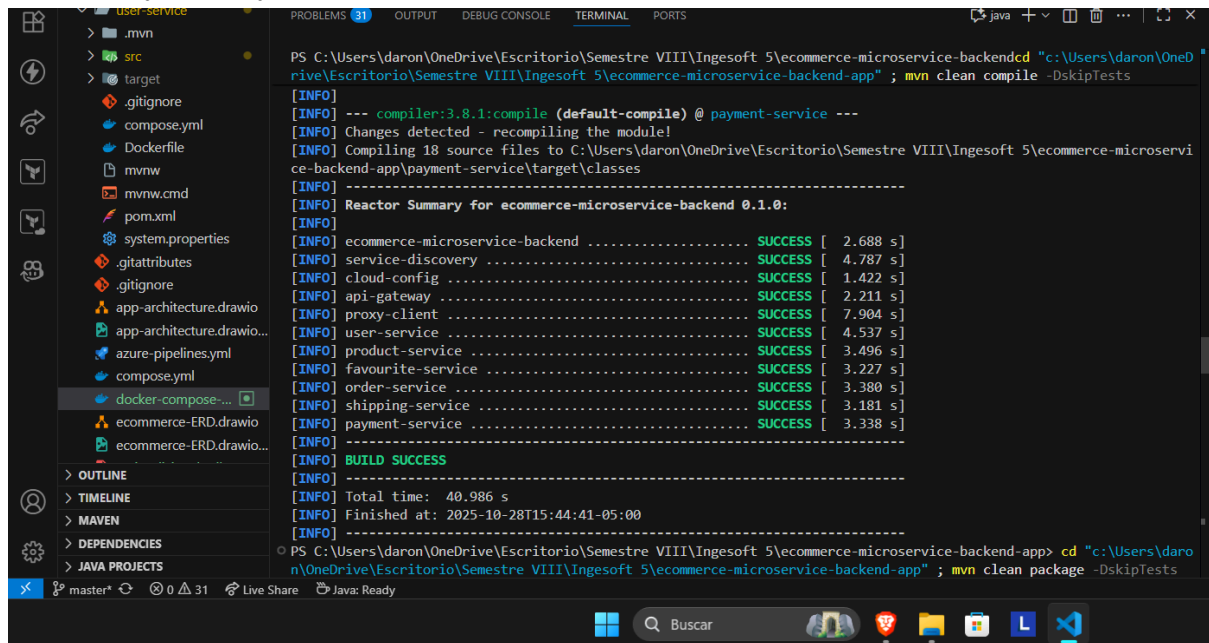


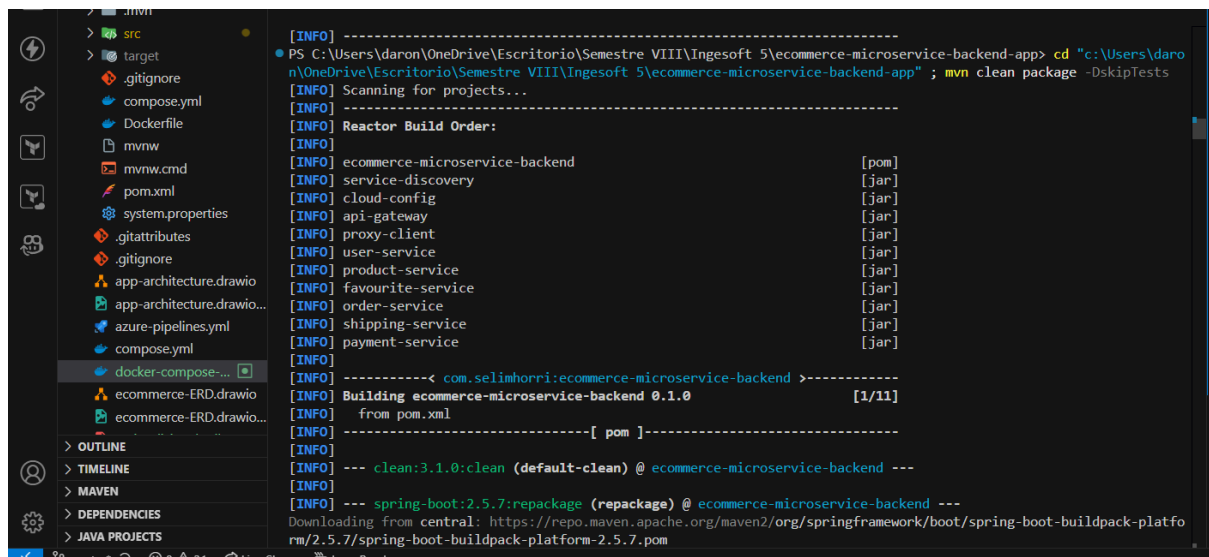
Se construye el proyecto:



```
PS C:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend> cd "c:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app" ; mvn clean compile -DskipTests

[INFO] --- compiler:3.8.1:compile (default-compile) @ payment-service ---
[INFO] Changes detected - recompiling the module!
[INFO] Compiling 18 source files to C:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app\payment-service\target\classes
[INFO] -----
[INFO] Reactor Summary for ecommerce-microservice-backend 0.1.0:
[INFO] ecommerce-microservice-backend ..... SUCCESS [ 2.688 s]
[INFO] service-discovery ..... SUCCESS [ 4.787 s]
[INFO] cloud-config ..... SUCCESS [ 1.422 s]
[INFO] api-gateway ..... SUCCESS [ 2.211 s]
[INFO] proxy-client ..... SUCCESS [ 7.904 s]
[INFO] user-service ..... SUCCESS [ 4.537 s]
[INFO] product-service ..... SUCCESS [ 3.496 s]
[INFO] favourite-service ..... SUCCESS [ 3.227 s]
[INFO] order-service ..... SUCCESS [ 3.380 s]
[INFO] shipping-service ..... SUCCESS [ 3.181 s]
[INFO] payment-service ..... SUCCESS [ 3.338 s]
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 40.986 s
[INFO] Finished at: 2025-10-28T15:44:41-05:00
[INFO] -----
