

## Лабораторна робота 5

1. Реалізувати два варіанти черги: [Producer / Consumer](#) (Point-to-Point) і [Publish / Subscribe](#) (Topic)

`docker run -p 5672:5672 rabbitmq:3`

The image displays four terminal windows arranged in a 2x2 grid, showing the execution of a message queue application. The top-left window shows a consumer script receiving messages from 'msgProducer0' to 'msgProducer9'. The top-right window shows a producer script sending messages to 'msgProducer0' to 'msgProducer9'. The bottom-left window shows an emitter script sending messages to 'msgEmitter0' to 'msgEmitter9'. The bottom-right window shows a receiver script receiving messages from 'b'msgEmitter0' to 'b'msgEmitter9'.

```
Командная строка - python Consumer.py
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>python Consumer.py
[*] waiting for messages. To exit press CTRL+C
[X] Received 'msgProducer0'
[X] Done
[X] Received 'msgProducer1'
[X] Done
[X] Received 'msgProducer2'
[X] Done
[X] Received 'msgProducer3'
[X] Done
[X] Received 'msgProducer4'
[X] Done
[X] Received 'msgProducer5'
[X] Done
[X] Received 'msgProducer6'
[X] Done
[X] Received 'msgProducer7'
[X] Done
[X] Received 'msgProducer8'
[X] Done
[X] Received 'msgProducer9'
[X] Done

Командная строка
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>python Producer.py
[X] Sent msgProducer0
[X] Sent msgProducer1
[X] Sent msgProducer2
[X] Sent msgProducer3
[X] Sent msgProducer4
[X] Sent msgProducer5
[X] Sent msgProducer6
[X] Sent msgProducer7
[X] Sent msgProducer8
[X] Sent msgProducer9

Командная строка
C:\Users\Admin>d:
D:\>cd D:\study\Родионов\lab5
D:\study\Родионов\lab5>python Emitter.py
[X] Sent msgEmitter0
[X] Sent msgEmitter1
[X] Sent msgEmitter2
[X] Sent msgEmitter3
[X] Sent msgEmitter4
[X] Sent msgEmitter5
[X] Sent msgEmitter6
[X] Sent msgEmitter7
[X] Sent msgEmitter8
[X] Sent msgEmitter9
D:\study\Родионов\lab5>python Emitter.py
[X] Sent msgEmitter0
[X] Sent msgEmitter1
[X] Sent msgEmitter2
[X] Sent msgEmitter3
[X] Sent msgEmitter4
[X] Sent msgEmitter5
[X] Sent msgEmitter6
[X] Sent msgEmitter7
[X] Sent msgEmitter8
[X] Sent msgEmitter9
D:\study\Родионов\lab5>

Командная строка - python Receiver.py
(C) Корпорация Майкрософт (Microsoft Corporation). Все права защищены
C:\Users\Admin>d:
D:\>cd D:\study\Родионов\lab5
D:\study\Родионов\lab5>python Receiver.py
[*] Waiting for logs. To exit press CTRL+C
[X] b'msgEmitter0'
[X] b'msgEmitter1'
[X] b'msgEmitter2'
[X] b'msgEmitter3'
[X] b'msgEmitter4'
[X] b'msgEmitter5'
[X] b'msgEmitter6'
[X] b'msgEmitter7'
[X] b'msgEmitter8'
[X] b'msgEmitter9'
```

2. Для окремої черги реалізувати наступну логіку - клієнт відправляє повідомлення в чергу, один з консьюмерів його вичитує, модифікує і кладе у відповідну чергу клієнту, який виконував відправку, клієнт вичитує відповідь і відображає його
  1. перевірити випадок коли консьюмер не працює і що повідомлення будуть збережені у черзі, а після включення консьюмера - всі опрацьовані і відповіді доставлені клієнту

