Lab 7. Registry cluster, load balancing, API gateway

Part 1: Consul cluster

Create a consul cluster using the following docker compose file:

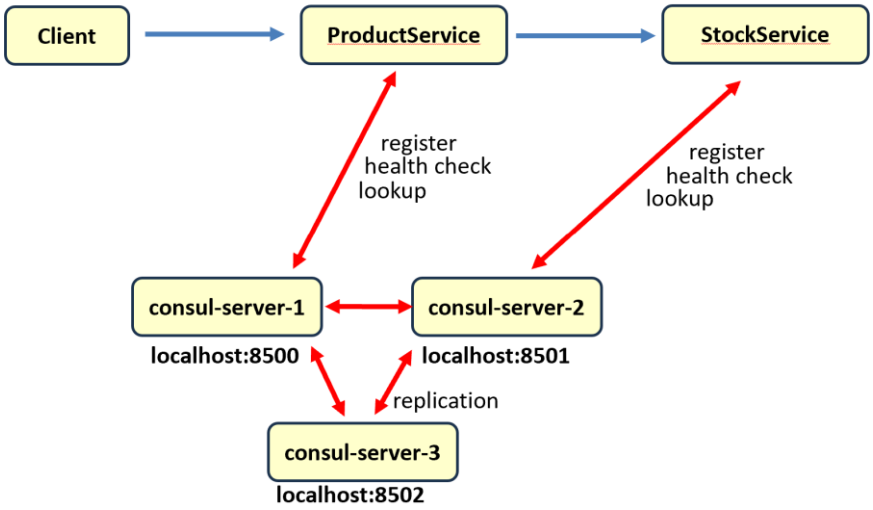
```
version: '3.8'

services:
  consul-server-1:
    image: hashicorp/consul:latest
    container_name: consul-server-1
    command: "agent -server -bootstrap-expect=3 -client=0.0.0.0 -ui -retry-join=consul-server-2 -retry-join=consul-server-3"
    ports:
      - "8500:8500" # UI and HTTP API
      - "8600:8600/udp" # DNS
    networks:
      - consul-net

  consul-server-2:
    image: hashicorp/consul:latest
    container_name: consul-server-2
    command: "agent -server -client=0.0.0.0 -ui -retry-join=consul-server-1 -retry-join=consul-server-3"
    ports:
      - "8501:8500" # UI and HTTP API (different host port to avoid conflict)
    networks:
      - consul-net

  consul-server-3:
    image: hashicorp/consul:latest
    container_name: consul-server-3
    command: "agent -server -client=0.0.0.0 -ui -retry-join=consul-server-1 -retry-join=consul-server-2"
    ports:
      - "8502:8500" # UI and HTTP API (different host port to avoid conflict)
    networks:
      - consul-net

networks:
  consul-net:
    driver: bridge
```

Check if the 3 consul agents are running

dockerconsul	-	-	-		11.31%	1 day ago	
consul-server-:	746250df0e12	hashicorp/consu	8501:8500		1.74%	1 day ago	
consul-server-	5b17d854017b	hashicorp/consu	8500:8500 Show all ports (2)		7.63%	1 day ago	
consul-server-:	855028781c48	hashicorp/consu	8502:8500		1.94%	1 day ago	

Modify the StockService so that it uses one of the Consul registries.
Start the StockService
Check if the StockService is registered in all Consul instances

Modify the ProductService so that it uses a different Consul instance.
Start the ProductService
Check if the ProductService is registered in all Consul instances
Check if everything works



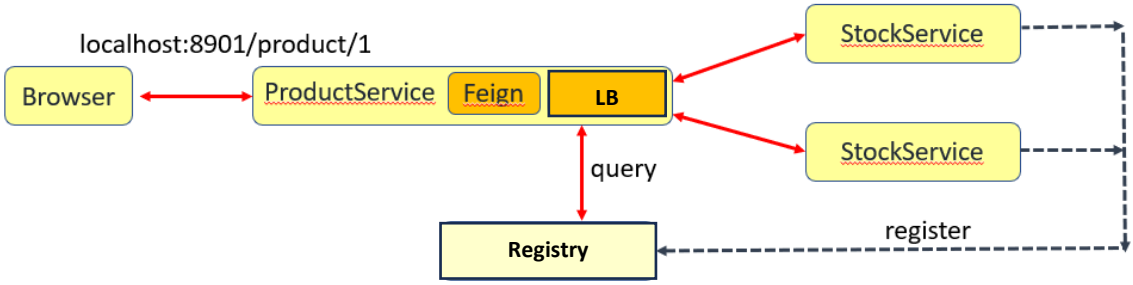
Part 2: load balancing with ribbon

Copy and paste the StockService, and make sure the 2nd stockservice runs at a different port. Let the 2nd stockservice return a different number that the 1st stocksevice.

Then run both StockService applications and see in the Consul dashboard that we have 2 instances of StockService.
Then run the ProductService and see in the Consul dashboard if it is registered.

Then if you call the ProductService, it should load balance the call to the StockService.
Then stop one StockService. Check in the Consul dashboard if it is removed.
Now if you call the ProductService, it should call to the StockService that is still running.

Then start the stopped StockService again. Check in the Eureka dashboard if it registered again.
Now if you call the ProductService, it should load balance the call to the StockService again.



Part 3: API gateway

Write an API gateway in front of the ProductService and StockService so that the browser can call both services via the API gateway

Part 4: Practice midterm

Make the practice midterm.

What to hand in?

1. A zip file containing all services for part 1, 2 and 3
2. A PDF of part 4