PS C:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app> cd "c:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app" ; mvn clean package -DskipTests
```

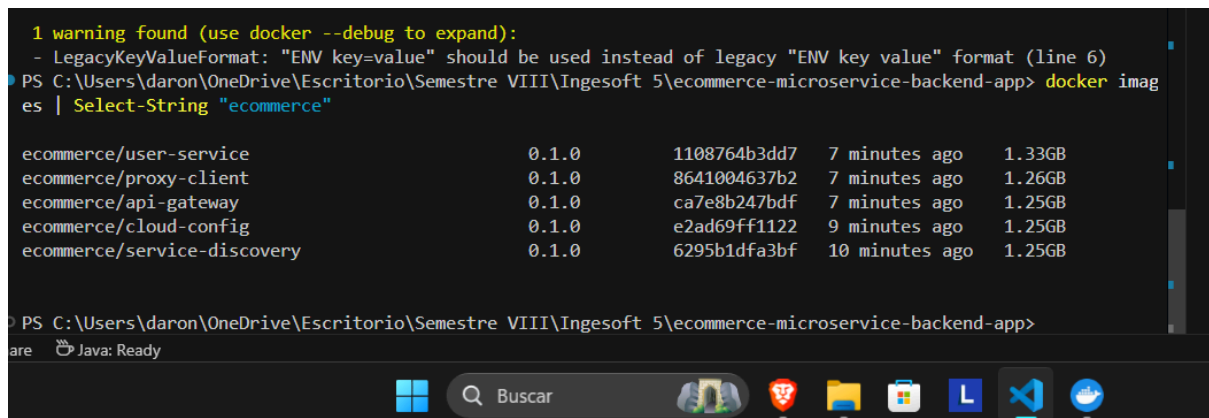
se crean los JAR de los microservicios:



```
PS C:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app> cd "c:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app" ; mvn clean package -DskipTests

[INFO] Scanning for projects...
[INFO] -----
[INFO] Reactor Build Order:
[INFO] ecommerce-microservice-backend [pom]
[INFO] service-discovery [jar]
[INFO] cloud-config [jar]
[INFO] api-gateway [jar]
[INFO] proxy-client [jar]
[INFO] user-service [jar]
[INFO] product-service [jar]
[INFO] favourite-service [jar]
[INFO] order-service [jar]
[INFO] shipping-service [jar]
[INFO] payment-service [jar]
[INFO] -----
[INFO] -----< com.selimhorri:ecommerce-microservice-backend >-----
[INFO] Building ecommerce-microservice-backend 0.1.0 [1/11]
[INFO] from pom.xml
[INFO] -----[ pom ]-----
[INFO] -----
[INFO] --- clean:3.1.0:clean (default-clean) @ ecommerce-microservice-backend ---
[INFO] --- spring-boot:2.5.7:repackage (repackage) @ ecommerce-microservice-backend ---
[INFO] Downloading from central: https://repo.maven.apache.org/maven2/org/springframework/boot/spring-boot-buildpack-platform/2.5.7/spring-boot-buildpack-platform-2.5.7.pom
```