<pre>Командная строка Microsoft Windows [Version 10.0.19042.985] (c) Корпорация Майкрософт (Microsoft Corporation). Все права защищены.  C:\Users\Admin&gt;d: D:\&gt;cd D:\study\Родионов\lab5 D:\study\Родионов\lab5&gt;python Consumer2.py</pre>	<pre>Командная строка - python Producer2.py [x] Sent msgProducer9 D:\study\Родионов\lab5&gt;python Producer2.py [x] Sent {msg} [x] Sent {msg} [x] Sent {msg} [x] Sent {msg} [x] Sent {msg} [x] Sent {msg} [x] Sent {msg} [x] Sent {msg} [x] Sent {msg} [x] Sent {msg} [*] Waiting for messages. To exit press CTRL+C</pre>
<pre>Командная строка - python Consumer2.py Microsoft Windows [Version 10.0.19042.985] (c) Корпорация Майкрософт (Microsoft Corporation). Все права защищены.  C:\Users\Admin&gt;d: D:\&gt;cd D:\study\Родионов\lab5 D:\study\Родионов\lab5&gt;python Consumer2.py [*] Waiting for messages. To exit press CTRL+C [x] Received 'msg0' [x] Received 'msg1' [x] Received 'msg2' [x] Received 'msg3' [x] Received 'msg4' [x] Received 'msg5' [x] Received 'msg6' [x] Received 'msg7' [x] Received 'msg8' [x] Received 'msg9'</pre>	<pre>Командная строка - python Producer2.py Microsoft Windows [Version 10.0.19042.985] (c) Корпорация Майкрософт (Microsoft Corporation). Все права защищены.  C:\Users\Admin&gt;d: D:\&gt;cd D:\study\Родионов\lab5 D:\study\Родионов\lab5&gt;python Producer2.py [x] Sent {msg} [x] Sent {msg} [x] Sent {msg} [x] Sent {msg} [x] Sent {msg} [x] Sent {msg} [x] Sent {msg} [x] Sent {msg} [x] Sent {msg} [x] Sent {msg} [*] Waiting for messages. To exit press CTRL+C [x] Received 'msg0_response' [x] Received 'msg1_response' [x] Received 'msg2_response' [x] Received 'msg3_response' [x] Received 'msg4_response' [x] Received 'msg5_response' [x] Received 'msg6_response' [x] Received 'msg7_response' [x] Received 'msg8_response' [x] Received 'msg9_response'</pre>

3. Налаштувати максимальна довжина черги (*Maxlength*) (
1. подивитись що відбувається з новими повідомленнями коли черга заповнена
  2. мають бути два варіанти: затираються старі, не додаються нові

```
Администратор: Командная строка
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>python Producer3_1.py
[X] Sent msg0
[X] Sent msg1
[X] Sent msg2
[X] Sent msg3
[X] Sent msg4
[X] Sent msg5
[X] Sent msg6
[X] Sent msg7
[X] Sent msg8
[X] Sent msg9

Администратор: Командная строка - python Consumer3.py
AC
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>python Consumer3.py
[*] Waiting for messages. To exit press CTRL+C
[X] Received 'msg5'
[X] Done
[X] Received 'msg6'
[X] Done
[X] Received 'msg7'
[X] Done
[X] Received 'msg8'
[X] Done
[X] Received 'msg9'
[X] Done
```

`channel.queue_declare(queue='limit', arguments={'x-max-length': 5})`

За замовчуванням видаляються старі повідомлення, але можна виділяти і нові

```
channel.queue_declare(queue='limit_reject', arguments={'x-max-length': 5, 'x-overflow': 'reject-publish'})
```

CA. Выбрать Администратор: Командная строка

```
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>python Producer3_1.py
[x] Sent msg0
[x] Sent msg1
[x] Sent msg2
[x] Sent msg3
[x] Sent msg4
[x] Sent msg5
[x] Sent msg6
[x] Sent msg7
[x] Sent msg8
[x] Sent msg9
```

CA. Администратор: Командная строка - python Consumer3.py

```
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>python Consumer3.py
[*] Waiting for messages. To exit press CTRL+C
[x] Received 'msg0'
[x] Done
[x] Received 'msg1'
[x] Done
[x] Received 'msg2'
[x] Done
[x] Received 'msg3'
[x] Done
[x] Received 'msg4'
[x] Done
```

