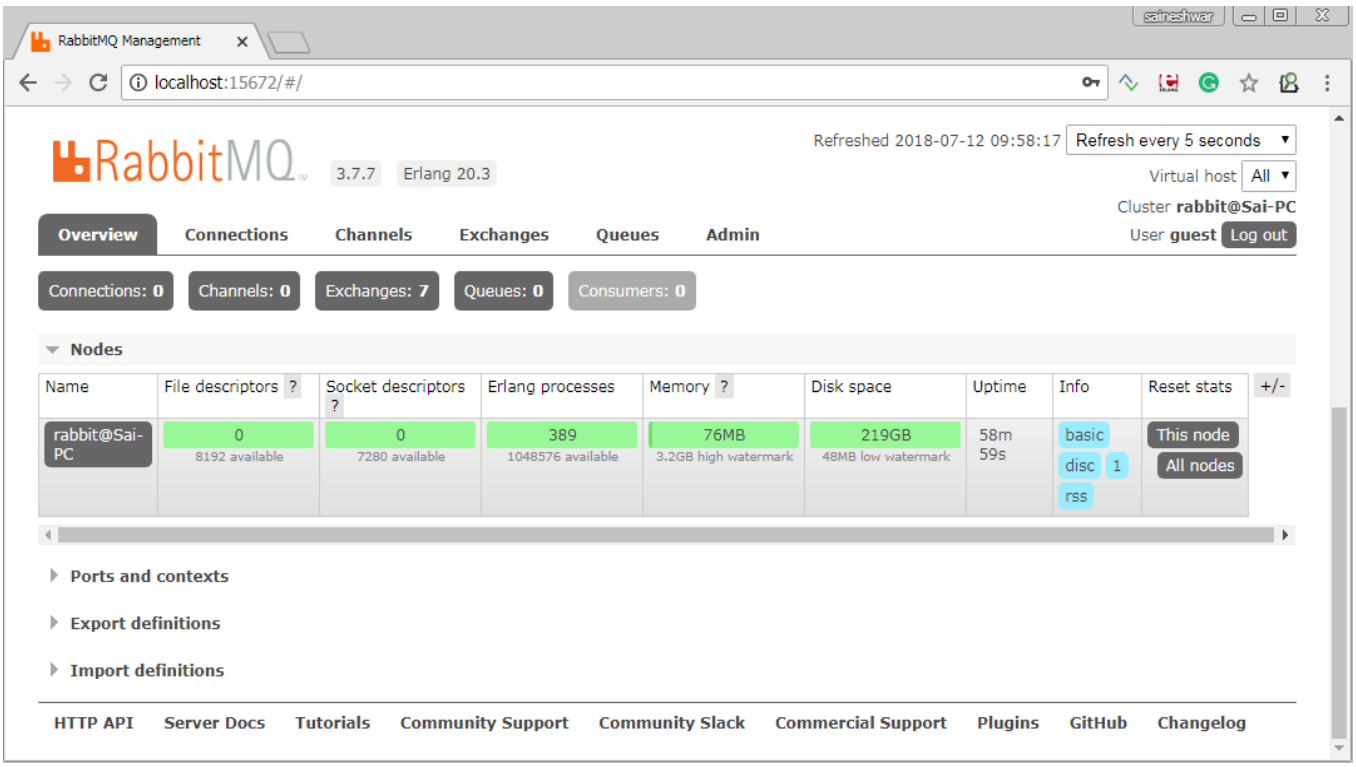
Now to use web Management plugin enter localhost URL in browser "http://localhost:15672/".

After entering localhost URL in browser, it will ask for credentials for accessing web management plugin.

The Default Username and password of management plugin is "guest" (Username: "guest" | Password: "guest").



After login with default credentials below overview screen will appear.



For detail information on all tabs, you can visit: - *https://www.cloudamqp.com/blog/2015-05-27-part3-rabbitmq-for-beginners_the-management-interface.html#overview*

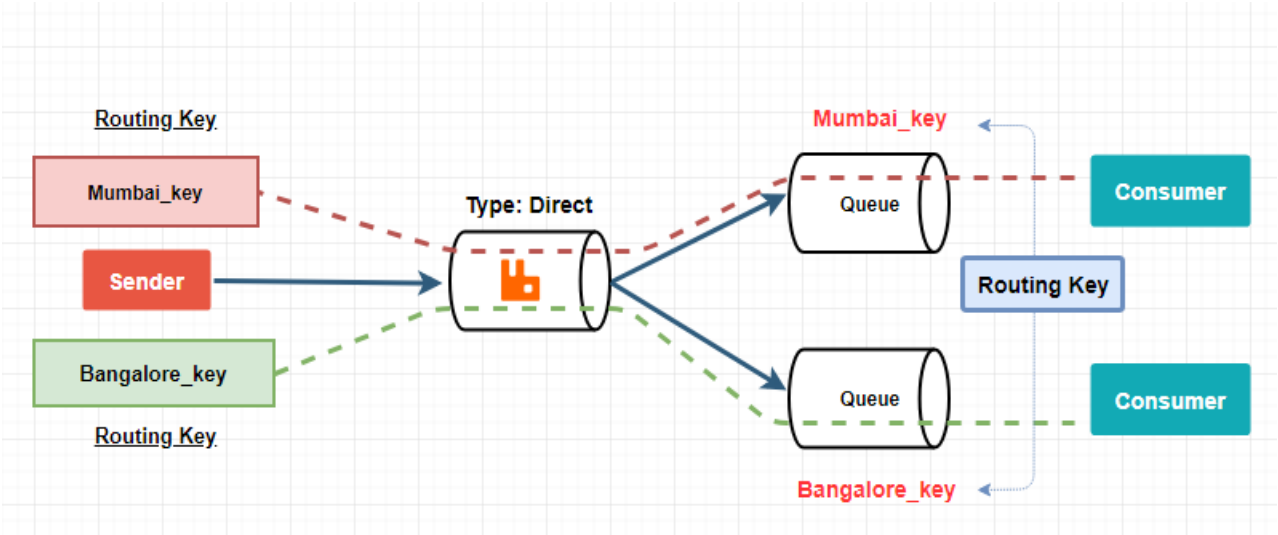
RabbitMQ Exchanges

What are the Exchanges?

When a producer creates a message, it is not directly sent to a queue first message is send to exchanges after that a routing agent reads and sends it to the appropriate queue with help of header attributes, bindings, and routing keys. There are four types of Exchanges which route the message in different ways along with that there are various parameters which you can set such as Type, Durability Auto-delete, Internal,

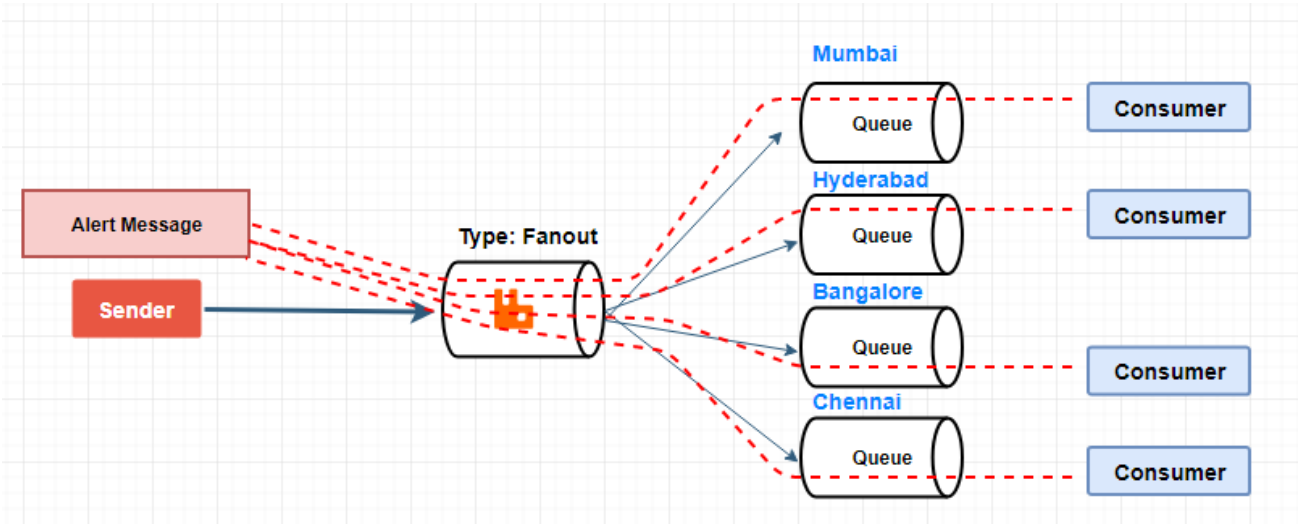
Direct Exchange

Direct: A direct exchange delivers messages to queues based on a message routing key. In a direct exchange, the message is routed to the queues whose binding key exactly matches the routing key of the message.



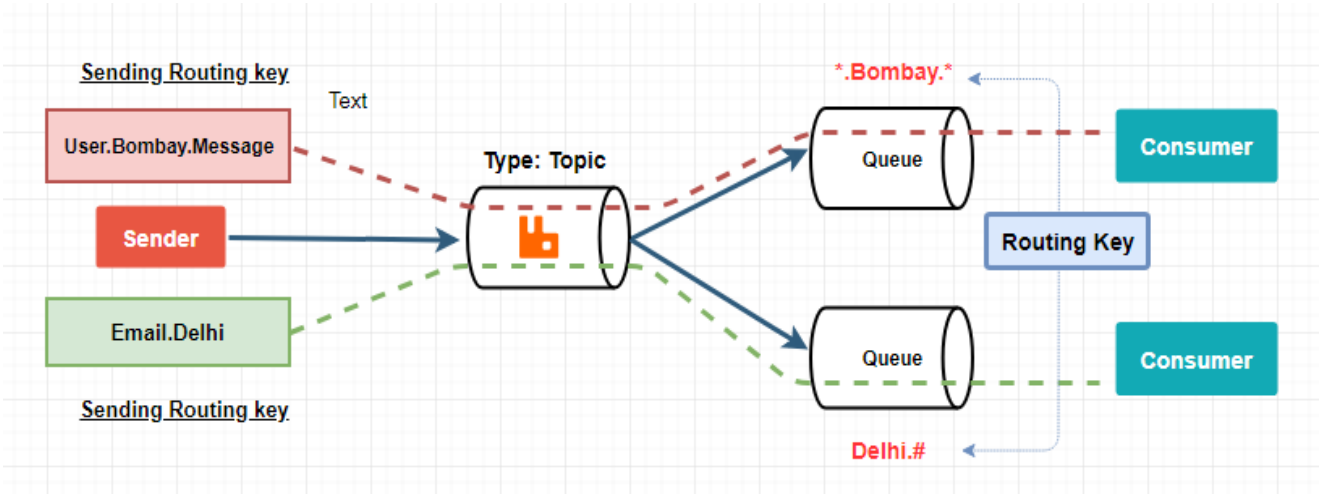
Fanout Exchange

Fanout: A fanout exchange routes messages to all of the queues that are bound to it.



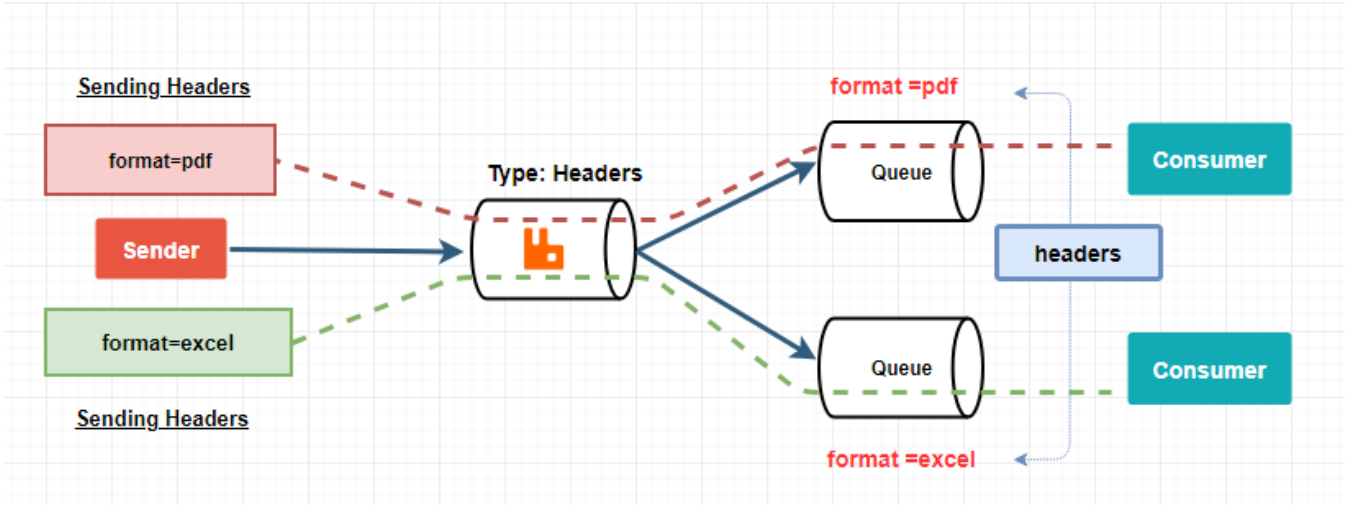
Topic Exchange

Topic: The topic exchange does a wildcard match between the routing key and the routing pattern specified in the binding.



Headers Exchange

Headers: Headers exchanges use the message header attributes for routing.



Properties Details

Name

The name will be an exchange name which you will set it must be unique.

Type

Direct: A direct exchange delivers messages to queues based on a message routing key. In a direct exchange, the message is routed to the queues whose binding key exactly matches the routing key of the message.

Fanout: A fanout exchange routes messages to all of the queues that are bound to it.

Topic: The topic exchange does a wildcard match between the routing key and the routing pattern specified in the binding.

Headers: Headers exchanges use the message header attributes for routing.

Durability

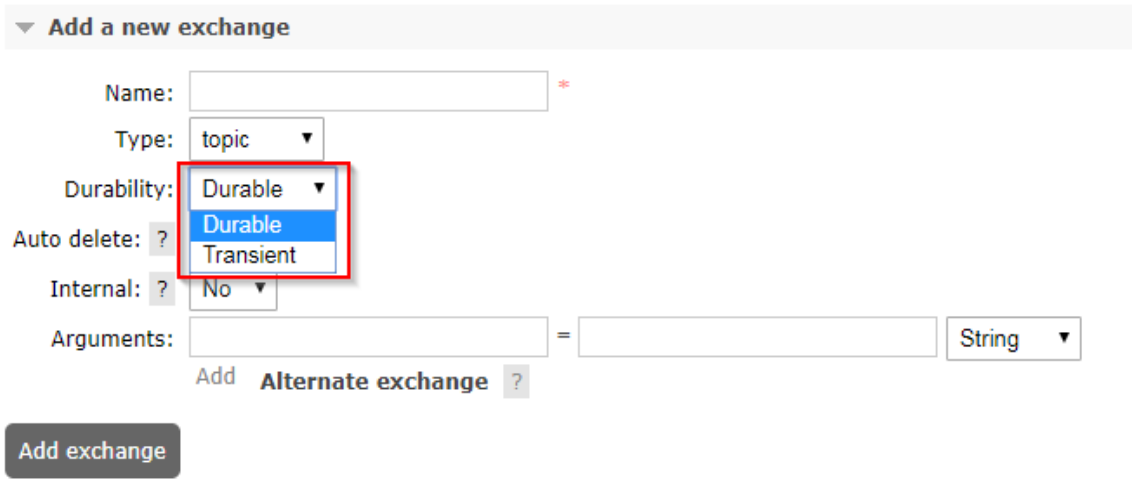
Durability is a property of exchange which tells that a message can survive server restarts (broker restart).

There are 2 types of Durability options.

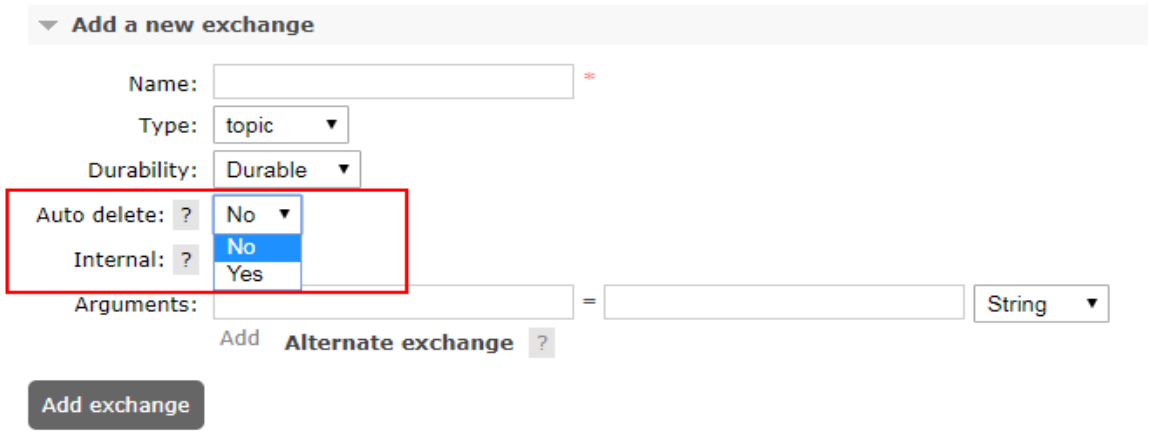
1. Durable
2. Transient (Non-Durable)

Durable: - if you mark exchange as durable then it will survive server restarts

Transient: - if you mark exchange as Transient then it will survive server restarts.



Auto delete



There are 2 options in auto delete

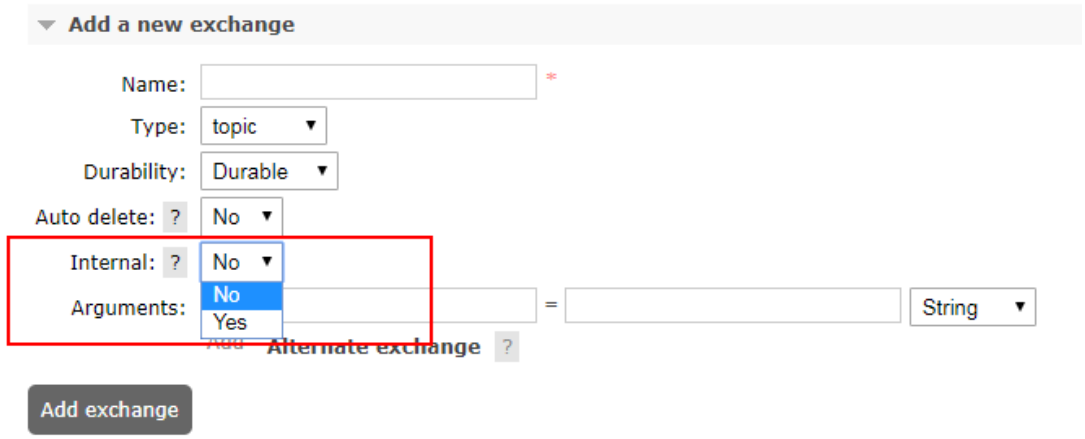
1. Yes
2. No

If yes, the exchange will delete itself after at least one queue or exchange has been bound to this one, and then all queues or exchanges have been unbound.

e.g. In this part, if you Create an Exchange and bind it to a queue and as you unbind queue it will delete it exchange also.

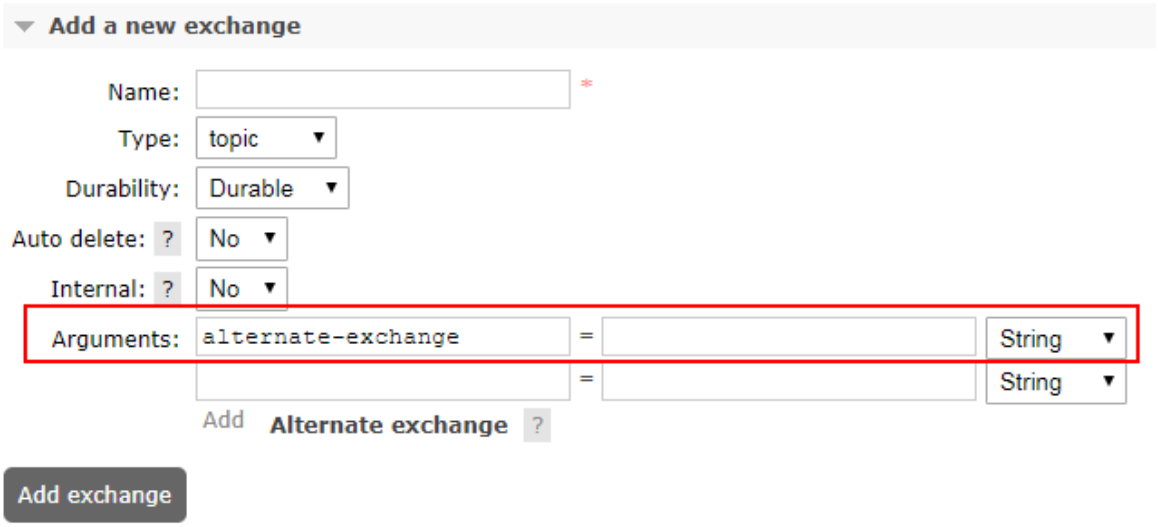
Internal

If set, the exchange may not be used directly by publishers, but only when bound to other exchanges. Internal exchanges are used to construct wiring that is not visible to applications.



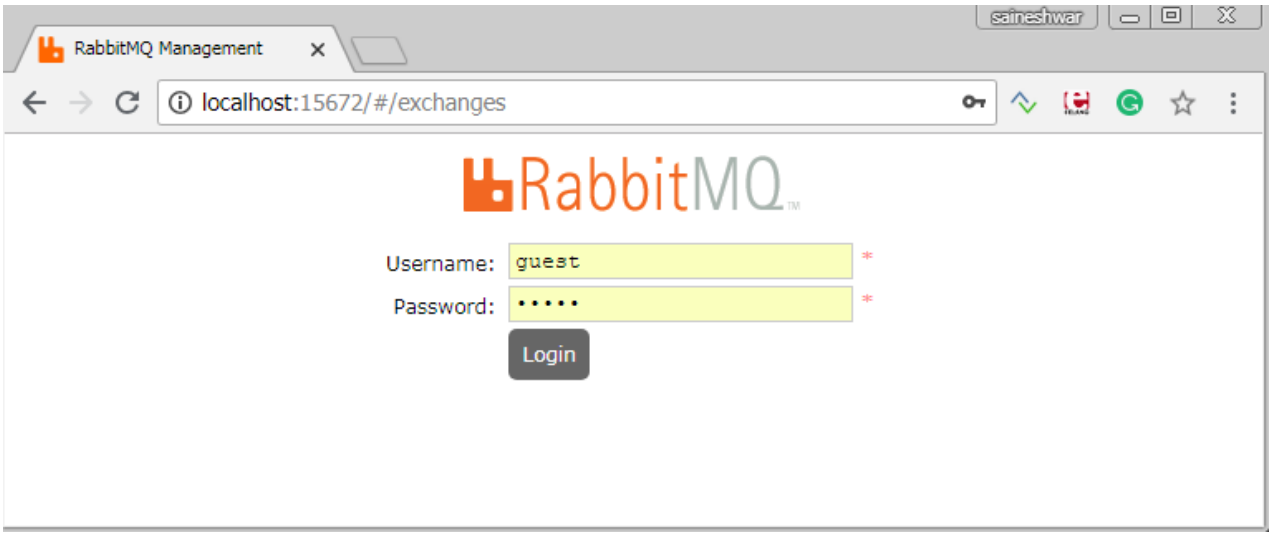
Alternate-exchange:

If there is an issue in publishing message to an exchange you can specify alternate exchange it will send a message to another queue.

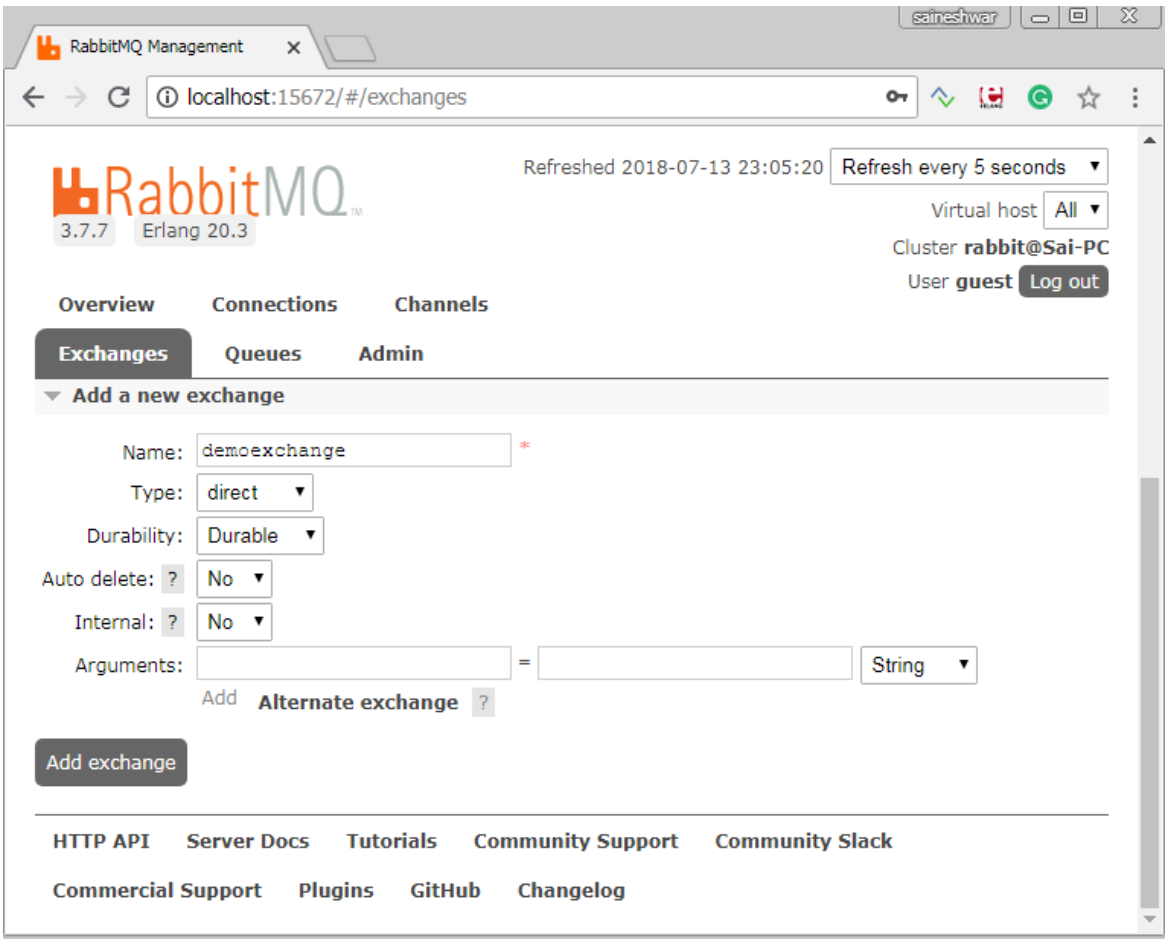


Adding Exchanges

To add exchanges, we are first going to log in with default credentials and then we are going to choose Exchanges tab.

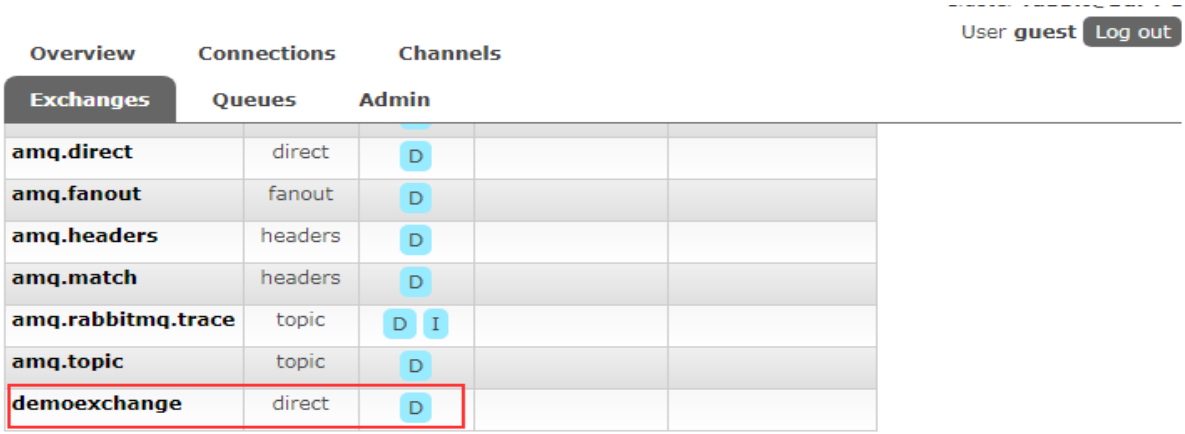


After choosing tab you will see "Add a new exchange panel" just click on that panel to expand, next after expansion it will ask for exchange name for demo we are going to name exchange as "**demoexchange**" and in type we are going to choose "direct" and click on add button to create.



After entering all details next, we are going click on add exchange button to create an exchange.

Snapshot after adding Exchanges



In a similar way, we can add various exchanges and with different types.

RabbitMQ Queues

What is the Queue?

A Queue is a Buffer that stores messages that are sent from exchanges to queues.

Parameters of Queues in details

Name

Name of the queue which we can reference in the application. The name must be unique and it must not be any system define queue name.

Durability

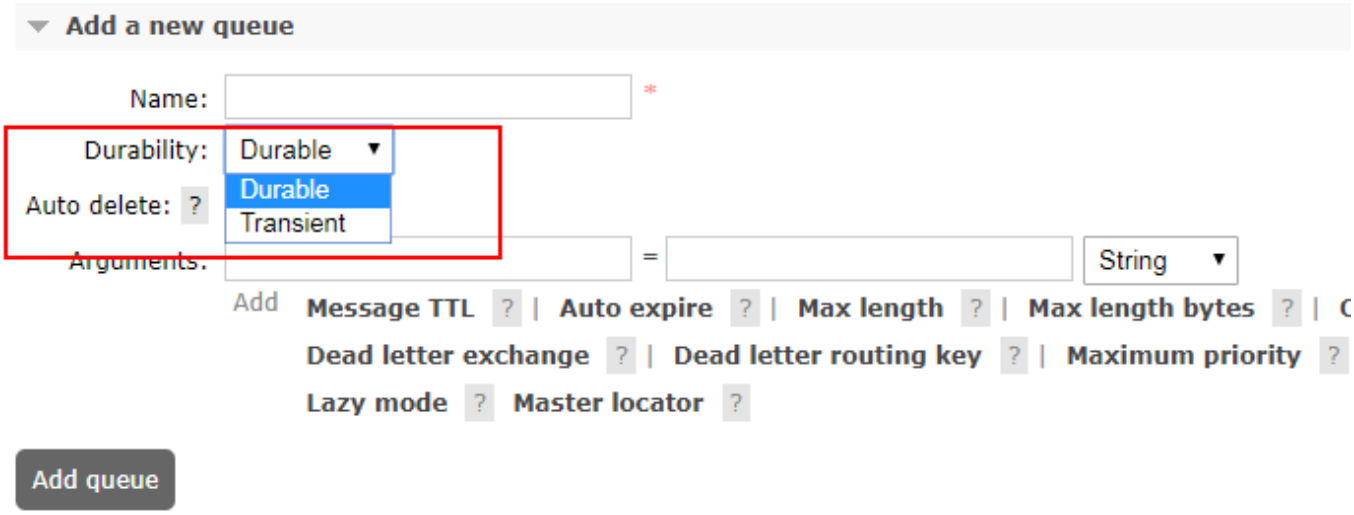
Durability is a property of queue which tells that a message can survive server restarts (broker restart).

There are 2 types of Durability options.

1. Durable
2. Transient (Non-Durable)

Durable: - if you mark queue as durable then it will survive server restarts

Transient: - if you mark exchange as Transient then it will not survive server restarts.



Auto delete

There are 2 options in auto delete

1. Yes
2. No

If the queue is exclusive, the durability attribute has no effect because the queue will be deleted as soon as client disconnects (or its connection is lost). auto-deleted queues are deleted when the last consumer is canceled (or its channel is closed, or its connection is lost).

If there never was a consumer it won't be deleted.

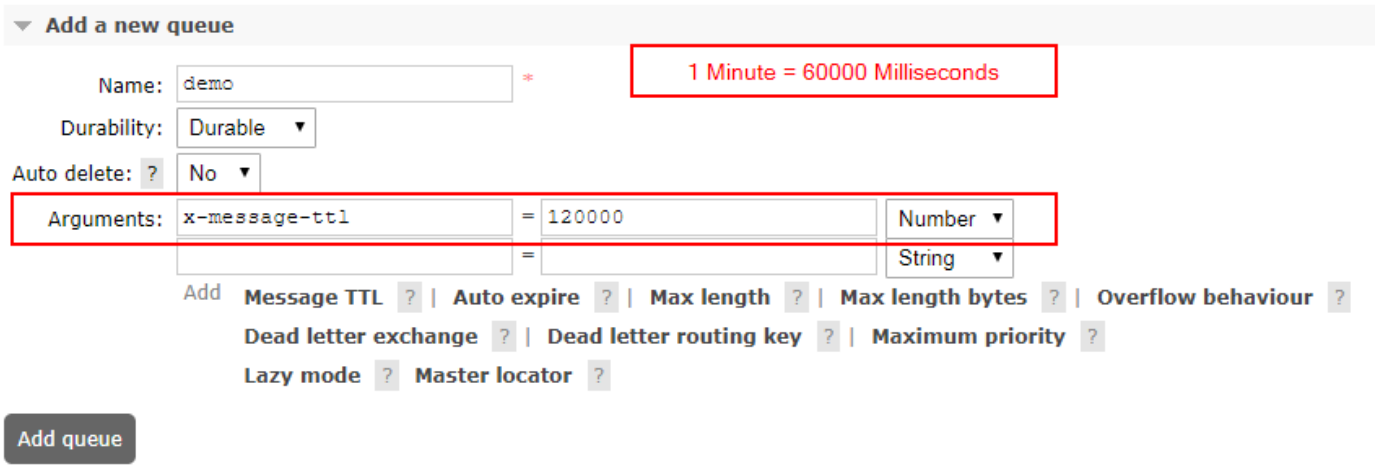
Arguments

Arguments (optional; used by plugins and broker-specific features such as message TTL, queue length limit, etc)

Time-to-live

In this part, you can set timespan to a queue which will discard if it reaches its lifespan which is set.

Time will be in milliseconds.

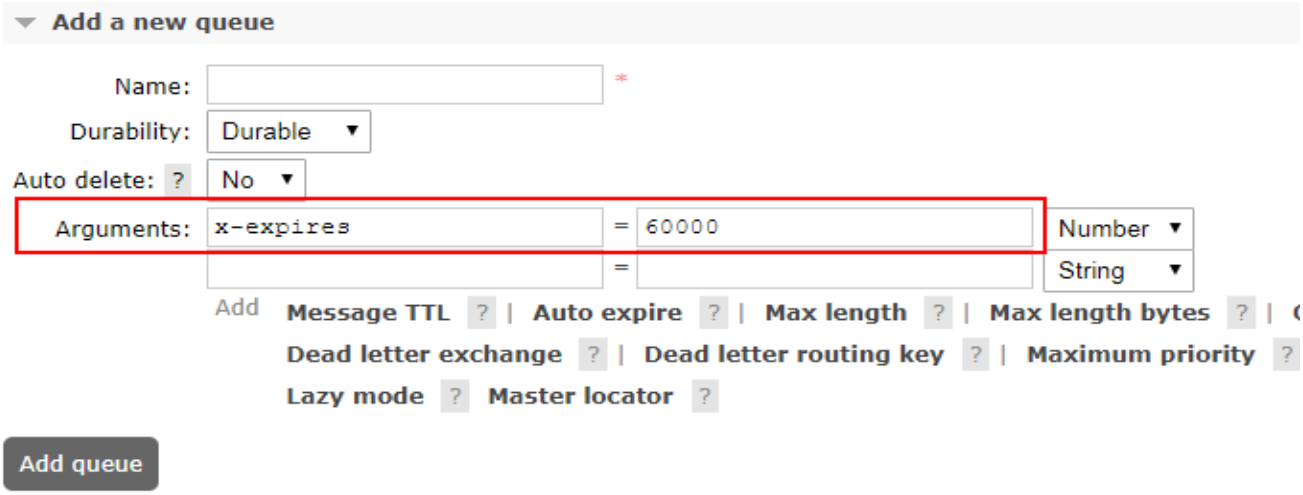


Auto expire

In this part, you can set expiry to a queue by setting this property.

This controls for how long a queue can be unused before it is automatically deleted.

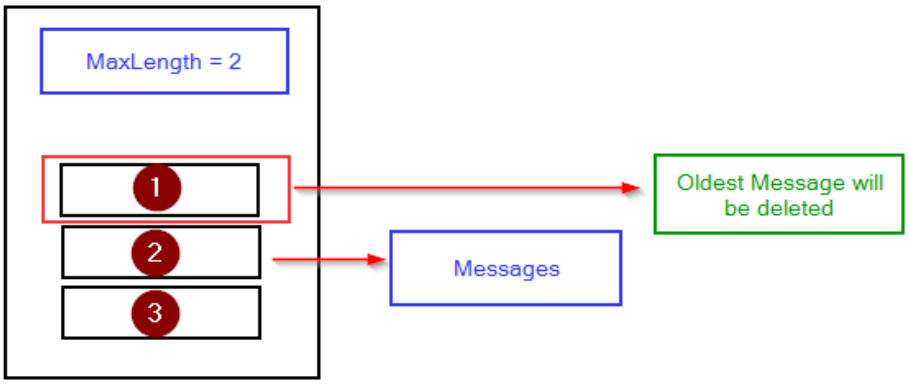
Unused means the queue has no consumers, the queue has not been redeclared, and basic.get has not been invoked for a duration of at least the expiration period



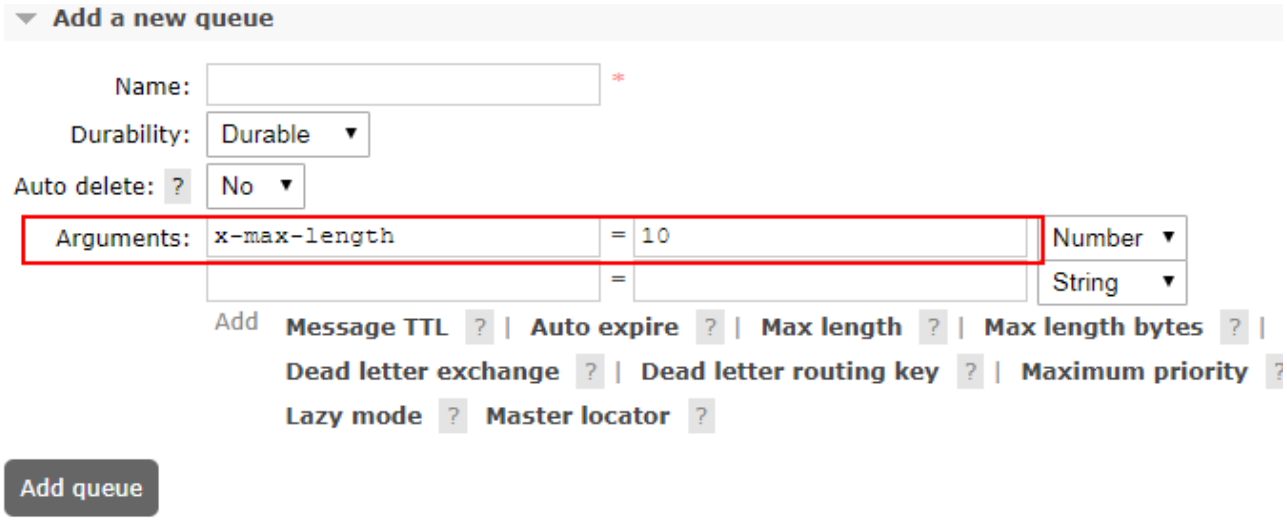
Max Length

How many (ready) messages a queue can contain before it starts to drop them from its head.

A maximum number of messages can be set by supplying the x-max-length queue declaration argument with a non-negative integer value.



e.g. If you set value x-max-length = 2 and if you publish 3 messages in the queue then only 2 messages will be there the oldest will be deleted from the queue.



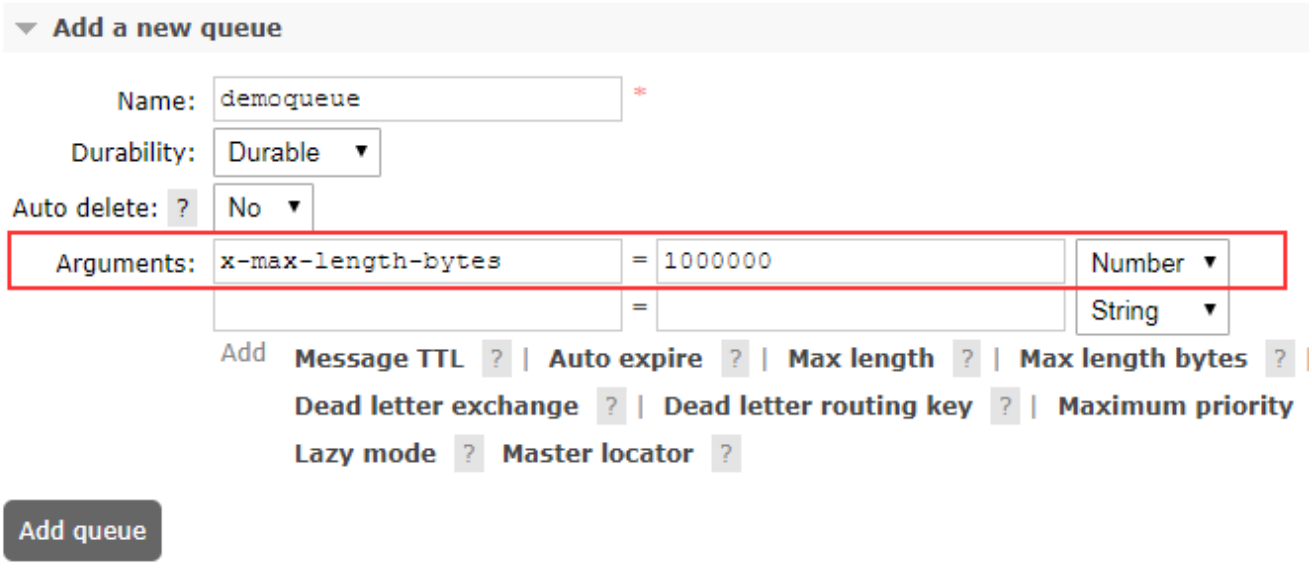
Max Length Bytes

Total body size for ready messages a queue can contain before it starts to drop them from its head.