Las imagenes creadas en docker:



```
1 warning found (use docker --debug to expand):
- LegacyKeyValueFormat: "ENV key=value" should be used instead of legacy "ENV key value" format (line 6)
PS C:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app> docker images | Select-String "ecommerce"

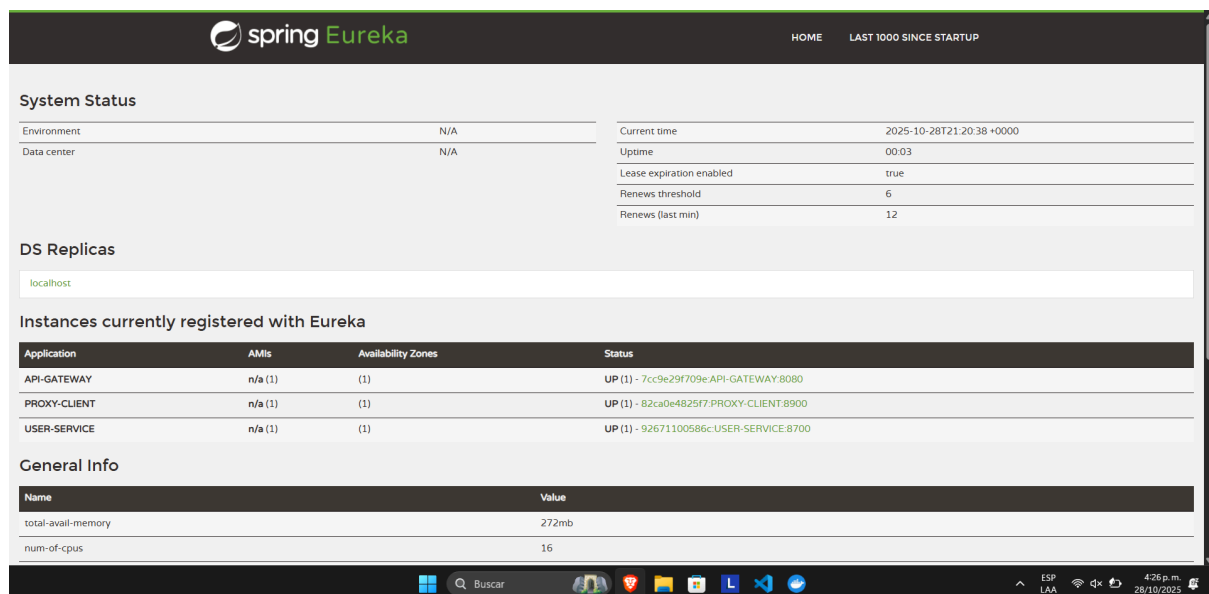
ecommerce/user-service          0.1.0          1108764b3dd7   7 minutes ago   1.33GB
ecommerce/proxy-client          0.1.0          8641004637b2   7 minutes ago   1.26GB
ecommerce/api-gateway           0.1.0          ca7e8b247bdf   7 minutes ago   1.25GB
ecommerce/cloud-config          0.1.0          e2ad69ff1122   9 minutes ago   1.25GB
ecommerce/service-discovery     0.1.0          6295b1dfa3bf   10 minutes ago  1.25GB

PS C:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app>
```