#### 4. Налаштувати збереження черги повідомлень (Message Persistence - *Durable* queue)

```
Администратор: Windows PowerShell
PS C:\WINDOWS\system32> docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS
086e3b1287af	rabbitmq:3	"docker-entrypoint.s..."	2 weeks ago	Up 42 seconds	4369/tcp,
5671/tcp, 15691-15692/tcp, 25672/tcp, 0.0.0.0:5672->5672/tcp, :::5672->5672/tcp	elastic_hertz			Exited (143) 8 hours ago	
4ccbb9ac4be5	hazelcast/hazelcast	"/opt/hazelcast/star..."	2 weeks ago	adoring_euler	
be8d78299826	hazelcast/management-center	"bash ./bin/mc-start..."	2 weeks ago	Exited (143) 8 hours ago	
3306a0224d3d	hazelcast/hazelcast	"/opt/hazelcast/star..."	2 weeks ago	jolly_satoshi	
fcfa3337b9a5	hazelcast/hazelcast	"/opt/hazelcast/star..."	2 weeks ago	Exited (143) 6 hours ago	
706e4029485f	hazelcast/hazelcast	"/opt/hazelcast/star..."	2 weeks ago	determined_feistel	
				Exited (143) 6 hours ago	
				great_allen	
				Exited (143) 6 hours ago	
				compassionate_shannon	

```
PS C:\WINDOWS\system32> docker container stop 086e3b1287af
086e3b1287af
PS C:\WINDOWS\system32>
```

```
Администратор: Командная строка
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>python Producer4.py
Traceback (most recent call last):
  File "D:\study\Родионов\lab5\Producer4.py", line 4, in <module>
    connection = pika.BlockingConnection(
  File "C:\Python39\lib\site-packages\pika\adapters\blocking_connection.py", line 360, in __init__
    self._impl = self._create_connection(parameters, _impl_class)
  File "C:\Python39\lib\site-packages\pika\adapters\blocking_connection.py", line 451, in _create_connection
    raise self._reap_last_connection_workflow_error(error)
pika.exceptions.IncompatibleProtocolError: StreamLostError: ('Transport indicated EOF',)
```

```
D:\study\Родионов\lab5>python Producer4.py
[x] Sent msg0
[x] Sent msg1
[x] Sent msg2
[x] Sent msg3
[x] Sent msg4
[x] Sent msg5
[x] Sent msg6
[x] Sent msg7
[x] Sent msg8
[x] Sent msg9
D:\study\Родионов\lab5>
```

Заповнив чергу і вимкнув RabbitMQ, після ввімкнунв

```
Администратор: Командная строка - python Consumer4.py
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>
D:\study\Родионов\lab5>python Consumer4.py
[*] Waiting for messages. To exit press CTRL+C
[x] Received 'msg0'
[x] Done
[x] Received 'msg1'
[x] Done
[x] Received 'msg2'
[x] Done
[x] Received 'msg3'
[x] Done
[x] Received 'msg4'
[x] Done
[x] Received 'msg5'
[x] Done
[x] Received 'msg6'
[x] Done
[x] Received 'msg7'
[x] Done
[x] Received 'msg8'
[x] Done
[x] Received 'msg9'
[x] Done
```

