

Lab 5 - Мікросервіси з використанням Service Discovery та Config Server на базі Consul

Завдання базується на функціоналі розробленому у попередньому завданні, і є його подальшим розвитком.

До системи необхідно додати *Consul*, який буде виконувати роль *Service Register*, *Service Discovery* та *Config Server*.

Це дасть змогу явно не вказувати адреси мікросервісів та конфігурації для Hazelcast та Message Queue

Вимоги:

Всі мікросервіси мають самостійно динамічно реєструватись при старті у *Consul*, кожного з сервісів може бути запущено кілька екземплярів (це буде відображатись як кількість instances на UI):

- **facade-service**
- **logging-service**
- **messages-service**

<input type="checkbox"/>	dist-lab5	-	-	-	31.83%	2 minutes ago		:	
<input type="checkbox"/>	hazelcast3	de267dbf819c	hazelcast/hazelcast:5.3	5703:5701	2.58%	3 minutes ago		:	
<input type="checkbox"/>	hazelcast2	8d9af280ff35	hazelcast/hazelcast:5.3	5702:5701	4.47%	3 minutes ago		:	
<input type="checkbox"/>	hazelcast1	0bcf3a6991b2	hazelcast/hazelcast:5.3	5701:5701	1.93%	3 minutes ago		:	
<input type="checkbox"/>	zookeeper	d634fe285060	confluentinc/cp-zookeeper	2181:2181	3.25%	3 minutes ago		:	
<input type="checkbox"/>	consul	705010b54b3f	hashicorp/consul:1.15	8500:8500 Show all ports (2)	0.36%	3 minutes ago		:	

Showing 22 items

<input type="checkbox"/>	logging2	3b2cbc4cd5c1	dist-lab5-logging2	50052:50052	1.2%	3 minutes ago		:	
<input type="checkbox"/>	kafka3	95051f4e7874	confluentinc/cp-kafka:7.3.0	9094:9094	2.71%	3 minutes ago		:	
<input type="checkbox"/>	kafka1	61b4336873e6	confluentinc/cp-kafka:7.3.0	9092:9092	2.91%	3 minutes ago		:	
<input type="checkbox"/>	logging1	4867ea736130	dist-lab5-logging1	50051:50051	1.31%	3 minutes ago		:	
<input type="checkbox"/>	messages2	bec2ae36021e	dist-lab5-messages2	8883:8883	0.54%	3 minutes ago		:	
<input type="checkbox"/>	logging3	335a777f3f17	dist-lab5-logging3	50053:50053	1.3%	3 minutes ago		:	
<input type="checkbox"/>	messages1	748dcc2491fa	dist-lab5-messages1	8882:8882	0.58%	3 minutes ago		:	
<input type="checkbox"/>	facade	4234afa0648f	dist-lab5-facade	8880:8880	0.01%	3 minutes ago		:	

Services 4 total

Q Search	Search Across ▾	Health Status ▾	Service Type ▾	Unhealthy to Healthy ▾
✓ consul				
1 instance				
✓ facade-service				
1 instance				
✓ messages-service				
2 instances				
✓ logging-service				
3 instances				

При звертанні **facade-service** до **logging-service** та **messages-service**, IP-адреси (і порти) мають зчитуватись **facade-service** з *Consul*. Немає бути задано в коді чи конфігураціях статичних значень адрес.

< Key / Values / hazelcast

config

Value

JSON

Code

1 hazelcast1:5701,hazelcast2:5701,hazelcast3:5701

Налаштування для клієнтів Hazelcast мають зберігатись як key/value у *Consul* і зчитуватись **logging-service**

< Key / Values / kafka

config

Value

JSON

Code

1 {"bootstrap_servers": "kafka1:9092,kafka2:9093,kafka3:9094", "topic": "messages-topic"}

Продемонструвати, що у випадку відключення екземпляру певного мікросервісу, це буде відображатись у Consul (відключений екземпляр сервісу змінить статус) , а виклики будуть перенаправлятись до інших працюючих екземплярів.

Тестування відправки повідомлення:

```
D:\shared\dist-lab5>curl -X POST http://localhost:8880/messages -F "txt=Hello, Consul!"
{"id":"c098f4ad-cea7-4079-9015-1ae9186f6042","txt":"Hello, Consul!"}

D:\shared\dist-lab5>curl -X POST http://localhost:8880/messages -F "txt=Hello, Consul again!"
{"id":"492fd0fb-0ebc-41bb-93ac-0d9b530ad53d","txt":"Hello, Consul again!"}

D:\shared\dist-lab5>curl http://localhost:8880/messages
{"all_messages_from_messages_service":[{"id":"c098f4ad-cea7-4079-9015-1ae9186f6042","text":"Hello, Consul!","id":"492fd0fb-0ebc-41bb-93ac-0d9b530ad53d","text":"Hello, Consul again!"}],"combined_messages":[{"id":"c098f4ad-cea7-4079-9015-1ae9186f6042","text":"Hello, Consul!","id":"492fd0fb-0ebc-41bb-93ac-0d9b530ad53d","text":"Hello, Consul again!"}],"logging_services":[{"instance":"369fa8d3566f","messages":["Hello, Consul again! (processed by 369fa8d3566f)","Hello, Consul! (processed by a9c9873e99f5)"],"service":"http://369fa8d3566f:50052/logging"}, {"instance":"712beb82ac08","messages":["Hello, Consul again! (processed by 369fa8d3566f)","Hello, Consul! (processed by a9c9873e99f5)"],"service":"http://712beb82ac08:50053/logging"}, {"instance":"a9c9873e99f5","messages":["Hello, Consul again! (processed by 369fa8d3566f)","Hello, Consul! (processed by a9c9873e99f5)"],"service":"http://a9c9873e99f5:50051/logging"}]}

D:\shared\dist-lab5>
```