Contenedores arriba:

```
PS C:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app> cd "c:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app" ; docker-compose -f docker-compose-orchester.yml up -d
time="2025-10-28T16:16:43-05:00" level=warning msg="C:\\Users\\daron\\OneDrive\\Escritorio\\Semestre VIII\\Ingesoft 5\\ecommerce-microservice-backend-app\\docker-compose-orchester.yml: the attribute `version` is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] Running 7/7
  ✓ Network ecommerce-network      Created                                0.1s
  ✓ Container zipkin-server         Healthy                             12.7s
  ✓ Container service-discovery     Healthy                             34.7s
  ✓ Container cloud-config          Healthy                             55.4s
  ✓ Container proxy-client          Started                             55.9s
  ✓ Container api-gateway           Started                             55.7s
  ✓ Container user-service          Started                             55.9s
PS C:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app>
```

se verifica los servicios inscritos a eureka:



primer error: El cloud-config está intentando conectarse a localhost:8761 en lugar de service-discovery:8761

```
2025-10-28 21:17:36.670 INFO [CLOUD-CONFIG,,] 1 --- [main]
c.n.d.s.t.d.RedirectingEurekaHttpClient : Request execution error. endpoint=DefaultEndpoint{
serviceUrl='http://localhost:8761/eureka/}, exception=I/O error on GET request for
"http://localhost:8761/eureka/apps/": Connect to localhost:8761 [localhost/127.0.0.1,
localhost/0:0:0:0:0:0:0:1] failed: Connection refused (Connection refused); nested exception is
org.apache.http.conn.HttpHostConnectException: Connect to localhost:8761 [localhost/127.0.0.1,
localhost/0:0:0:0:0:0:0:1] failed: Connection refused (Connection refused)
```

segundo error encontrado en user-service:


Resumen de los Problemas Resueltos

✓ 1. Error de Enrutamiento del API Gateway (RESUELTO)

Problema: API Gateway retornaba error 500 al intentar enrutar a user-service

```
AnnotatedConnectException: Connection refused: localhost/127.0.0.1:8700
```

Solución: Agregamos EUREKA_INSTANCE_PREFER_IP_ADDRESS=true a todos los servicios en docker-compose-orchester.yml para que Eureka registre las IPs de los contenedores en lugar de localhost.

Resultado:  API Gateway ahora enruta correctamente.
http://localhost:8080/user-service/api/users devuelve 200 OK

Otro problema encontrado en zipkin y solucionado:


API-Gateway (archivo: application.yml)

 Eliminamos la ruta directa /user-service/** que iba directo a USER-SERVICE

 Dejamos solo la ruta /app/** que va a PROXY-CLIENT

Resultado: Ahora TODO el tráfico pasa obligatoriamente por Proxy-Client

2. Proxy-Client (archivo: SecurityConfig.java)

 Agregamos .antMatchers("/api/users/**").permitAll() en Spring Security

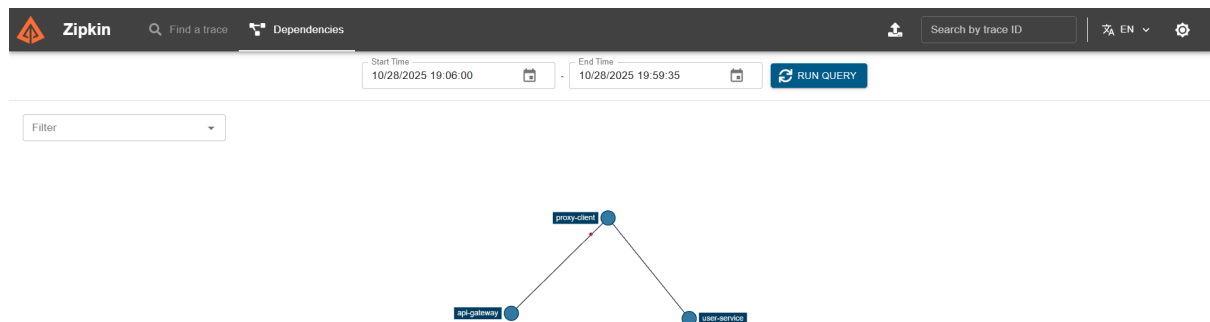
Resultado: Ahora las peticiones a /api/users NO requieren autenticación (antes daba 403)