```
Администратор: Windows PowerShell
PS C:\WINDOWS\system32> docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS
086e3b1287af	rabbitmq:3	"docker-entrypoint.s..."	2 weeks ago	Up 5 seconds	4369/tcp,
5671/tcp, 15691-15692/tcp, 25672/tcp, 0.0.0.0:5672->5672/tcp, :::5672->5672/tcp	elastic_hertz			Exited (143) 8 hours ago	
4ccbb9ac4be5	hazelcast/hazelcast	"/opt/hazelcast/star..."	2 weeks ago	adoring_euler	
be8d78299826	hazelcast/management-center	"bash ./bin/mc-start..."	2 weeks ago	Exited (143) 8 hours ago	
3306a0224d3d	hazelcast/hazelcast	"/opt/hazelcast/star..."	2 weeks ago	jolly_satoshi	
fcfa3337b9a5	hazelcast/hazelcast	"/opt/hazelcast/star..."	2 weeks ago	Exited (143) 6 hours ago	
706e4029485f	hazelcast/hazelcast	"/opt/hazelcast/star..."	2 weeks ago	determined_feistel	
				Exited (143) 6 hours ago	
				great_allen	
				Exited (143) 6 hours ago	
				compassionate_shannon	

```
PS C:\WINDOWS\system32> docker container stop 086e3b1287af
086e3b1287af
PS C:\WINDOWS\system32> docker container start 086e3b1287af
086e3b1287af
PS C:\WINDOWS\system32> docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS
086e3b1287af	rabbitmq:3	"docker-entrypoint.s..."	2 weeks ago	Up 5 seconds	4369/tcp,
5671/tcp, 15691-15692/tcp, 25672/tcp, 0.0.0.0:5672->5672/tcp, :::5672->5672/tcp	elastic_hertz			Exited (143) 8 hours ago	
4ccbb9ac4be5	hazelcast/hazelcast	"/opt/hazelcast/star..."	2 weeks ago	adoring_euler	
be8d78299826	hazelcast/management-center	"bash ./bin/mc-start..."	2 weeks ago	Exited (143) 8 hours ago	
3306a0224d3d	hazelcast/hazelcast	"/opt/hazelcast/star..."	2 weeks ago	jolly_satoshi	
fcfa3337b9a5	hazelcast/hazelcast	"/opt/hazelcast/star..."	2 weeks ago	Exited (143) 6 hours ago	
706e4029485f	hazelcast/hazelcast	"/opt/hazelcast/star..."	2 weeks ago	determined_feistel	
				Exited (143) 6 hours ago	
				great_allen	
				Exited (143) 6 hours ago	
				compassionate_shannon	

```
PS C:\WINDOWS\system32>
```

5. Налаштувати максимальний час перебування повідомлення в черзі (MessageTTL)

Администратор: Командная строка - python Producer5.py

```
[x] Sent msg8
[x] Sent msg9
```

D:\study\Родионов\lab5>python Producer5.py

```
[x] Sent msg0
[x] Sent msg1
[x] Sent msg2
[x] Sent msg3
[x] Sent msg4
[x] Sent msg5
[x] Sent msg6
[x] Sent msg7
[x] Sent msg8
[x] Sent msg9
```

Администратор: Командная строка - python Consumer5.py

D:\study\Родионов\lab5>

D:\study\Родионов\lab5>

D:\study\Родионов\lab5>

D:\study\Родионов\lab5>

D:\study\Родионов\lab5>

D:\study\Родионов\lab5>

D:\study\Родионов\lab5>

D:\study\Родионов\lab5>python Consumer5.py

[\*] Waiting for messages. To exit press CTRL+C