Maximum length in bytes can be set by supplying the x-max-length-bytes queue declaration argument with a non-negative integer value.

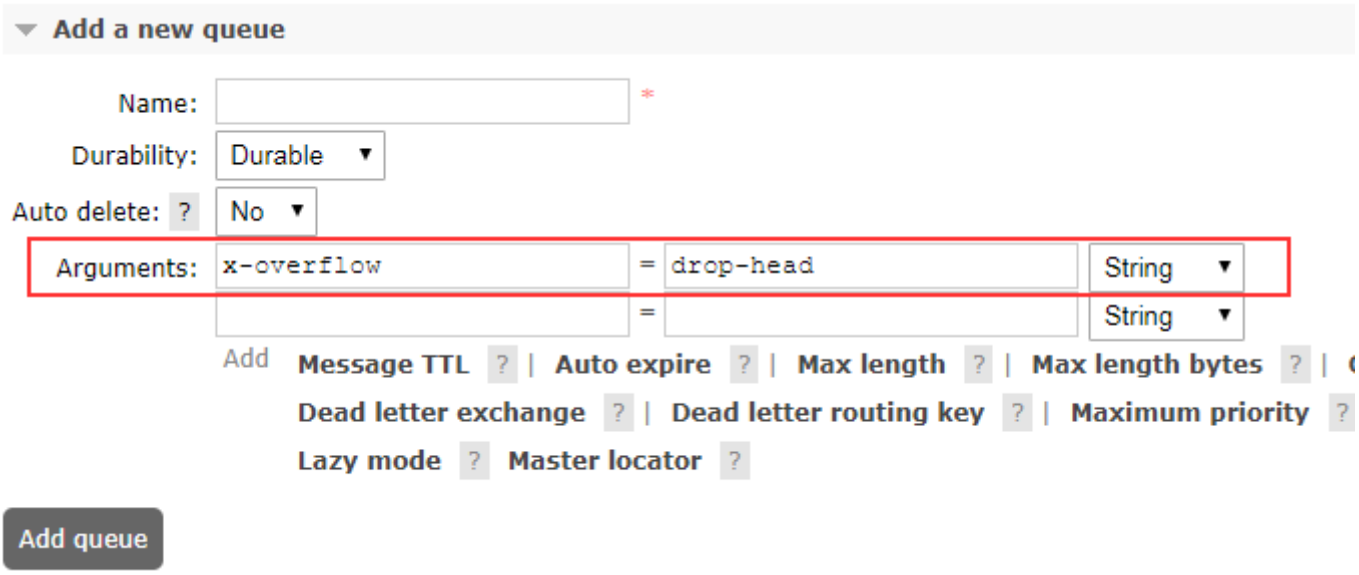
(Sets the "x-max-length-bytes" argument.) 1000000 bytes = 1MB

e.g. If you set value x-max-length-bytes = 1000000 and if you publish messages in queue and the queue size increase more than 1 MB then the oldest will be deleted from the queue (drop them from its head).



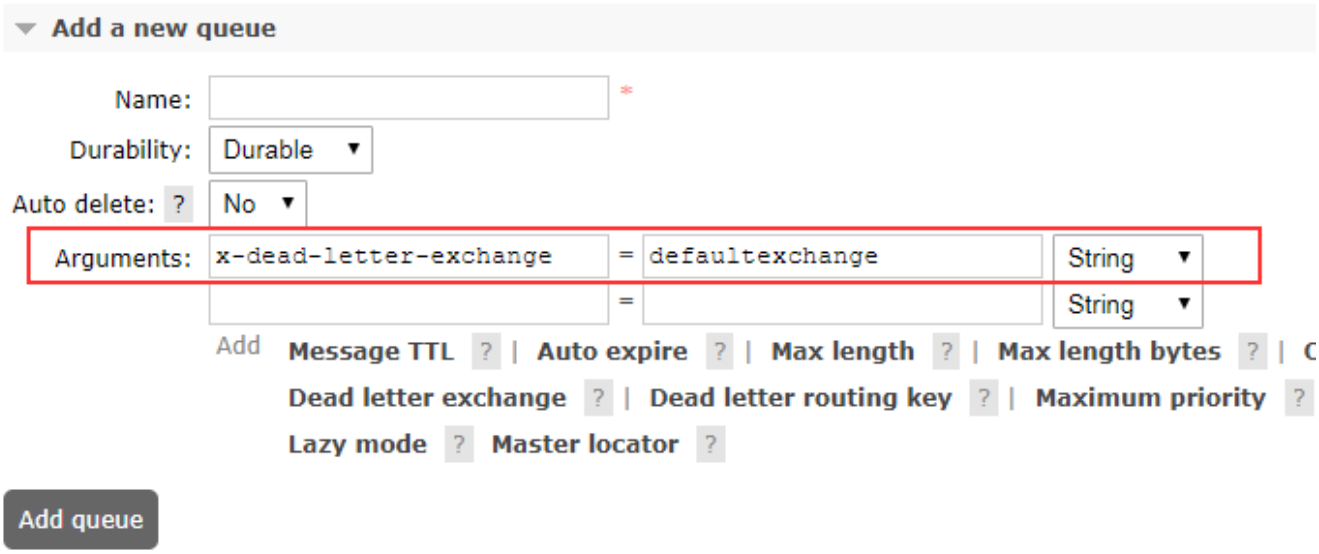
Overflow behaviour

Sets the queue overflow behavior. This determines what happens to messages when the maximum length of a queue is reached. Valid values are drop-head or reject-publish.



Dead letter exchange

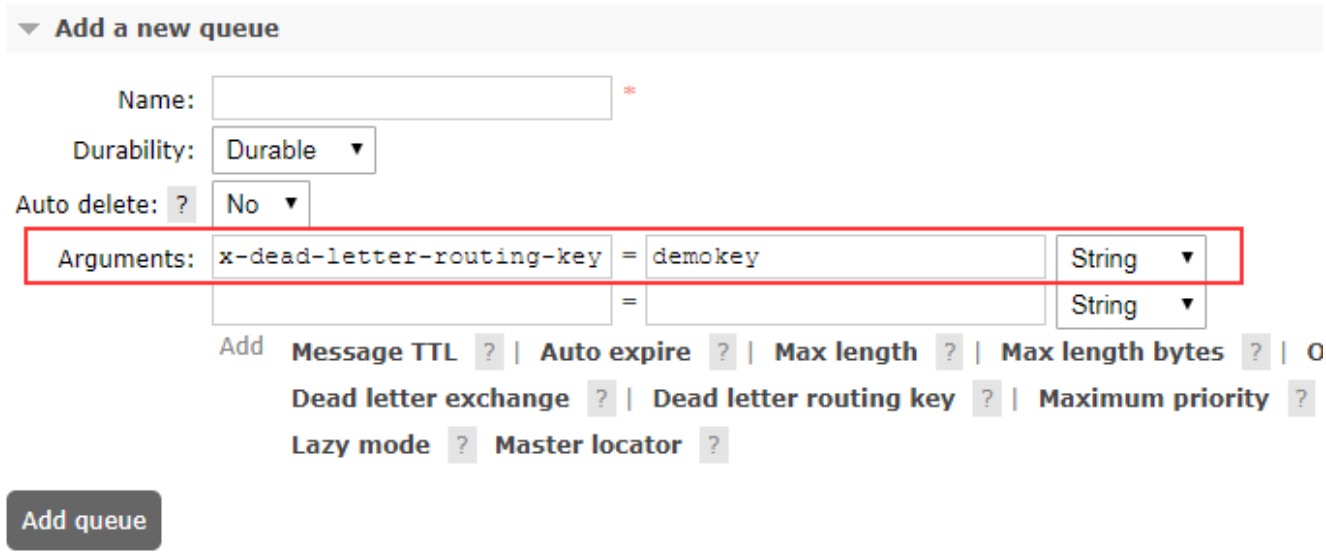
Optional name of an exchange to which messages will be republished if they are rejected or expire.



Dead letter routing key

Optional replacement routing key to use when a message is dead-lettered. If this is not set, the message's original routing key will be used.

For example, if you publish a message to an exchange with routing key foo, and that message is dead-lettered, it will be published to its dead letter exchange with routing key foo. If the queue the message originally landed on had been declared with x-dead-letter-routing-key set to bar, then the message will be published to its dead letter exchange with routing key bar.

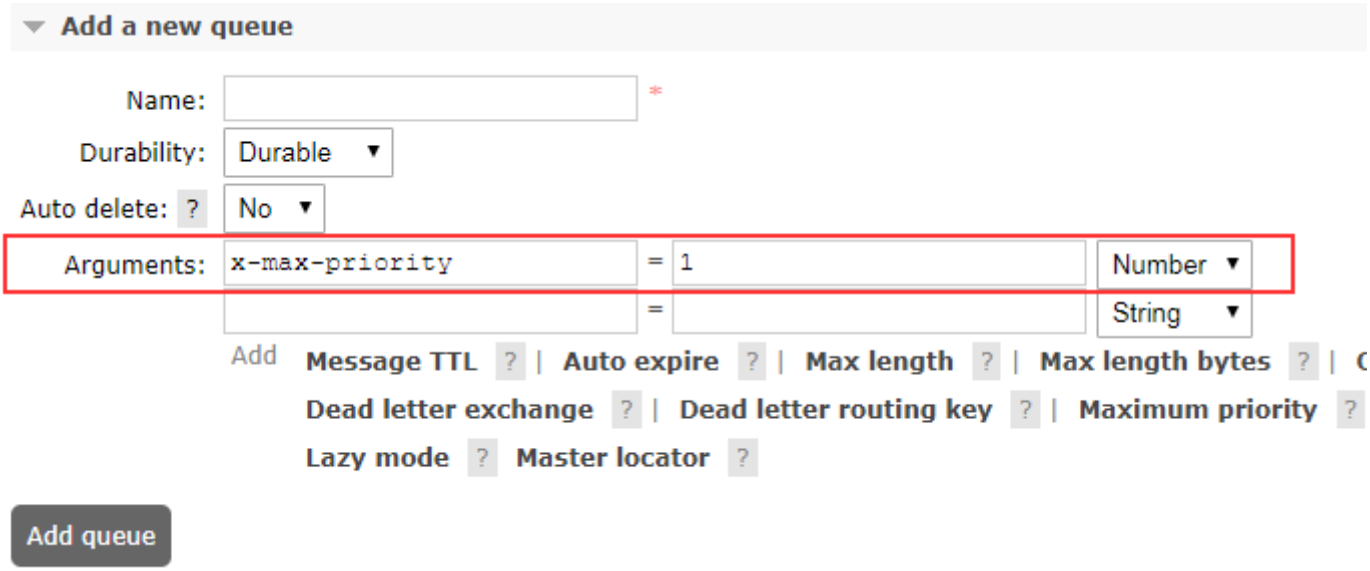


Maximum priority

A maximum number of priority levels for the queue to support; if not set, the queue will not support message priorities.

(Sets the "x-max-priority" argument.)

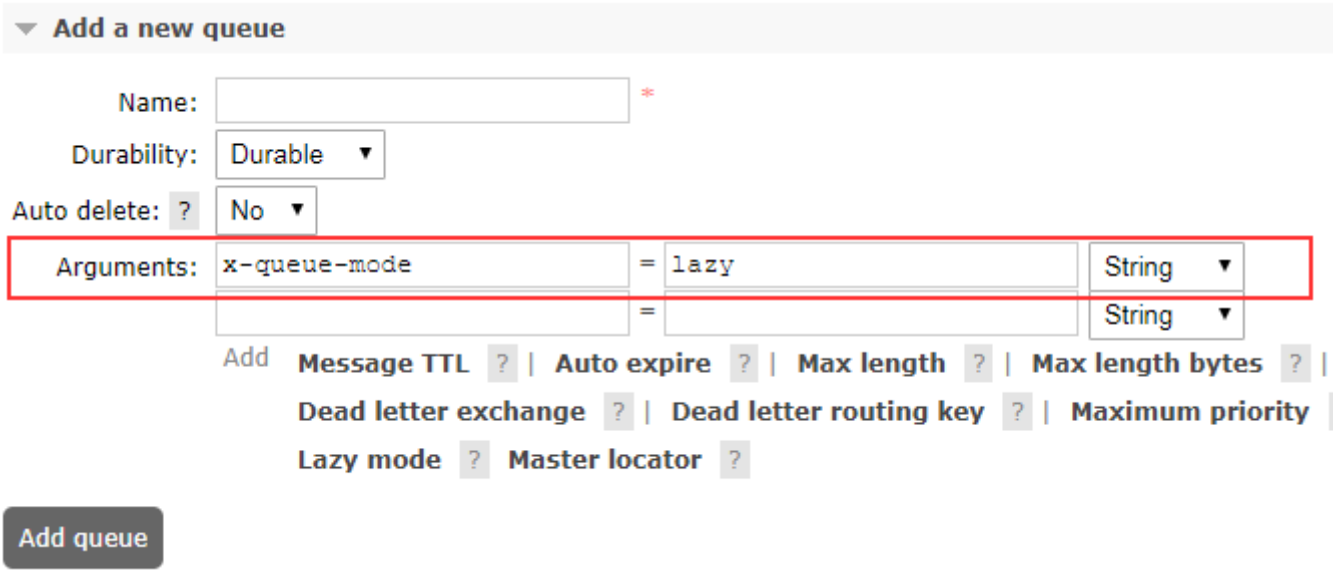
To declare a priority queue, use the x-max-priority optional queue argument. This argument should be a positive integer between 1 and 255, indicating the maximum priority the queue should support



Lazy mode

Set the queue into the lazy mode, keeping as many messages as possible on disk to reduce RAM usage; if not set, the queue will keep an in-memory cache to deliver messages as fast as possible.

(Sets the "x-queue-mode" argument.)



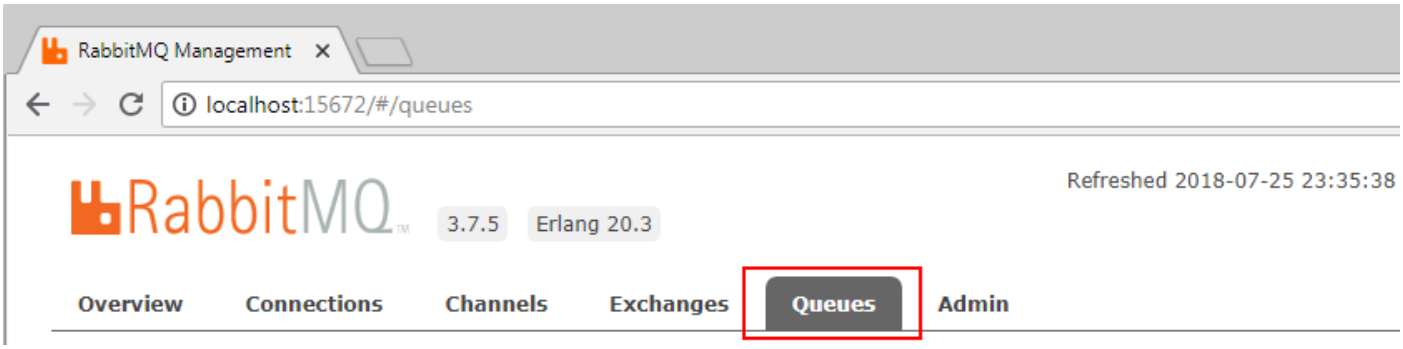
Master locator

Set the queue into master location mode, determining the rule by which the queue master is located when declared on a cluster of nodes.

(Sets the "x-queue-master-locator" argument.)

Adding queue

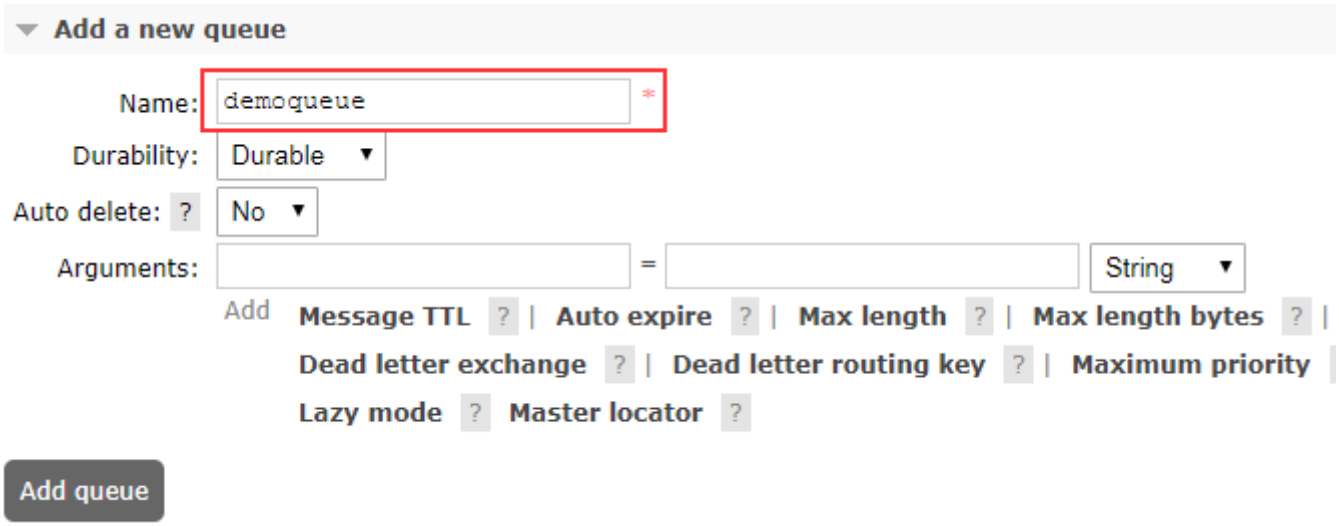
To create a queue, you need to click on the queue tab in web management plugin.



After clicking on queues tab, you will see add Queue panel with an arrow just click on that panel to expand.

After clicking on Add a new panel queue will expand in that we are going enter queue details.

First, we are going to start with the name of the queue we are going to name it as **"demoqueue"** then we are going to choose durability as a Durable and final option we are going set is auto delete to No and click on Add queue button to create a queue.



After adding a queue, you can view queue which you have recently added, it is located just above add queue panel.

Queues

All queues (1)

Pagination

Page 1 of 1 - Filter: Regex ?

Overview			Messages			Message rates			+/-
Name	Features	**State**	**Ready**	**Unacked**	**Total**	**incoming**	**deliver / get**	**ack**	
demoqueue	D	idle	0	0	0				

Binding in RabbitMQ

What is Binding

A binding is a connection which we can configure between a queue and an exchange.

Simple words: - A binding is a relationship between an exchange and a queue.

In this part, we are going to bind exchange with queue using routing key and this will be used for direct type exchange. The exchange will route the request to particular queue on basis of routing key.

For binding click on queue name which you have entered "**demoqueue**" after click on it bindings panel will expand, next it will ask for exchange name enter exchange name which we have created "**demoexchange**" and routing key "**demokey**" and click on bind button.

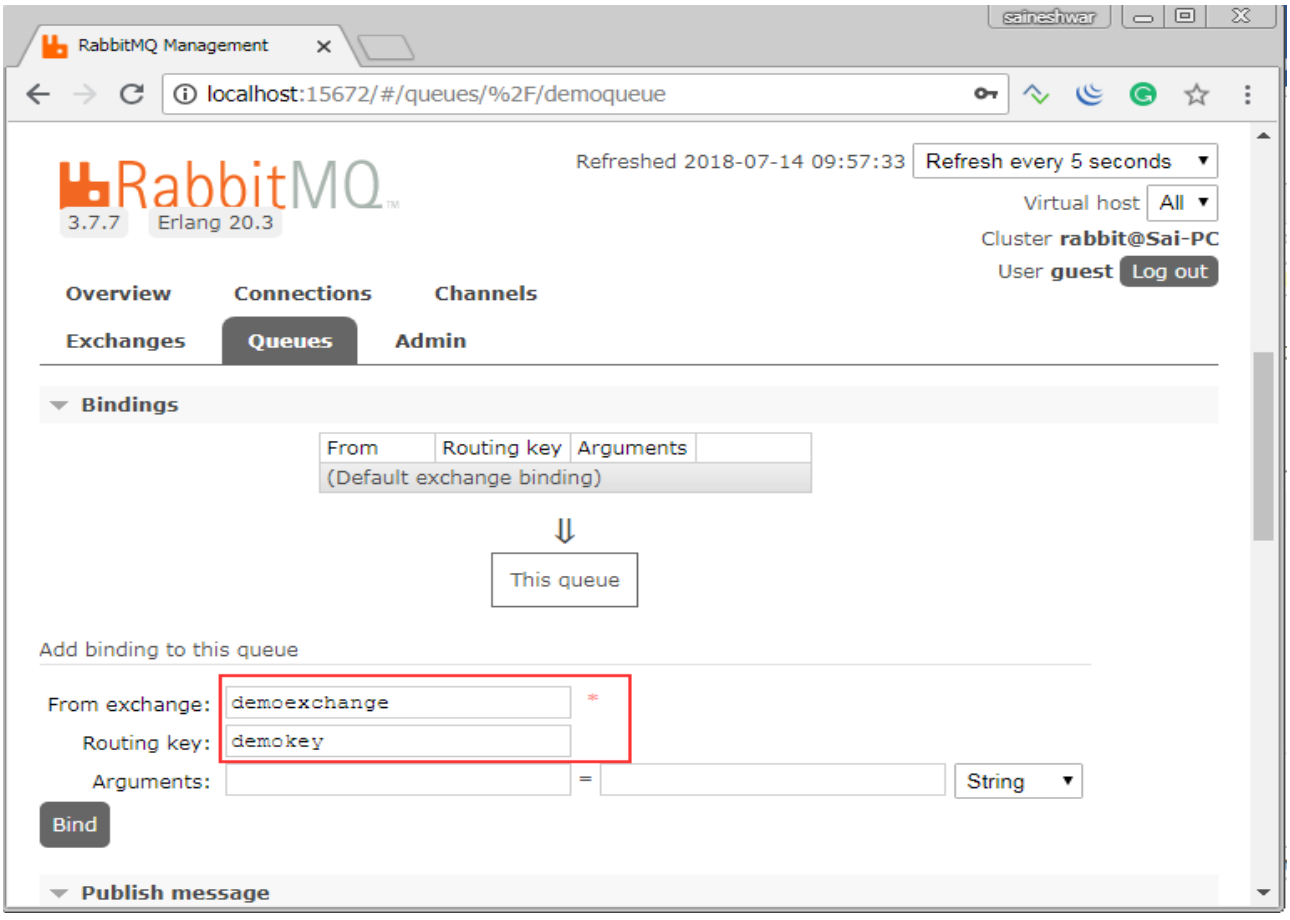
Pagination

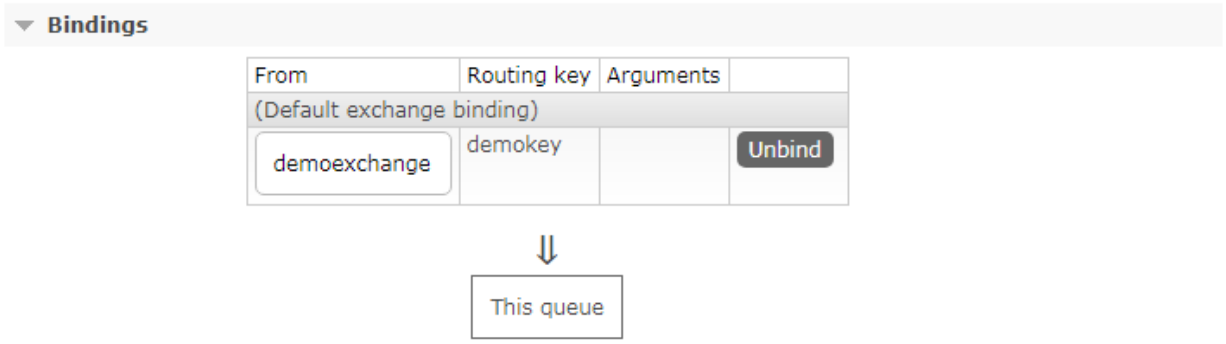
Page 1 of 1 - Filter: Regex ?

Displaying 1 item , page size up to: 100

Overview			Messages			Message rates			+/-
Name	Features	**State**	**Ready**	**Unacked**	**Total**	**incoming**	**deliver / get**	**ack**	
demoqueue	D	idle	0	0	0				

Snapshot after binding





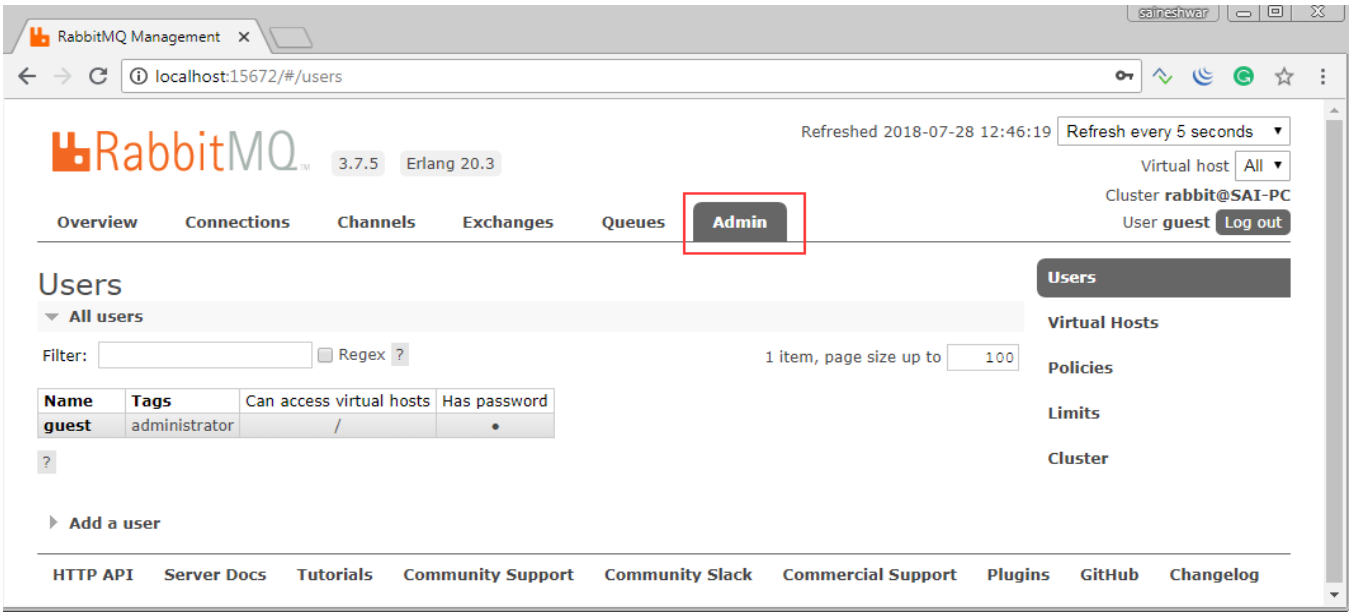
After binding if you want to unbind it then you can click on unbind button to remove binding.

RabbitMQ Users

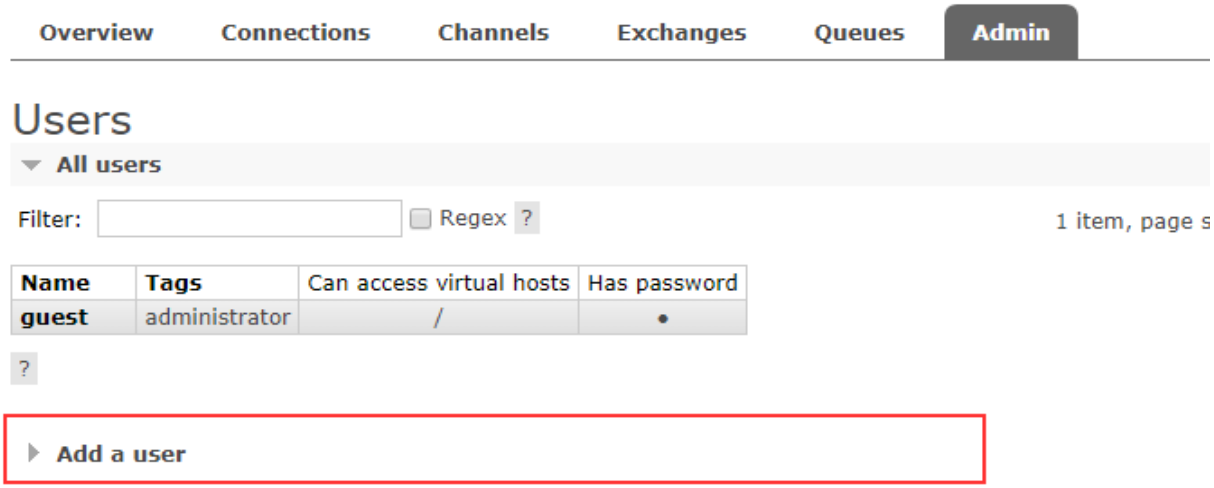
In this part, we are going to learn how to create a new User and give permission to New User.

For creating a New user, we need to login into Web Management Plugin using default credentials.

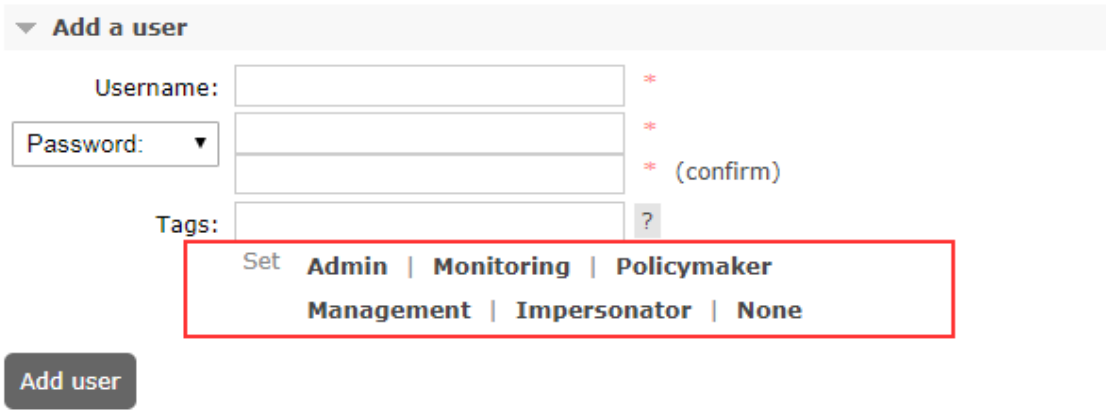
After logging into the application, we are going to choose Admin tab.



After choosing admin tab we can see a default user which is "**guest**" which as "administrator" privilege below that we can see add new user panel.



Clicking on "Add a User" panel to create new Users.



Before moving ahead lets first have a look at tags. Tags in this part are as rights (privileges) which are assigned to users which are created. we can set single or multiple privileges to a user if we want multiple privileges then just set privileges as comma-separated (administrator, management)

Currently supported by the management plugin

Management

The user can access the management plugin

Policymaker

The user can access the management plugin and manage policies and parameters for the vhosts they have access to.

Monitoring

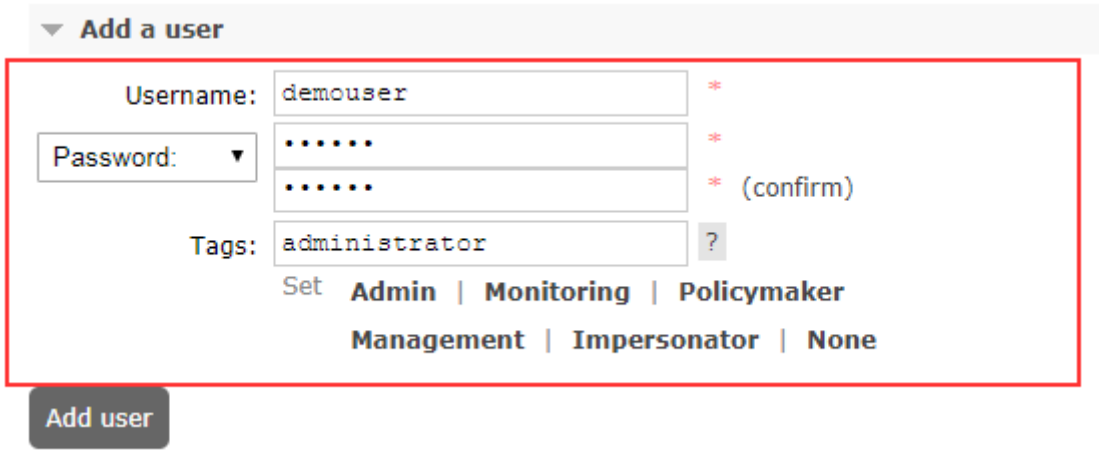
The user can access the management plugin and see all connections and channels as well as node-related information.

Administrator

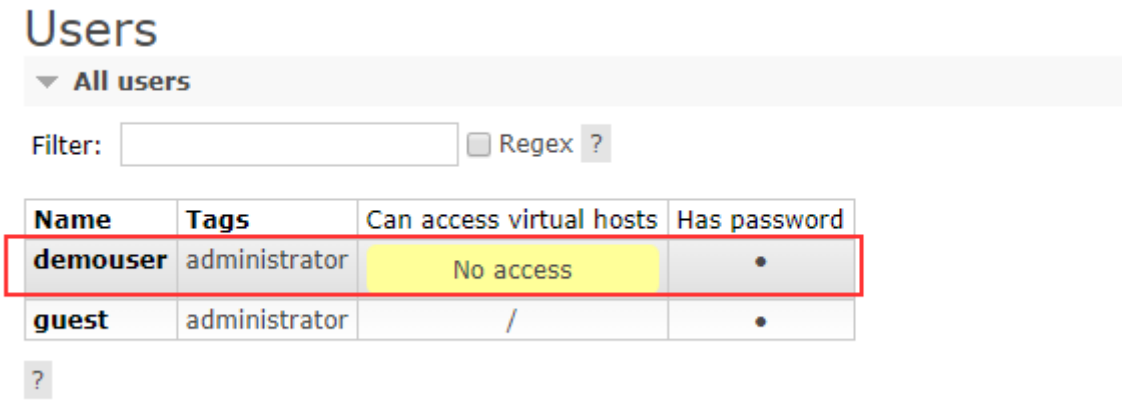
The user can do everything monitoring can do, manage users, vhosts, and permissions, close other user's connections, and manage policies and parameters for all vhosts.

Creating Users

In this part we are going to create new user and we are going to set Username as "**demouser**" after that we are going to set password as "123456" after that we are going set privilege to this user as "**administrator**" (just click on Admin link it will set "**administrator**" in tags field) finally click on Add user to create new user.

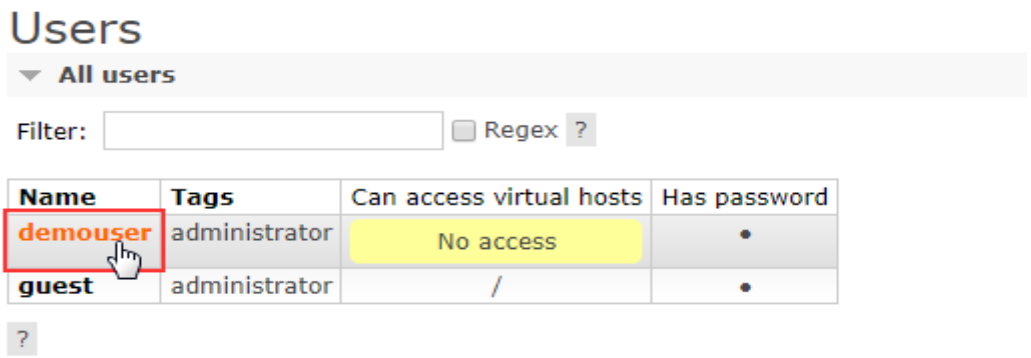


After adding a user, you can see all Users in all user's panel just expand it. After expanding you can see the new user "demouser" but in the grid, you can see "can access virtual hosts" columns where it has the value "No access" which means we do not have the privilege to virtual hosts.



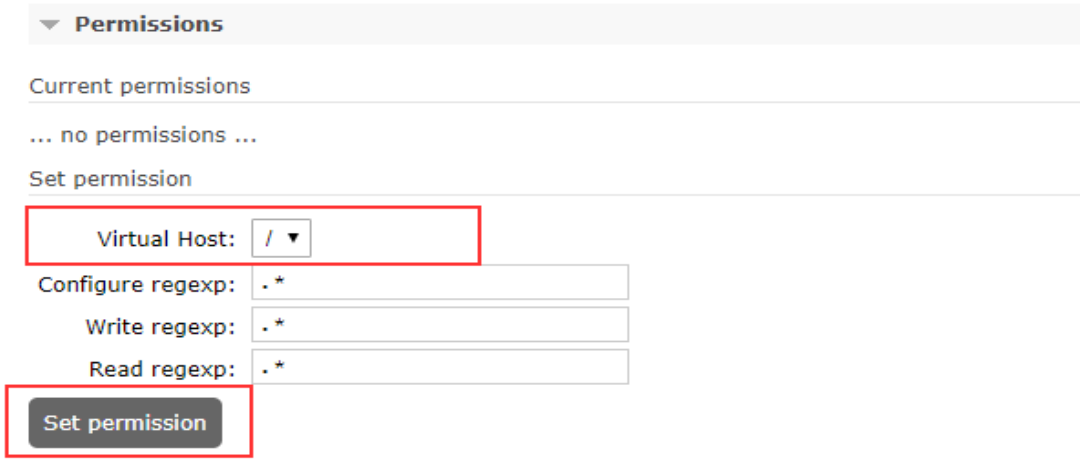
Setting privilege to access virtual hosts

For setting permission just click on username which we have created "demouser".



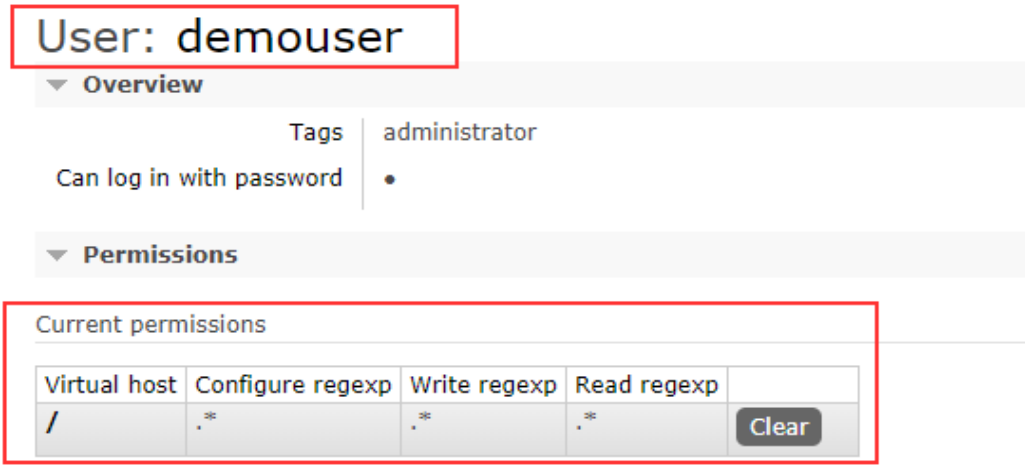
After clicking on "**demouser**" go to permission panel which is just below overview panel.

Just expand permission panel and just click on set permission button to set permission to demouser.



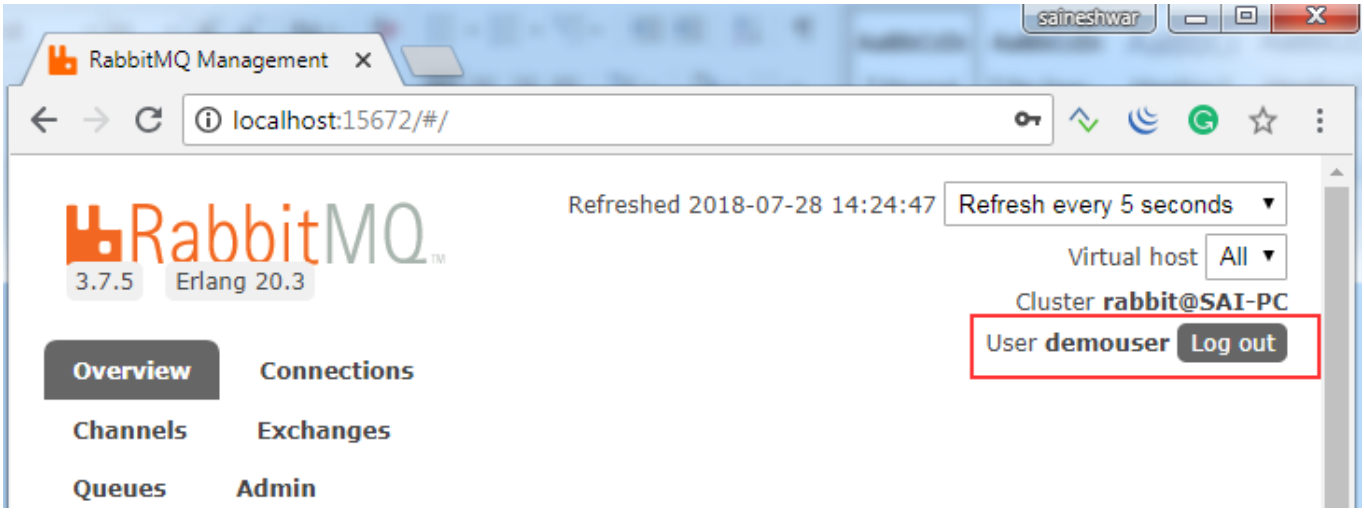
Once the permission is set, you'll see the "Current permission" as shown below.