3. Reconstrucción y despliegue:

Recompilamos ambos servicios con mvn clean package

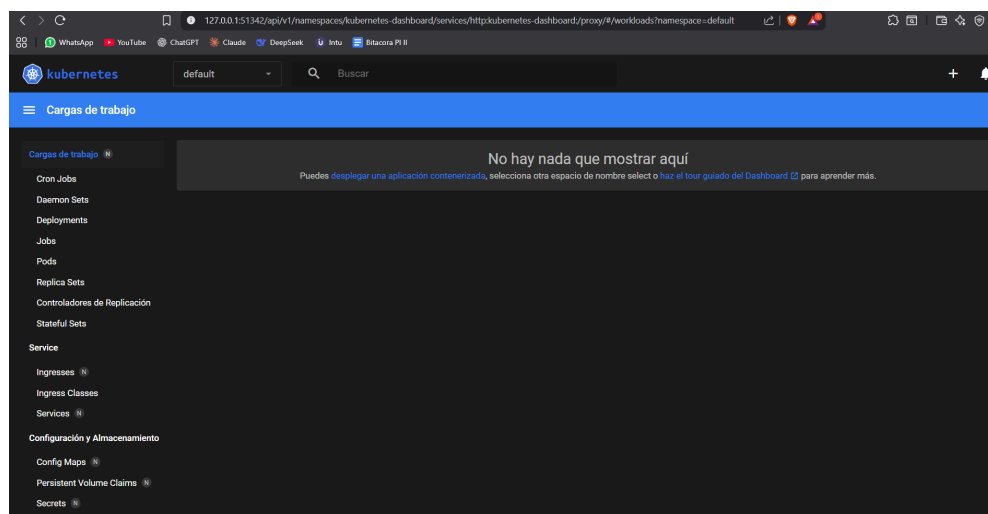
Reconstruimos las imágenes Docker

Reiniciamos los contenedores con docker-compose restart



Luego instalamos minikube e inicializamos un cluster:

```
* Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
PS C:\Windows\system32> kubectl get nodes
NAME          STATUS    ROLES          AGE    VERSION
minikube      Ready     control-plane  113s   v1.34.0
PS C:\Windows\system32> minikube dashboard
```



Una vez instalado minikube debemos copiar las imagenes docker al hipervisor que usa minikube, en mi caso uso el Docker-desktop, cabe resaltar que minikube ya usa un docker propio, por eso toca volver a mandar las imágenes que se tenían en mi propio docker al del minikube.

para eso se hace:

```
minikube docker-env -> esto saca las variables de entorno.
```

```
minikube docker-env --shell powershell | Invoke-Expression -> y esto ya apunta al docker de minikube
```

y con esto comandos construimos las imágenes en minikube:

```
# Service Discovery
docker build -t service-discovery:v0.1.0 -f
service-discovery/Dockerfile .

# Cloud Config
docker build -t cloud-config:v0.1.0 -f cloud-config/Dockerfile .

# API Gateway
docker build -t api-gateway:v0.1.0 -f api-gateway/Dockerfile .

# Proxy Client
docker build -t proxy-client:v0.1.0 -f proxy-client/Dockerfile .

# User Service
docker build -t user-service:v0.1.0 -f user-service/Dockerfile .
```