Перевірка відмовостійкості:

```
PS D:\shared\dist-lab5> docker-compose stop logging2
[+] Stopping 1/1
  ✓ Container logging2 Stopped
PS D:\shared\dist-lab5>
```

У консул є:

logging-service

Instances	Intentions	Routing	Tags
<input type="text" value="Search"/>	<input type="text" value="Search Across"/>		<input type="text" value="Health Status"/>
logging-369fa8d3566f-50052			
<div><div>✗ All service checks failing</div><div>✓ All node checks passing</div><div>🔗 c1d14bc5db2c</div><div>🌐 369fa8d3566f:50052</div></div>			
logging-712beb82ac08-50053			
<div><div>✓ All service checks passing</div><div>✓ All node checks passing</div><div>🔗 c1d14bc5db2c</div><div>🌐 712beb82ac08:50053</div></div>			
logging-a9c9873e99f5-50051			
<div><div>✓ All service checks passing</div><div>✓ All node checks passing</div><div>🔗 c1d14bc5db2c</div><div>🌐 a9c9873e99f5:50051</div></div>			

```
D:\shared\dist-lab5>curl -X POST http://localhost:8880/messages -F "txt=Hello, Consul third!"
{"id":"964e60b9-b500-4b63-9c1e-780864cfb1cc","txt":"Hello, Consul third!"}
```

```
D:\shared\dist-lab5>curl http://localhost:8880/messages
{"all_messages_from_messages_service":[{"id":"c098f4ad-cea7-4079-9015-1ae9186f6042","text":"Hello, Consul!},{\"id\":\"492fd0fb-0ebc-41bb-93ac-0d9b530ad53d\",\"text\":\"Hello, Consul again!},{\"id\":\"964e60b9-b500-4b63-9c1e-780864cfb1cc\",\"text\":\"Hello, Consul third!}],\"combined_messages\":{\"id\":\"c098f4ad-cea7-4079-9015-1ae9186f6042\",\"text\":\"Hello, Consul!},{\"id\":\"492fd0fb-0ebc-41bb-93ac-0d9b530ad53d\",\"text\":\"Hello, Consul again!},{\"id\":\"964e60b9-b500-4b63-9c1e-780864cfb1cc\",\"text\":\"Hello, Consul third!}],\"logging_services\":{\"instance\":\"712beb82ac08\",\"messages\":[\"Hello, Consul again! (processed by 369fa8d3566f)\",\"Hello, Consul third! (processed by 712beb82ac08)\",\"Hello, Consul! (processed by a9c9873e99f5)\"],\"service\":\"http://712beb82ac08:50053/logging\"},{\"instance\":\"a9c9873e99f5\",\"messages\":[\"Hello, Consul again! (processed by 369fa8d3566f)\",\"Hello, Consul third! (processed by 712beb82ac08)\",\"Hello, Consul! (processed by a9c9873e99f5)\"],\"service\":\"http://a9c9873e99f5:50051/logging\"}]}
```

```
D:\shared\dist-lab5>
```

Logging3:

```
INFO:werkzeug:172.18.0.4 - - [31/May/2025 17:57:20] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 17:57:30] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 17:57:40] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 17:57:50] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 17:58:00] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 17:58:10] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 17:58:20] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 17:58:30] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 17:58:40] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 17:58:50] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 17:59:00] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 17:59:10] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 17:59:20] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.15 - - [31/May/2025 17:59:30] "GET /logging HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 17:59:30] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 17:59:40] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 17:59:50] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 18:00:00] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 18:00:10] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 18:00:20] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 18:00:30] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 18:00:40] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 18:00:50] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 18:01:00] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 18:01:10] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 18:01:21] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.15 - - [31/May/2025 18:01:26] "POST /logging HTTP/1.1" 201 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 18:01:31] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 18:01:41] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 18:01:51] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 18:02:01] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.15 - - [31/May/2025 18:02:01] "GET /logging HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 18:02:11] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 18:02:21] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 18:02:31] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 18:02:41] "GET /health HTTP/1.1" 200 -
INFO:werkzeug:172.18.0.4 - - [31/May/2025 18:02:51] "GET /health HTTP/1.1" 200 -
PS D:\shared\dist-lab5>
```