Now you should be able to log in as this "**demouser**" to the RabbitMQ Web Management Plugin.



Let's login into RabbitMQ Web Management Plugin with new user "demouser".

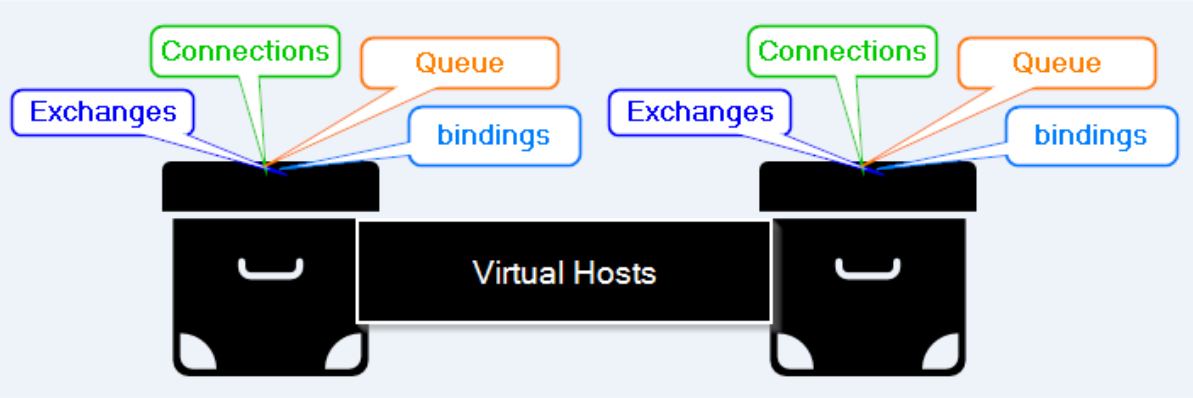
Below is snapshot after logging into RabbitMQ Web Management Plugin with new user "demouser".



RabbitMQ Virtual Hosts

What are Virtual Hosts?

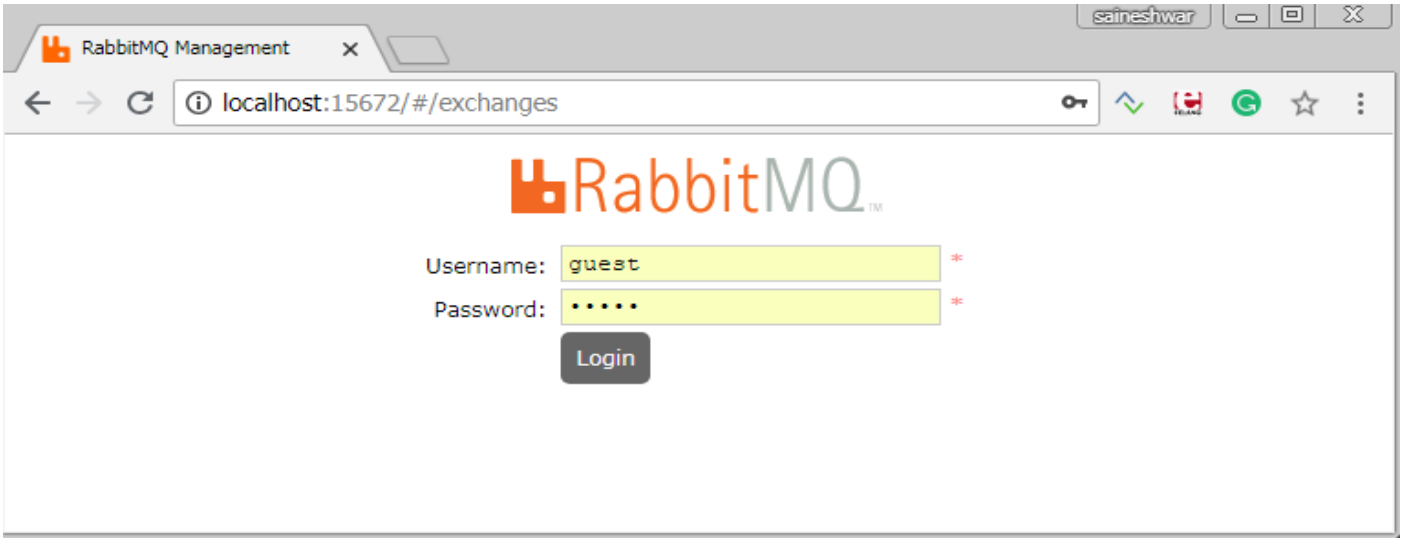
Virtual hosts are like a virtual box which contains a logical grouping of connections, exchanges, queues, bindings, user permissions, policies and many more things.



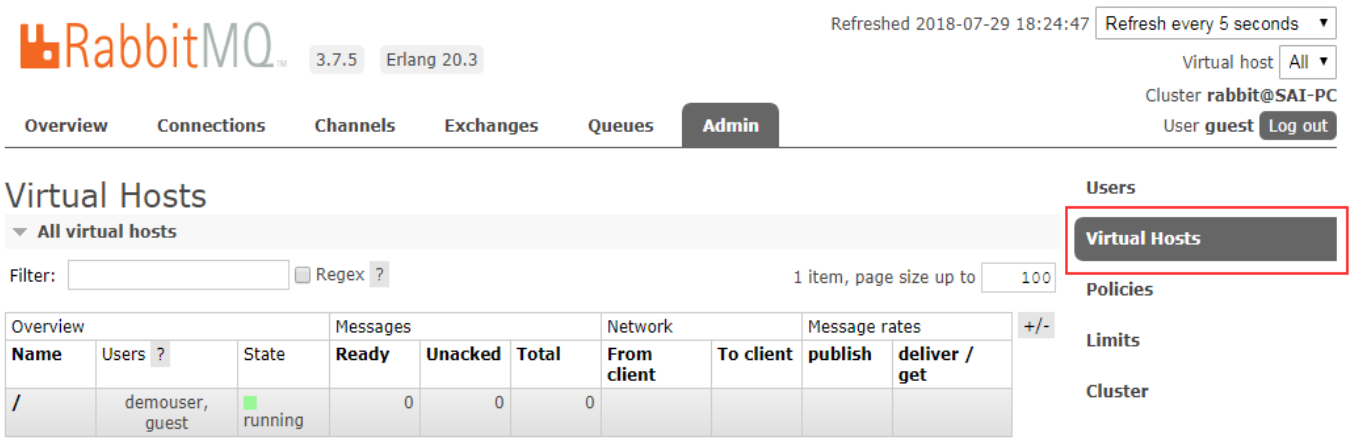
We can create different virtual host and each virtual host will have users.

Creating Virtual host

To create a new virtual host, we are first going to log in with default credentials and then we are going to choose admin tab.

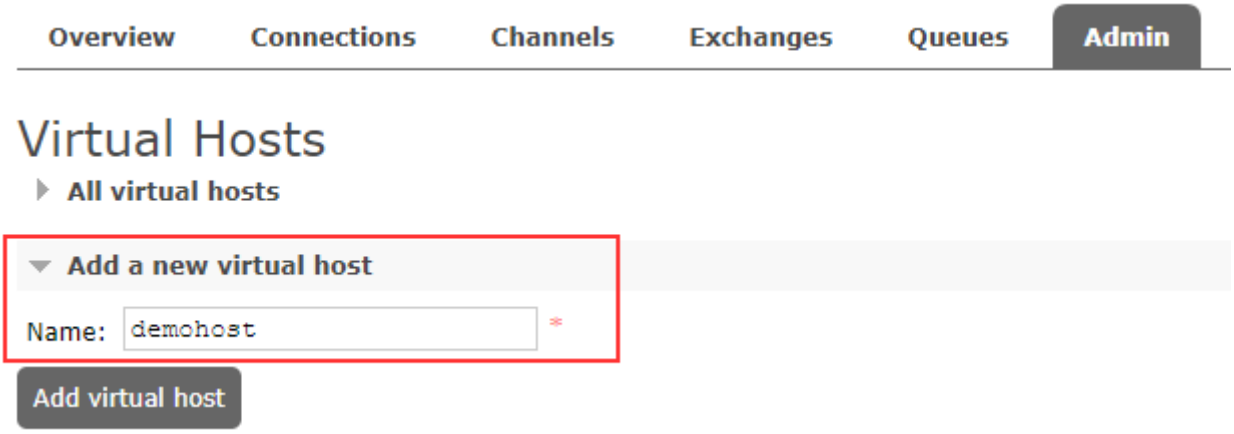


After choosing admin tab you will see vertical menus in right part of the page in that choose "**Virtual Hosts**".

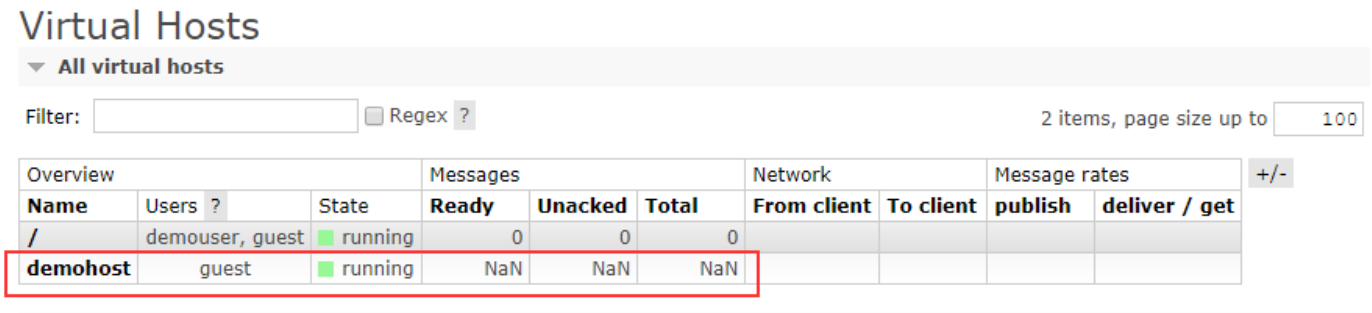


After choosing "**Virtual Hosts**" you will see the default "**Virtual Hosts**" which is already present below that there is a panel "**Add a new virtual host**" just click on it to expand.

After expanding we can see for adding virtual host we need to add Name parameter here I am entering the name as "**demohost**" next click on Add virtual host button to create "**demohost**" virtual host.



After adding a virtual host, we can see the newly added virtual host in All virtual hosts panel.

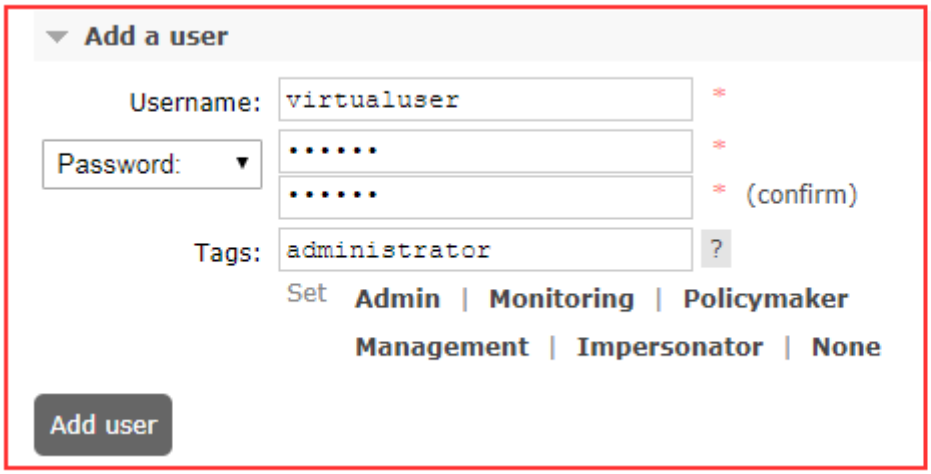


Now till now, we have created virtual host but we have not assigned any user to this virtual host let's create new User.

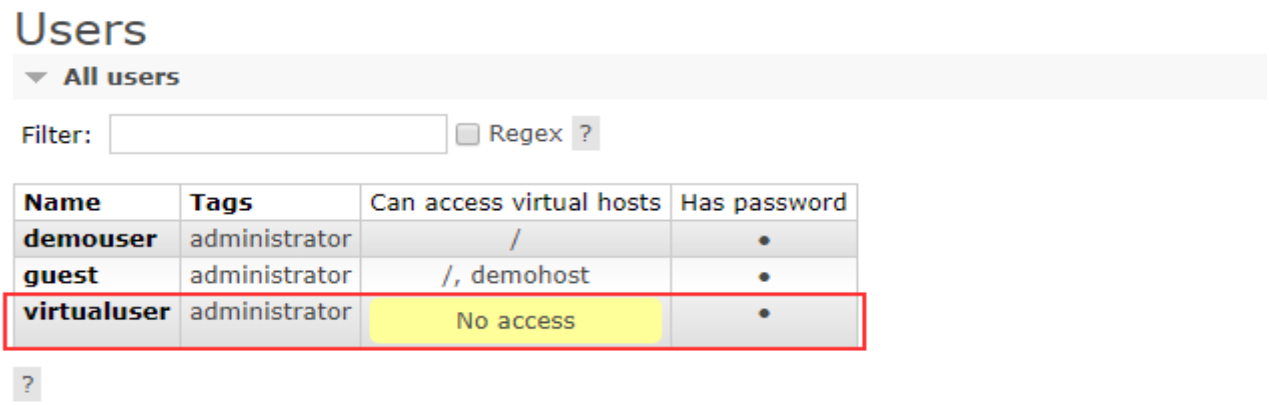
Creating Users

In this part we are going to create new user and we are going to set Username as "**virtualuser**" after that we are going to set password as "123456" after that we are going set privilege to this user as

"**administrator**" (just click on Admin link it will set "**administrator**" in tags field) finally click on Add user to create new user.

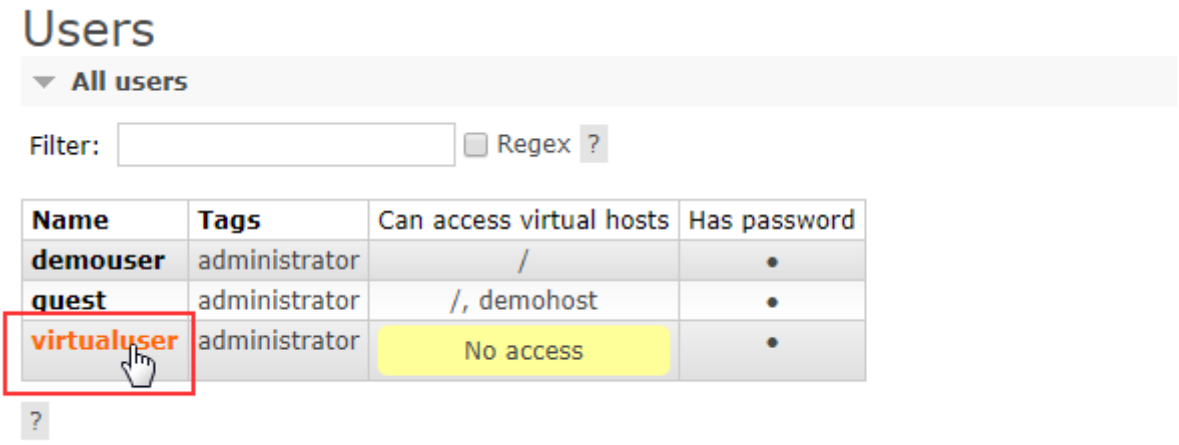


After adding a user, you can see all Users in all user's panel just expand it. After expanding you can see the new user "**virtualuser**" but in the grid, you can see "can access virtual hosts" columns where it has the value "No access" which means we do not have the privilege to virtual hosts.



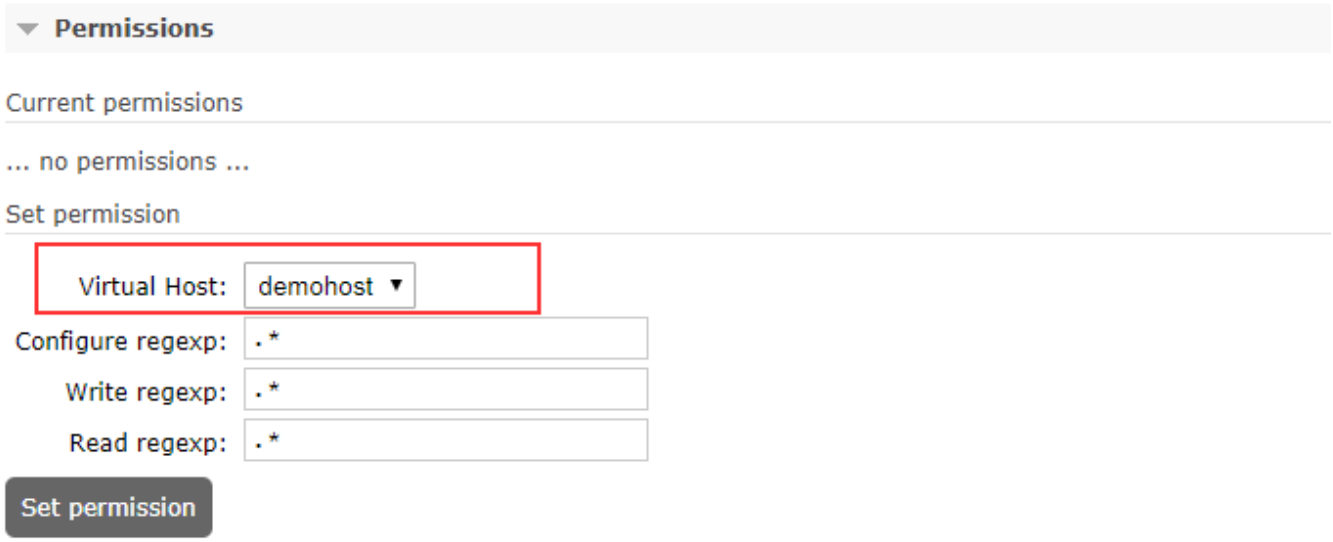
Setting privilege to access virtual hosts

For setting permission just click on username which we have created "**virtualuser**".



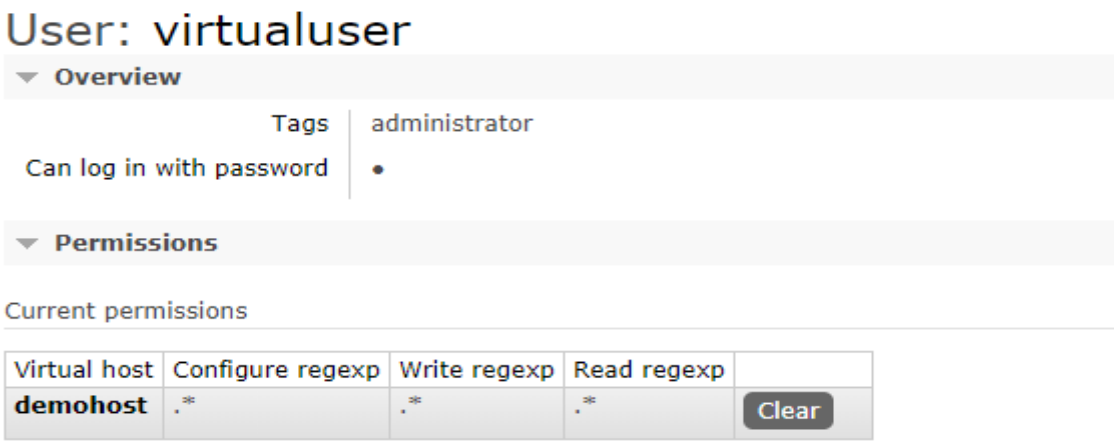
After clicking on "**virtualuser**" go to permission panel which is just below overview panel.

Just expand permission panel and just click on set permission button to set permission to **virtualuser**.



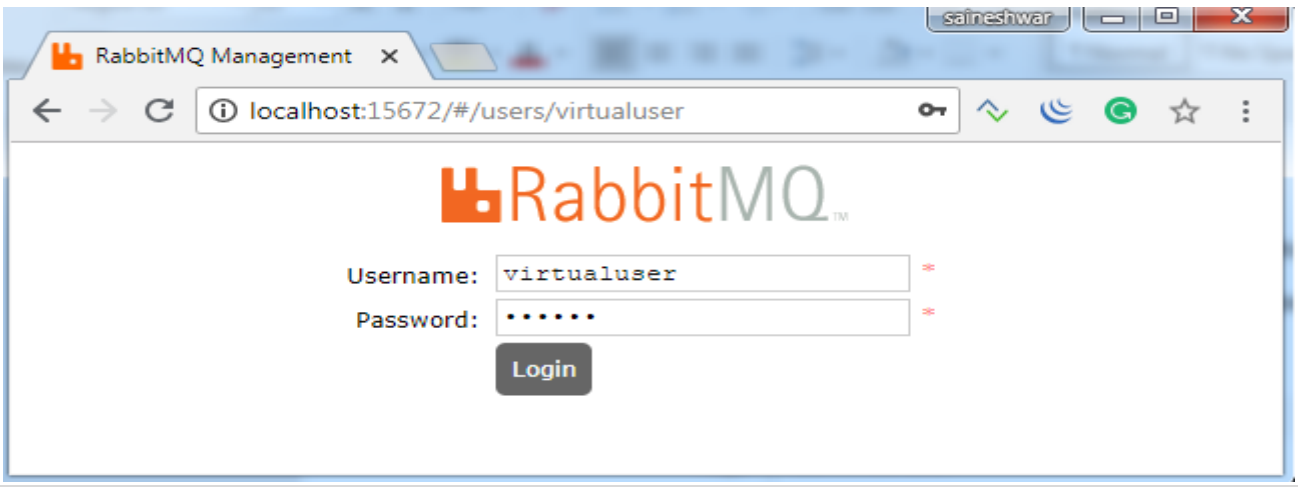
The default value is ".*" which allows access to all exchanges and queues in the virtual host.

Once the permission is set, you'll see the "Current permission" as shown below.

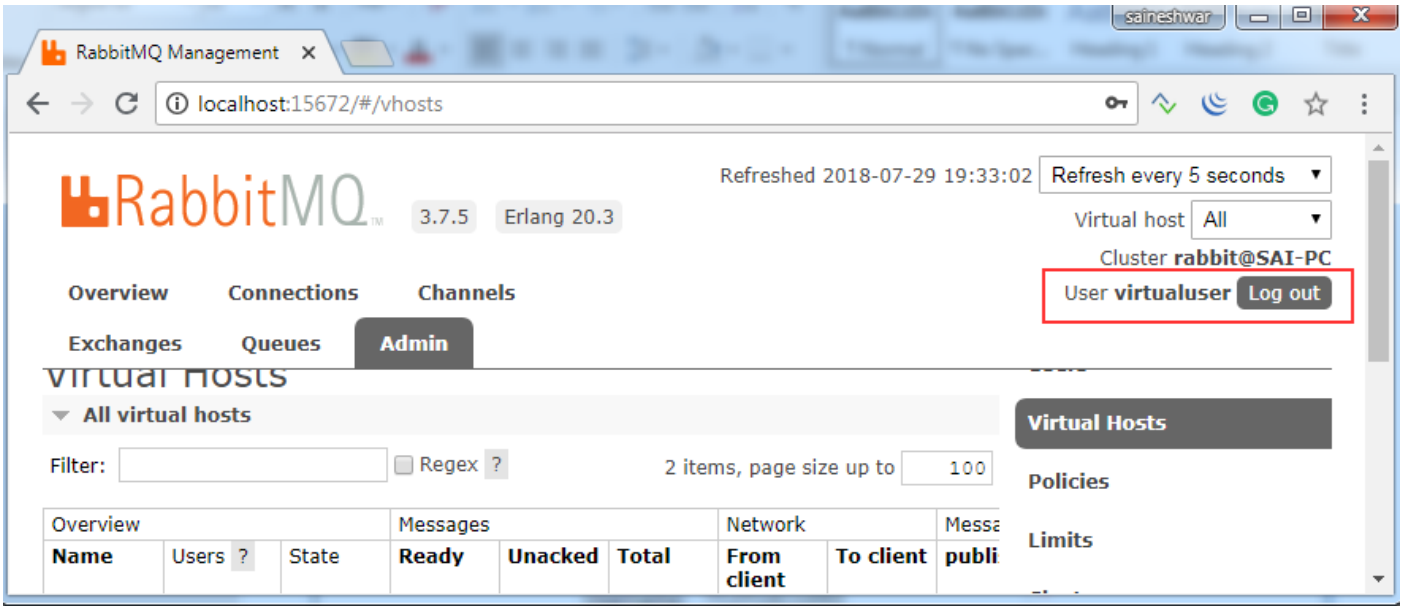


Now you should be able to log in as this "**virtualuser**" to the RabbitMQ Web Management Plugin.

Let's login into RabbitMQ Web Management Plugin with new user "**virtualuser**".



Below is snapshot after logging into RabbitMQ Web Management Plugin with new user "**virtualuser**".



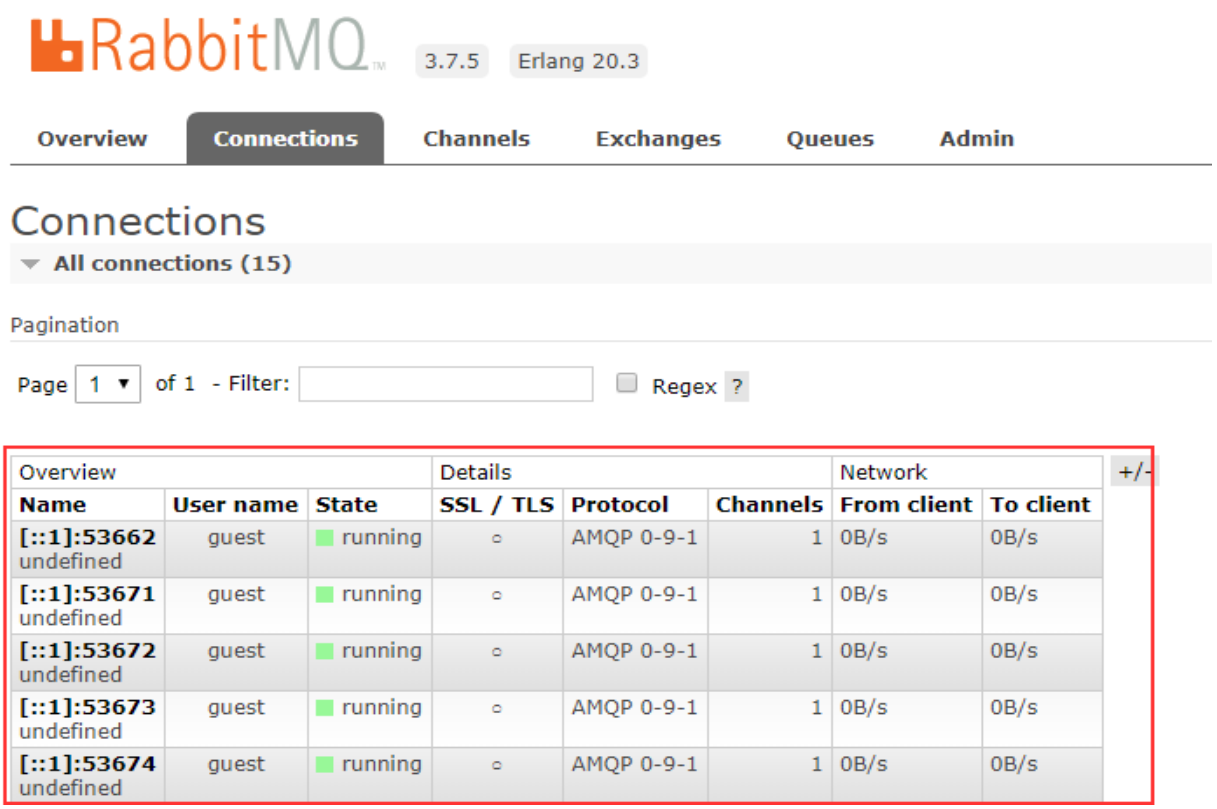
Now we have completed creating new virtual host along with that we have to assign a new user to it.

Connections

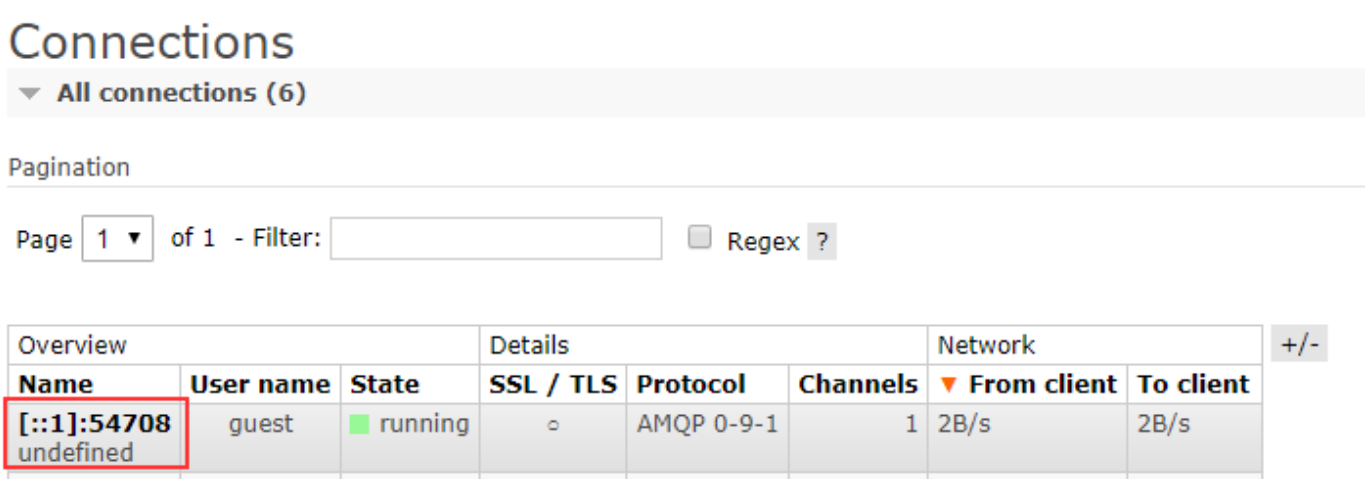
A connection is a TCP connection between your application and the RabbitMQ broker.

Referenced from: - https://www.cloudamqp.com/blog/2015-05-18-part1-rabbitmq-for-beginners-what-is-rabbitmq.html

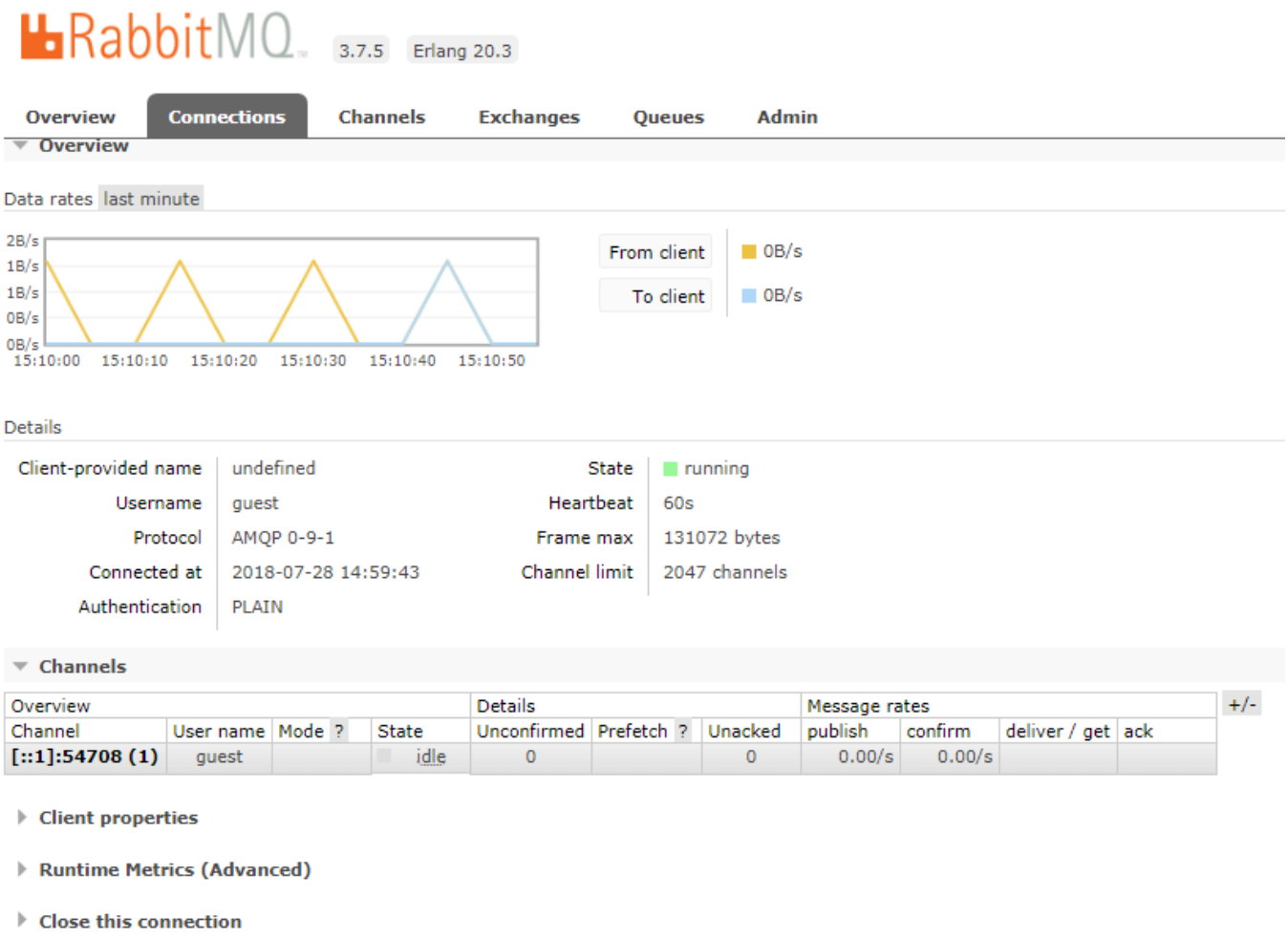
In connection tab it will show live connections of both producer of message and consumer of the message along with that it will show usernames of each connection with the state of connection if you are using SSL/TLS then it will indicate in the connection it will mark with a dark dot "**.**" It will also show which protocol is been used after that in the network it will show from the client and to client network utilization.



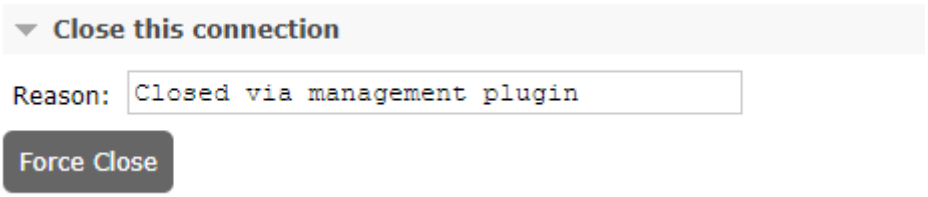
If you want to see details of each connection then click on connection name.



After clicking on connection name, it will show all details of connection along with data rates, channels, client properties, runtime metric, and finally close connection.



If you want to close connection then you can open "close this connection" tab type reason and click on force close button.



Channels

A channel is a virtual connection inside a connection. When you are publishing or consuming messages from a queue - it's all done over a channel.

Referenced from: - https://www.cloudamqp.com/blog/2015-05-18-part1-rabbitmq-for-beginners-what-is-rabbitmq.html

In channel tab it will show live channels of both producer of message and consumer of the message along with that it will show mode. There are 2 modes. C – confirm Channel will send streaming publish confirmations. T – transactional Channel is transactional after that it will show state of channel.Next details in that we have Unconfirmed column it will show Number of published messages not yet

confirmed next to Unconfirmed column is Prefetch column which shows details of per channel limit. Next to Prefetch column is Unacked column the Unacked means that the consumer has promised to process them but has not acknowledged that they are processed further we have message rates which show published and confirmed rates along with delivered and acknowledge details.

Note for Mode

Channel guarantee mode. Can be one of the following, or neither:

C – confirm

Channel will send streaming publish confirmations.

T – transactional

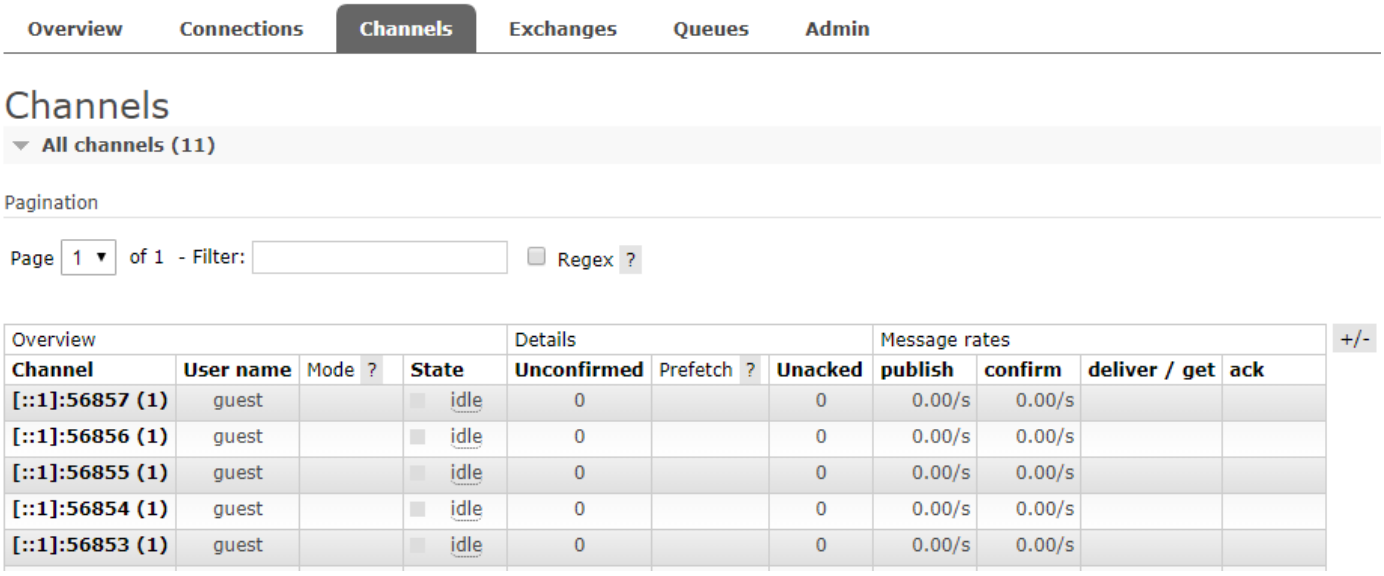
Channel is transactional.

Note for Prefetch count

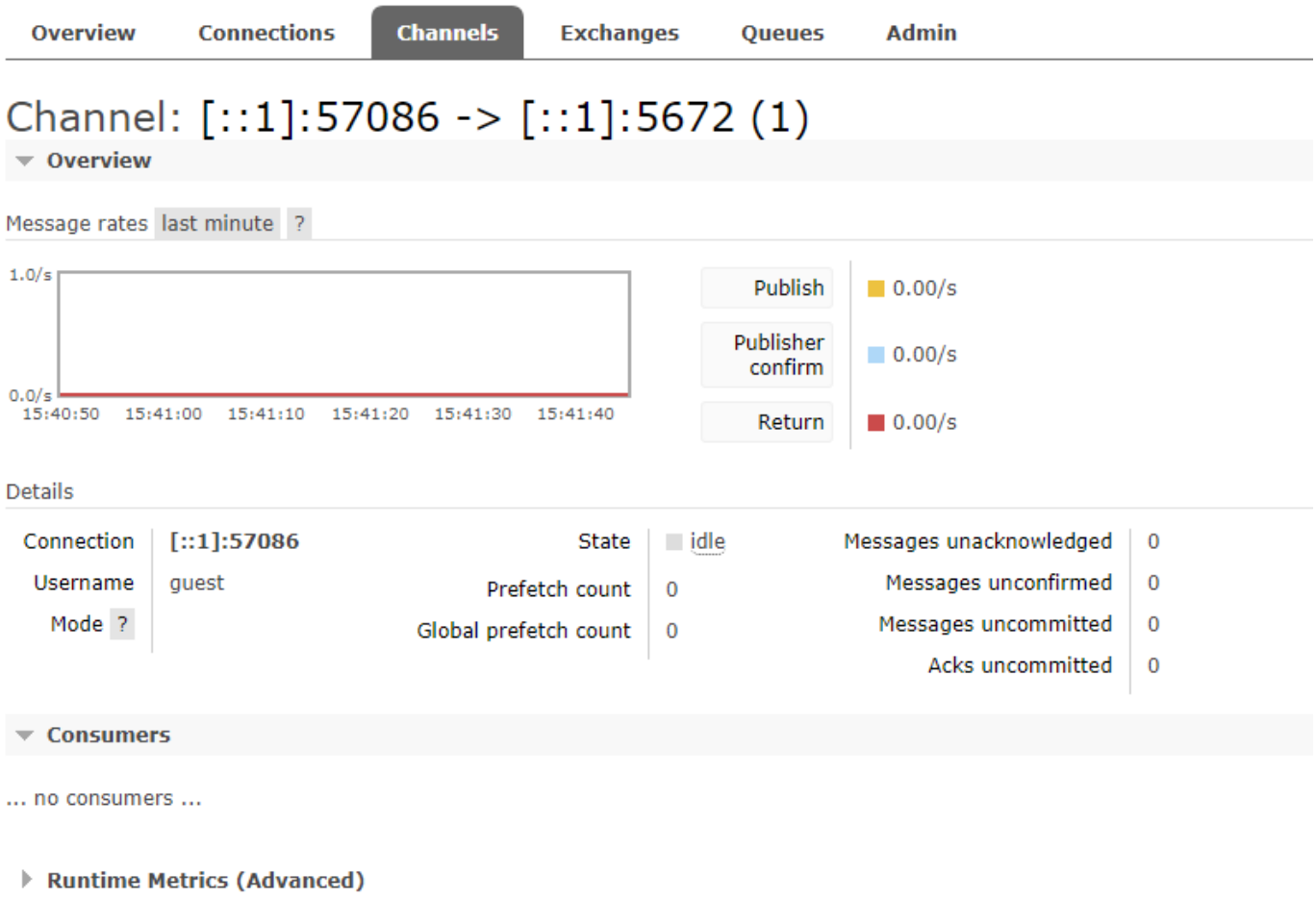
Channel prefetch counts.

Each channel can have two prefetch counts: A per-consumer count, which will limit each new consumer created on the channel, and a global count, which is shared between all consumers on the channel.

This column shows one, the other, or both limits if they are set.

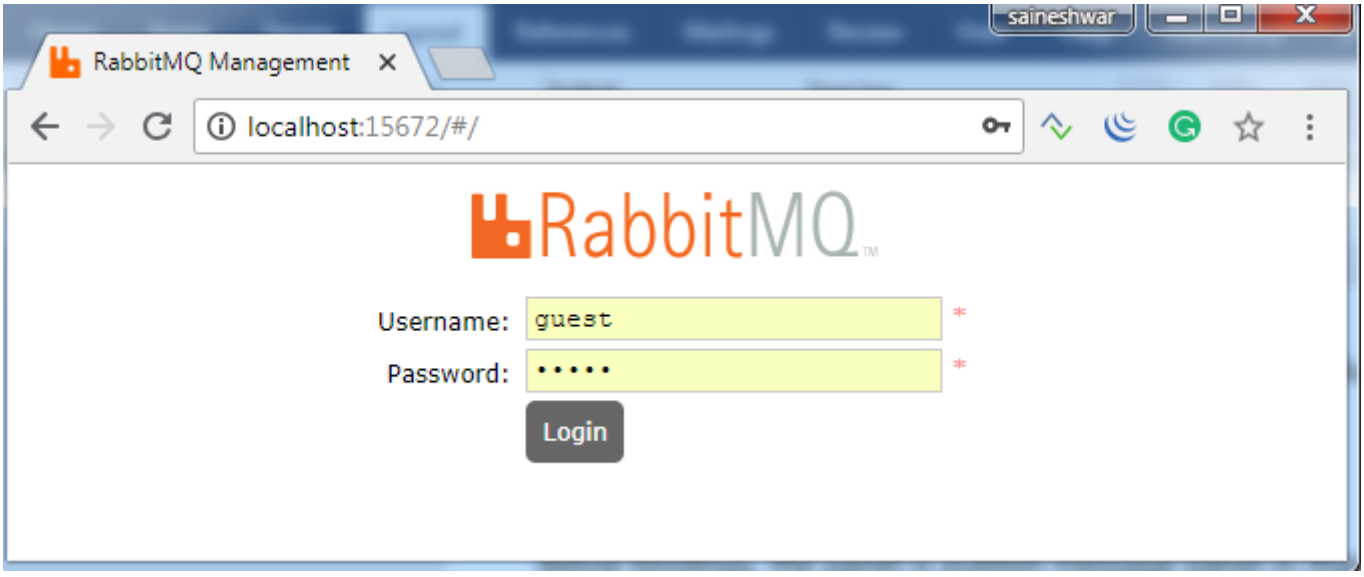


If you want to see details of each channel then click on "channel" name "**[::1]:57086 (1)**" it will show all details related to that channel.

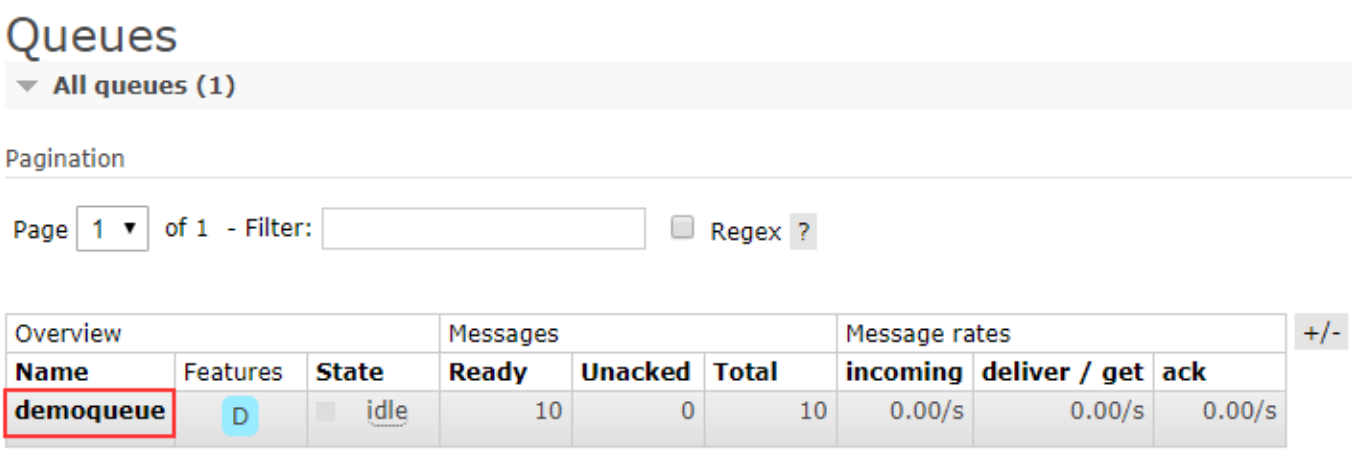


Publishing Message

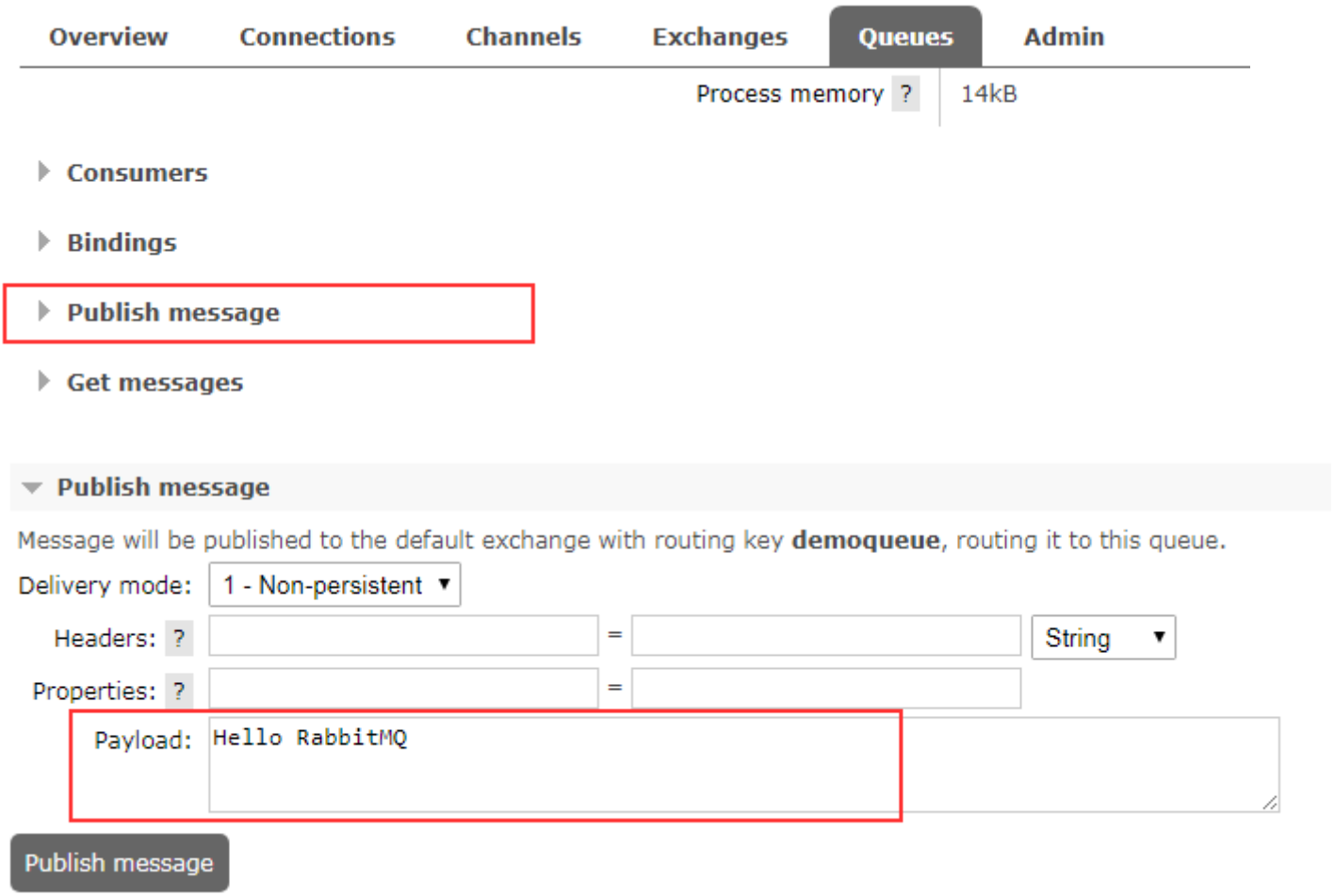
For publishing a message Login into web management plugin with credentials.



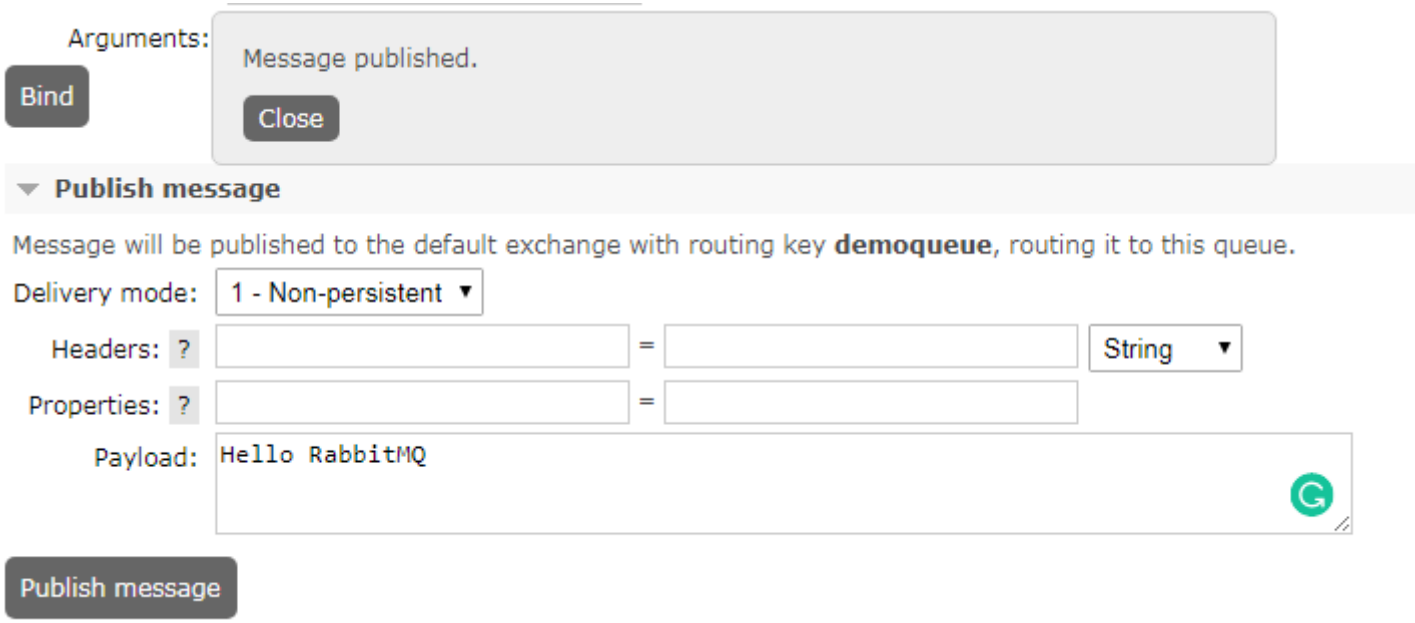
After logging into web management plugin next click on the queue(demoqueue).



After clicking on demoqueue "queue" just Below bindings panel is publish message panel in that just enter a message in Payload text area and click on publish message.



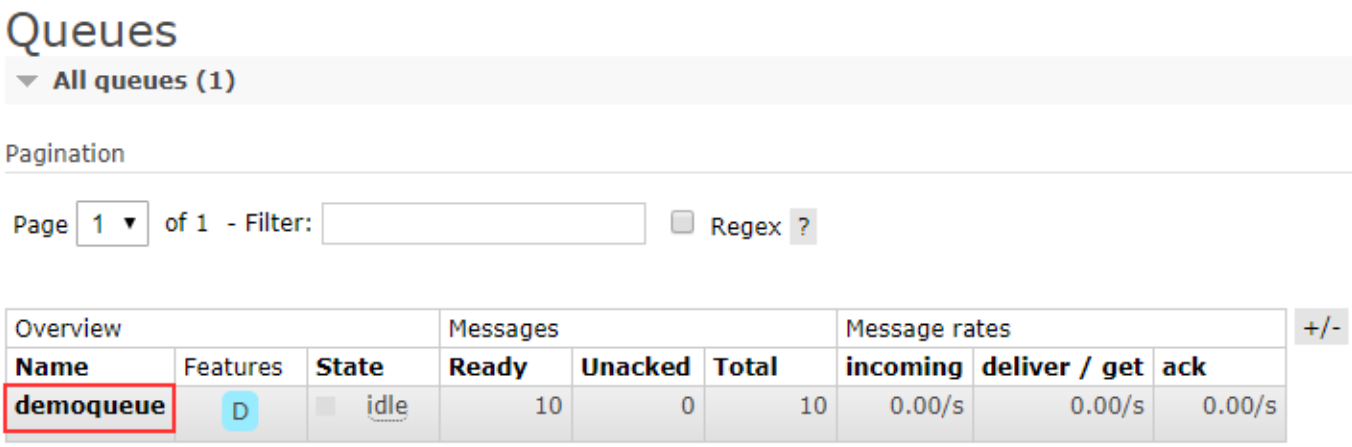
Snapshot after publishing message



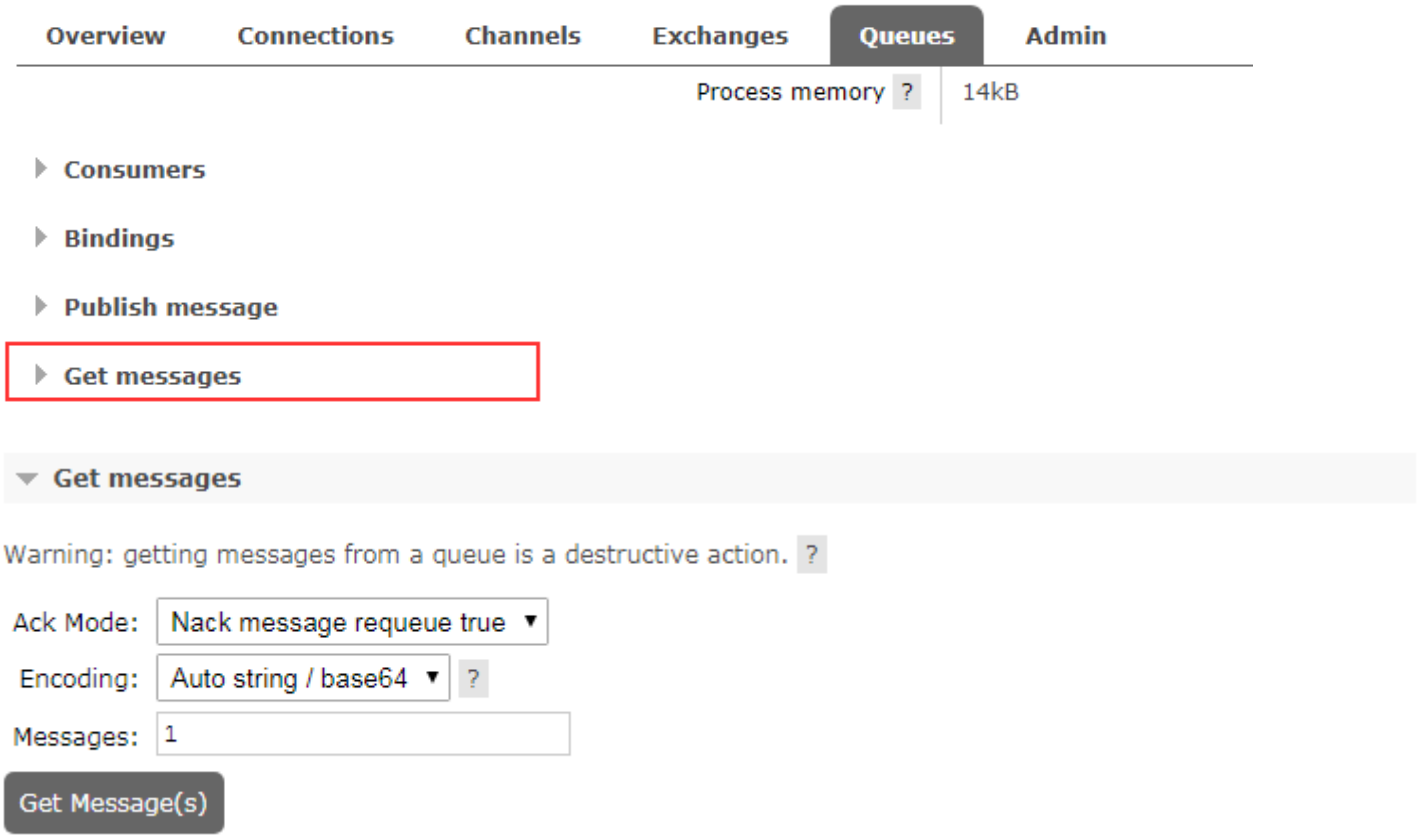
Reading Message

For reading a message Login into web management plugin with credentials.

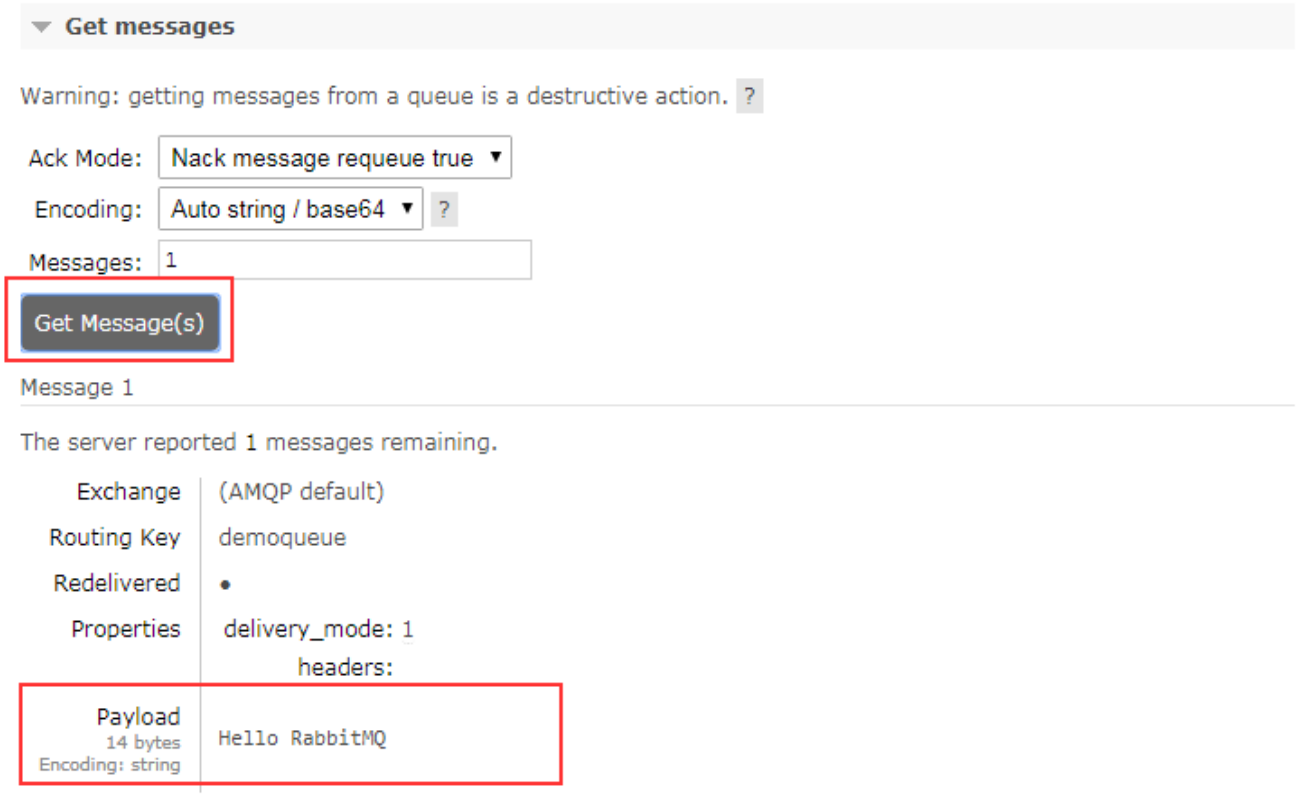
After logging into web management plugin next click on the queue(demoqueue).



Below publishes message is Get message here you can read a message from "**demoqueue**" here in message textbox you can enter the count of messages to read from the queue and click on Get Message but to get Message.



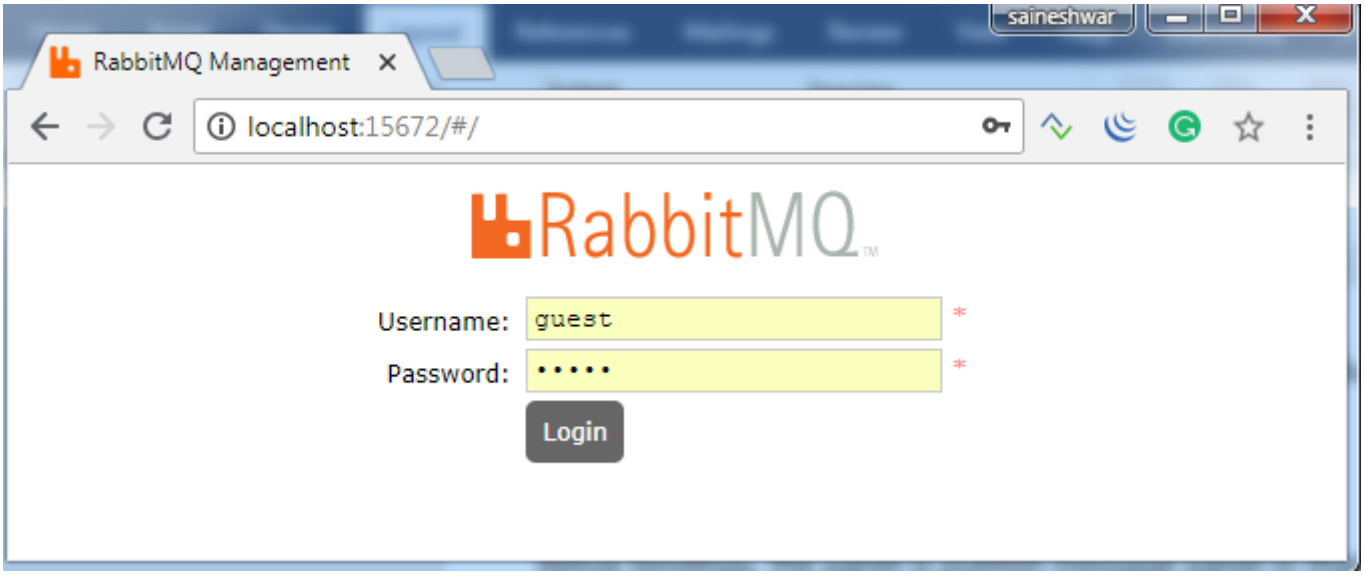
Snapshot while reading the message



After reading the message next last part we are going to see is Deleting Queue.

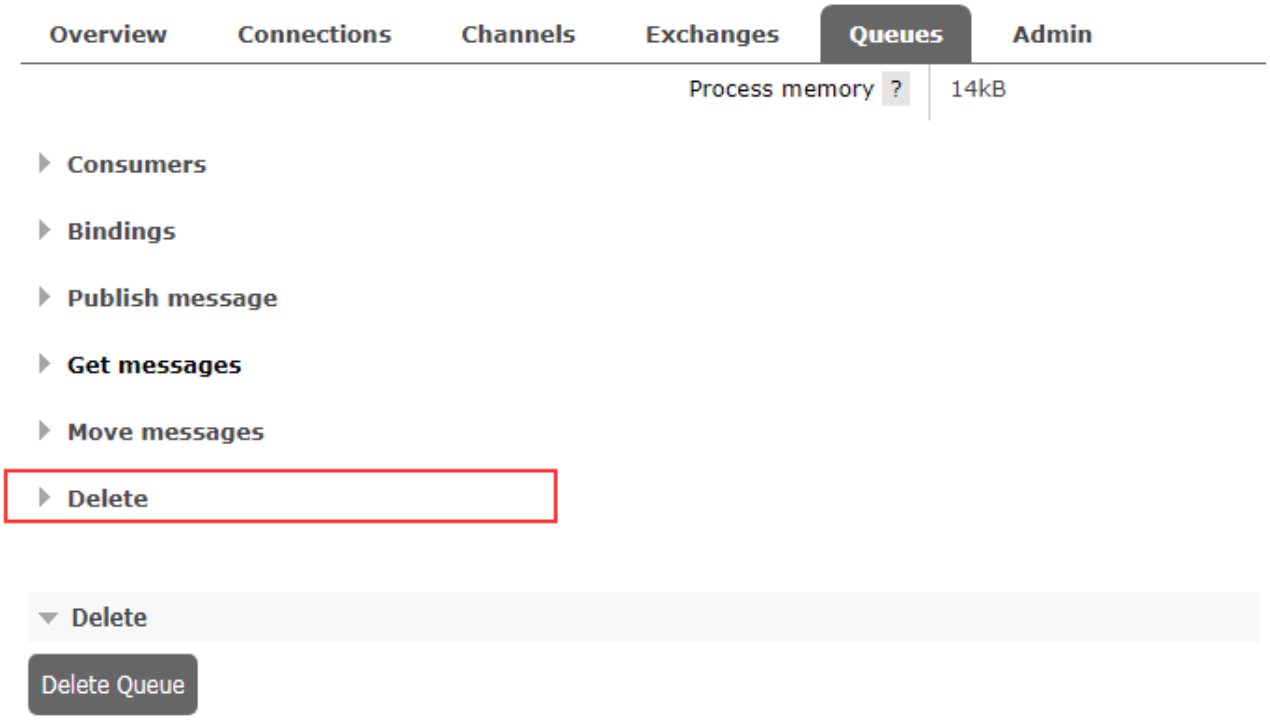
Delete Message

For deleting a message Login into web management plugin with credentials.

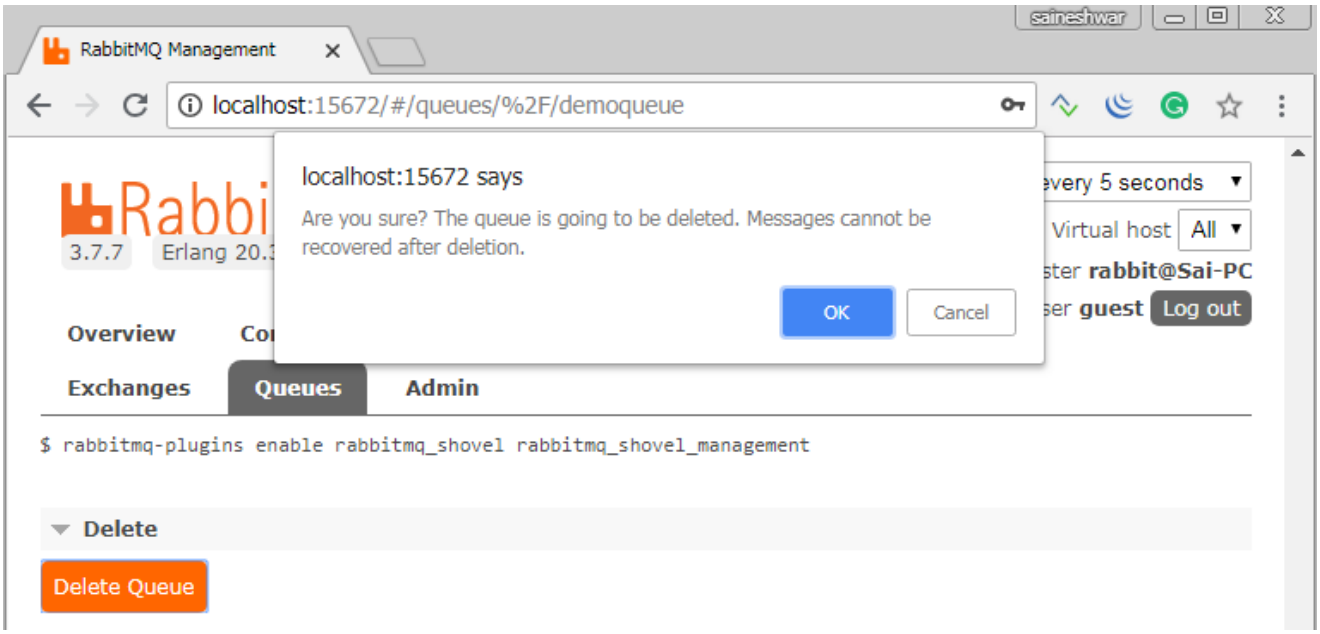


After logging into web management plugin next click on the queue(demoqueue).

To delete the message, you can expand delete panel in that you will see only delete button. Just click on it to delete.



After clicking on deleting a message it will ask for confirmation as shown below.



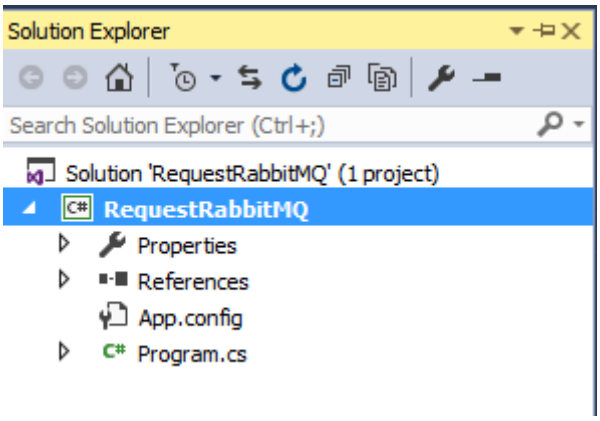
If we click on the ok button it will delete queue.

Publish Message Using C# to RabbitMQ

In this article, we are going to learn how to Publish a Message to RabbitMQ using .Net Application and RabbitMQ.Client in step by step way.

Creating RequestRabbitMQ Application

Let's Create a simple console application with Name "**RequestRabbitMQ**".

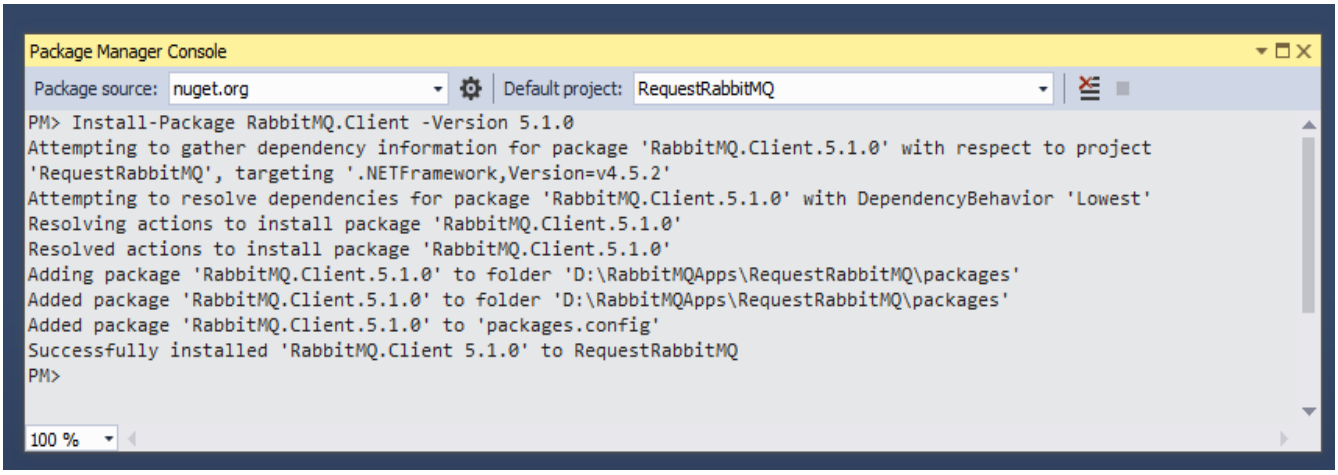


After creating application next we are going to add "**RabbitMQ.Client**" NuGet package.

Adding RabbitMQ.Client NuGet Package

In this part for creating a connection with the RabbitMQ server to create request, we need to add "RabbitMQ.Client" package from NuGet Package.

Command to install: - Install-Package RabbitMQ.Client -Version 5.1.0



After installing NuGet package of "**RabbitMQ.Client**" next we are going to create an exchange from web admin console.

Adding Direct Exchange

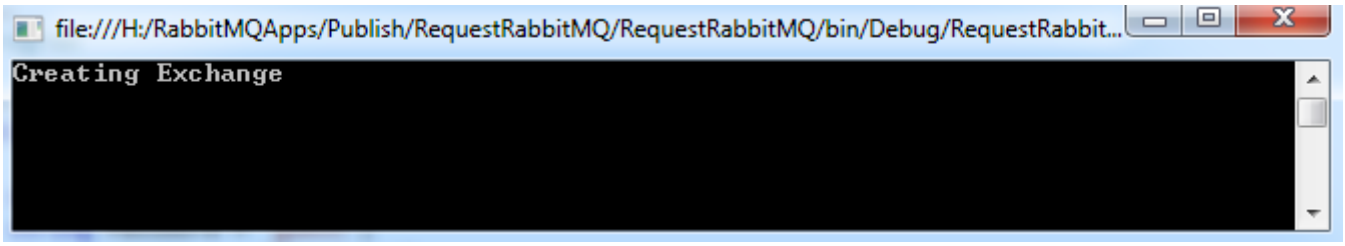
In this part, we are going to create an exchange for doing that we have first created a connection to RabbitMQ server using RabbitMQ.Client after creating connection next we have passed credentials along with HostName to connectionFactory after that we have created a connection by calling "**CreateConnection**" method, next to add exchange we have called method "**ExchangeDeclare**" method and passed parameters such as "exchange name" and "exchange type".

Code Snippet

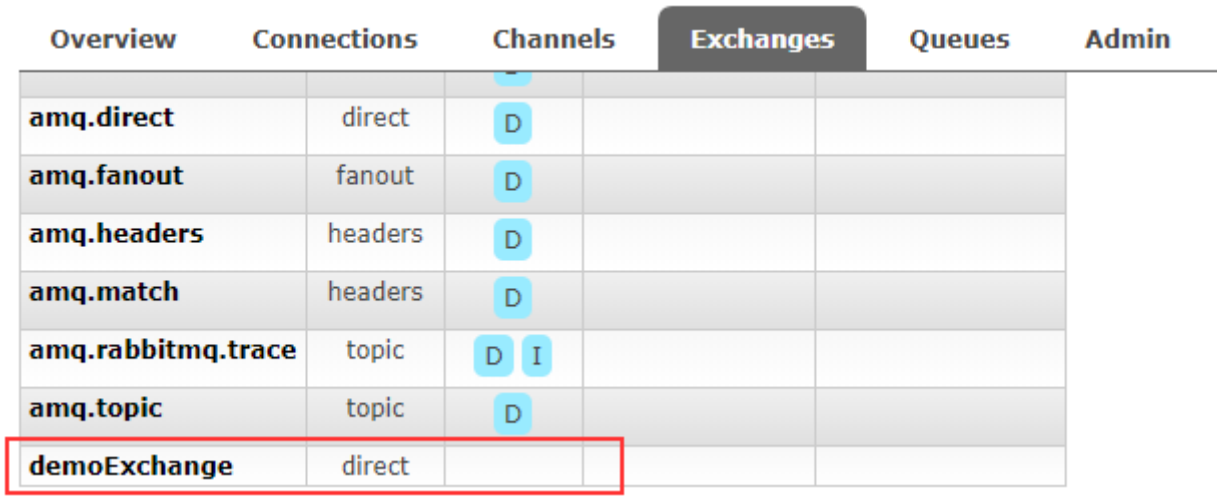
```
using RabbitMQ.Client;
```

```
using System;

namespace RequestRabbitMQ
{
    class Program
    {
        static void Main(string[] args)
        {
            string UserName = "guest";
            string Password = "guest";
            string HostName = "localhost";

            //Main entry point to the RabbitMQ .NET AMQP client
            var connectionFactory = new RabbitMQ.Client.ConnectionFactory()
            {
                UserName = UserName,
                Password = Password,
                HostName = HostName
            };

            var connection = connectionFactory.CreateConnection();
            var model = connection.CreateModel();

            //// Create Exchange
            model.ExchangeDeclare("demoExchange", ExchangeType.Direct);

            Console.ReadLine();
        }
    }
}
```

Let's check result by running application.



After adding exchange let's check web management plugin you will see we have successfully created exchanges.



Adding queue

Now we are going to add a queue.

For doing that we are going to add call "**QueueDeclare**" method and pass parameters to it.

Method definition

```
//
// Summary:
//     Declare a queue.
[AmqpMethodDoNotImplement(null)]
QueueDeclareOk QueueDeclare(string queue, bool durable, bool exclusive, bool autoDelete, IDictionary<string, object> arguments);
//
```

First parameter is queue name "demoqueue".

The second parameter is Durable "true".

The third parameter is Exclusive "false".

The fourth parameter is autodelete "false".

Fifth parameter is Arguments "null".

```
// Create Queue
model.QueueDeclare("demoqueue", true, false, false, null);
```

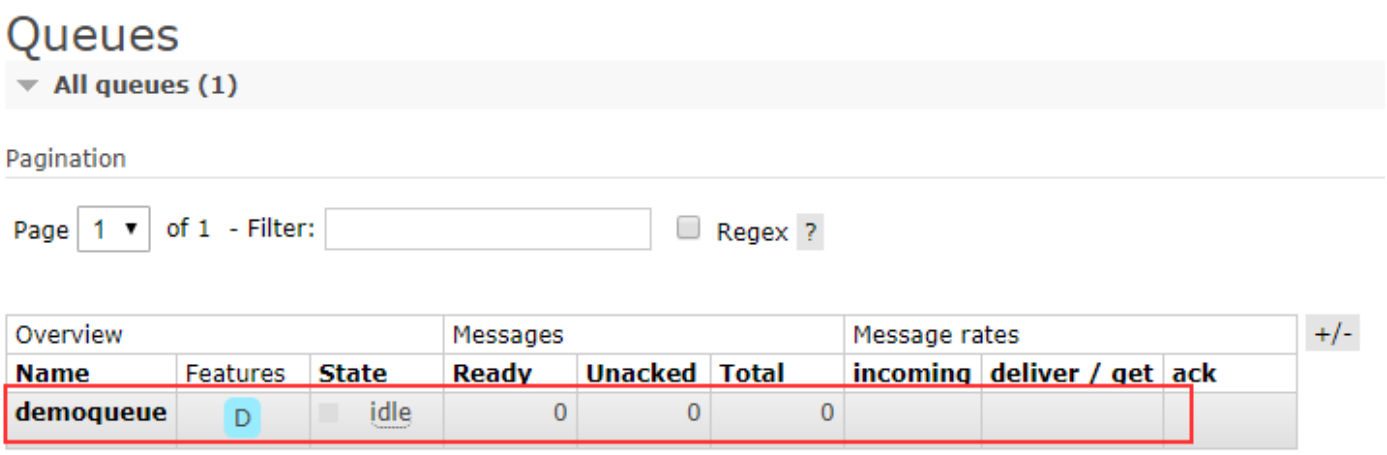
Code Snippet

```
using RabbitMQ.Client;
using System;

namespace RequestRabbitMQ
{
    class Program
    {
        static void Main(string[] args)
        {
            string UserName = "guest";
            string Password = "guest";
            string HostName = "localhost";

            //Main entry point to the RabbitMQ .NET AMQP client
            var connectionFactory = new RabbitMQ.Client.ConnectionFactory()
            {
                UserName = UserName,
                Password = Password,
                HostName = HostName
            };

            var connection = connectionFactory.CreateConnection();
            var model = connection.CreateModel();

            //// Create Exchange
            //model.ExchangeDeclare("demoExchange", ExchangeType.Direct);
            //Console.WriteLine("Creating Exchange");
```

```
            // Create Queue
            model.QueueDeclare("demoqueue", true, false, false, null);
            Console.WriteLine("Creating Queue");

            Console.ReadLine();
        }
    }
}
```

Let's check result by running application.

After adding queue let's check web management plugin you will see we have successfully created the queue.



After adding queue next we are going to bind queue with the exchange.

Binding the demoqueue with demoExchange

In binding, we are going to enter the name of exchange "**demoExchange**" and we are going to enter routing key as "**directexchange_key".**

Method definition

```
//
// Summary:
//     /// (Spec method) Binds a queue. ///
public static void QueueBind(this IModel model, string queue, string exchange, string routingKey, IDictionary<string, object> arguments = null);
//
```

First parameter is queue name "**demoqueue**".

The second parameter is Exchange "**demoExchange**".

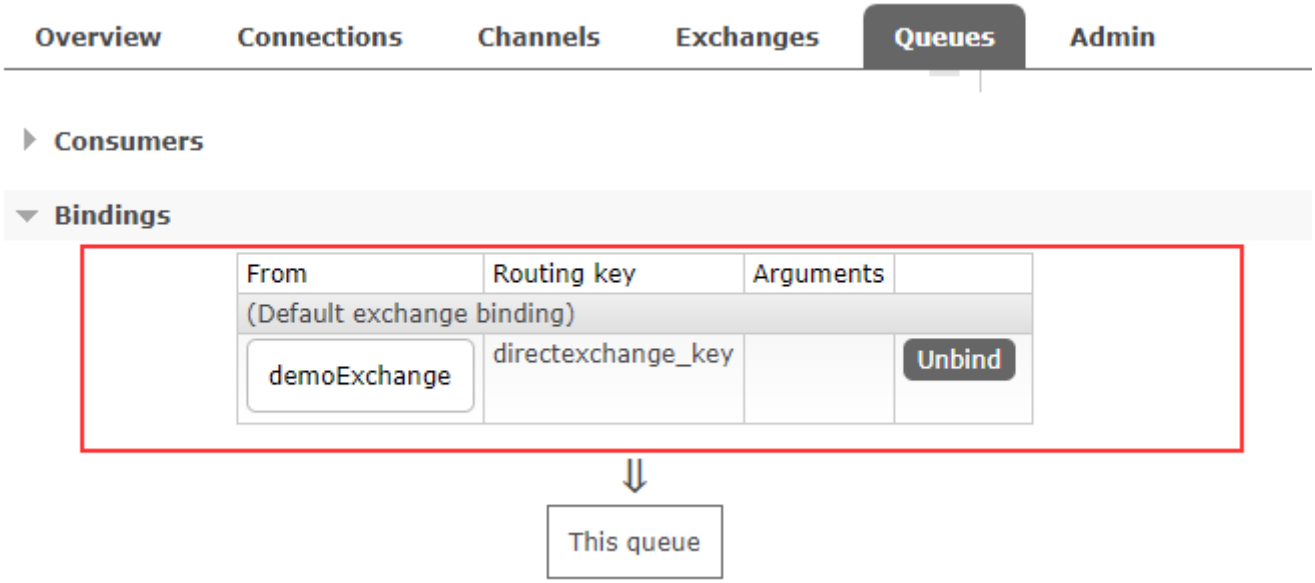
Third parameter is routing key "**directexchange_key**".

```
// Creating Binding
model.QueueBind("demoqueue", "demoExchange", "directexchange_key");
Console.WriteLine("Creating Binding");
```

Code Snippet

```
using RabbitMQ.Client;
using System;

namespace RequestRabbitMQ
{
    class Program
    {
        static void Main(string[] args)
        {
            string UserName = "guest";
            string Password = "guest";
            string HostName = "localhost";

            //Main entry point to the RabbitMQ .NET AMQP client
            var connectionFactory = new RabbitMQ.Client.ConnectionFactory()
            {
                UserName = UserName,
                Password = Password,
                HostName = HostName
            };

            var connection = connectionFactory.CreateConnection();
            var model = connection.CreateModel();

            //// Create Exchange
            //model.ExchangeDeclare("demoExchange", ExchangeType.Direct);
            //Console.WriteLine("Creating Exchange");

            //// Create Queue
            //model.QueueDeclare("demoqueue", true, false, false, null);
            //Console.WriteLine("Creating Queue");

            // Creating Binding
            model.QueueBind("demoqueue", "demoExchange", "directexchange_key");
            Console.WriteLine("Creating Binding");

            Console.ReadLine();
        }
    }
}
```

After creating binding let's check web management plugin you will see we have successfully created the binding.



Now let's Create Push Message to "**demoqueue**" from a console application.

Adding a Directmessages Class

We have created a "Directmessage" name class in this class we are going to create request and push to RabbitMQ.

First, we have declared Username, Password, and HostName as constant. After that, we have created a method with name "**SendMessage**" in that message we have created a connection to RabbitMQ server using RabbitMQ.Client after creating connection next we have passed credentials along with HostName to connectionFactory.

Next, we have written a simple message "Direct Message" and got it in bytes array form, finally, we are going to assign all these values to a BasicPublish method of "**RabbitMQ.Client**"

Method definition

```
/// <summary>
/// (Extension method) Convenience overload of BasicPublish.
/// </summary>
/// <remarks>The publication occurs with mandatory=false</remarks>
public static void BasicPublish(this IModel model, string exchange, string routingKey, IBasicProperties basicProperties, byte[] body)
{
  model.BasicPublish(exchange, routingKey, false, basicProperties, body);
}
```

The parameter passed to it

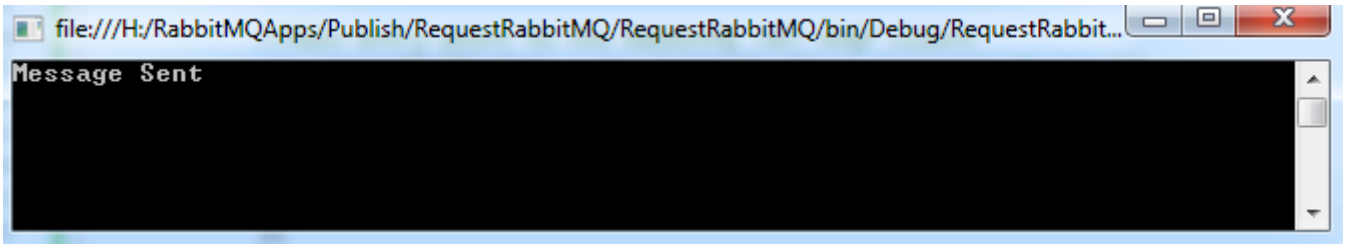
Exchange: "demoExchange"

Routing key: "directexchange_key"

Code Snippet

```
using RabbitMQ.Client;
using System;
using System.Text;

namespace RequestRabbitMQ
{
    class Program
    {
        static void Main(string[] args)
        {
            string UserName = "guest";
            string Password = "guest";
            string HostName = "localhost";

            //Main entry point to the RabbitMQ .NET AMQP client
            var connectionFactory = new RabbitMQ.Client.ConnectionFactory()
            {
                UserName = UserName,
                Password = Password,
                HostName = HostName
            };

            var connection = connectionFactory.CreateConnection();
            var model = connection.CreateModel();

            //// Create Exchange
            //model.ExchangeDeclare("demoExchange", ExchangeType.Direct);
            //Console.WriteLine("Creating Exchange");

            //// Create Queue
            //model.QueueDeclare("demoqueue", true, false, false, null);
            //Console.WriteLine("Creating Queue");

            // Creating Binding
            //model.QueueBind("demoqueue", "demoExchange", "directexchange_key");
            //Console.WriteLine("Creating Binding");

            var properties = model.CreateBasicProperties();
            properties.Persistent = false;

            byte[] messagebuffer = Encoding.Default.GetBytes("Direct Message");

            model.BasicPublish("demoExchange", "directexchange_key", properties, messagebuffer);
            Console.WriteLine("Message Sent");

            Console.ReadLine();
        }
    }
}
```

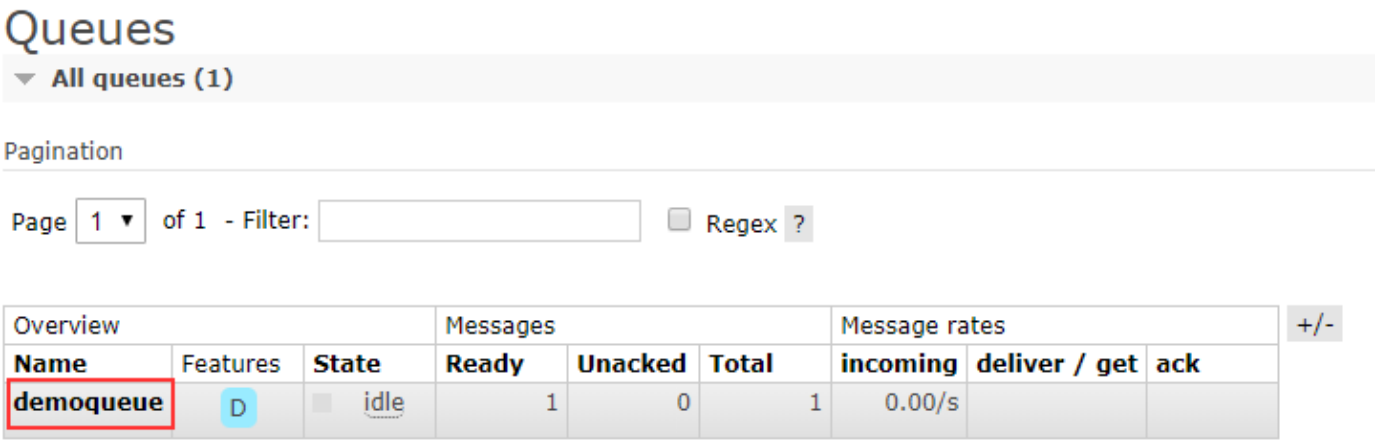
After completing entire process let's save the application and run after running the application you will see a Message sent a message on a console just for notification.



After sending a message now let's have a look on the queue (demoqueue).

Now Let's See queue status "demoqueue"

If you see Queues status you will see Ready "1" which means we have successfully published a message to "demoqueue".

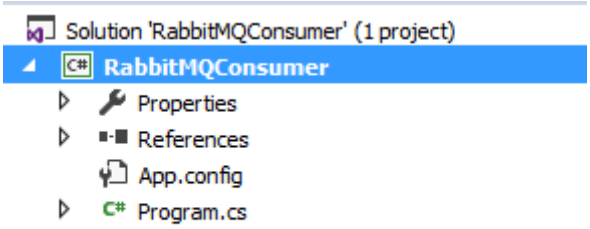


Consume Message Using C# to RabbitMQ

In this article we are going to learn how to consume messages from RabbitMQ using .Net in step by step way.

Creating RabbitMQConsumer Application

Let's create another console application for consuming messages from a queue with Name "**RabbitMQConsumer**"

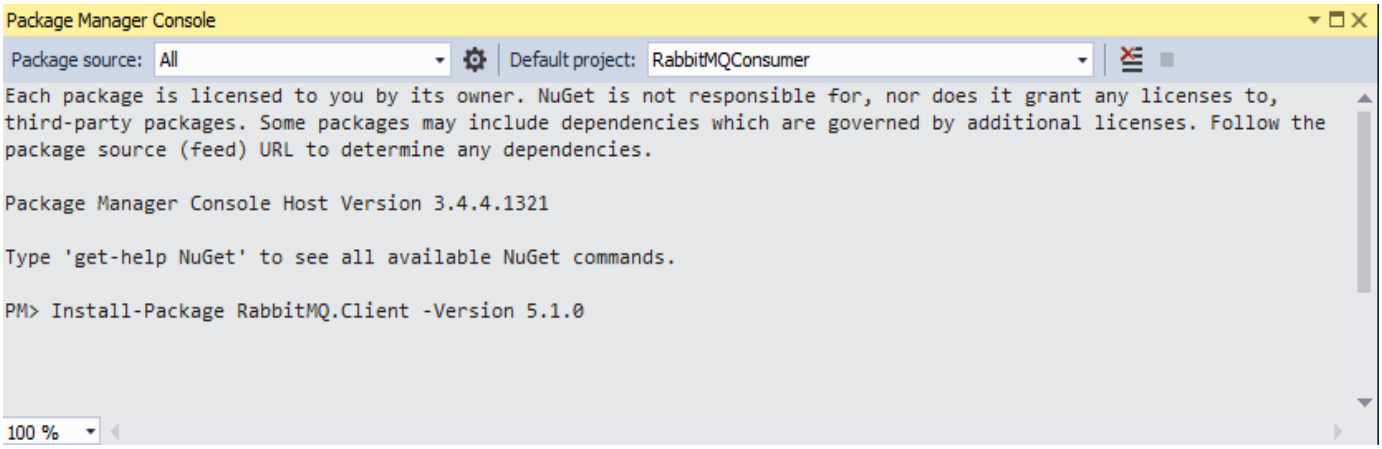


After creating application next we are going to add "**RabbitMQ.Client**" NuGet package.

Adding RabbitMQ.Client NuGet Package

In this part for creating a connection with RabbitMQ server to create request, we need to add "RabbitMQ.Client" package from NuGet Package.

Command to install: - Install-Package RabbitMQ.Client -Version 5.1.0



After installing RabbitMQ.Client next we are going to add a class with name "**MessageReceiver**".

Code snippet of MessageReceiver class

In this part, we have created MessageReceiver class and this class inherits DefaultBasicConsumer class which is from RabbitMQ.Client next we have to override HandleBasicDeliver method this method receives message body next, we are going to write these messages as we can see in its console.

```
using System;
using System.Text;
using RabbitMQ.Client;

namespace RabbitMQConsumer
{
    public class MessageReceiver : DefaultBasicConsumer
    {
        private readonly IModel _channel;

        public MessageReceiver(IModel channel)
        {
            _channel = channel;
        }

        public override void HandleBasicDeliver(string consumerTag, ulong deliveryTag, bool
redelivered, string exchange, string routingKey, IBasicProperties properties, byte[] body)
        {
            Console.WriteLine($"Consuming Message");
            Console.WriteLine(string.Concat("Message received from the exchange ", exchange));
            Console.WriteLine(string.Concat("Consumer tag: ", consumerTag));
            Console.WriteLine(string.Concat("Delivery tag: ", deliveryTag));
            Console.WriteLine(string.Concat("Routing tag: ", routingKey));
            Console.WriteLine(string.Concat("Message: ", Encoding.UTF8.GetString(body)));
            _channel.BasicAck(deliveryTag, false);
        }
    }
}
```

After completing with understanding code snippet of MessageReceiver class next we are going to calls this class in the Main method.

Code snippet of Main Method

In the main method we have created connectionFactory class and passed credentials and Hostname after that we have created connection, next we have created channel and set prefetchCount to 1 such that it tells RabbitMQ not to give more than one message to a worker at a time, Next, we have created instance of MessageReceiver class and passed IModel (channel) to it, in final step we have called "**BasicConsume**" method and passed queue name to it "**demoqueue**" along with we have set autoAck to false and passed the messageReceiver instance to it.

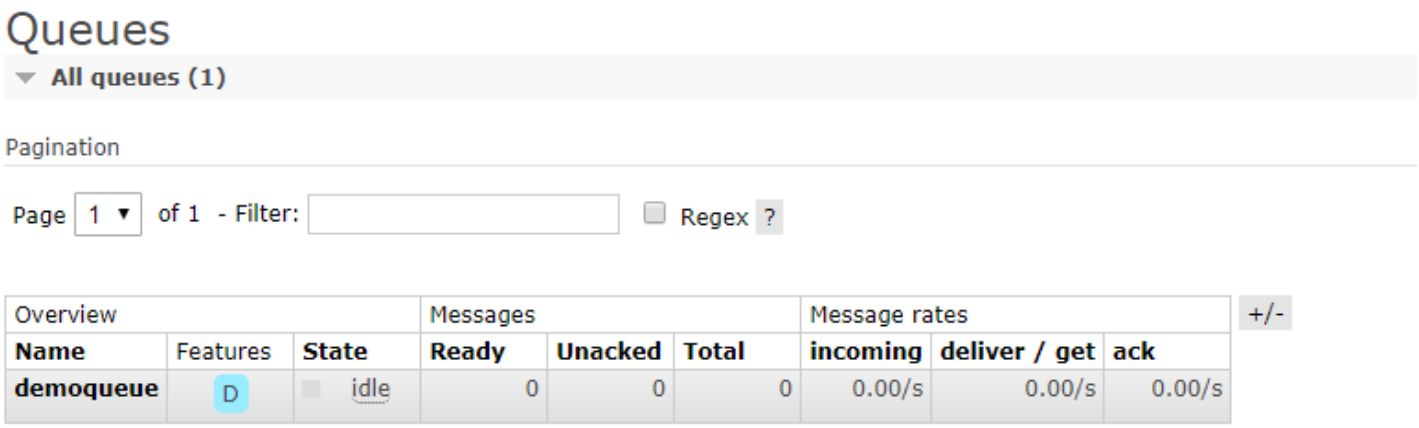
```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using RabbitMQ.Client;

namespace RabbitMQConsumer
{
    class Program
    {
        private const string UserName = "guest";
        private const string Password = "guest";
        private const string HostName = "localhost";

        static void Main(string[] args)
        {
            ConnectionFactory connectionFactory = new ConnectionFactory
            {
                HostName = HostName,
                UserName = UserName,
                Password = Password,
            };

            var connection = connectionFactory.CreateConnection();
            var channel = connection.CreateModel();

            // accept only one unack-ed message at a time
            // uint prefetchSize, ushort prefetchCount, bool global

            channel.BasicQos(0, 1, false);

            MessageReceiver messageReceiver = new MessageReceiver(channel);
            channel.BasicConsume("demoqueue", false, messageReceiver);

            Console.ReadLine();
        }
    }
}
```

Note: - prefetchCount

In order to defeat that we can set the prefetch count with the value of 1. This tells RabbitMQ not to give more than one message to a worker at a time. Or, in other words, don't dispatch a new message to a worker until it has processed and acknowledged the previous one. Instead, it will dispatch it to the next worker that is not still busy.

Now we have complete working mechanism Let's create request from "**RequestRabbitMQ**" console and consume a message from "**RabbitMQConsumer**" application.

Queue is Empty



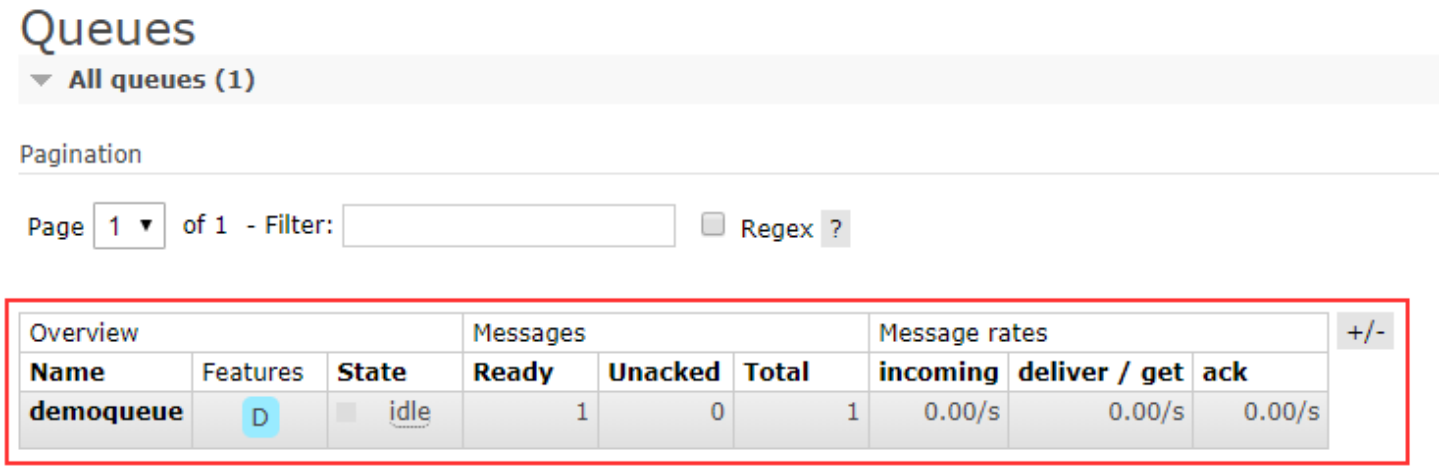
After we saw that queue (demoqueue) is empty next we are going to publish message to demoqueue.

Publishing Message

```
var connection = connectionFactory.CreateConnection();
var model = connection.CreateModel();

Create Exchange | Create Queue | Creating Binding

var properties = model.CreateBasicProperties();
properties.Persistent = false;

byte[] messagebuffer = Encoding.Default.GetBytes("Direct Message");

model.BasicPublish("demoExchange", "directexchange_key", properties, messagebuffer);
Console.WriteLine("Message Sent");

Console.ReadLine();
```

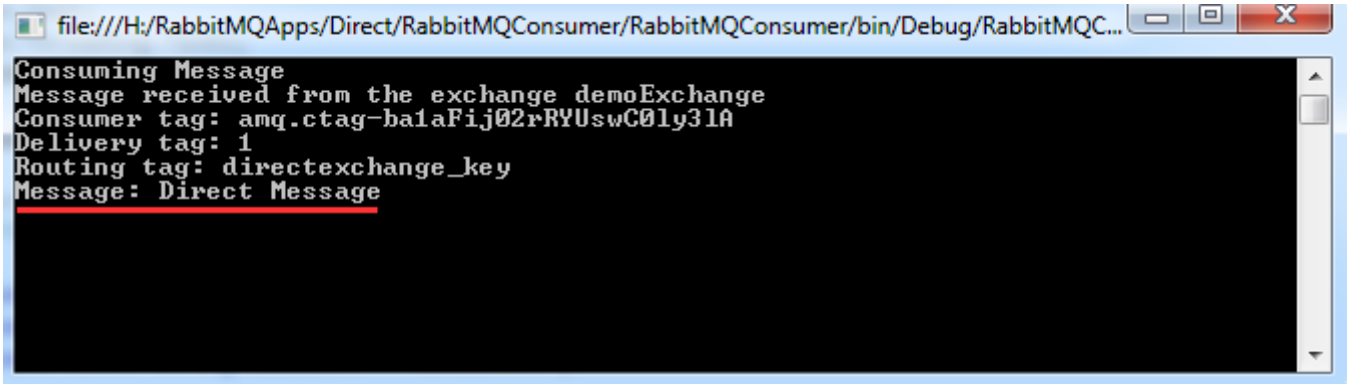
After we have published message now let's have a view on (queue) demoqueue.

Queue after publishing Message



After we have push message to (queue) demoqueue the console application will start consuming it below is snapshot.

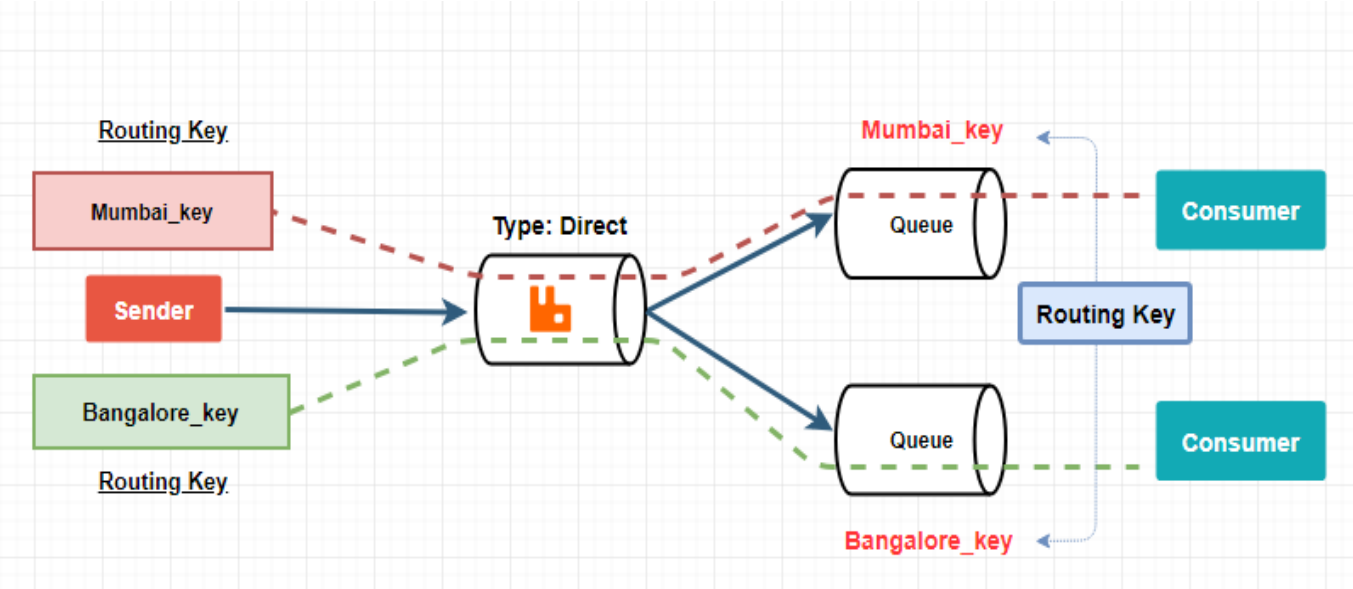
Consumed Message from demoqueue



Finally, we have completed consuming Message from RabbitMQ queue.

Using RabbitMQ Direct Message Exchanges with .Net Application

In this article, we are going to use Direct Message Exchanges and push messages into RabbitMQ using .Net Application and RabbitMQ.Client and read messages from RabbitMQ using .Net Application and RabbitMQ.Client in step by step way.



Types of Exchanges

1. Direct
2. fanout
3. Headers
4. Topic

Details of Exchanges

Direct: A direct exchange delivers messages to queues based on a message routing key.

In a direct exchange, the message is routed to the queues whose binding key exactly matches the routing key of the message.

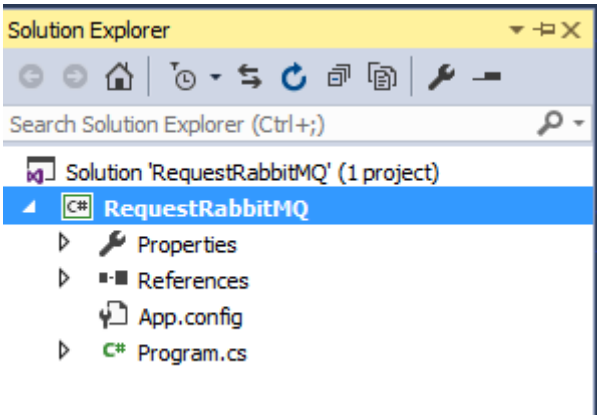
Fanout: A fanout exchange routes messages to all of the queues that are bound to it.

Topic: The topic exchange does a wildcard match between the routing key and the routing pattern specified in the binding.

Headers: Headers exchanges use the message header attributes for routing.

Creating RequestRabbitMQ Application

Let's Create a simple console application with Name "**RequestRabbitMQ**".

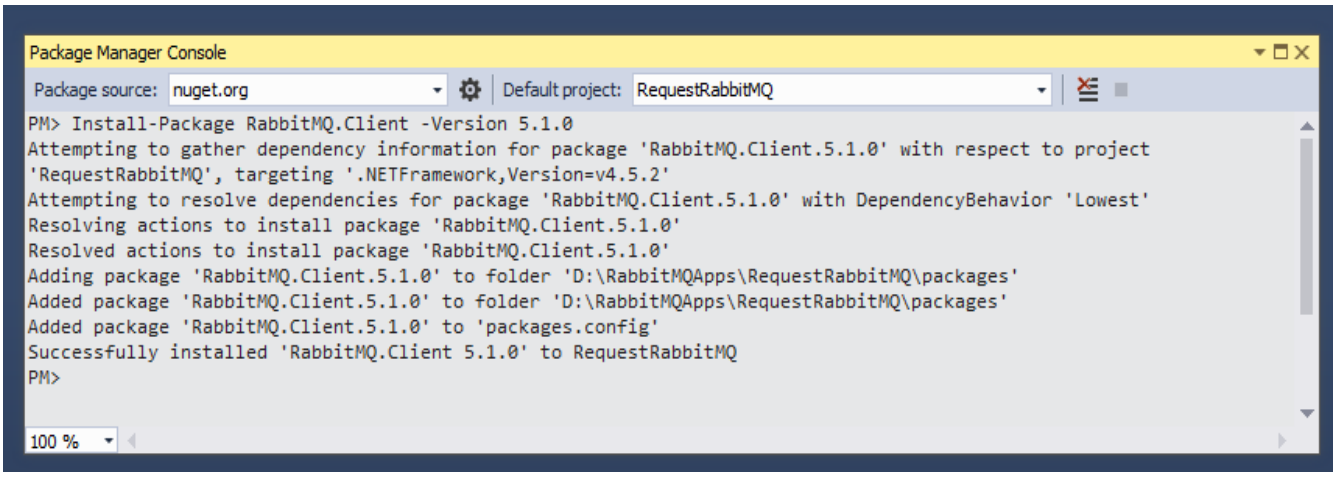


After creating application next we are going to add "**RabbitMQ.Client**" NuGet package.

Adding RabbitMQ.Client NuGet Package

In this part for creating a connection with RabbitMQ server to create request, we need to add "RabbitMQ.Client" package from NuGet Package.

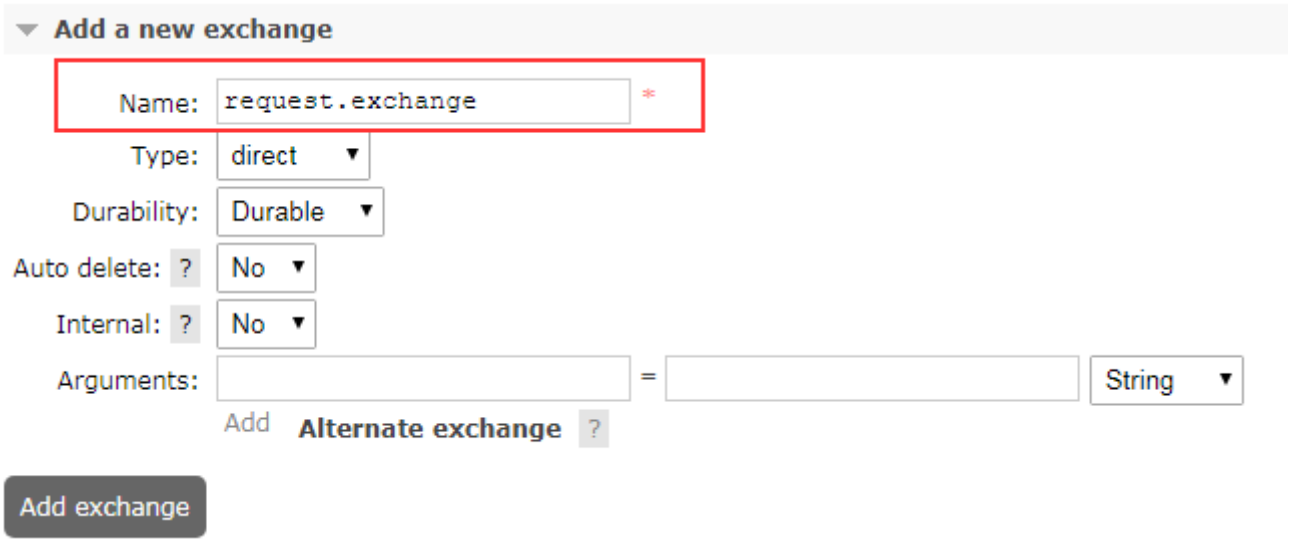
Command to install: - Install-Package RabbitMQ.Client -Version 5.1.0



After installing NuGet package of "**RabbitMQ.Client**" next we are going to create an exchange from web admin console.

Adding Direct Exchange

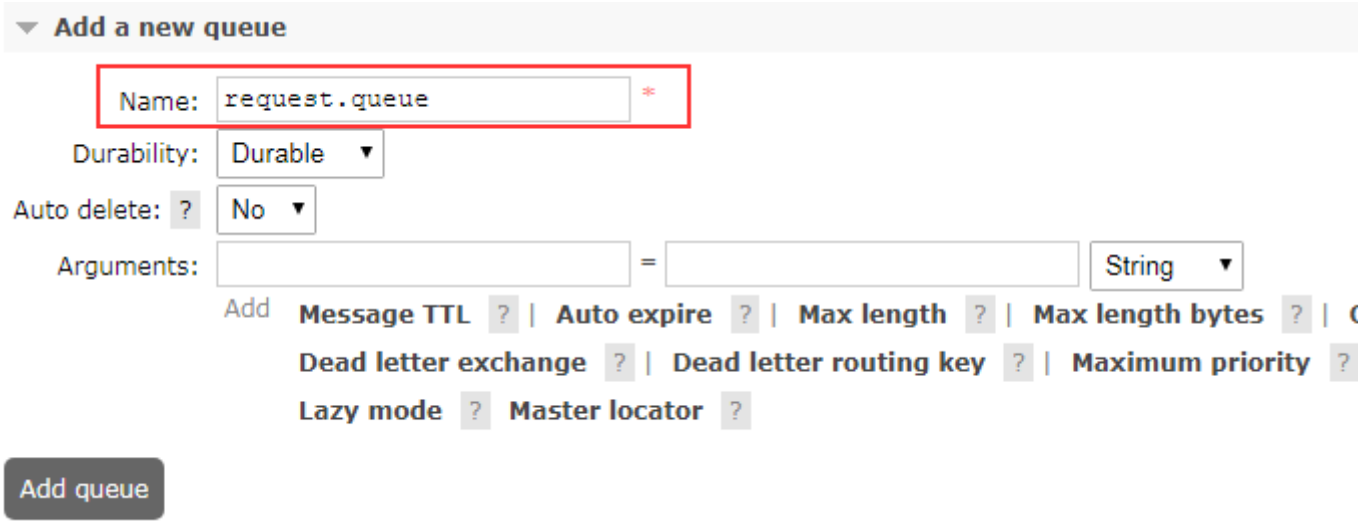
Go to http://localhost:15672/#/exchanges , name exchange as "**request.exchange**" after entering name next, we select Type as "**direct**" and click on add exchange button to create.



After adding exchange (request.exchange) next we are going to add Queue (request Queue).

Adding queue

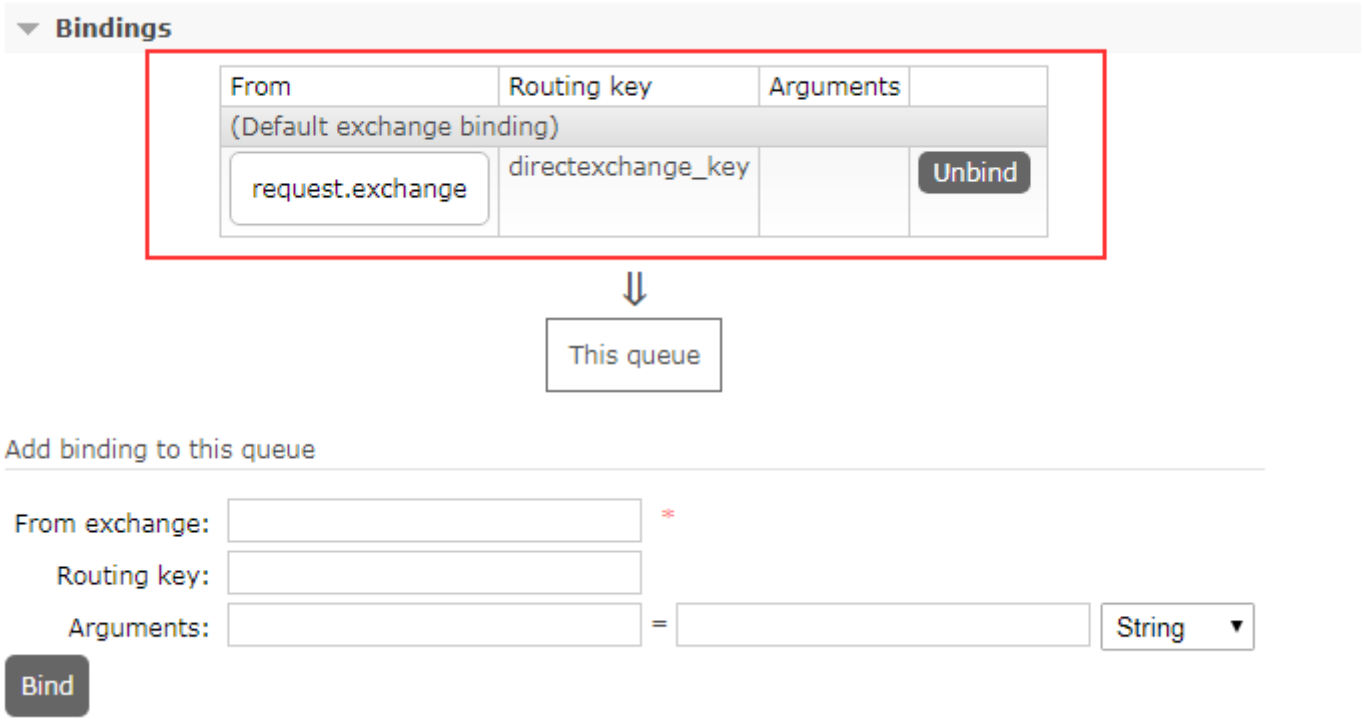
Go to http://localhost:15672/#/queues , add queue: request.queue.



After adding queue next we are going to bind queue with exchange.

Binding the request.queue with request.exchange

In binding, we are going to enter the name of exchange "**request.exchange**" and we are going to enter routing key as "**directexchange_key".**



Now let's Create Push Message to "**request.queue**" from a console application.

Adding a Directmessages Class

We have created a "Directmessage" name class in this class we are going to create request and push to RabbitMQ.

First, we have declared Username, Password and HostName as constant. After that, we have created a method with name "**SendMessage**" in that message we have created a connection to RabbitMQ server using RabbitMQ.Client after creating connection next we have passed credentials along with HostName to connectionFactory. Next, we have written a simple message "Direct Message" and got it in bytes array form, finally, we are going assign all these values to a BasicPublish method of "**RabbitMQ.Client**"

BasicPublish View

```
/// <summary>
/// (Extension method) Convenience overload of BasicPublish.
/// </summary>
/// <remarks>The publication occurs with mandatory=false</remarks>
public static void BasicPublish(this IModel model, string exchange, string routingKey, IBasicProperties basicProperties, byte[] body)
{
  model.BasicPublish(exchange, routingKey, false, basicProperties, body);
}
```

The parameter passed to it

Exchange: "request.exchange"

Routingkey: "directexchange_key"

Code Snippet

```
using RabbitMQ.Client;
using System.Text;

namespace RequestRabbitMQ
{
    public class Directmessages
    {
        private const string UserName = "guest";
        private const string Password = "guest";
        private const string HostName = "localhost";

        public void SendMessage()
        {
            //Main entry point to the RabbitMQ .NET AMQP client
            var connectionFactory = new RabbitMQ.Client.ConnectionFactory()
            {
                UserName = UserName,
                Password = Password,
                HostName = HostName
            };

            var connection = connectionFactory.CreateConnection();
            var model = connection.CreateModel();

            var properties = model.CreateBasicProperties();
            properties.Persistent = false;


            byte[] messagebuffer = Encoding.Default.GetBytes("Direct Message");

            model.BasicPublish("request.exchange", "directexchange_key", properties,
messagebuffer);
            Console.WriteLine("Message Sent");
        }
    }
}
```

Main Code snippet

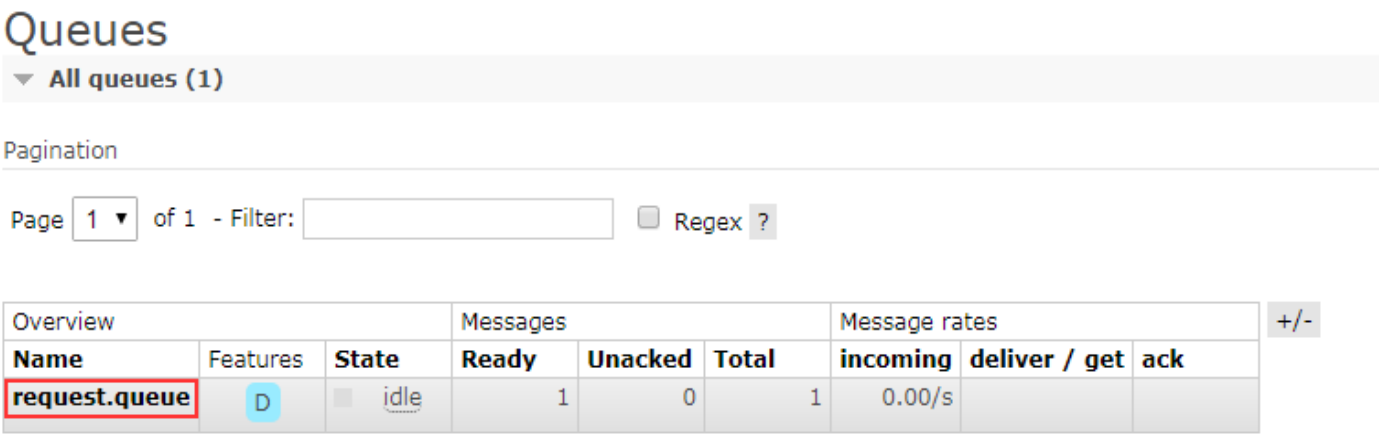
```
using System;

namespace RequestRabbitMQ
{
    class Program
    {
        static void Main(string[] args)
        {
            Directmessages directmessages = new Directmessages();
            directmessages.SendMessage();
            Console.ReadLine();
        }
    }
}
```

After completing entire process let's save the application and run after running the application you will see a Message sent a message on a console just for notification.

After sending message now let's have a look on queue (request.queue).

Now Let's See queue status "request.queue"

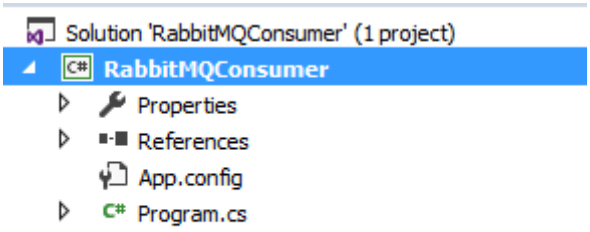
If you see Queues status you will see Ready "1" which means we have successfully published a message to "request.queue".



After publishing message next we are going to create .Net Console application for consuming message from queue.

Creating RabbitMQConsumer Application

Let's create another console application for consuming messages from a queue with Name "**RabbitMQConsumer**"

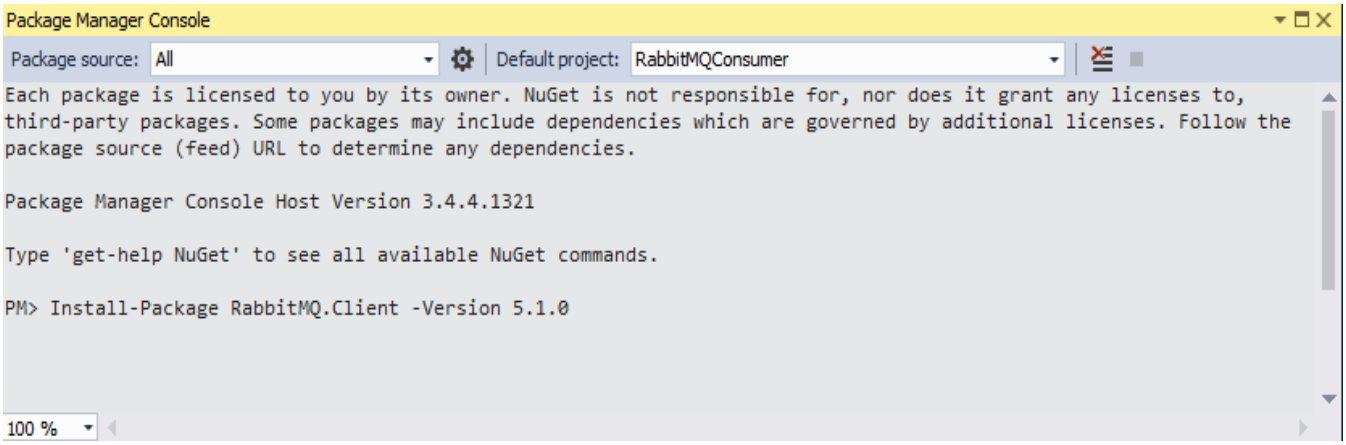


After creating application next we are going to add "**RabbitMQ.Client**" NuGet package.

Adding RabbitMQ.Client NuGet Package

In this part for creating a connection with RabbitMQ server to create request, we need to add "RabbitMQ.Client" package from NuGet Package.

Command to install: - Install-Package RabbitMQ.Client -Version 5.1.0



After installing RabbitMQ.Client next we are going to add a class with name "**MessageReceiver**".

Code snippet of MessageReceiver class

In this part, we have created MessageReceiver class and this class inherits DefaultBasicConsumer class which is from RabbitMQ.Client next we have to override HandleBasicDeliver method this method receives message body next, we are going to write these messages as we can see in its console.

```
using System;
using System.Text;
using RabbitMQ.Client;

namespace RabbitMQConsumer
{
    public class MessageReceiver : DefaultBasicConsumer
    {
        private readonly IModel _channel;

        public MessageReceiver(IModel channel)
        {
            _channel = channel;
        }

        public override void HandleBasicDeliver(string consumerTag, ulong deliveryTag, bool
redelivered, string exchange, string routingKey, IBasicProperties properties, byte[] body)
        {
            Console.WriteLine($"Consuming Message");
            Console.WriteLine(string.Concat("Message received from the exchange ", exchange));
            Console.WriteLine(string.Concat("Consumer tag: ", consumerTag));
            Console.WriteLine(string.Concat("Delivery tag: ", deliveryTag));
            Console.WriteLine(string.Concat("Routing tag: ", routingKey));
            Console.WriteLine(string.Concat("Message: ", Encoding.UTF8.GetString(body)));
            _channel.BasicAck(deliveryTag, false);
        }
```

```
    }
}
```

After completing with understanding code snippet of MessageReceiver class next we are going to calls this class in the Main method.

Code snippet of Main Method

In the main method we have created connectionFactory class and passed credentials and Hostname after that we have created connection, next we have created channel and set prefetchCount to 1 such that it tells RabbitMQ not to give more than one message to a worker at a time, Next, we have created instance of MessageReceiver class and passed IModel (channel) to it, in final step we have called "**BasicConsume**" method and passed queue name to it "**request.queue**" along with we have set autoAck to false and passed the messageReceiver instance to it.

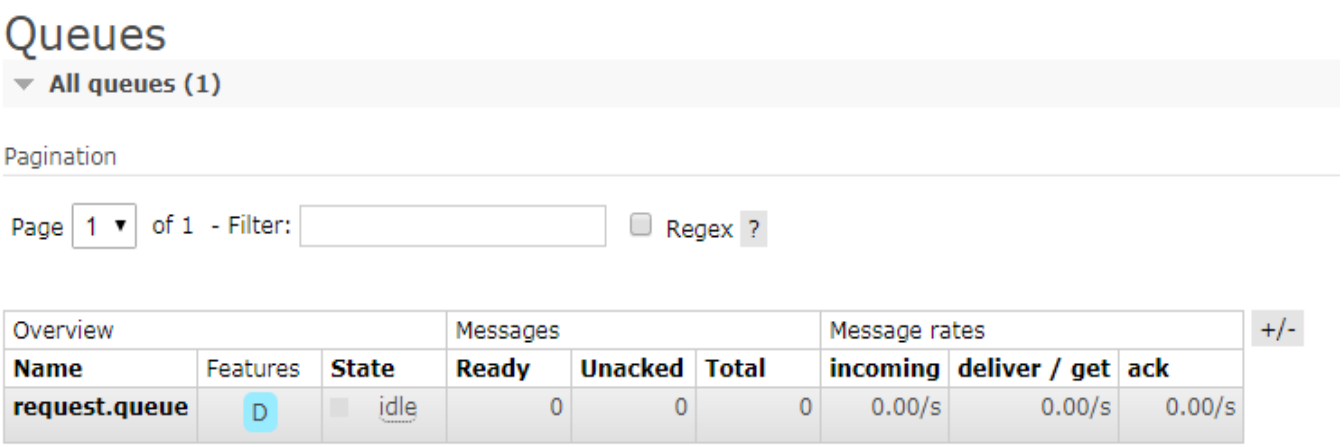
```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using RabbitMQ.Client;

namespace RabbitMQConsumer
{
    class Program
    {
        private const string UserName = "guest";
        private const string Password = "guest";
        private const string HostName = "localhost";

        static void Main(string[] args)
        {
            ConnectionFactory connectionFactory = new ConnectionFactory
            {
                HostName = HostName,
                UserName = UserName,
                Password = Password,
            };

            var connection = connectionFactory.CreateConnection();
            var channel = connection.CreateModel();

            // accept only one unack-ed message at a time
            // uint prefetchSize, ushort prefetchCount, bool global

            channel.BasicQos(0, 1, false);

            MessageReceiver messageReceiver = new MessageReceiver(channel);
            channel.BasicConsume("request.queue", false, messageReceiver);

            Console.ReadLine();
        }
    }
}
```

Note: - prefetchCount

In order to defeat that we can set the prefetch count with the value of 1. This tells RabbitMQ not to give more than one message to a worker at a time. Or, in other words, don't dispatch a new message to a worker until it has processed and acknowledged the previous one. Instead, it will dispatch it to the next worker that is not still busy.

Now we have complete working mechanism Let's create request from "**RequestRabbitMQ**" console and consume a message from "**RabbitMQConsumer**" application.

Queue is Empty



After we saw that queue (request.queue) is empty next we are going to publish message to request.queue.

Publishing Message

```
public class Directmessages
{
    private const string UserName = "guest";
    private const string Password = "guest";
    private const string HostName = "localhost";

    public void SendMessage()
    {
        Code

        byte[] messagebuffer = Encoding.Default.GetBytes("Send My First RabbitMQ Message");

        model.BasicPublish("request.exchange", "directexchange_key", properties, messagebuffer);

        Console.WriteLine("Message Sent");
    }
}
```

After we have published message now let's have a view on (queue) request.queue.

Queue after publishing Message

Exchanges | Queues | Admin

Pagination

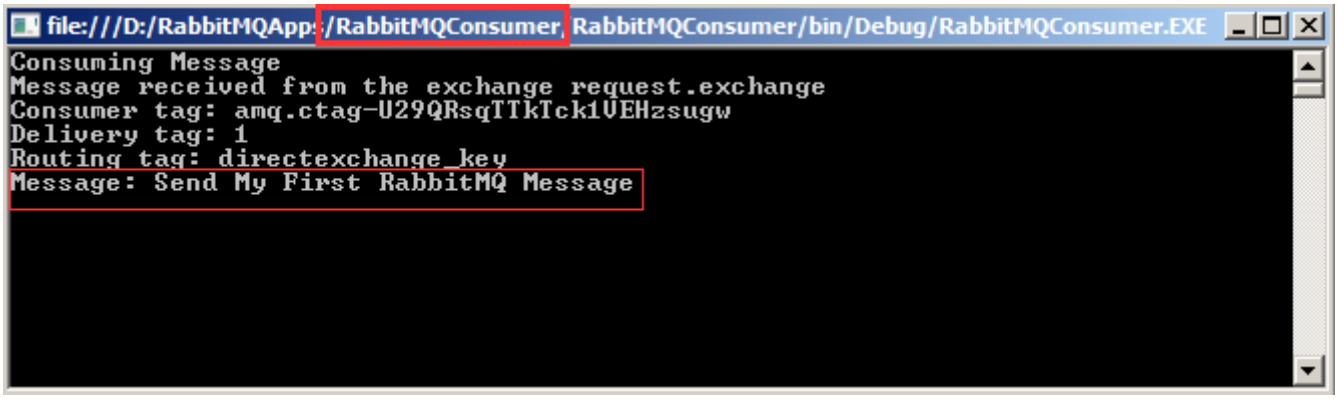
Page 1 of 1 - Filter: Regex ? Displaying 1 item , page size up to: 100

Overview			Messages			Message rates			+/-
Name	Features	State	Ready	Unacked	Total	incoming	deliver / get	ack	
request.queue	D	idle	1	0	1	0.00/s	0.00/s	0.00/s	

Add a new queue

After we have push message to (queue) request.queue the console application will start consuming it below is snapshot.

Consumed Message from request.queue



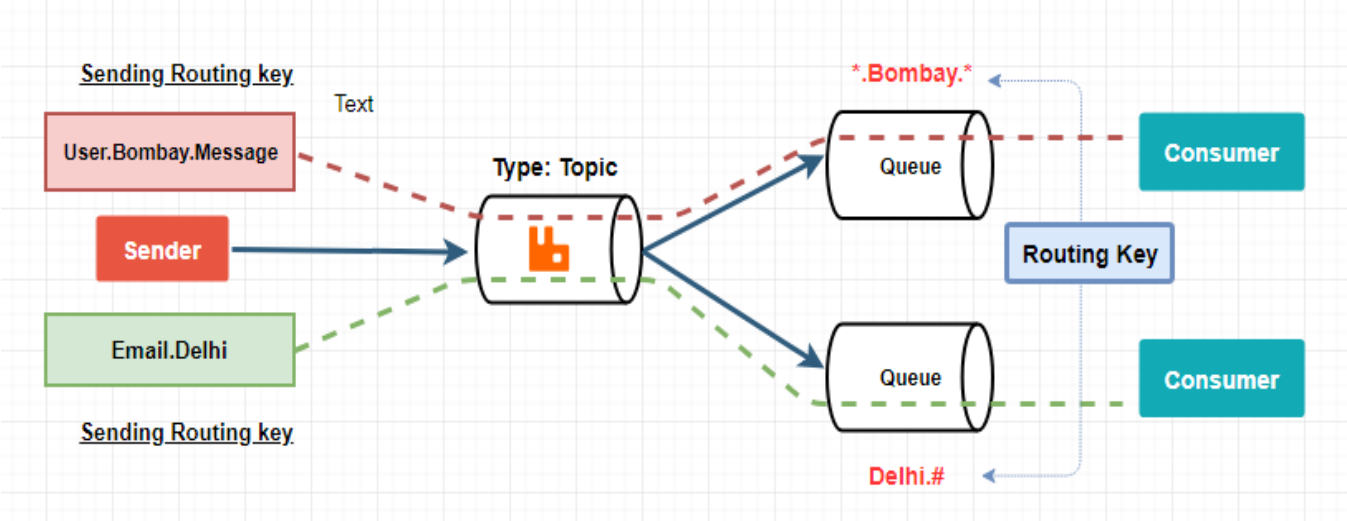
Finally, we have completed consuming Message from RabbitMQ queue.

Conclusion

In this article, we have learned how to Produce and consume RabbitMQ Direct Message Exchanges with .Net Application in step by step way along with that how to connect to RabbitMQ server using RabbitMQ.Client, how to create direct exchange, queue and bindings.

Using RabbitMQ Topic Message Exchanges with .Net Application

In this article, we are going to use Topic Message Exchanges and push messages into RabbitMQ using .Net Application and RabbitMQ.Client and read messages from RabbitMQ using .Net Application and RabbitMQ.Client in step by step way.



What is the Topic Exchange?

The topic exchange does a wildcard match between the routing key and the routing pattern specified in the binding.

In topic exchange, the routing key must not be a simple text such as "Bombay" it must be words with delimited by dots such as "*.bombay.*" or "#.bombay" or "Bombay.#".

For example :- I have 2 queues one for Bombay and other for Delhi then the user must send routing key which will match the pattern of routing key then only that message will be added to queue, else message will be lost.

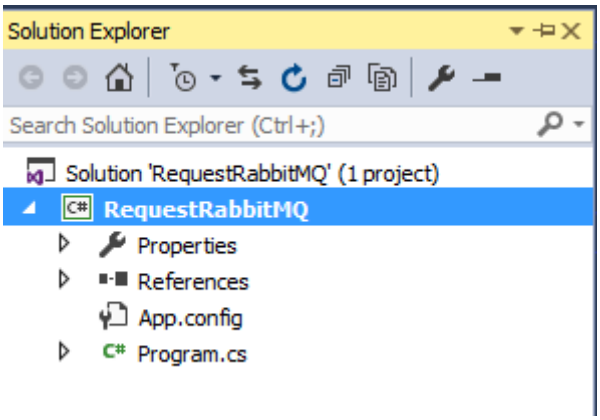
Note: -

* (star) can substitute for exactly one word.

(hash) can substitute for zero or more words.

Creating RequestRabbitMQ Application

Let's Create a simple console application with Name "**RequestRabbitMQ**".

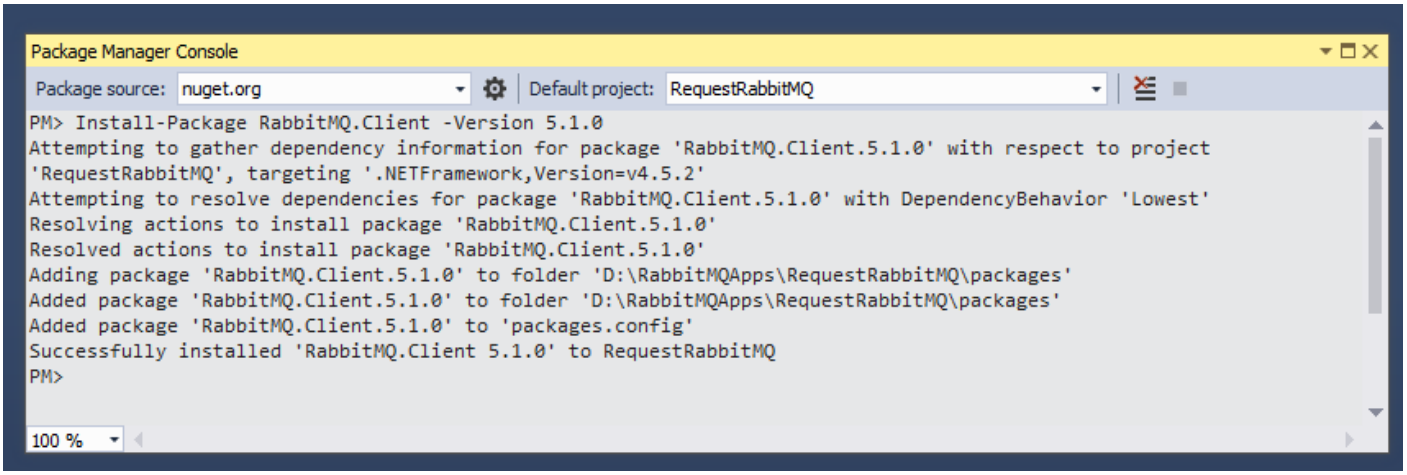


After creating application next we are going to add "**RabbitMQ.Client**" NuGet package.

Adding RabbitMQ.Client NuGet Package

In this part for creating a connection with the RabbitMQ server to create request, we need to add "RabbitMQ.Client" package from NuGet Package.

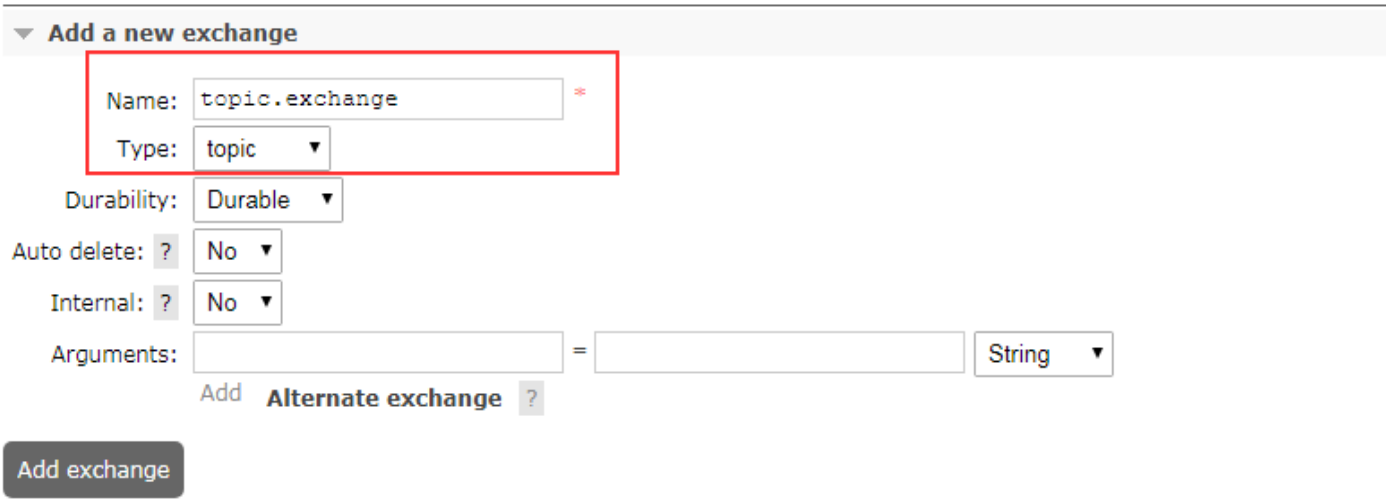
Command to install: - Install-Package RabbitMQ.Client -Version 5.1.0



After installing NuGet package of "**RabbitMQ.Client**" next we are going to create an exchange from web admin console.

Adding Topic Exchange

Go to http://localhost:15672/#/exchanges , name exchange as "**topic.exchange**" after entering name next, we select Type as "**topic**" and click on add exchange button to create.



After adding "**topic.exchange**" next we are going to Add 2 Queue.

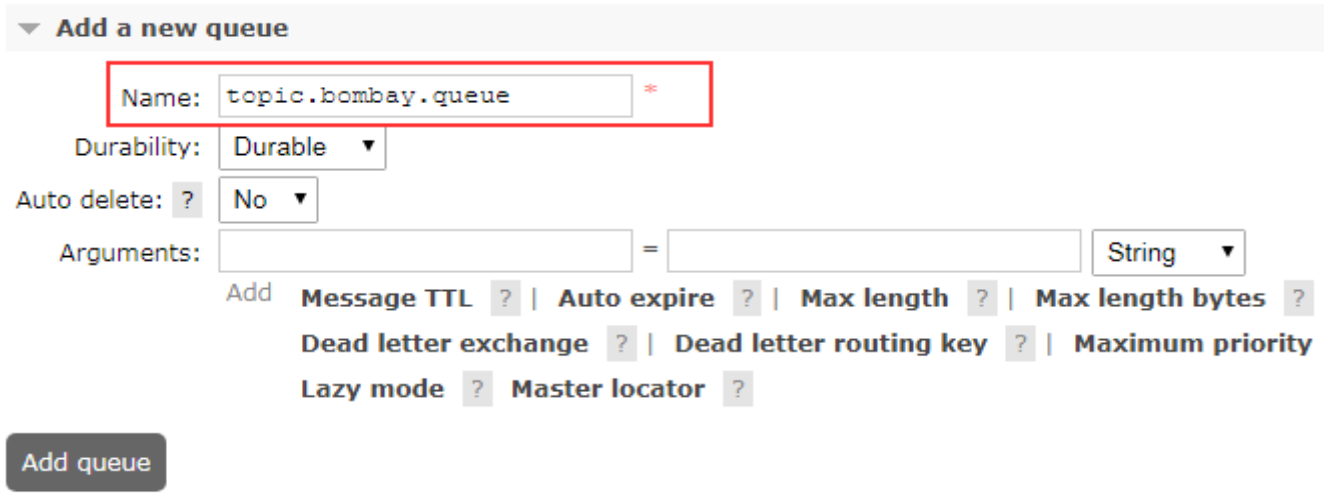
Adding queue

In this part we are going to create 2 queues with different routing key but for same "**topic.exchange**".

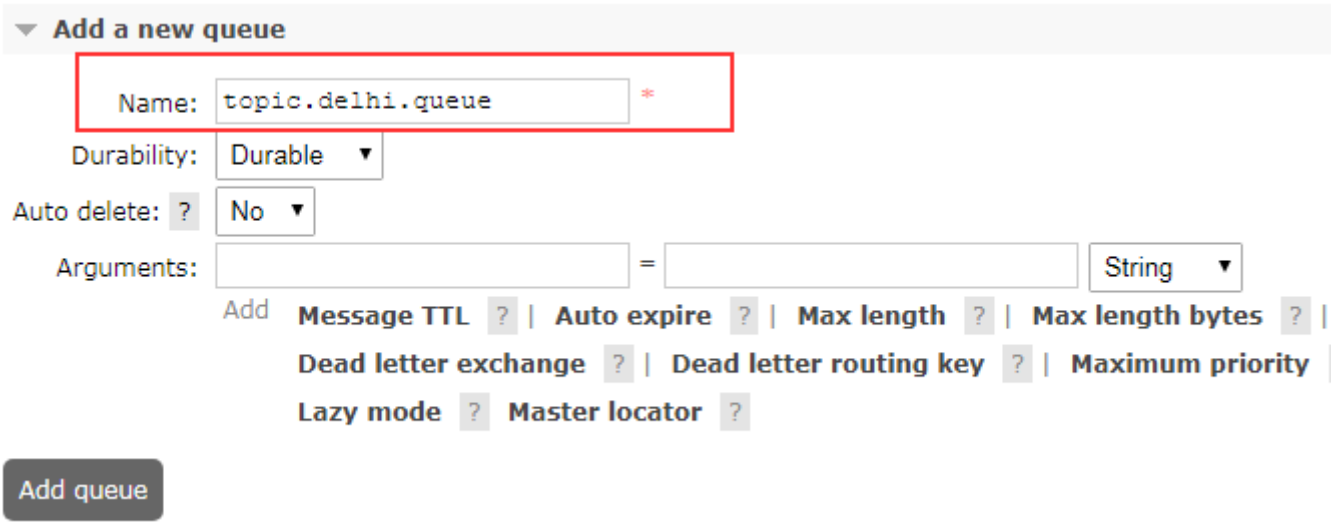
Go to http://localhost:15672/#/queues

1. topic.bombay.queue
2. topic.delhi.queue

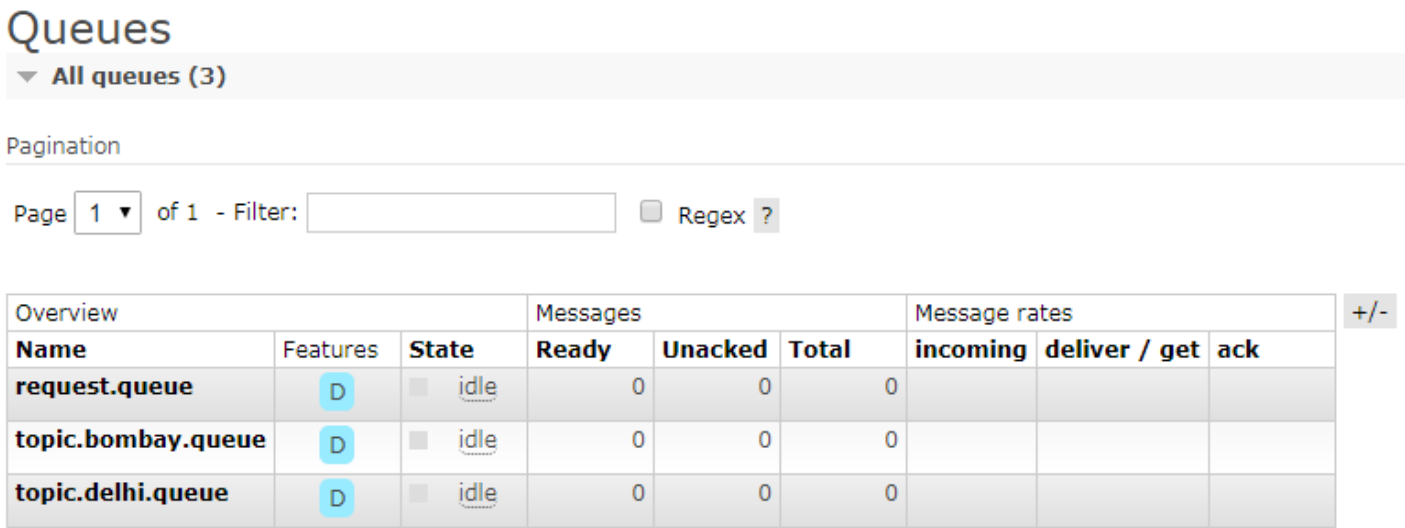
Adding first queue with name “topic.bombay.queue”.



Adding the second queue with name “topic.delhi.queue”.



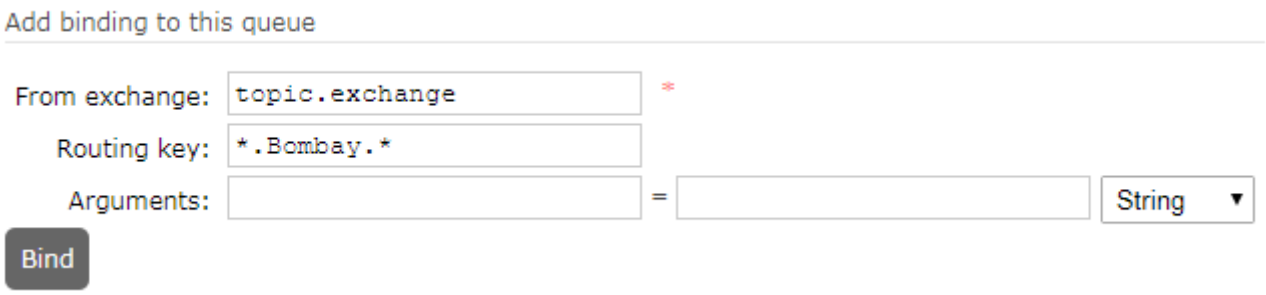
After adding queue is View of the queues which we have added.



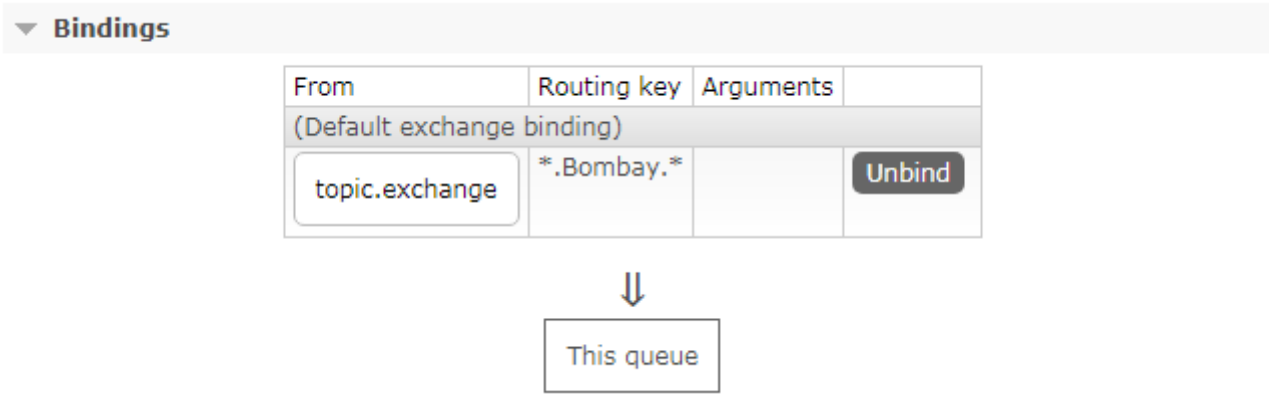
After adding queue next we are going to binding queue with "**topic.exchange**".

Binding the topic.bombay.queue with topic.exchange

In this part, we are binding **topic.exchange** with a **topic.bombay.queue** using a pattern of unique routing key "***.Bombay.***".

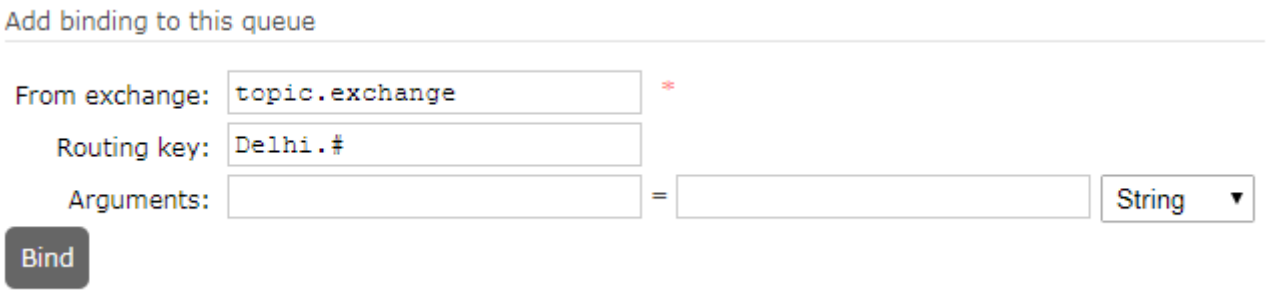


Snapshot of binding

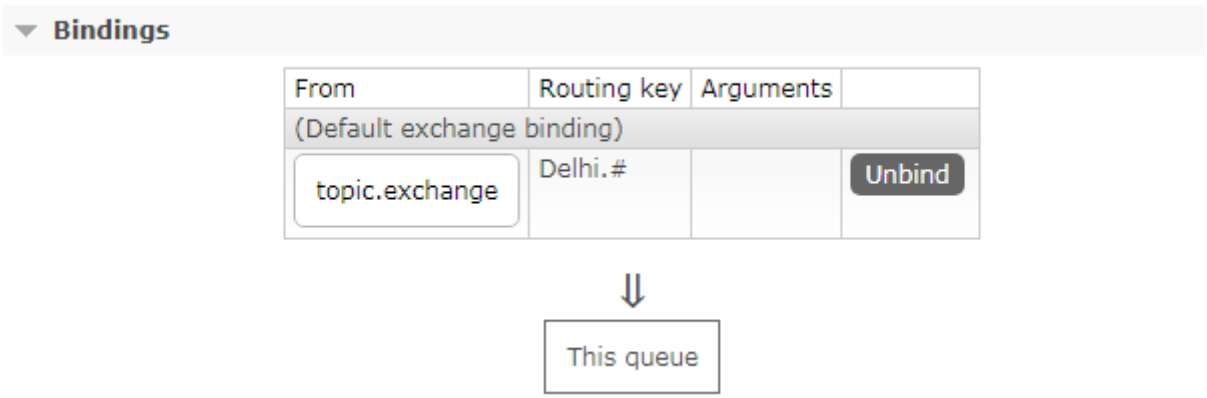


Binding the topic.delhi.queue with topic.exchange

In this part, we are binding **topic.exchange** with a **topic.delhi.queue** using a pattern of unique routing key "**Delhi.#**".



Snapshot of binding



After completing with binding next we are going to publish message

Adding a Topicmessages Class

we have created a "Topicmessage" name class in this class we are going to create request and push to RabbitMQ.

First, we have declared Username, Password and HostName as constant. After that, we have created a method with name "**SendMessage**" in that message we have created a connection to RabbitMQ server using RabbitMQ.Client after creating connection next we have passed credentials along with HostName to connectionFactory. Next, we have written a simple message "**Message from Topic Exchange 'Bombay'**" and got it in bytes array form, finally, we are going assign all these values to a BasicPublish method of "**RabbitMQ.Client**"

Routing pattern: - "any text .Bombay. any text".

Examples of routing key: -

"Order.Bombay.Pizza",

"Book.Bombay.Hotels",

"Visit.Bombay.Parks",

"List.Bombay.Colleges".

The parameter passed to it

Exchange: "topic.exchange"

Routing key: "Message.Bombay.Email"

Code Snippet

```
    public class Topicmessages
    {
        private const string UserName = "guest";
        private const string Password = "guest";
        private const string HostName = "localhost";

        public void SendMessage()
        {
            //Main entry point to the RabbitMQ .NET AMQP client
            var connectionFactory = new RabbitMQ.Client.ConnectionFactory()
            {
                UserName = UserName,Password = Password,HostName = HostName
            };

            var connection = connectionFactory.CreateConnection();
            var model = connection.CreateModel();
            var properties = model.CreateBasicProperties();
            properties.Persistent = false;

      byte[] messagebuffer = Encoding.Default.GetBytes("Message from Topic Exchange 'Bombay' ");
      model.BasicPublish("topic.exchange", "Message.Bombay.Email", properties, messagebuffer);
            Console.WriteLine("Message Sent From :- topic.exchange ");
            Console.WriteLine("Routing Key :- Message.Bombay.Email");
            Console.WriteLine("Message Sent");
        }
    }
```

Main Code snippet

```
using System;
namespace RequestRabbitMQ
{
    class Program
    {
        static void Main(string[] args)
        {
            Topicmessages topicmessages = new Topicmessages();
            topicmessages.SendMessage();
            Console.ReadLine();
        }
    }
}
```

After completing entire process let's save the application and run after running the application you will see a Message sent a message on a console just for notification it means we have successfully published a message to "topic.bombay.queue".

Published Message to "topic.bombay.queue"

Now Let's See queue status "request.queue"

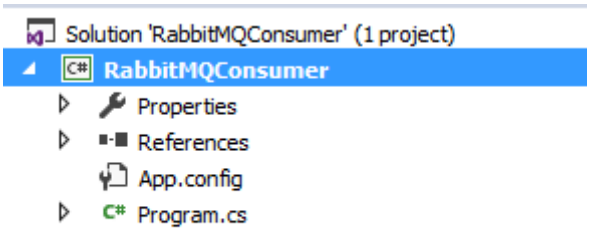
If you see Queues status you will see Ready "1" which means we have successfully published a message to "**topic.bombay.queue**".

Overview			Messages			Message rates			+/-
Name	Features	**State**	**Ready**	**Unacked**	**Total**	**incoming**	**deliver / get**	**ack**	
request.queue	D	idle	0	0	0				
topic.bombay.queue	D	idle	1	0	1	0.00/s	0.00/s	0.00/s	
topic.delhi.queue	D	idle	0	0	0				

After publishing a message next we are going to create .Net Console application for consuming message from the queue.

Creating RabbitMQConsumer Application

Let's create another console application for consuming messages from a queue with Name "**RabbitMQConsumer**"

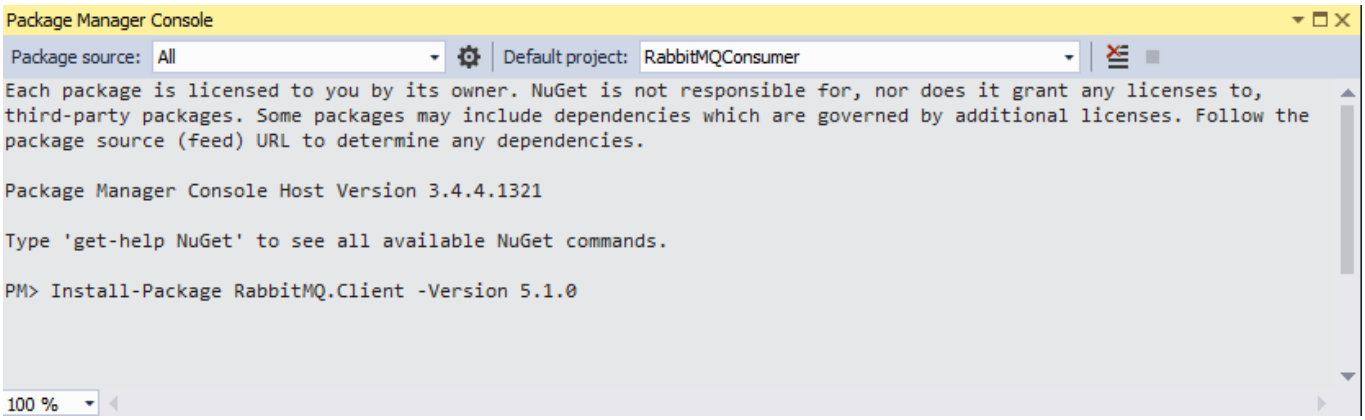


After creating application next we are going to add "**RabbitMQ.Client**" NuGet package.

Adding RabbitMQ.Client NuGet Package

In this part for creating a connection with the RabbitMQ server to create request, we need to add "RabbitMQ.Client" package from NuGet Package.

Command to install: - Install-Package RabbitMQ.Client -Version 5.1.0



After installing RabbitMQ.Client next we are going to add a class with name "**MessageReceiver**".

Code snippet of MessageReceiver class

In this part, we have created MessageReceiver class and this class inherits DefaultBasicConsumer class which is from RabbitMQ.Client next we have to override HandleBasicDeliver method this method receives message body next, we are going to write these messages as we can see in its console.

```
public class MessageReceiver : DefaultBasicConsumer
    {
        private readonly IModel _channel;

        public MessageReceiver(IModel channel)
        {
            _channel = channel;
        }

        public override void HandleBasicDeliver(string consumerTag, ulong deliveryTag, bool
redelivered, string exchange, string routingKey, IBasicProperties properties, byte[] body)
        {
            Console.WriteLine($"Consuming Topic Message");
            Console.WriteLine(string.Concat("Message received from the exchange ", exchange));
            Console.WriteLine(string.Concat("Consumer tag: ", consumerTag));
            Console.WriteLine(string.Concat("Delivery tag: ", deliveryTag));
            Console.WriteLine(string.Concat("Routing tag: ", routingKey));
            Console.WriteLine(string.Concat("Message: ", Encoding.UTF8.GetString(body)));
            _channel.BasicAck(deliveryTag, false);
        }
    }
```

After completing with understanding code snippet of MessageReceiver class next we are going to calls this class in the Main method.

Code snippet of Main Method while consuming "topic.bombay.queue"

In the main method we have created connectionFactory class and passed credentials and Hostname after that we have created connection, next we have created channel and set prefetchCount to 1 such that it tells RabbitMQ not to give more than one message to a worker at a time, Next, we have created instance of MessageReceiver class and passed IModel (channel) to it, in final step we have called "**BasicConsume**"

method and passed queue name to it "**topic.bombay.queue**" along with we have set autoAck to false and passed the messageReceiver instance to it.

```
using System;
using RabbitMQ.Client;

namespace RabbitMQConsumer
{
    class Program
    {
        private const string UserName = "guest";
        private const string Password = "guest";
        private const string HostName = "localhost";

        static void Main(string[] args)
        {
            ConnectionFactory connectionFactory = new ConnectionFactory
            {
                HostName = HostName,
                UserName = UserName,
                Password = Password,
            };

            var connection = connectionFactory.CreateConnection();
            var channel = connection.CreateModel();

            // accept only one unack-ed message at a time
            // uint prefetchSize, ushort prefetchCount, bool global

            channel.BasicQos(0, 1, false);

            // ==== prefetchCount
            // In order to defeat that we can set the prefetch count with the value of 1
            // This tells RabbitMQ not to give more than one message to a worker at a time.
            // Or, in other words, don't dispatch a new message to a worker until it has
            // processed and acknowledged the previous one. Instead, it will dispatch it to t
            // the next worker that is not still busy.

            MessageReceiver messageReceiver = new MessageReceiver(channel);
            channel.BasicConsume("topic.bombay.queue", false, messageReceiver);

            Console.ReadLine();
        }
    }
}
```

Now we have complete working mechanism Let's create request from "**RequestRabbitMQ**" console and consume a message from "**RabbitMQConsumer**" application.

The queue has one Request which we have published

The below snapshot contains only one message in topic.bombay.queue which we have published.

Queues

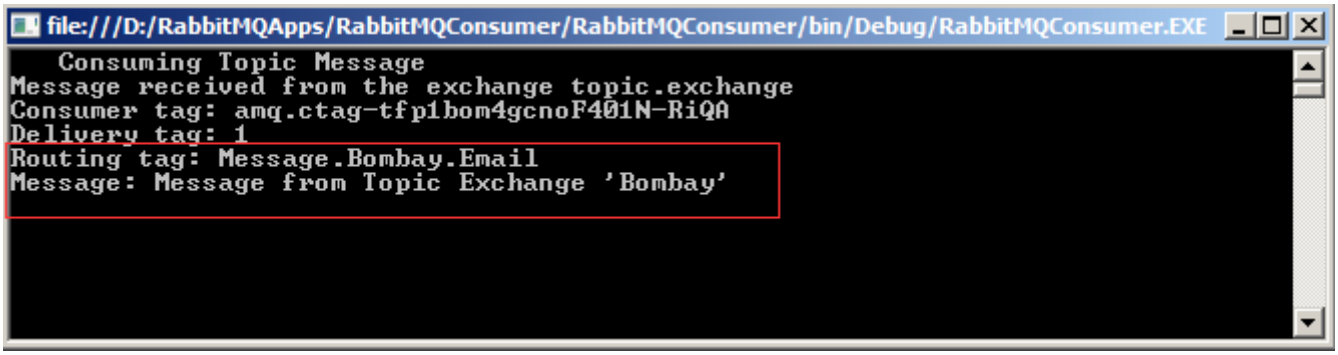
All queues (3)

Pagination

Page 1 of 1 - Filter: Regex ?

Overview			Messages			Message rates			+/-
Name	Features	State	Ready	Unacked	Total	incoming	deliver / get	ack	
request.queue	D	idle	0	0	0				
topic.bombay.queue	D	idle	1	0	1	0.00/s	0.00/s	0.00/s	
topic.delhi.queue	D	idle	0	0	0				

Consumed Message from topic.bombay.queue



After successfully consuming message from "topic.bombay.queue" next we are going to publish a message to another queue which is "topic.delhi.queue".

Published Message to topic.delhi.queue

In topicmessage class, I have just made a small change in routing key "Delhi.TicketBooking" and message which we send to publish a message to "topic.delhi.queue".

Routing pattern: - "Delhi. any text".

Examples of routing key: - "Delhi.Pizza", "Delhi.Hotels", "Delhi.Parks", "Delhi.Colleges".

Code Snippet

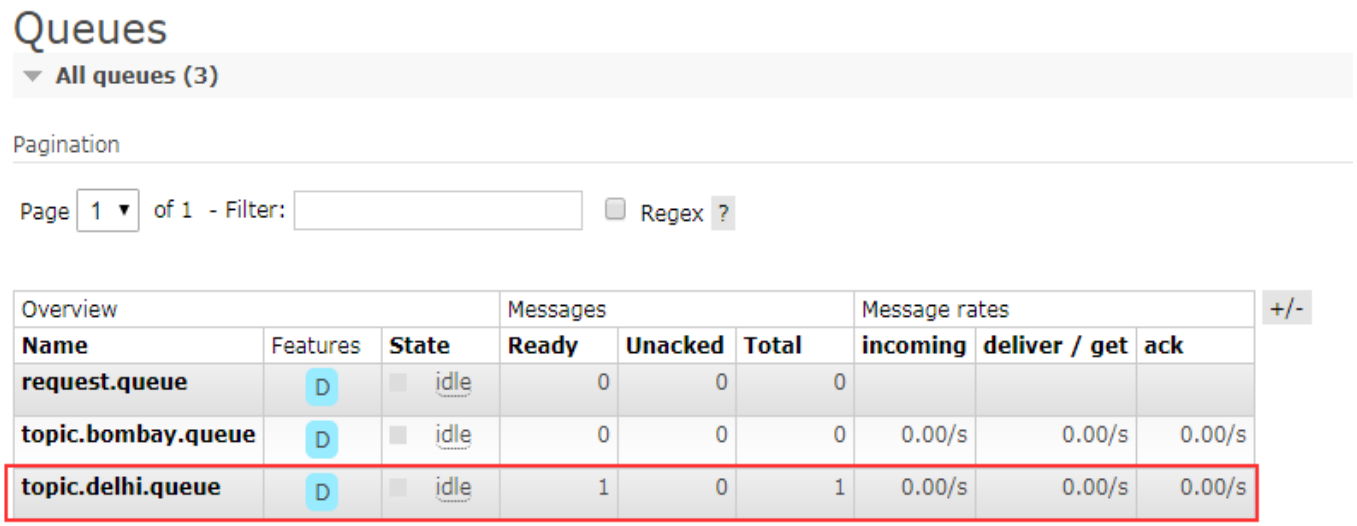
```
public class Topicmessages
  {
      private const string UserName = "guest";
      private const string Password = "guest";
      private const string HostName = "localhost";

      public void SendMessage()
      {
          //Main entry point to the RabbitMQ .NET AMQP client
          var connectionFactory = new RabbitMQ.Client.ConnectionFactory()
          {
              UserName = UserName,
```

```
                Password = Password,
                HostName = HostName
            };

            var connection = connectionFactory.CreateConnection();
            var model = connection.CreateModel();

            var properties = model.CreateBasicProperties();
            properties.Persistent = false;

            byte[] messagebuffer = Encoding.Default.GetBytes("Message from Topic Exchange 'Delhi'
");

            model.BasicPublish("topic.exchange", "Delhi.TicketBooking", properties,
messagebuffer);

            Console.WriteLine("Message Sent From :- topic.exchange ");
            Console.WriteLine("Routing Key :- Delhi.TicketBooking");
            Console.WriteLine("Message Sent");
        }
    }
```

After making changes let's save and run application to publish message to "topic.delhi.queue".

Published Message to "topic.delhi.queue"

The queue has one Request which we have published

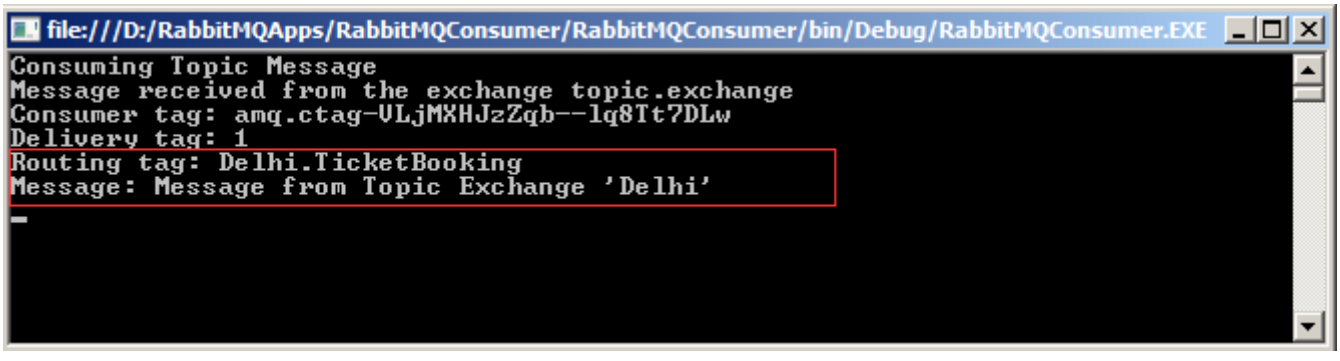


Code snippet of Main Method while consuming "topic.delhi.queue" from RabbitMQConsumer

In this part, I have just changed the queue name to "**topic.delhi.queue**" in RabbitMQConsumer application.

```
using System;
using RabbitMQ.Client;

namespace RabbitMQConsumer
{
    class Program
    {
        private const string UserName = "guest";
        private const string Password = "guest";
        private const string HostName = "localhost";

        static void Main(string[] args)
        {
            ConnectionFactory connectionFactory = new ConnectionFactory
            {
                HostName = HostName,
                UserName = UserName,
                Password = Password,
            };

            var connection = connectionFactory.CreateConnection();
            var channel = connection.CreateModel();

            // accept only one unack-ed message at a time
            // uint prefetchSize, ushort prefetchCount, bool global

            channel.BasicQos(0, 1, false);

            // ==== prefetchCount
            // In order to defeat that we can set the prefetch count with the value of 1
            // This tells RabbitMQ not to give more than one message to a worker at a time.
            // Or, in other words, don't dispatch a new message to a worker until it has
            // processed and acknowledged the previous one. Instead, it will dispatch it to t
            // the next worker that is not still busy.

            MessageReceiver messageReceiver = new MessageReceiver(channel);
            channel.BasicConsume("topic.delhi.queue", false, messageReceiver);
            Console.ReadLine();
        }
    }
}
```

Consumed Message from topic.delhi.queue



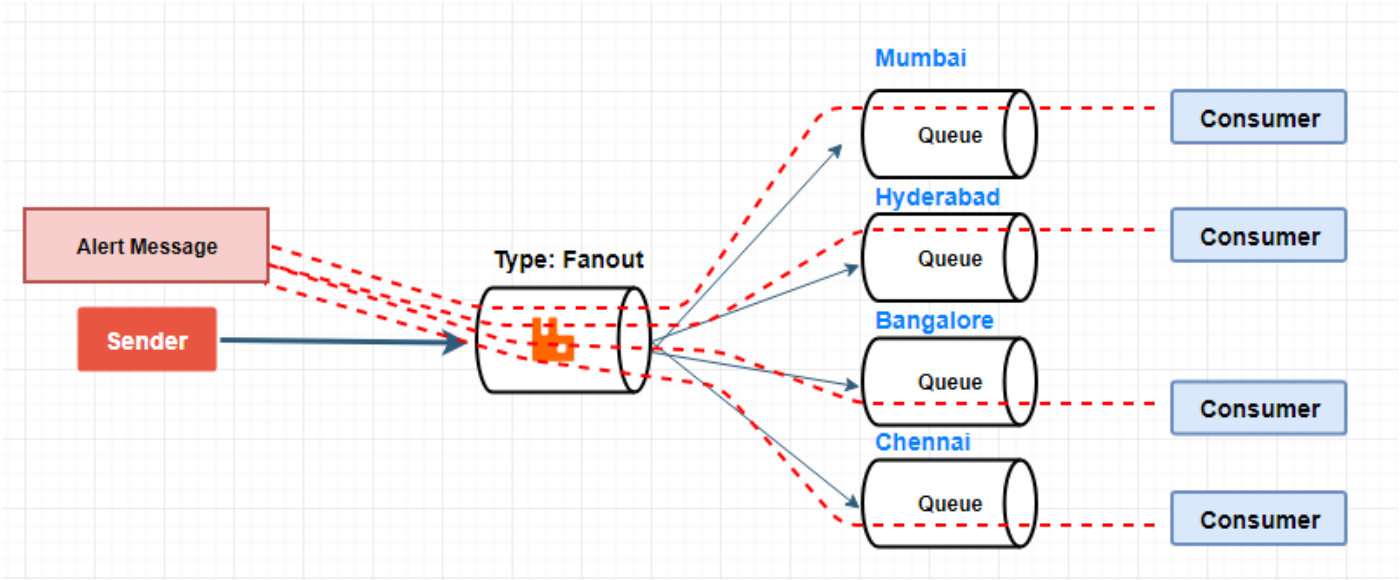
Finally, we have completed consuming Message from "**topic.delhi.queue**" queue.

Conclusion

In this article, we have learned how to use Topic Message Exchanges and how to create exchange and queue for topic exchange and how to push messages into RabbitMQ using .Net Application and RabbitMQ.Client and read messages from RabbitMQ using .Net Application and RabbitMQ.Client in step by step way.

Using RabbitMQ Fanout Message Exchanges with .Net Application

In this article, we are going to use Fanout Message Exchanges and push messages into RabbitMQ using .Net Application and RabbitMQ.Client and read messages from RabbitMQ using .Net Application and RabbitMQ.Client in step by step way.



What is a fanout exchange?

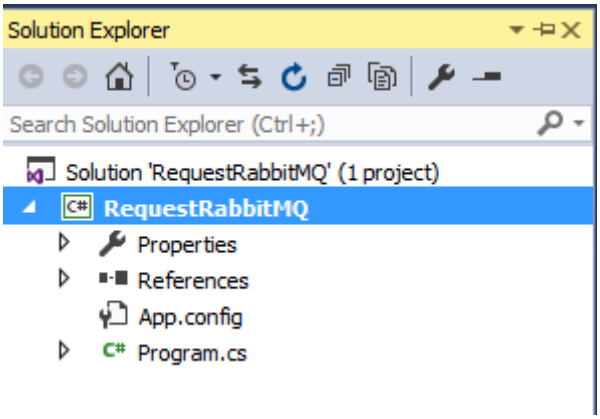
A fanout exchange routes messages to all of the queues that are bound to it.

This exchange is used when you want to publish a common message to all queue which is connected to the particular exchange and in fanout exchange **routing key** is ignored.

e.g. if a company has updated some guidelines and you want push guideline all branches that time you can use fanout exchange.

Creating RequestRabbitMQ Application

Let's Create a simple console application with Name "**RequestRabbitMQ**".

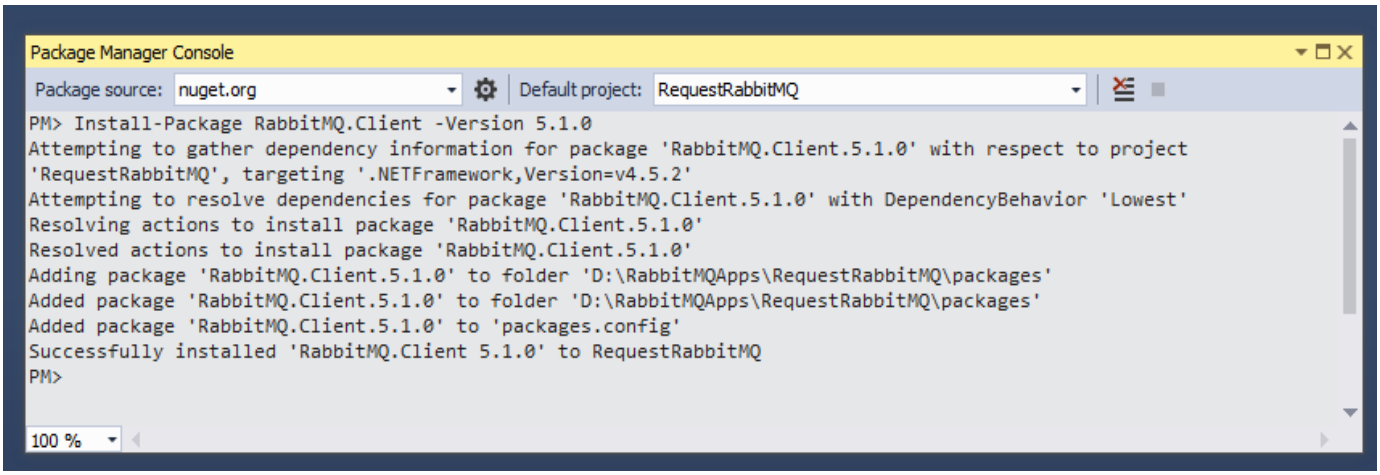


After creating application next we are going to add "**RabbitMQ.Client**" NuGet package.

Adding RabbitMQ.Client NuGet Package

In this part for creating a connection with the RabbitMQ server to create request, we need to add "RabbitMQ.Client" package from NuGet Package.

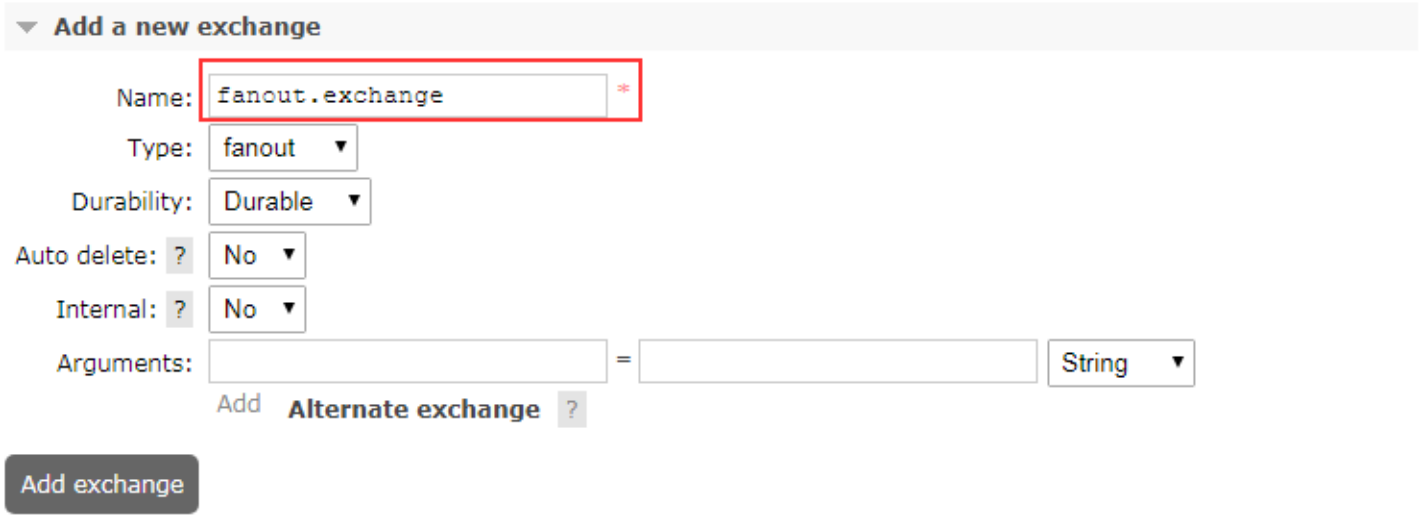
Command to install: - Install-Package RabbitMQ.Client -Version 5.1.0



After installing NuGet package of "**RabbitMQ.Client**" next we are going to create an exchange from web admin console.

Adding Fanout Exchange

Go to http://localhost:15672/#/exchanges , name exchange as "**fanout.exchange**" after entering name next, we select Type as "**fanout**" and click on add exchange button to create.



After adding "**fanout.exchange**" next we are going to Add 4 Queue and bind it to same exchange.

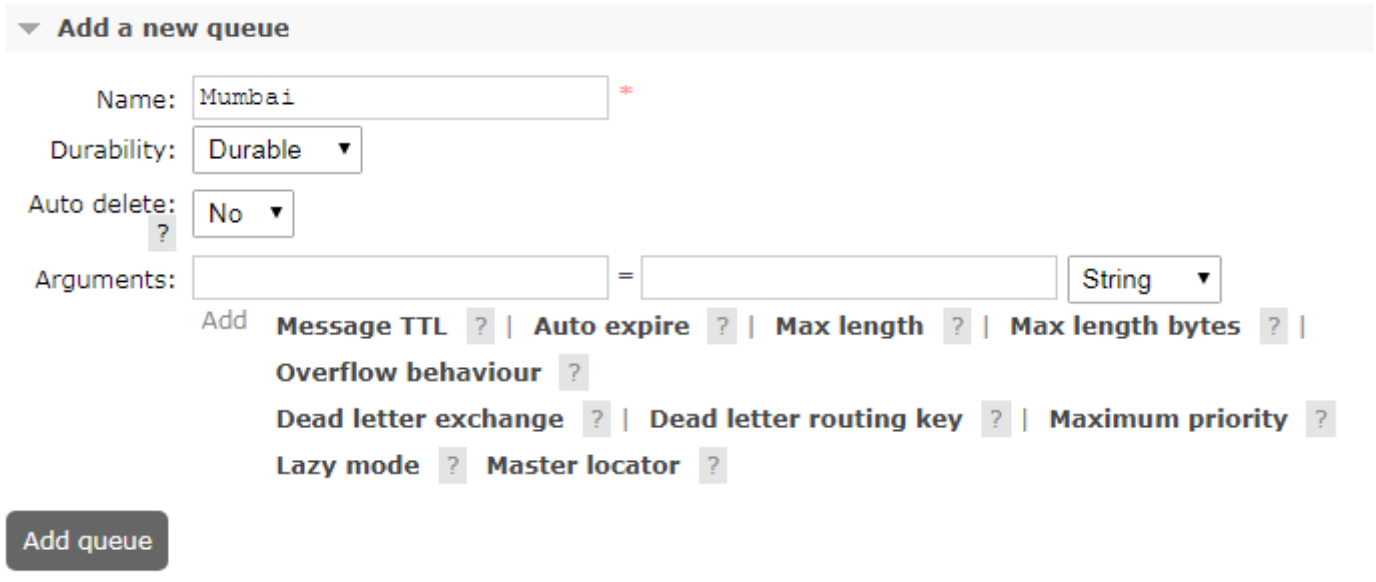
Adding queue

In this part we are going to create 4 queues with different routing key but for same "**fanout.exchange**".

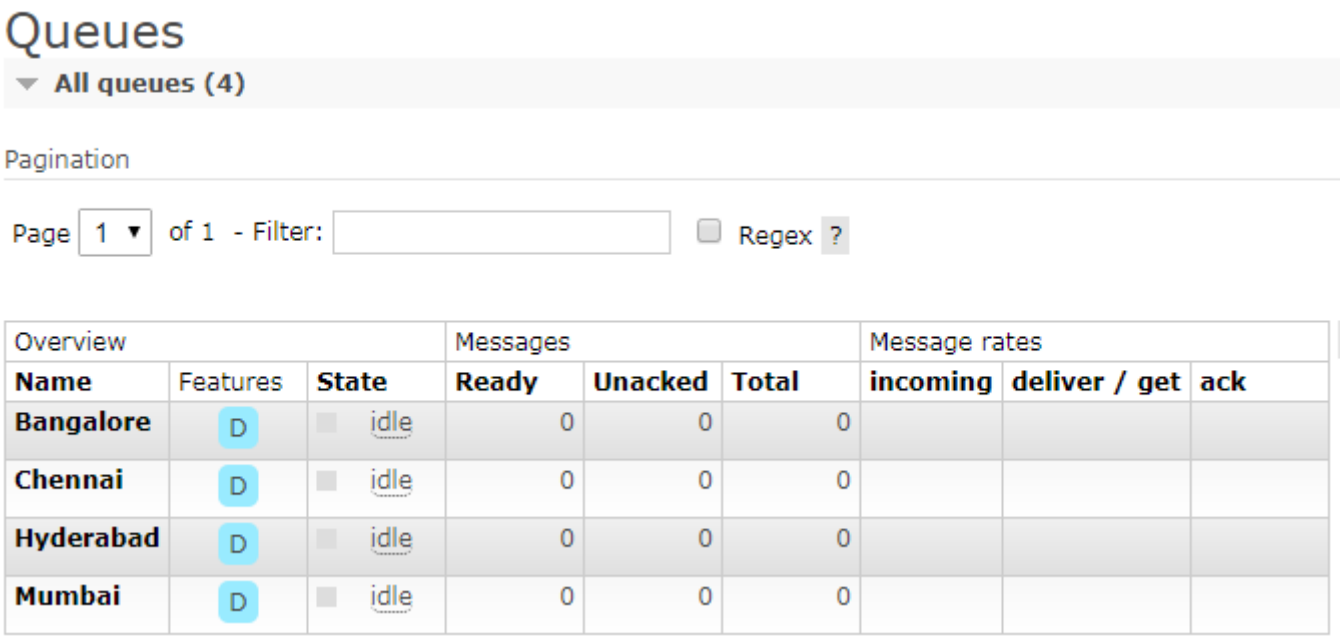
Go to http://localhost:15672/#/queues

1. Mumbai
2. Hyderabad
3. Bangalore
4. Chennai

Adding the first queue with name "**Mumbai**".



In a similar way, I have added rest of queues as shown in below snapshot.

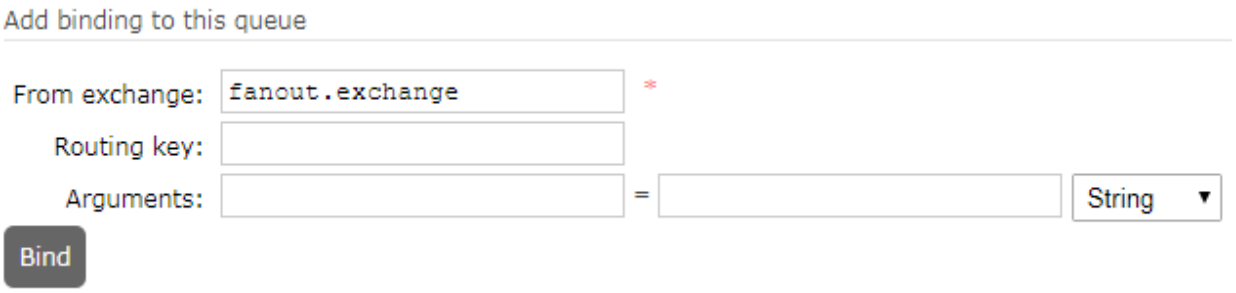


After adding all queues next we are going to bind queues with "**fanout.exchange**".

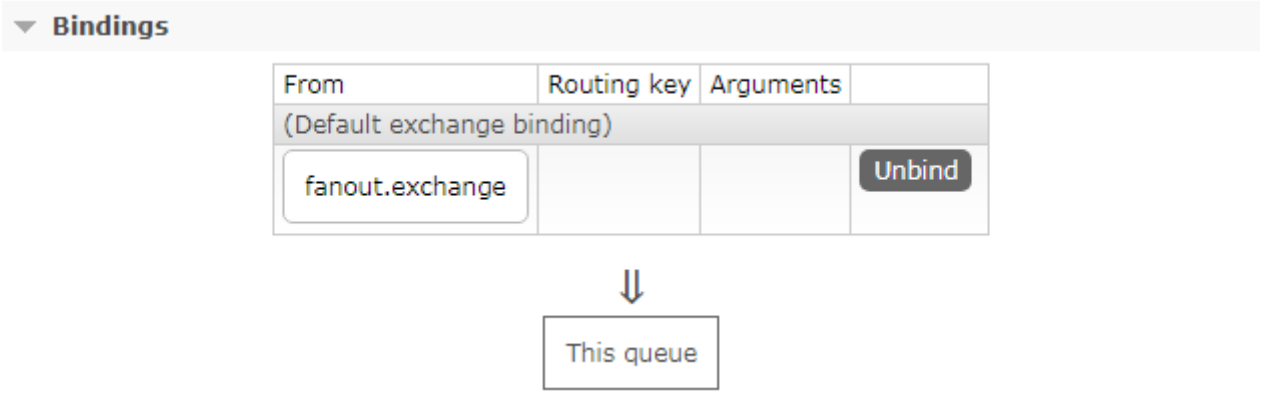
Binding the Queues (Bangalore, Chennai, Hyderabad, Mumbai) with fanout.exchange

In this part, we are binding **fanout.exchange** with all queues (Bangalore, Chennai, Hyderabad, Mumbai).

First queue we are going to bind is Bangalore.



Snapshot of binding



An example is for Bangalore queue in a similar way we are going to do for all rest of queues which are there of fanout exchange (Chennai, Hyderabad, Mumbai).

After completing with binding next we are going to publish message

Adding a Fanoutmessages Class

we have created a "fanoutmessage" name class in this class we are going to create request and push to RabbitMQ.

First, we have declared Username, Password and HostName as constant. After that, we have created a method with name "**SendMessage**" in that message we have created a connection to RabbitMQ server using RabbitMQ.Client after creating connection next we have passed credentials along with HostName to connectionFactory. Next, we have written a simple message "**Message is of fanout Exchange type**" and got it in bytes array form, finally, we are going assign all these values to a BasicPublish method of "**RabbitMQ.Client**"

While assigning we are going to set exchange as "**fanout.exchange**" and there will not be routing key for fanout exchange.

Code Snippet

```
using System;
using RabbitMQ.Client;
using System.Text;

namespace RequestRabbitMQ
{
    public class Fanoutmessages
    {
        private const string UserName = "guest";
        private const string Password = "guest";
        private const string HostName = "localhost";

        public void SendMessage()
        {
            //Main entry point to the RabbitMQ .NET AMQP client
            var connectionFactory = new RabbitMQ.Client.ConnectionFactory()
            {
                UserName = UserName,
                Password = Password,
                HostName = HostName
            };

            var connection = connectionFactory.CreateConnection();
            var model = connection.CreateModel();

            var properties = model.CreateBasicProperties();
            properties.Persistent = false;


            byte[] messagebuffer = Encoding.Default.GetBytes("Message is of fanout Exchange
type");
            model.BasicPublish("fanout.exchange", "", properties, messagebuffer);
            Console.WriteLine("Message Sent From :- fanout.exchange ");
```

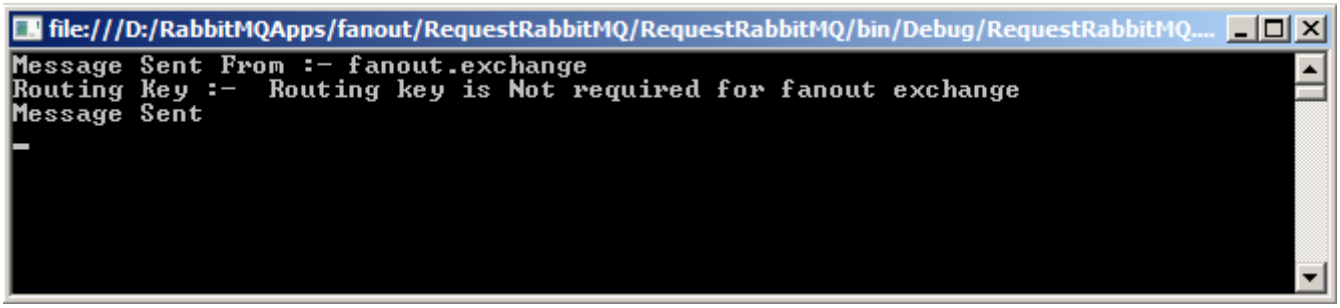
```
            Console.WriteLine("Routing Key :-  Routing key is Not required for fanout exchange");
            Console.WriteLine("Message Sent");
        }
    }
}
```

Main Code snippet

```
using System;
namespace RequestRabbitMQ
{
    class Program
    {
        static void Main(string[] args)
        {
            Fanoutmessages fanoutmessages = new Fanoutmessages();
            fanoutmessages.SendMessage();
            Console.ReadLine();
        }
    }
}
```

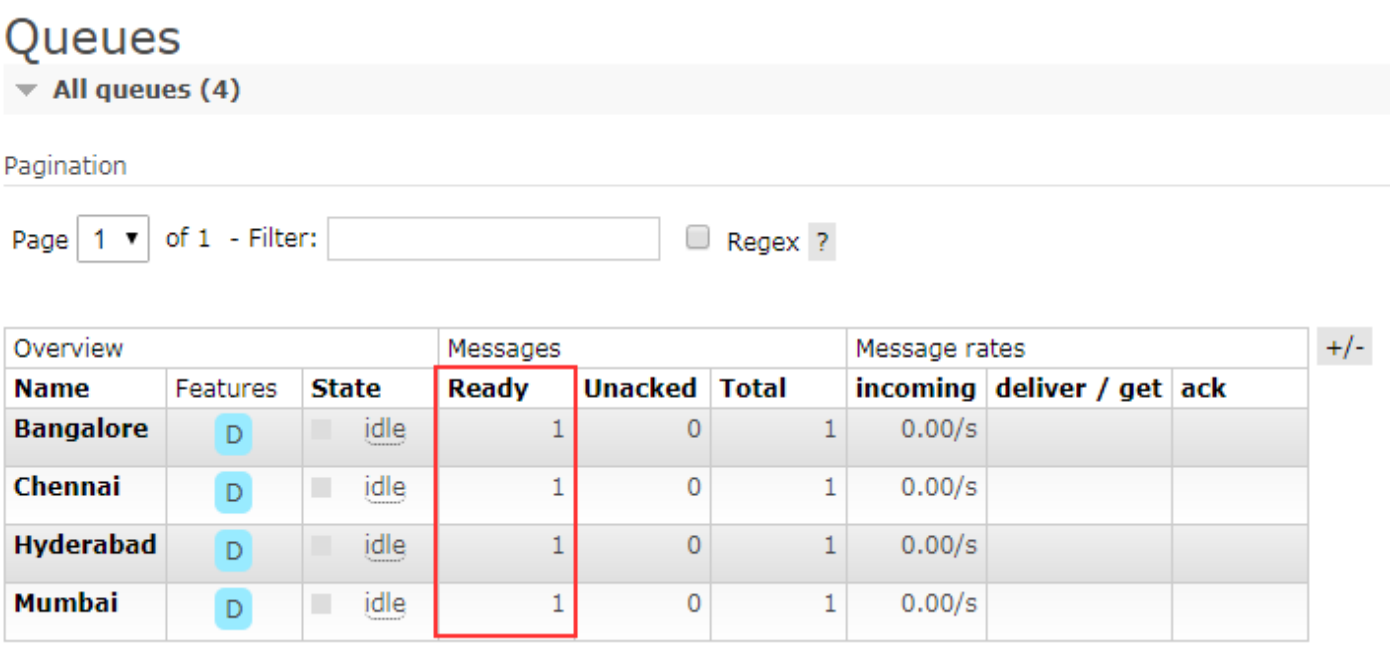
After completing entire process let's save the application and run after running the application you will see a Message sent a message on a console just for notification it means we have successfully published a message to all queues of "fanout.exchange" exchange.

Published Message to all queues of "fanout.exchange"



Now Let's See queue status (Bangalore, Chennai, Hyderabad, Mumbai) queue

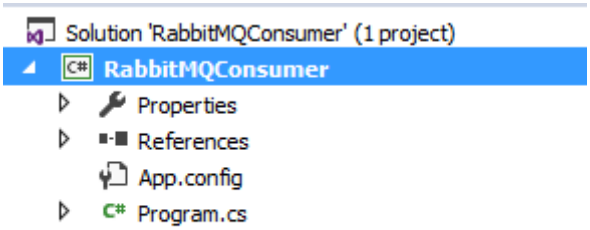
If you see Queues status you will see Ready "1" which means we have successfully published a message to all queues of fanout exchanges.



After publishing a message next we are going to create .Net Console application for consuming message from the queue.

Creating RabbitMQConsumer Application

Let's create another console application for consuming messages from a queue with Name "**RabbitMQConsumer**"

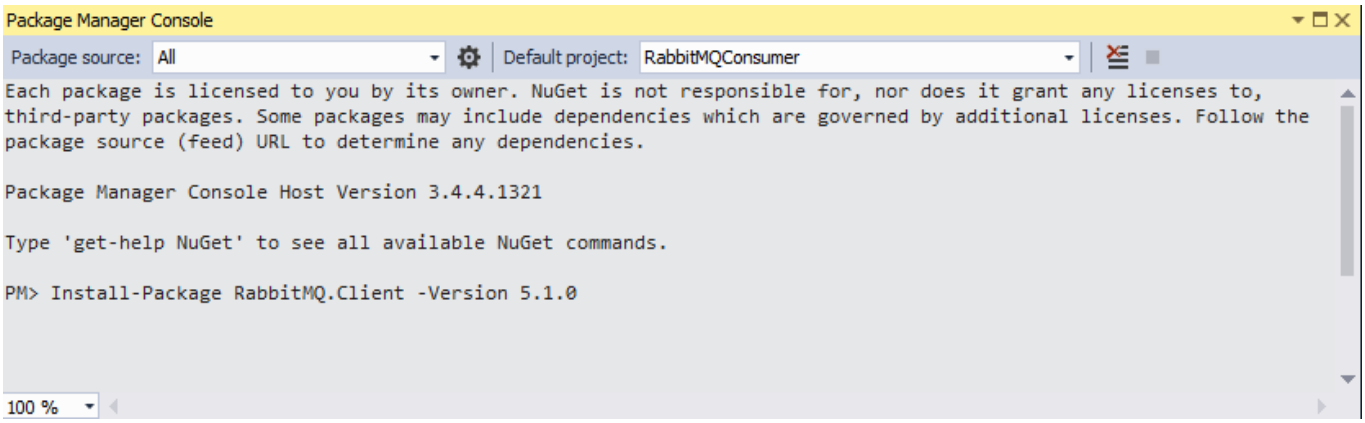


After creating application next we are going to add "**RabbitMQ.Client**" NuGet package.

Adding RabbitMQ.Client NuGet Package

In this part for creating a connection with the RabbitMQ server to create request, we need to add "RabbitMQ.Client" package from NuGet Package.

Command to install: - Install-Package RabbitMQ.Client -Version 5.1.0



After installing RabbitMQ.Client next we are going to add a class with name "**MessageReceiver**".

Code snippet of MessageReceiver class

In this part, we have created MessageReceiver class and this class inherits DefaultBasicConsumer class which is from RabbitMQ.Client next we have to override HandleBasicDeliver method this method receives message body next, we are going to write these messages as we can see in its console.

```
public class MessageReceiver : DefaultBasicConsumer
    {
        private readonly IModel _channel;

        public MessageReceiver(IModel channel)
        {
            _channel = channel;
        }

        public override void HandleBasicDeliver(string consumerTag, ulong deliveryTag, bool
redelivered, string exchange, string routingKey, IBasicProperties properties, byte[] body)
        {
            Console.WriteLine($"Consuming fanout Message");
            Console.WriteLine(string.Concat("Message received from the exchange ", exchange));
            Console.WriteLine(string.Concat("Consumer tag: ", consumerTag));
            Console.WriteLine(string.Concat("Delivery tag: ", deliveryTag));
            Console.WriteLine(string.Concat("Routing tag: ", routingKey));
            Console.WriteLine(string.Concat("Message: ", Encoding.UTF8.GetString(body)));
            _channel.BasicAck(deliveryTag, false);
        }
    }
```

After completing with understanding code snippet of MessageReceiver class next we are going to calls this class in the Main method.

Code snippet of Main Method while consuming "Mumbai" queue

In the main method we have created connectionFactory class and passed credentials and Hostname after that we have created connection, next we have created channel and set prefetchCount to 1 such that it tells RabbitMQ not to give more than one message to a worker at a time, Next, we have created instance of MessageReceiver class and passed IModel (channel) to it, in final step we have called "**BasicConsume**" method and passed queue name to it "**Mumbai**" along with we have set autoAck to false and passed the messageReceiver instance to it.

```
        // uint prefetchSize, ushort prefetchCount, bool global

        channel.BasicQos(0, 1, false);

        // ==== prefetchCount
        // In order to defeat that we can set the prefetch count with the value of 1
        // This tells RabbitMQ not to give more than one message to a worker at a time.
        // Or, in other words, don't dispatch a new message to a worker until it has
        // processed and acknowledged the previous one. Instead, it will dispatch it to t
        // he next worker that is not still busy.

        MessageReceiver messageReceiver = new MessageReceiver(channel);
        channel.BasicConsume("Mumbai", false, messageReceiver);

        Console.ReadLine()
    }
```

(extension) string IModel.BasicConsume(string queue, bool autoAck, IBasicConsumer consumer) (+ 4 overloads)
Start a Basic content-class consumer.

```
using System;
using RabbitMQ.Client;
namespace RabbitMQConsumer
{
    class Program
    {
        private const string UserName = "guest";
        private const string Password = "guest";
        private const string HostName = "localhost";

        static void Main(string[] args)
        {
            ConnectionFactory connectionFactory = new ConnectionFactory
            {
                HostName = HostName,
                UserName = UserName,
                Password = Password,
            };

            var connection = connectionFactory.CreateConnection();
            var channel = connection.CreateModel();
            // accept only one unack-ed message at a time
            // uint prefetchSize, ushort prefetchCount, bool global

            channel.BasicQos(0, 1, false);
            // ==== prefetchCount
            // In order to defeat that we can set the prefetch count with the value of 1
            // This tells RabbitMQ not to give more than one message to a worker at a time.
            // Or, in other words, don't dispatch a new message to a worker until it has
            // processed and acknowledged the previous one. Instead, it will dispatch it to t
            // the next worker that is not still busy.
            MessageReceiver messageReceiver = new MessageReceiver(channel);
            channel.BasicConsume("Mumbai", false, messageReceiver);

            Console.ReadLine();
        }
    }
}
```

Now we have complete working mechanism Let's create request from "**RequestRabbitMQ**" console and consume a message from "**RabbitMQConsumer**" application.

The queue has one Request which we have published

The below snapshot shows all queues have one message which we have published using fanout exchange.

Queues

All queues (4)

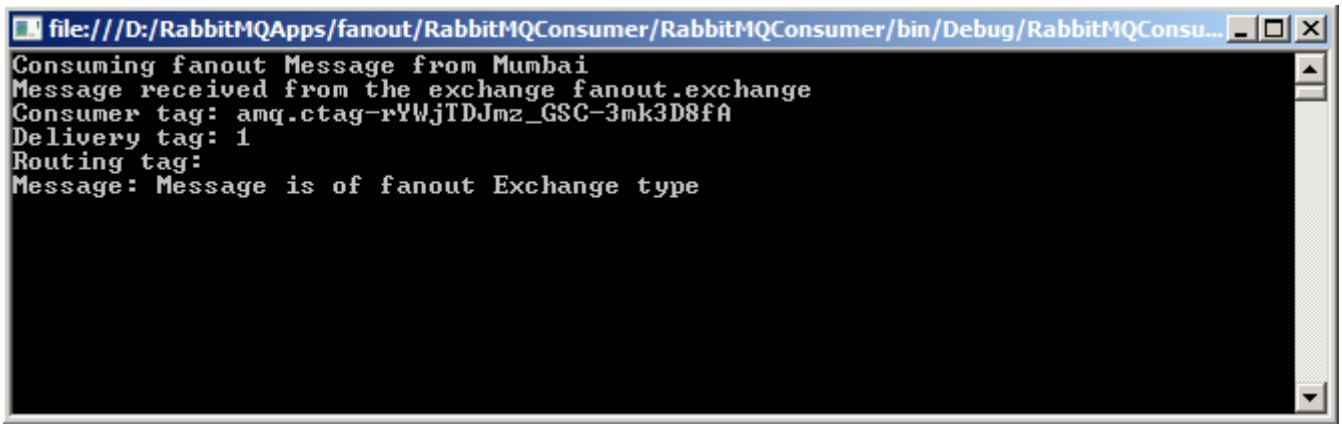
Pagination

Page 1 of 1 - Filter: Regex ?

