

Task 4: Pub-Sub Messaging

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Link to Github:<https://github.com/yuyanen/Task4.git>

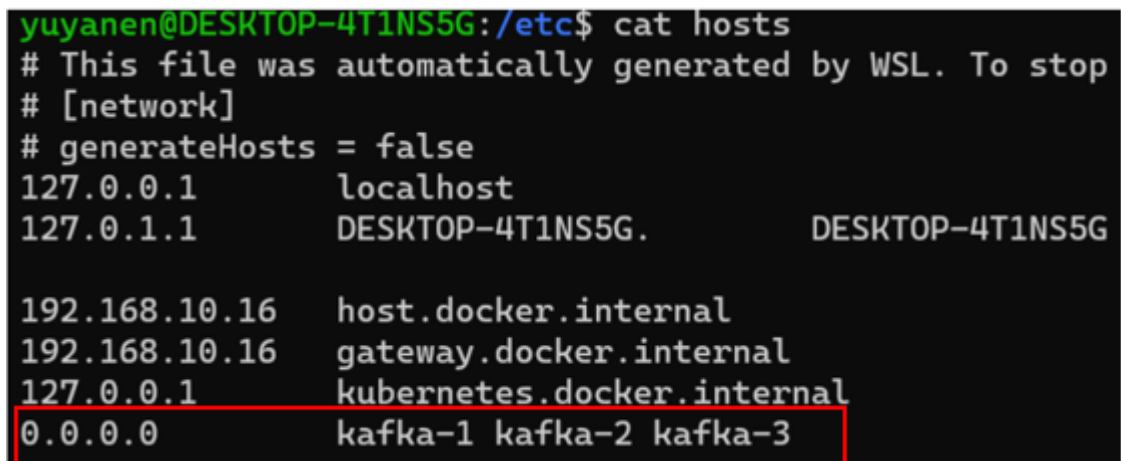
Environment setup: install Linux Ubuntu

Setup instructions :

`mkdir Task4`

`cd Task4`

- (1) Turn on docker app and install docker-compose: `sudo apt install docker-compose`
- (2) Install kafkacat : `sudo apt-get install kafkacat`
- (3) Edit /etc/hosts file and add 0.0.0.0 kafka-1 kafka-2 kafka-3



```
yuyanen@DESKTOP-4T1NS5G:/etc$ cat hosts
# This file was automatically generated by WSL. To stop
# [network]
# generateHosts = false
127.0.0.1        localhost
127.0.1.1        DESKTOP-4T1NS5G.          DESKTOP-4T1NS5G

192.168.10.16    host.docker.internal
192.168.10.16    gateway.docker.internal
127.0.0.1        kubernetes.docker.internal
0.0.0.0          kafka-1 kafka-2 kafka-3
```

- (4) Create docker-compose.yml file : `sudo nano -w docker-compose.yml`
- (5) Edit docker-compose.yml file with below content: `cat docker-compose.yml`
Ctrl+S save

```
services:

  zookeeper-1:

    image: confluentinc/cp-zookeeper:latest

    hostname: zookeeper-1

    ports:

      - "13181:13181"

    environment:

      ZOOKEEPER_SERVER_ID: 1

      ZOOKEEPER_CLIENT_PORT: 13181

      ZOOKEEPER_TICK_TIME: 2000

      ZOOKEEPER_INIT_LIMIT: 5
```

```
    ZOOKEEPER_SYNC_LIMIT: 2

    ZOOKEEPER_SERVERS:
zookeeper-1:13888:14888;zookeeper-2:23888:24888;zookeeper-3:33
888:34888
    networks:
        - proxy

zookeeper-2:

    image: confluentinc/cp-zookeeper:latest
    hostname: zookeeper-2
    ports:
        - "23181:23181"
    environment:
        ZOOKEEPER_SERVER_ID: 2
        ZOOKEEPER_CLIENT_PORT: 23181
        ZOOKEEPER_TICK_TIME: 2000
        ZOOKEEPER_INIT_LIMIT: 5
        ZOOKEEPER_SYNC_LIMIT: 2
        ZOOKEEPER_SERVERS:
zookeeper-1:13888:14888;zookeeper-2:23888:24888;zookeeper-3:33
888:34888
    networks:
        - proxy

zookeeper-3:

    image: confluentinc/cp-zookeeper:latest
    hostname: zookeeper-3
    ports:
        - "33181:33181"
    environment:
        ZOOKEEPER_SERVER_ID: 3
        ZOOKEEPER_CLIENT_PORT: 33181
        ZOOKEEPER_TICK_TIME: 2000
        ZOOKEEPER_INIT_LIMIT: 5
        ZOOKEEPER_SYNC_LIMIT: 2
```

```
    ZOOKEEPER_SERVERS:
zookeeper-1:13888:14888;zookeeper-2:23888:24888;zookeeper-3:33
888:34888
```

```
    networks:
      - proxy
```

```
kafka-1:
```

```
    image: confluentinc/cp-kafka:latest
```

```
    hostname: kafka-1
```

```
    ports:
```

```
      - "20092:20092"
```

```
    depends_on:
```

```
      - zookeeper-1
```

```
      - zookeeper-2
```

```
      - zookeeper-3
```

```
    environment:
```

```
      KAFKA_BROKER_ID: 1
```

```
      KAFKA_ZOOKEEPER_CONNECT:
```

```
zookeeper-1:13181,zookeeper-2:13181,zookeeper-3:13181
```

```
      KAFKA_ADVERTISED_LISTENERS: PLAINTEXT://kafka-1:20092
```

```
    networks:
```

```
      - proxy
```

```
kafka-2:
```

```
    image: confluentinc/cp-kafka:latest
```

```
    hostname: kafka-2
```

```
    ports:
```

```
      - "30092:30092"
```

```
    depends_on:
```

```
      - zookeeper-1
```

```
      - zookeeper-2
```

```
      - zookeeper-3
```

```
    environment:
```

```
      KAFKA_BROKER_ID: 2
```

```
      KAFKA_ZOOKEEPER_CONNECT:
```

```
zookeeper-1:13181,zookeeper-2:13181,zookeeper-3:13181
```

```

      KAFKA_ADVERTISED_LISTENERS: PLAINTEXT://kafka-2:30092

networks:
  - proxy

kafka-3:
  image: confluentinc/cp-kafka:latest
  hostname: kafka-3
  ports:
    - "40092:40092"
  depends_on:
    - zookeeper-1
    - zookeeper-2
    - zookeeper-3
  environment:
    KAFKA_BROKER_ID: 3
    KAFKA_ZOOKEEPER_CONNECT:
zookeeper-1:13181,zookeeper-2:13181,zookeeper-3:13181
    KAFKA_ADVERTISED_LISTENERS: PLAINTEXT://kafka-3:40092
  networks:
    - proxy

networks:
  proxy:
    driver: bridge

```

(6) Run docker : `sudo docker-compose up -d`

```

yuyanen@DESKTOP-4T1NS5G:/Task4$ sudo docker-compose up -d
Starting task4_zookeeper-2_1 ... done
Starting task4_zookeeper-3_1 ... done
Starting task4_zookeeper-1_1 ... done
Creating task4_kafka-3_1      ... done
Creating task4_kafka-2_1      ... done
Creating task4_kafka-1_1      ... done

```

- (7) Check running service: **docker-compose ps**

```
yuyanen@DESKTOP-4T1NS5G:/Task4$ docker-compose ps
```

Name	Command	State	Ports
task4_kafka-1_1	/etc/confluent/docker/run	Up	0.0.0.0:20092->20092/tcp, 9092/tcp
task4_kafka-2_1	/etc/confluent/docker/run	Up	0.0.0.0:30092->30092/tcp, 9092/tcp
task4_kafka-3_1	/etc/confluent/docker/run	Up	0.0.0.0:40092->40092/tcp, 9092/tcp
task4_zookeeper-1_1	/etc/confluent/docker/run	Up	0.0.0.0:13181->13181/tcp, 2181/tcp, 2888/tcp, 3888/tcp
task4_zookeeper-2_1	/etc/confluent/docker/run	Up	2181/tcp, 0.0.0.0:23181->23181/tcp, 2888/tcp, 3888/tcp
task4_zookeeper-3_1	/etc/confluent/docker/run	Up	2181/tcp, 2888/tcp, 0.0.0.0:33181->33181/tcp, 3888/tcp

- (8) Choose a controller from below 3 brokers

sudo kafkacat -L -b kafka-1:20092

sudo kafkacat -L -b kafka-2:30092

sudo kafkacat -L -b kafka-3:40092

```
yuyanen@DESKTOP-4T1NS5G:/Task4$ sudo kafkacat -L -b kafka-1:20092
Metadata for all topics (from broker 1: kafka-1:20092/1):
 3 brokers:
  broker 2 at kafka-2:30092
  broker 3 at kafka-3:40092
  broker 1 at kafka-1:20092 (controller)
 0 topics:
```

- (9) Opening another terminal, set the controller as a producer using the following command:

sudo kafkacat -P -b kafka-1:20092 -t test_topic

Open another terminal, set any other cluster as consumer

sudo kafkacat -C -b kafka-2:30092 -t test_topic

- (10) Test the Pub-Sub messaging between two terminals

```
yuyanen@DESKTOP-4T1NS5G:~/Task4$ sudo kafkacat -P -b kafka-1:20092 -t test_topic
Hello
This is James
I love TIC3001
```

```
yuyanen@DESKTOP-4T1NS5G:~/Task4$ sudo kafkacat -C -b kafka-2:30092 -t test_topic
[sudo] password for yuyanen:
% Reached end of topic test_topic [0] at offset 0
Hello
% Reached end of topic test_topic [0] at offset 1
This is James
% Reached end of topic test_topic [0] at offset 2
I love TIC3001
% Reached end of topic test_topic [0] at offset 3
```

- (11) In the control terminal, stop the controller terminal:

docker stop task4_kafka-1_1

```
yuyanen@DESKTOP-4T1NS5G:/Task4$ docker stop task4_kafka-1_1
task4_kafka-1_1
```

(12) Verify that kafka-1:20092 stop

```
yuyanen@DESKTOP-4T1NS5G:~/Task4$ sudo kafkacat -L -b kafka-1:20092
[sudo] password for yuyanen:
%3|1679232647.096|FAIL|rdkafka#producer-1| [thrd:kafka-1:20092/bootstrap]: kafka-1:20092/bootstrap: Connect to ipv4#0.0.0.0:20092 failed: Connection refused (after 0ms in state CONNECT)
%3|1679232648.095|FAIL|rdkafka#producer-1| [thrd:kafka-1:20092/bootstrap]: kafka-1:20092/bootstrap: Connect to ipv4#0.0.0.0:20092 failed: Connection refused (after 0ms in state CONNECT, 1 identical error(s) suppressed)
% ERROR: Failed to acquire metadata: Local: Broker transport failure
```

(13) Test the Pub-Sub feature through the two terminals again

```
yuyanen@DESKTOP-4T1NS5G:~/Task4$ sudo kafkacat -P -b kafka-1:20092 -t test_topic
Hello
I am still here
```

```
yuyanen@DESKTOP-4T1NS5G:~/Task4$ sudo kafkacat -C -b kafka-2:30092 -t test_topic
[sudo] password for yuyanen:
% Reached end of topic test_topic [0] at offset 0
Hello
% Reached end of topic test_topic [0] at offset 1
I am still here
% Reached end of topic test_topic [0] at offset 2
```

(14) Clean up everything with command:

[docker-compose down](#)

```
yuyanen@DESKTOP-4T1NS5G:~/Task4$ docker-compose down
Stopping task4_kafka-3_1      ... done
Stopping task4_kafka-2_1      ... done
Stopping task4_zookeeper-3_1  ... done
Stopping task4_zookeeper-1_1  ... done
Stopping task4_zookeeper-2_1  ... done
Removing task4_kafka-3_1      ... done
Removing task4_kafka-2_1      ... done
Removing task4_kafka-1_1      ... done
Removing task4_zookeeper-3_1  ... done
Removing task4_zookeeper-1_1  ... done
Removing task4_zookeeper-2_1  ... done
Removing network task4_proxy
```