```
[x] Received 'msg0'
```

```
[x] Done
```

```
[x] Received 'msg1'
```

```
[x] Done
```

```
[x] Received 'msg2'
```

```
[x] Done
```

```
[x] Received 'msg3'
```

```
[x] Done
```

```
[x] Received 'msg4'
```

```
[x] Done
```

```
[x] Received 'msg5'
```

```
[x] Done
```

```
[x] Received 'msg6'
```

```
[x] Done
```

```
[x] Received 'msg7'
```

```
[x] Done
```

```
[x] Received 'msg8'
```

```
[x] Done
```

```
[x] Received 'msg9'
```

```
[x] Done
```

Администратор: Командная строка

```
[x] Sent msg8
```

```
[x] Sent msg9
```

D:\study\Родионов\lab5>python Producer5.py

```
[x] Sent msg0
```

```
[x] Sent msg1
```

```
[x] Sent msg2
```

```
[x] Sent msg3
```

```
[x] Sent msg4
```

```
[x] Sent msg5
```

```
[x] Sent msg6
```

```
[x] Sent msg7
```

```
[x] Sent msg8
```

```
[x] Sent msg9
```

D:\study\Родионов\lab5>

Администратор: Командная строка - python Consumer5.py

AC

D:\study\Родионов\lab5>

D:\study\Родионов\lab5>python Consumer5.py

[\*] Waiting for messages. To exit press CTRL+C

6. Для окремої черги Producer / Consumer налаштувати *Message Acknowledgment*, який забезпечує гарантовану доставку повідомлень. Показати випадок, коли Consumer бере з черги повідомлення на обробку, але не може його обробити і падає (тобто не повертає Ack чи повертає негативний Ack). Показати, чи буде при цьому дане необроблене повідомлення взято на обробку іншим Consumer або виявиться втраченим.

1. Для цього мають бути відправлені в чергу 10 повідомлень - msg1 - msg10
  2. Паралельно запускаються Consumer 1 та Consumer 2
  3. Consumer 1 - відправляє Ack, Consumer 2 - не повертає Ack
- Consumer 1 та Consumer 2 мають вичитати по 5 повідомлень кожен

```
Администратор: Командная строка - python ConsumerWithAck.py
Microsoft Windows [Version 10.0.19042.1052]
(c) Корпорация Майкрософт (Microsoft Corporation).
C:\WINDOWS\system32>d:
D:\>cd D:\study\Родионов\lab5
D:\study\Родионов\lab5>python ConsumerWithAck.py
[*] Waiting for messages. To exit press CTRL+C
[x] Received 'msg0'
[x] Done
[x] Received 'msg1'
[x] Done
[x] Received 'msg2'
[x] Done
[x] Received 'msg0'
[x] Done
[x] Received 'msg1'
[x] Done
[x] Received 'msg2'
[x] Done
[x] Received 'msg3'
[x] Done
[x] Received 'msg5'
[x] Done
[x] Received 'msg7'
[x] Done
[x] Received 'msg9'
[x] Done

Администратор: Командная строка - python Producer5.py
Microsoft Windows [Version 10.0.19042.1052]
(c) Корпорация Майкрософт (Microsoft Corporation). Все права защищены.
C:\WINDOWS\system32>d:
D:\>cd D:\study\Родионов\lab5
D:\study\Родионов\lab5>cd D:\study\Родионов\lab5
D:\study\Родионов\lab5>python Producer5.py
[x] Sent msg0
[x] Sent msg1
[x] Sent msg2
Traceback (most recent call last):
  File "D:\study\Родионов\lab5\Producer5.py", line 13, in <module>
    time.sleep(1)
KeyboardInterrupt
AC
D:\study\Родионов\lab5>python Producer5.py
[x] Sent msg0
[x] Sent msg1
[x] Sent msg2
[x] Sent msg3
[x] Sent msg4
[x] Sent msg5
[x] Sent msg6
[x] Sent msg7
[x] Sent msg8
[x] Sent msg9

Администратор: Командная строка - python ConsumerWithoutAck.py
raise self._closing_reason # pylint: disable=E0702
pika.exceptions.ChannelClosedByBroker: (404, "NOT_FOUND - no queue 'limit' in vhost '/'")
D:\study\Родионов\lab5>python ConsumerWithoutAck.py
[*] Waiting for messages. To exit press CTRL+C
[x] Received 'msg4'
[x] Done
[x] Received 'msg6'
[x] Done
[x] Received 'msg8'
[x] Done
```

Consumer 2 (який не повертав Ack) відключається

Після того всі повідомлення які були доставлені на Consumer 2 має бути автоматично вчитані Consumer 1

```
D:\study\Родионов\lab5>python ConsumerWithAck.py
[*] Waiting for messages. To exit press CTRL+C
[x] Received 'msg0'
[x] Done
[x] Received 'msg1'
[x] Done
[x] Received 'msg2'
[x] Done
[x] Received 'msg0'
[x] Done
[x] Received 'msg1'
[x] Done
[x] Received 'msg2'
[x] Done
[x] Received 'msg3'
[x] Done
[x] Received 'msg5'
[x] Done
[x] Received 'msg7'
[x] Done
[x] Received 'msg9'
[x] Done
[x] Received 'msg4'
[x] Done
[x] Received 'msg6'
[x] Done
[x] Received 'msg8'
[x] Done
```