Overview			Messages			Message rates			+/-
Name	Features	State	Ready	Unacked	Total	incoming	deliver / get	ack	
Bangalore	D	idle	1	0	1	0.00/s			
Chennai	D	idle	1	0	1	0.00/s			
Hyderabad	D	idle	1	0	1	0.00/s			
Mumbai	D	idle	1	0	1	0.00/s			

Consumed Message from Mumbai queue

This message is only consumed from Mumbai queue rest queues are unread till now.



The status of the queue after reading Message from Mumbai queue.

Overview			Messages			Message rates			+/-
Name	Features	State	Ready	Unacked	Total	incoming	deliver / get	ack	
Bangalore	D	idle	1	0	1	0.00/s			
Chennai	D	idle	1	0	1	0.00/s			
Hyderabad	D	idle	1	0	1	0.00/s			
Mumbai	D	idle	0	0	0	0.00/s	0.00/s	0.00/s	

In a similar way, if we read a message from Bangalore queue than just need to make a change in "**queue name**" in **RabbitMQConsumer.**

Consumed Message from Bangalore queue

We have changed just name of the queue from Mumbai to Bangalore. To read a message from Bangalore queue.

```
using System;
using RabbitMQ.Client;

namespace RabbitMQConsumer
{
    class Program
    {
        private const string UserName = "guest";
        private const string Password = "guest";
        private const string HostName = "localhost";

        static void Main(string[] args)
        {
            ConnectionFactory connectionFactory = new ConnectionFactory
            {
                HostName = HostName,
                UserName = UserName,
                Password = Password,
            };

            var connection = connectionFactory.CreateConnection();
            var channel = connection.CreateModel();

            // accept only one unack-ed message at a time
            // uint prefetchSize, ushort prefetchCount, bool global

            channel.BasicQos(0, 1, false);

            #region MyRegion
            // ==== prefetchCount
            // In order to defeat that we can set the prefetch count with the value of 1
            // This tells RabbitMQ not to give more than one message to a worker at a time.
            // Or, in other words, don't dispatch a new message to a worker until it has
            // processed and acknowledged the previous one. Instead, it will dispatch it to t
            // the next worker that is not still busy.
            #endregion

            MessageReceiver messageReceiver = new MessageReceiver(channel);
            channel.BasicConsume("Bangalore", false, messageReceiver);

            Console.ReadLine();
        }
    }
}
```

Let's save and run application to red message from Bangalore queue.

The status of the queue after reading Message from Bangalore queue.

Overview			Messages			Message rates			+/-
Name	Features	**State**	**Ready**	**Unacked**	**Total**	**incoming**	**deliver / get**	**ack**	
Bangalore	D	idle	0	0	0	0.00/s	0.00/s	0.00/s	
Chennai	D	idle	1	0	1	0.00/s			
Hyderabad	D	idle	1	0	1	0.00/s			
Mumbai	D	idle	0	0	0	0.00/s	0.00/s	0.00/s	

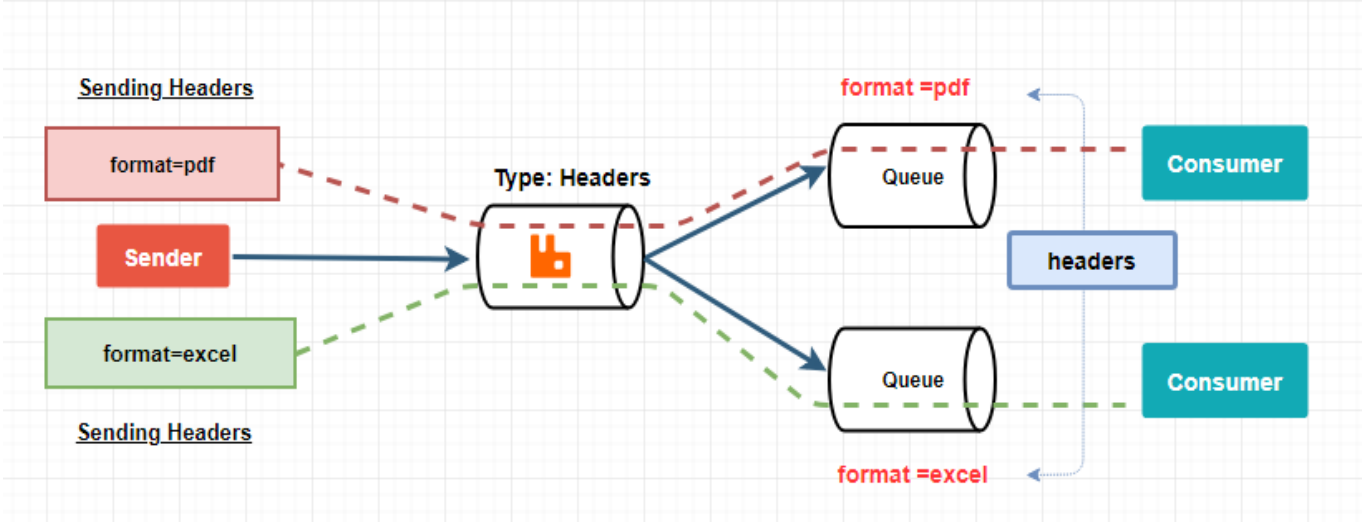
Finally, we have learned how fanout exchange works and how we can publish messages and consume messages from fanout exchange in step by step way.

Conclusion

In this article, we have learned how to use Fanout Message Exchanges and how to create exchange and queue for Fanout exchange and how to push messages into RabbitMQ using .Net Application and RabbitMQ.Client and read messages from RabbitMQ using .Net Application and RabbitMQ.Client in step by step way.

Using RabbitMQ Headers Message Exchanges with .Net Application

In this article, we are going to use Headers Message Exchanges and push messages into RabbitMQ using .Net Application and RabbitMQ.Client and read messages from RabbitMQ using .Net Application and RabbitMQ.Client in step by step way.



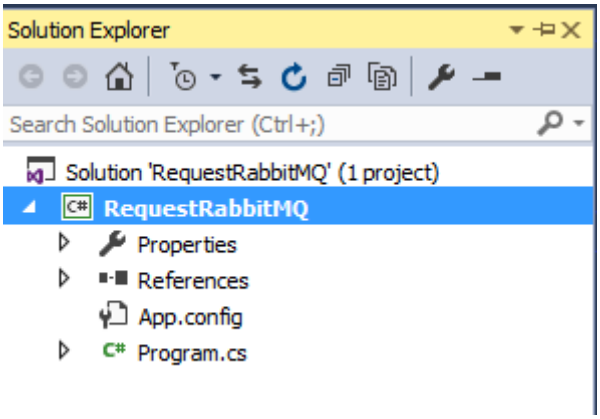
What is a Headers exchange?

Headers exchanges use the message header attributes for routing.

This exchange is used when you want to send a message to queue but this time it will not depend on routing key it will be sent to queue on bases of header attributes.

Creating RequestRabbitMQ Application

Let's Create a simple console application with Name "**RequestRabbitMQ**".

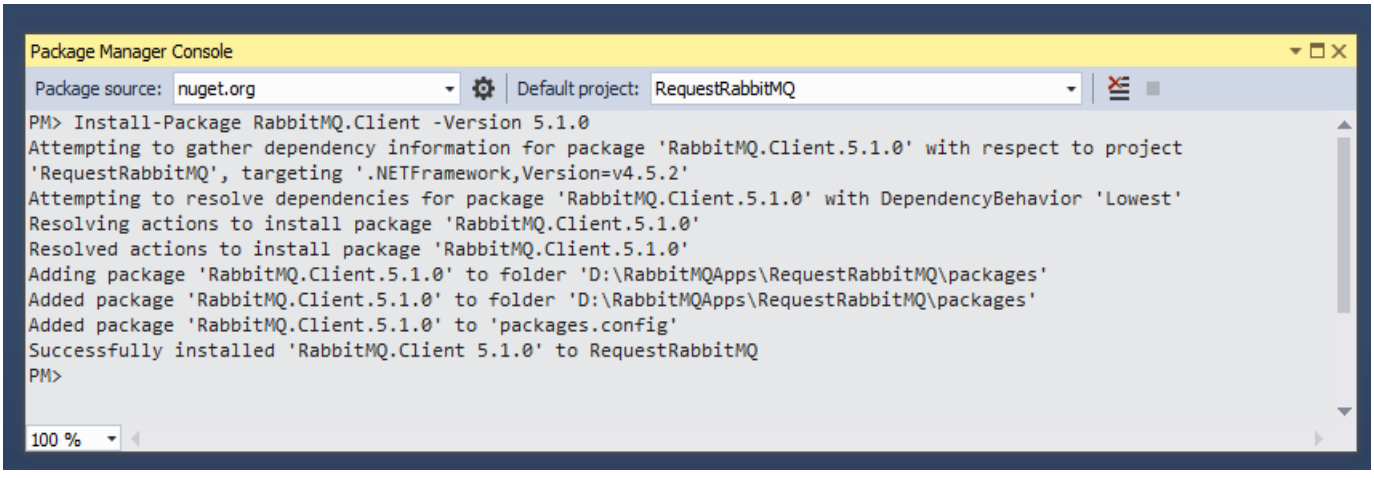


After creating application next we are going to add "**RabbitMQ.Client**" NuGet package.

Adding RabbitMQ.Client NuGet Package

In this part for creating a connection with the RabbitMQ server to create request, we need to add "RabbitMQ.Client" package from NuGet Package.

Command to install: - Install-Package RabbitMQ.Client -Version 5.1.0



After installing NuGet package of "**RabbitMQ.Client**" next we are going to create an exchange from web admin console.

Note: -

Headers exchange routes message based on header values instead of routing keys.

A special argument named x-match has 2 values {all, any} where all is the default value of a headers binding.

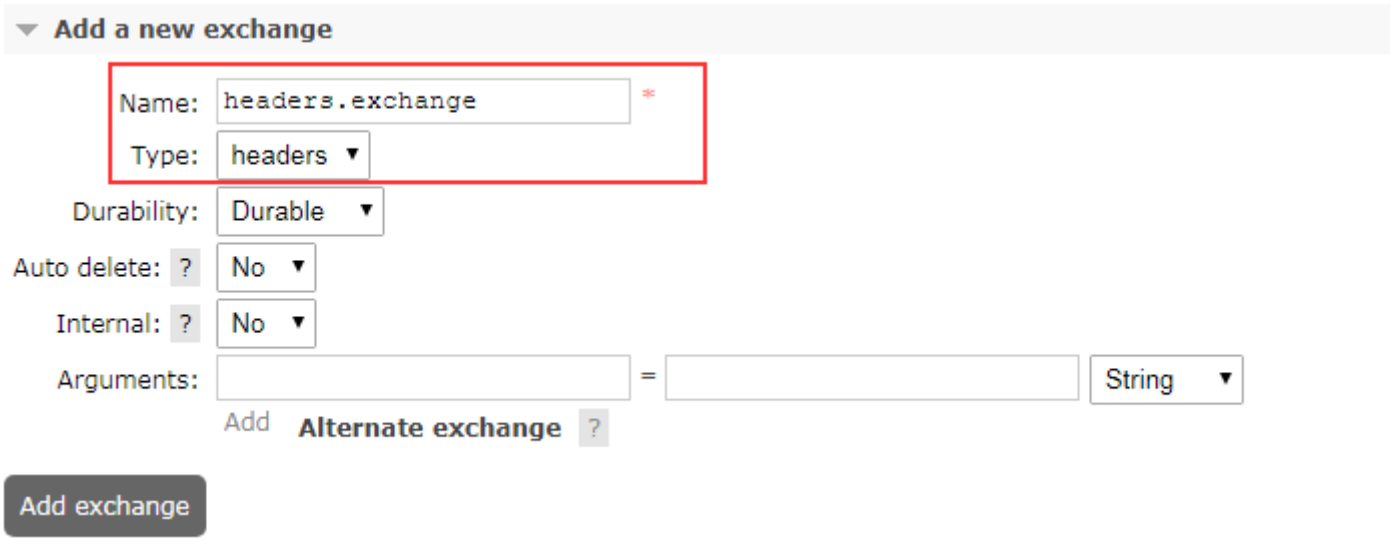
– x-match = all :- means that all the values must match.

– x-match = any :- means just one matching header value is sufficient.

Referenced from: - http://javasampleapproach.com/spring-framework/spring-boot/springboot-rabbitmq-headers-exchange

Adding Fanout Exchange

Go to http://localhost:15672/#/exchanges , name exchange as "**headers.exchange**" after entering name next, we select Type as "**headers**" and click on add exchange button to create.



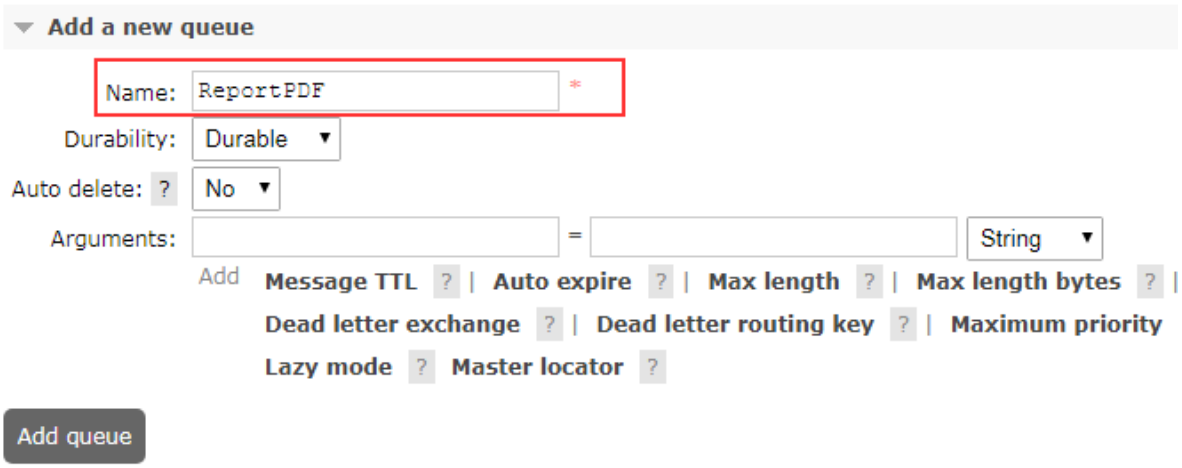
After adding "**headers.exchange**" next we are going to Add 2 Queue and bind it to same exchange.

Adding queue

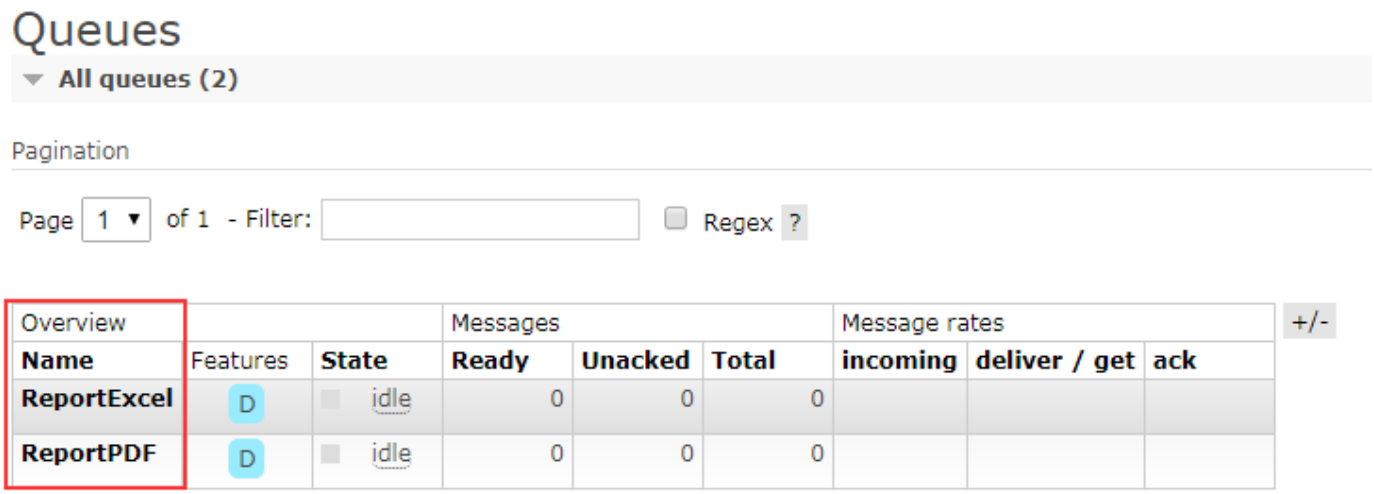
In this part, we are going to create 2 queues without different routing key but for same "**headers.exchange**".

Go to http://localhost:15672/#/queues

1. ReportPDF
2. ReportExcel



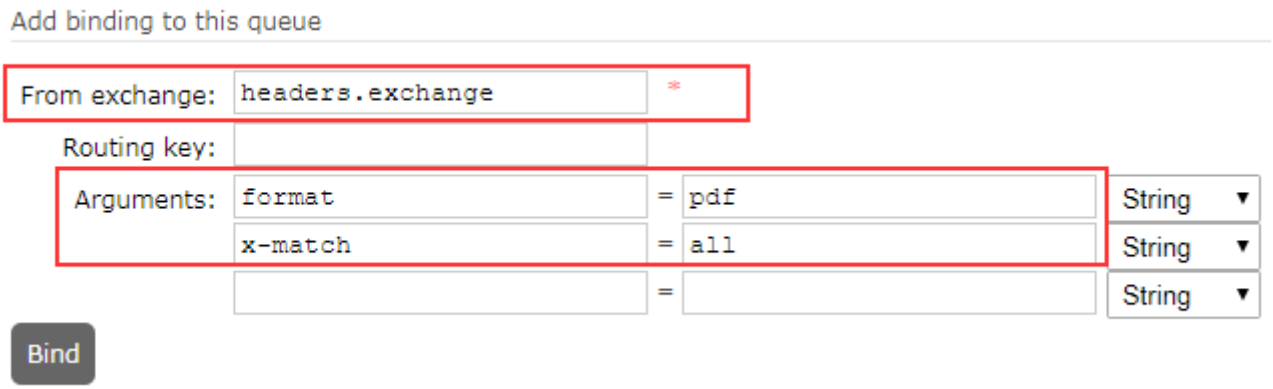
In a similar way, I have added rest of queues as shown in below snapshot.



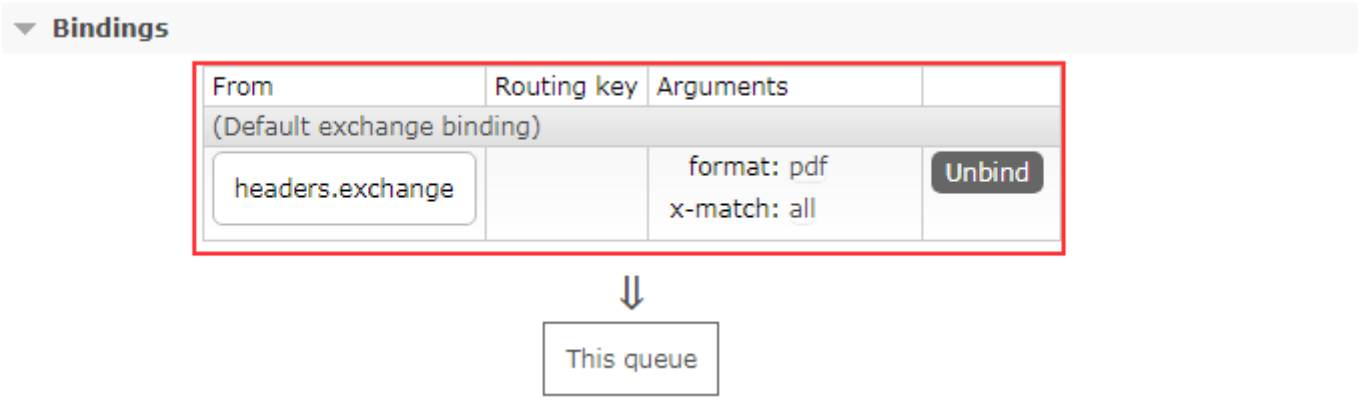
After adding all the queues next we are going to bind queues with "**headers.exchange**".

Binding the Queues

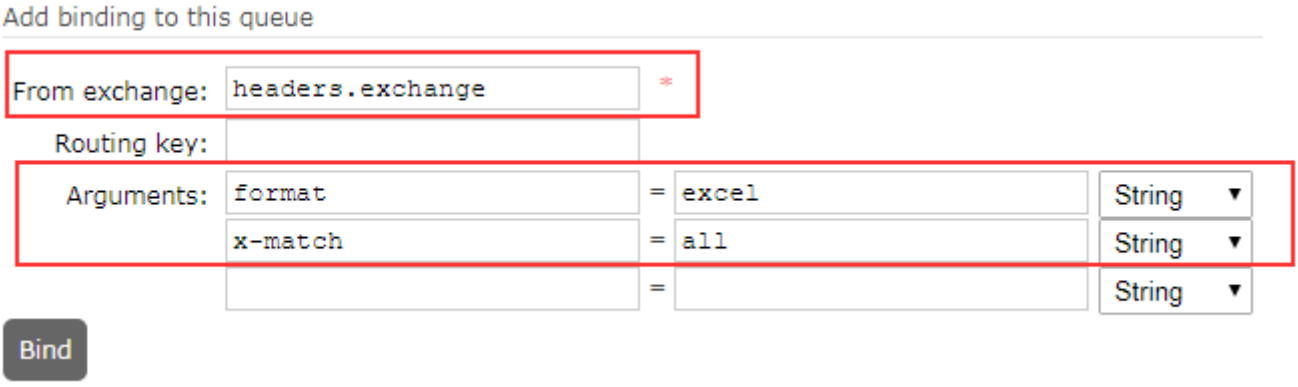
In this part, we are binding **headers.exchange** with a "**ReportPDF**" queue and while binding we are going to set arguments such as format=pdf and x-match=all these arguments need to be passed by producer in the header such that message will be sent to the accurate queue.



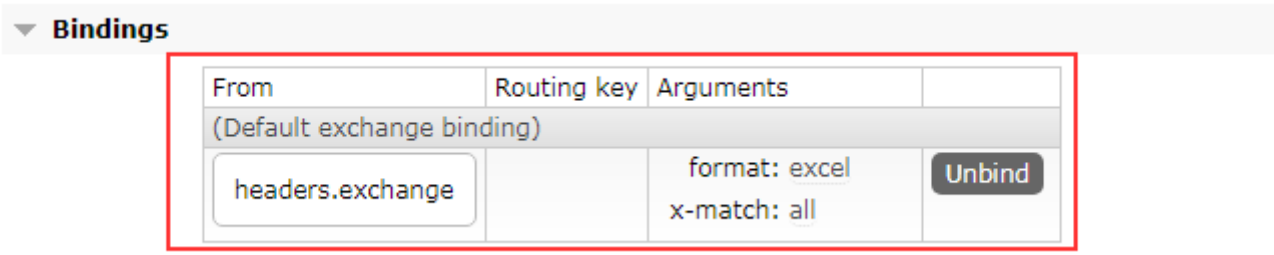
Snapshot of binding



In this part, we are binding **headers.exchange** with a "**ReportExcel**" queue and while binding we are going to set arguments such as format=pdf and x-match=all this argument needs to be passed by producer in the header such that message will be sent to the accurate queue.



Snapshot of binding



After binding all arguments to their respective queue next we are going to publish the message for that we are going to add a class.

Adding a Headersmessages Class

we have created a "Headersmessages" name class in this class we are going to create request and push to RabbitMQ.

First, we have declared Username, Password, and HostName as constant. After that, we have created a method with name "**SendMessage**" in that message we have created a connection to RabbitMQ server using RabbitMQ.Client after creating connection next we have passed credentials along with HostName to connectionFactory. Next, we have written a simple message "**Message to Headers Exchange 'format=pdf'**" and got it in bytes array form, finally, we are going assign all these values to a BasicPublish method of "**RabbitMQ.Client**"

While assigning we are going to set exchange as "**headers.exchange**" and there will not be routing key for headers exchange.

Code Snippet

```
public class Headersmessages
    {
        private const string UserName = "guest";
        private const string Password = "guest";
        private const string HostName = "localhost";

        public void SendMessage()
        {
            //Main entry point to the RabbitMQ .NET AMQP client
            var connectionFactory = new RabbitMQ.Client.ConnectionFactory()
            {
                UserName = UserName,
                Password = Password,
                HostName = HostName
            };

            var connection = connectionFactory.CreateConnection();
            var model = connection.CreateModel();

            var properties = model.CreateBasicProperties();
            properties.Persistent = false;

            Dictionary<string,object> dictionary = new Dictionary<string, object>();
            dictionary.Add("format", "pdf");
            properties.Headers = dictionary;

            byte[] messagebuffer = Encoding.Default.GetBytes("Message to Headers Exchange
'format=pdf' ");

            model.BasicPublish("headers.exchange", "", properties, messagebuffer);

            Console.WriteLine("Message Sent From :- headers.exchange ");
            Console.WriteLine("Routing Key :- Does not need routing key");
            Console.WriteLine("Message Sent");
        }
    }
```

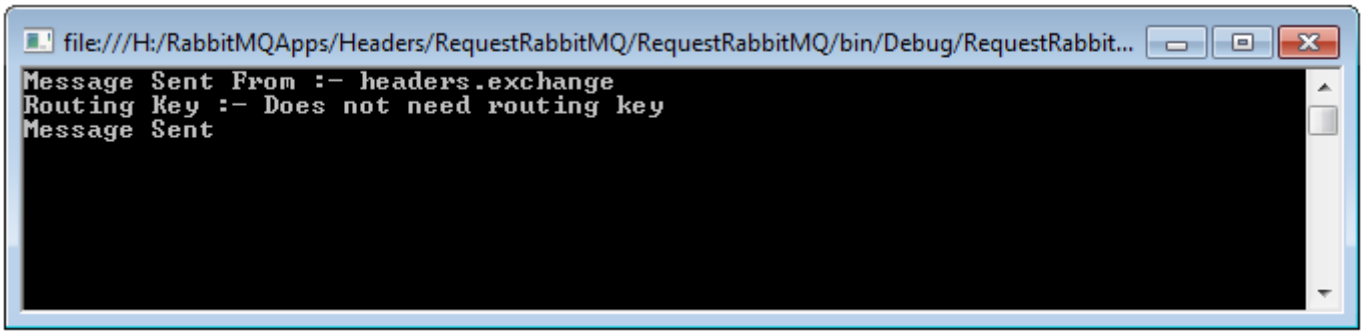
Main Code snippet

```
using System;
namespace RequestRabbitMQ
{
    class Program
    {
        static void Main(string[] args)
        {
```

```
            Headersmessages headersmessages = new Headersmessages();
            headersmessages.SendMessage();
            Console.ReadLine();
        }
    }
}
```

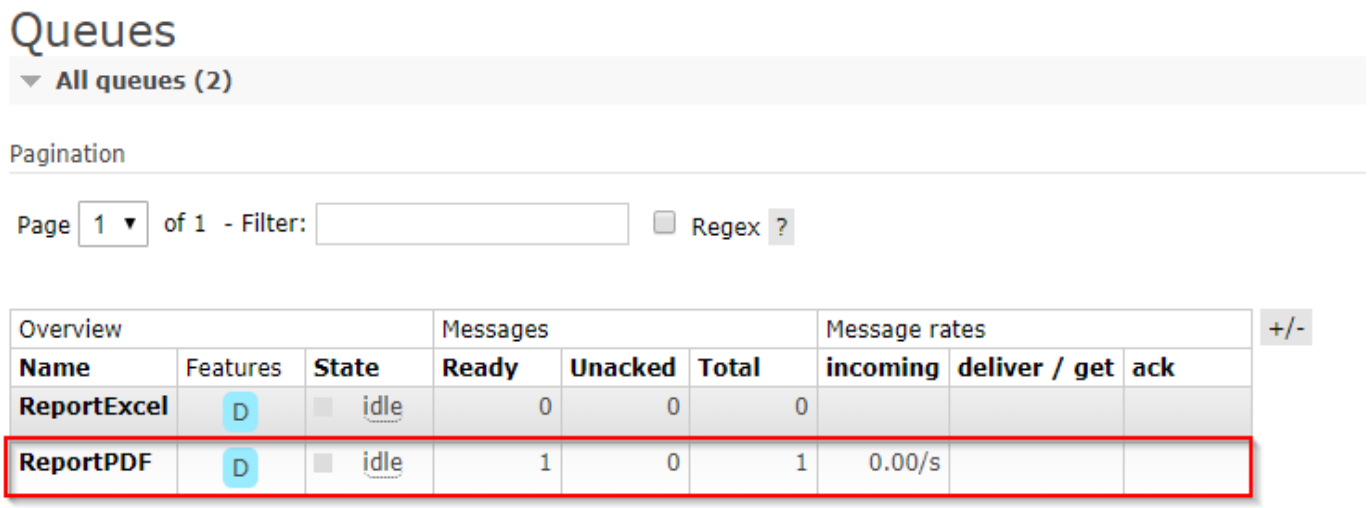
After completing entire process let's save the application and run after running the application you will see a Message sent a message on a console just for notification it means we have successfully published a message to all queues of "headers.exchange" exchange.

Published Message to Reportpdf queues of "Headers.exchange"



Now Let's See queue status

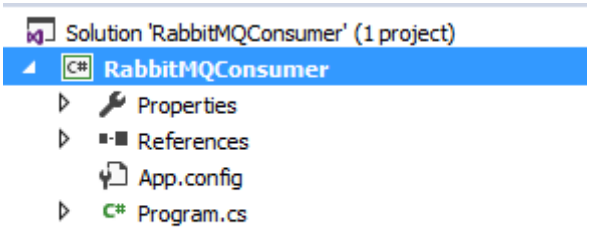
If you see Queues status of Reportpdf queue you will see Ready "1" which means, we have successfully published a message to Reportpdf queues using headers exchanges.



After publishing a message next, we are going to create .Net Console application for consuming message from the queue.

Creating RabbitMQConsumer Application

Let's create another console application for consuming messages from a queue with Name "**RabbitMQConsumer**"

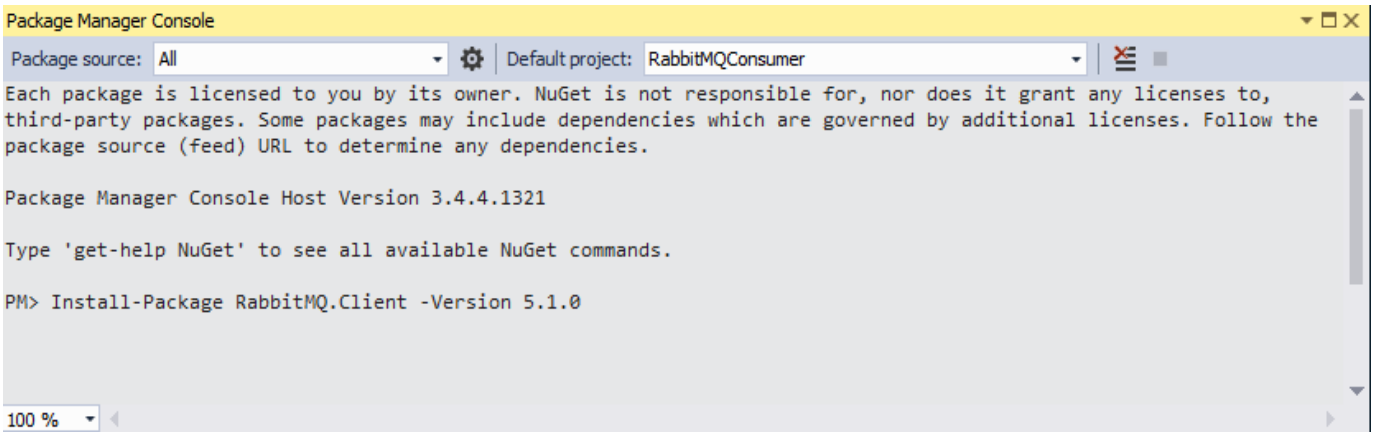


After creating application next, we are going to add "**RabbitMQ.Client**" NuGet package.

Adding RabbitMQ.Client NuGet Package

In this part for creating a connection with the RabbitMQ server to create request, we need to add "RabbitMQ.Client" package from NuGet Package.

Command to install: - Install-Package RabbitMQ.Client -Version 5.1.0



After installing RabbitMQ.Client next we are going to add a class with name "**MessageReceiver**".

Code snippet of MessageReceiver class

In this part, we have created MessageReceiver class and this class inherits DefaultBasicConsumer class which is from RabbitMQ.Client next we have to override HandleBasicDeliver method this method receives message body next, we are going to write these messages as we can see in its console.

```
using System;
using System.Text;
using RabbitMQ.Client;

namespace RabbitMQConsumer
{
    public class MessageReceiver : DefaultBasicConsumer
    {
        private readonly IModel _channel;

        public MessageReceiver(IModel channel)
        {
            _channel = channel;
```

```
        }

        public override void HandleBasicDeliver(string consumerTag, ulong deliveryTag, bool
redelivered, string exchange, string routingKey, IBasicProperties properties, byte[] body)
        {
            Console.WriteLine($"Consuming Headers Message");
            Console.WriteLine(string.Concat("Message received from the exchange ", exchange));
            Console.WriteLine(string.Concat("Consumer tag: ", consumerTag));
            Console.WriteLine(string.Concat("Delivery tag: ", deliveryTag));
            Console.WriteLine(string.Concat("Routing tag: ", routingKey));
            Console.WriteLine(string.Concat("Message: ", Encoding.UTF8.GetString(body)));
            _channel.BasicAck(deliveryTag, false);
        }
    }
}
```

After completing with understanding code snippet of MessageReceiver class next we are going to calls this class in the Main method.

Code snippet of Main Method while consuming "Mumbai" queue

In the main method we have created connectionFactory class and passed credentials and Hostname after that we have created connection, next we have created channel and set prefetchCount to 1 such that it tells RabbitMQ not to give more than one message to a worker at a time, Next, we have created instance of MessageReceiver class and passed IModel (channel) to it, in final step we have called "**BasicConsume**" method and passed queue name to it "**ReportPDF**" along with we have set autoAck to false and passed the messageReceiver instance to it.

```
channel.BasicQos(0, 1, false);

// ==== prefetchCount
// In order to defeat that we can set the prefetch count with the value of 1
// This tells RabbitMQ not to give more than one message to a worker at a time.
// Or, in other words, don't dispatch a new message to a worker until it has
// processed and acknowledged the previous one. Instead, it will dispatch it to t
// he next worker that is not still busy.

MessageReceiver messageReceiver = new MessageReceiver(channel);
channel.BasicConsume("ReportPDF", false, messageReceiver);

Console.ReadLine();
```

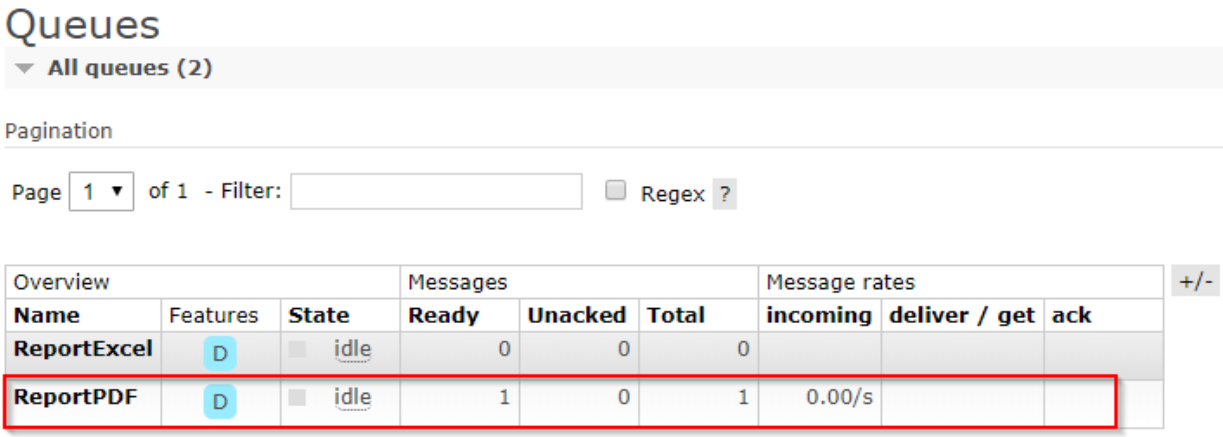
```
using System;
using RabbitMQ.Client;

namespace RabbitMQConsumer
{
    class Program
    {
        private const string UserName = "guest";
        private const string Password = "guest";
        private const string HostName = "localhost";
```

```
        static void Main(string[] args)
        {
            ConnectionFactory connectionFactory = new ConnectionFactory
            {
                HostName = HostName,
                UserName = UserName,
                Password = Password,
            };

            var connection = connectionFactory.CreateConnection();
            var channel = connection.CreateModel();

            // accept only one unack-ed message at a time
            // uint prefetchSize, ushort prefetchCount, bool global

            channel.BasicQos(0, 1, false);

            // ==== prefetchCount
            // In order to defeat that we can set the prefetch count with the value of 1
            // This tells RabbitMQ not to give more than one message to a worker at a time.
            // Or, in other words, don't dispatch a new message to a worker until it has
            // processed and acknowledged the previous one. Instead, it will dispatch it to t
            // the next worker that is not still busy.

            MessageReceiver messageReceiver = new MessageReceiver(channel);
            channel.BasicConsume("ReportPDF", false, messageReceiver);

            Console.ReadLine();
        }
    }
}
```

Now we have completed with consuming module Let's consume a message from "**ReportPDF**" queue which we have already published.

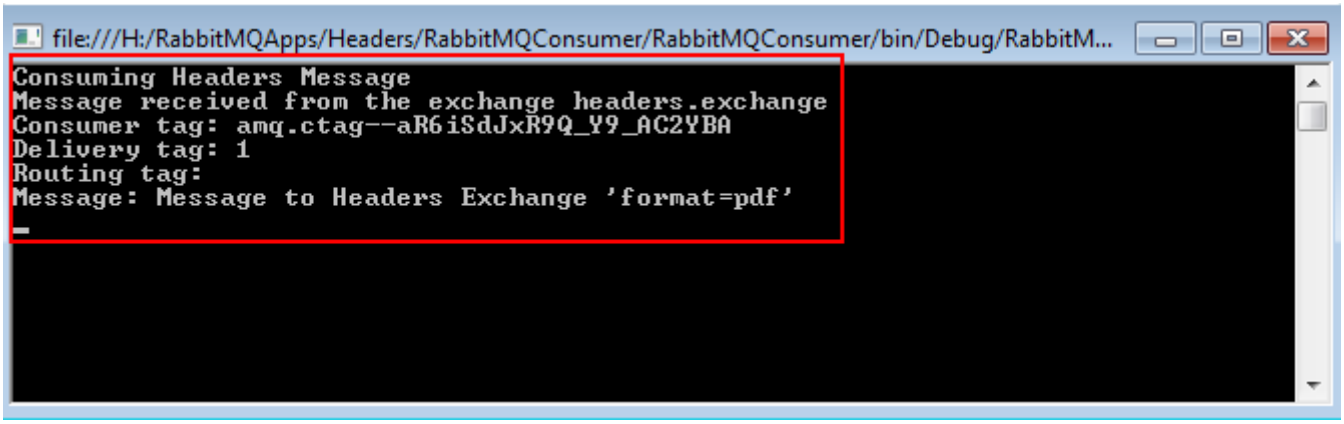
The queue has one Request which we have published

The below snapshot shows of ReportPDF queue have one message which we have published using headers exchange.

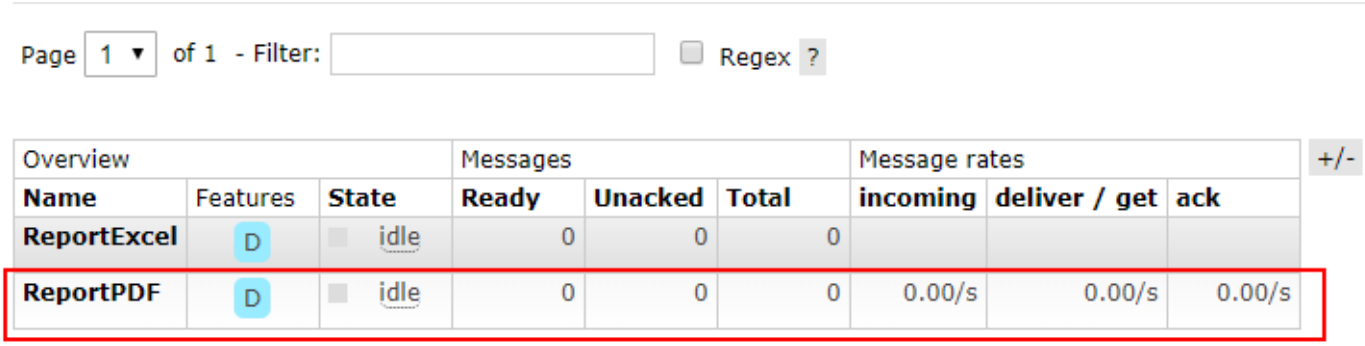


Consumed Message from ReportPDF queue

The snapshot while consuming message is only consumed from ReportPDF queue.



The status of the queue after reading Message from ReportPDF queue.



We have completed consuming messages from ReportPDF queue.

Conclusion

In this article, we have learned how to use headers Message Exchanges and how to create exchange and queue for headers exchange and how to push messages into RabbitMQ using .Net Application and RabbitMQ.Client and read messages from RabbitMQ using .Net Application and RabbitMQ.Client in step by step way.

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https://stackoverflow.com/users/1234855/saineshwar?tab=profile

Useful Links

- Source Code Download Link: - https://github.com/saineshwar/RabbitMQ
- Read Articles: - https://www.tutlane.com/tutorial/rabbitmq

Reference

- http://rabbitmq.com
- https://www.cloudamqp.com

NuGet's

- RabbitMQ.Client

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