Ejemplo de Cloud-config

```
PS C:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app> docker build -t cloud
-config:v0.1.0 -f cloud-config/Dockerfile .
[+] Building 2.9s (9/9) FINISHED                                docker:default
=> [internal] load build definition from Dockerfile              0.0s
=> => transferring dockerfile: 392B                               0.0s
=> [internal] load metadata for docker.io/library/openjdk:11    0.9s
=> [internal] load .dockerignore                                  0.0s
=> => transferring context: 2B                                       0.0s
=> CACHED [1/4] FROM docker.io/library/openjdk:11@sha256:99bac5bf83633e3c7399aed725c8415e7b569b54e03e4599e580fc9 0.0s
=> [internal] load build context                                  1.2s
=> => transferring context: 59.78MB                                  1.1s
=> [2/4] RUN mkdir -p /home/app                                   0.7s
=> [3/4] WORKDIR /home/app                                       0.1s
=> [4/4] ADD cloud-config/target/cloud-config-v0.1.0.jar cloud-config.jar 0.4s
=> exporting to image                                             0.3s
=> => exporting layers                                              0.2s
=> => writing image sha256:7cf6c61ea15fe4172fb20551c532e348dcac067d97c7b35969cd1d2048dd7c1f 0.0s
=> => naming to docker.io/library/cloud-config:v0.1.0           0.0s
PS C:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app>
```

api-getaway:

```
PS C:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app> docker build -t api-gateway:v0.1.0 -f api-gateway/Dockerfile .
[+] Building 2.5s (9/9) FINISHED                                docker:default
=> [internal] load build definition from Dockerfile              0.1s
=> => transferring dockerfile: 394B                             0.0s
=> [internal] load metadata for docker.io/library/openjdk:11    1.0s
=> [internal] load .dockerignore                                0.0s
=> => transferring context: 2B                                    0.0s
=> [1/4] FROM docker.io/library/openjdk:11@sha256:99bac5bf83633e3c7399aed725c8415e7b569b54e03e4599e580fc9cdb7c21 0.0s
=> [internal] load build context                                0.7s
=> => transferring context: 58.71MB                             0.7s
=> CACHED [2/4] RUN mkdir -p /home/app                          0.0s
=> CACHED [3/4] WORKDIR /home/app                               0.0s
=> [4/4] ADD api-gateway/target/api-gateway-v0.1.0.jar api-gateway.jar 0.3s
=> exporting to image                                           0.3s
=> => exporting layers                                           0.2s
=> => writing image sha256:3d6b24f681f25b81855f6390b2ec7006a84f0c39950bb9ae7dacb4e9c027b9e6 0.0s
=> => naming to docker.io/library/api-gateway:v0.1.0           0.0s
PS C:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app> _
```

verificamos con `docker images | Select-String`

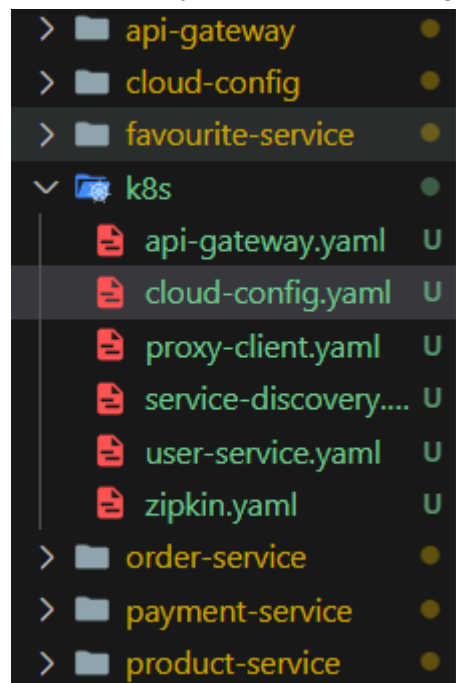
`"service-discovery|cloud-config|api-gateway|proxy-client|user-service"`

```
PS C:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app> docker images | Select-String "service-discovery|cloud-config|api-gateway|proxy-client|user-service"

user-service          v0.1.0      21411ddf492b   9 minutes ago    734MB
proxy-client          v0.1.0      1fa742584cd9   10 minutes ago   715MB
api-gateway           v0.1.0      3d6b24f681f2   11 minutes ago   713MB
cloud-config          v0.1.0      7cf6c61ea15f   12 minutes ago   714MB
service-discovery     v0.1.0      e0c7eb14b685   25 minutes ago   774MB

PS C:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app> _
```

Creamos los yaml para el despliegue en kubernetes:



Desplegamos todos los servicios con:

kubectl apply -f k8s/

```
PS C:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app> kubectl apply -f k8s/
deployment.apps/api-gateway created
service/api-gateway created
deployment.apps/cloud-config created
service/cloud-config created
deployment.apps/proxy-client created
service/proxy-client created
deployment.apps/service-discovery created
service/service-discovery created
deployment.apps/user-service created
service/user-service created
deployment.apps/zipkin created
service/zipkin created
```

Algunos servicios fallaron así que tuve que corregir el .yaml y volver a desplegar, para ello los siguientes comandos:

```
kubectl delete deployment proxy-client
kubectl apply -f k8s/proxy-client.yaml
```

Prueba de los servicios desplegados:

```
PS C:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app> kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
api-gateway-8b8c5b994-kxbsk        1/1     Running   0           105m
cloud-config-68b745f75f-dxpzw      1/1     Running   2 (97m ago) 105m
proxy-client-5d8b987dcb-rzsf5      1/1     Running   0           4m36s
service-discovery-b9bcf9674-v87d9  1/1     Running   2 (98m ago) 105m
user-service-7f78f45bfc-frqlz      1/1     Running   2 (96m ago) 105m
zipkin-bd67d9cf9-t77sn             1/1     Running   0           105m
PS C:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app>
```

Terminamos de desplegar el resto de microservicios:

```
PS C:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app> kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
api-gateway-8b8c5b994-kxbsk        1/1     Running   1 (5d16h ago) 5d18h
cloud-config-68b745f75f-dxpzw      1/1     Running   4 (30m ago)    5d18h
favourite-service-5885fb6668-z6g26 1/1     Running   0           4m32s
order-service-5956fbf86-h5hqz      1/1     Running   0           4m31s
payment-service-cd8d4787c-gbjcs     1/1     Running   0           24m
product-service-556ffbd5bc-l7jnl    1/1     Running   0           4m31s
proxy-client-5d8b987dcb-rzsf5      1/1     Running   1 (5d16h ago) 5d16h
service-discovery-b9bcf9674-v87d9  1/1     Running   3 (5d16h ago) 5d18h
shipping-service-5845d8695c-c5dg5   1/1     Running   0           4m30s
user-service-7f78f45bfc-frqlz      1/1     Running   3 (5d16h ago) 5d18h
zipkin-bd67d9cf9-t77sn             1/1     Running   1 (5d16h ago) 5d18h
PS C:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app>
```

Comandos utilizados para construir las imágenes locales:

Servicios de infraestructura

docker build -f service-discovery/Dockerfile -t ecommerce/service-discovery:v0.1.0 .

docker build -f cloud-config/Dockerfile -t ecommerce/cloud-config:v0.1.0 .

docker build -f api-gateway/Dockerfile -t ecommerce/api-gateway:v0.1.0 .

Proxy y Gateway

docker build -f proxy-client/Dockerfile -t ecommerce/proxy-client:v0.1.0 .

Microservicios de negocio

docker build -f user-service/Dockerfile -t ecommerce/user-service:v0.1.0 .

docker build -f product-service/Dockerfile -t ecommerce/product-service:v0.1.0 .

docker build -f order-service/Dockerfile -t ecommerce/order-service:v0.1.0 .
docker build -f payment-service/Dockerfile -t ecommerce/payment-service:v0.1.0 .
docker build -f favourite-service/Dockerfile -t ecommerce/favourite-service:v0.1.0 .
docker build -f shipping-service/Dockerfile -t ecommerce/shipping-service:v0.1.0 .

Verificamos que todos los servicios estén registrados en eureka:

```
PS C:\Users\daron\OneDrive\Escritorio\Semestre VIII\Ingesoft 5\ecommerce-microservice-backend-app> kubectl exec r-service-7f78f45bfc-g8zcp -- curl -s http://service-discovery:8761/eureka/apps | Select-String -Pattern "^\>e" | Select-Object -First 15

<name>FAVOURITE-SERVICE</name>
<name>PROXY-CLIENT</name>
<name>API-GATEWAY</name>
<name>PAYMENT-SERVICE</name>
<name>ORDER-SERVICE</name>
<name>PRODUCT-SERVICE</name>
<name>SHIPPING-SERVICE</name>
<name>USER-SERVICE</name>
```

Iniciamos sesion:

