

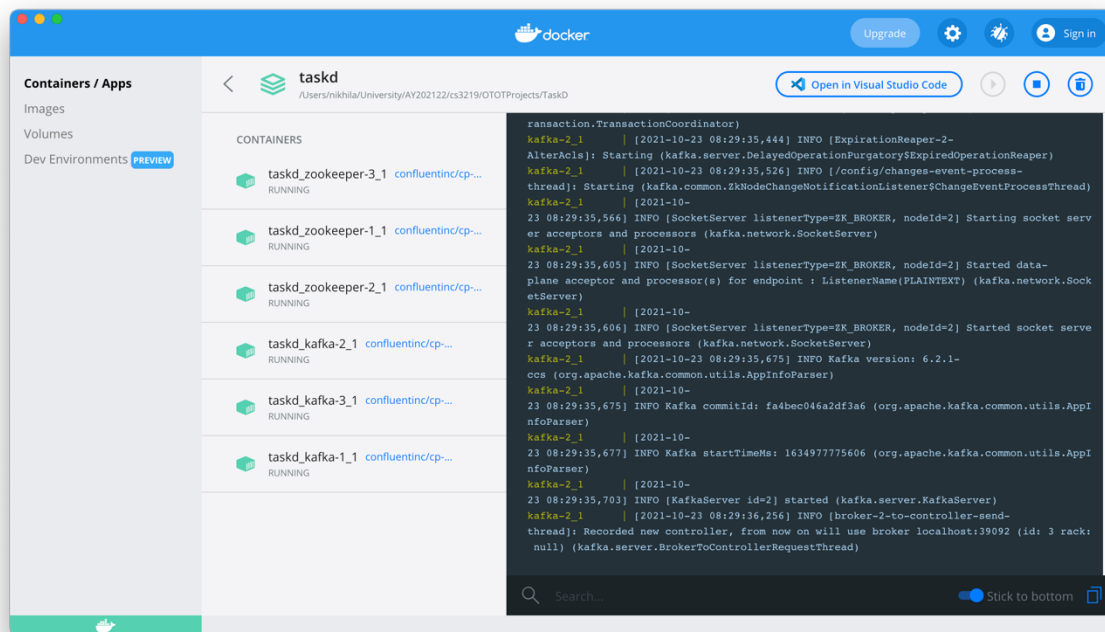
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Link to Github repo: https://github.com/Nikhilalalalala/CS3219_TaskD

Instructions and Screenshots:

Run docker-compose to start up the containers:
docker-compose up



The 3 zookeeper containers and 3 kafka containers are running

Enter the docker container:

```
docker exec -it taskd_kafka-1_1 /bin/sh
```

```
docker exec -it taskd_kafka-2_1 /bin/sh
```

```
docker exec -it taskd_kafka-3_1 /bin/sh
```

In all of the docker container run to go to root directory

```
cd ../../..
```



The image displays three separate terminal window screenshots, each showing the process of entering a Docker container and navigating to the root directory. Each window has a title bar that says 'docker' with a close button. The first window shows the command 'docker exec -it taskd_kafka-1_1 /bin/sh' being executed, followed by 'sh-4.4\$ cd ../../..' and a new prompt 'sh-4.4\$'. The second window shows 'docker exec -it taskd_kafka-2_1 /bin/sh', followed by 'sh-4.4\$ cd ../../..' and a new prompt 'sh-4.4\$'. The third window shows 'docker exec -it taskd_kafka-3_1 /bin/sh', followed by 'sh-4.4\$ cd ../../..' and a new prompt 'sh-4.4\$'.

```
docker
nikhila@Nikhilas-MBP TaskD %
docker exec -it taskd_kafka-1_1 /bin/sh

sh-4.4$ cd ../../..
sh-4.4$

docker
nikhila@Nikhilas-MBP TaskD %
docker exec -it taskd_kafka-2_1 /bin/sh

sh-4.4$ cd ../../..
sh-4.4$

docker
nikhila@Nikhilas-MBP TaskD %
docker exec -it taskd_kafka-3_1 /bin/sh

sh-4.4$ cd ../../..
sh-4.4$
```

Entered the 3 docker containers and at root directory

Create topic named example

```
./usr/bin/kafka-topics --create --topic example --partitions 3 --  
replication-factor 3 --if-not-exists --zookeeper localhost:32181
```

Describe topic example

```
./usr/bin/kafka-topics --describe --topic example --zookeeper  
localhost:32181
```

Ran the above commands in container, taskd_kafka-1_1

```
nikhila@Nikhilas-MBP TaskD %  
docker exec -it taskd_kafka-1_1 /bin/sh  
  
sh-4.4$ cd ../../  
sh-4.4$ ./usr/bin/kafka-topics --create --topic example --partitions 3 --replication-factor 3 --if-not-exists --zo  
okeeper localhost:32181  
Created topic example.  
sh-4.4$ ./usr/bin/kafka-topics --describe --topic example --zookeeper localhost:32181  
Topic: example TopicId: Am6EWXR5SxeFbU0XX7Zocg PartitionCount: 3 ReplicationFactor: 3 Configs:  
Topic: example Partition: 0 Leader: 2 Replicas: 2,3,1 Isr: 2,3,1  
Topic: example Partition: 1 Leader: 3 Replicas: 3,1,2 Isr: 3,1,2  
Topic: example Partition: 2 Leader: 1 Replicas: 1,2,3 Isr: 1,2,3  
sh-4.4$ █
```

Created topic “example” and run describe command

In a kafka node: (Producer)

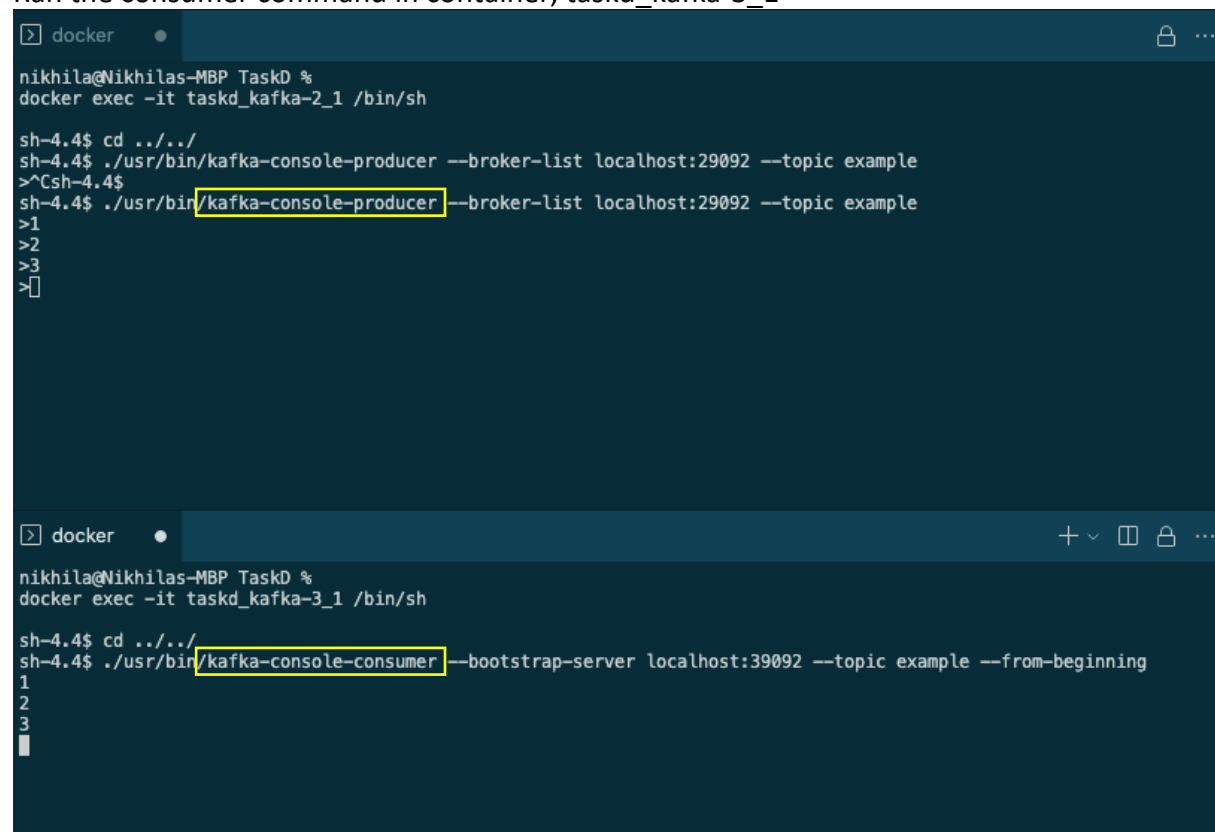
```
./usr/bin/kafka-console-producer --broker-list localhost:29092 --  
topic example
```

In another kafka node: (Consumer)

```
./usr/bin/kafka-console-consumer --bootstrap-server localhost:29092  
--topic example --from-beginning
```

Ran the producer command in container, taskd_kafka-2_1

Ran the consumer command in container, taskd_kafka-3_1



The image shows two terminal windows from a Docker Desktop application. The top window is titled 'docker' and shows a user 'nikhila@Nikhilas-MBP TaskD %' running 'docker exec -it taskd_kafka-2_1 /bin/sh'. Inside the container, the user runs 'cd ../../' and then './usr/bin/kafka-console-producer --broker-list localhost:29092 --topic example'. The command is highlighted with a yellow box. The output shows three messages being sent: '>1', '>2', and '>3'. The bottom window is also titled 'docker' and shows the same user running 'docker exec -it taskd_kafka-3_1 /bin/sh'. Inside the container, the user runs 'cd ../../' and then './usr/bin/kafka-console-consumer --bootstrap-server localhost:39092 --topic example --from-beginning'. The command is highlighted with a yellow box. The output shows three messages being received: '1', '2', and '3'.

```
docker
nikhila@Nikhilas-MBP TaskD %
docker exec -it taskd_kafka-2_1 /bin/sh

sh-4.4$ cd ../../
sh-4.4$ ./usr/bin/kafka-console-producer --broker-list localhost:29092 --topic example
>^Csh-4.4$
sh-4.4$ ./usr/bin/kafka-console-producer --broker-list localhost:29092 --topic example
>1
>2
>3
>

docker
nikhila@Nikhilas-MBP TaskD %
docker exec -it taskd_kafka-3_1 /bin/sh

sh-4.4$ cd ../../
sh-4.4$ ./usr/bin/kafka-console-consumer --bootstrap-server localhost:39092 --topic example --from-beginning
1
2
3
█
```

Messages passed from producer to consumer

We can try consuming and producing from different hosts.

Producer is now taskd_kafka-3_1

```
docker
nikhila@Nikhilas-MBP TaskD %
docker exec -it taskd_kafka-3_1 /bin/sh

sh-4.4$ cd ../../
sh-4.4$ ./usr/bin/kafka-console-consumer --bootstrap-server localhost:39092 --topic example --from-beginning
1
2
3
^CProcessed a total of 3 messages
sh-4.4$ ./usr/bin/kafka-console-producer --broker-list localhost:39092 --topic example
>Produce from kafka-3
>
```

Consuming on taskd_kafka-1_1

```
nikhila@Nikhilas-MBP TaskD %
docker exec -it taskd_kafka-1_1 /bin/sh

sh-4.4$ cd ../../
sh-4.4$ ./usr/bin/kafka-console-consumer --bootstrap-server localhost:19092 --topic example --from-beginning
1
2
3
Produce from kafka-3
█
```

Messages passed from a different producer to a different consumer

Kill a docker container to show the management of the failure of the master node

Stopped taskd_kafka-2_1

```
ser /
kafka-2_1 | [2021-10-23 09:01:39,057] INFO [KafkaServer id=2] shut down completed (kafka.server.KafkaServer)
taskd_kafka-2_1 exited with code 143
```

```
kafka-1_1 | [2021-10-23 09:01:43,048] INFO [Controller id=1] Starting replica leader election (PREFERRED) for partitions tri
gged by AutoTriggered (kafka.controller.KafkaController)
```

From kafka container logs about shut down and leader election

Describe the topic again

```
sh-4.4$ ./usr/bin/kafka-topics --describe --topic example --zookeeper localhost:32181
Topic: example TopicId: wiMIjWePSKWFS0YzRU7kzw PartitionCount: 3 ReplicationFactor: 3 Configs:
Topic: example Partition: 0 Leader: 3 Replicas: 2,3,1 Isr: 3,1
Topic: example Partition: 1 Leader: 3 Replicas: 3,1,2 Isr: 3,1
Topic: example Partition: 2 Leader: 1 Replicas: 1,2,3 Isr: 1,3
sh-4.4$
```

Description of the same topic example, the leader allocation does not include 2

And we can try producing to and consuming from the topic again

Producing from taskd_kafka-1_1

```
sh-4.4$ ./usr/bin/kafka-console-producer --broker-list localhost:19092 --topic example
>Produce after shutdownnnn
>
```

Consuming from taskd_kafka-3_1

```
sh-4.4$ ./usr/bin/kafka-console-consumer --bootstrap-server localhost:39092 --topic example --from-beginning
1
3
Produce from kafka-3
2
Produce after shutdownnnn
```

We can produce and consume from that topic again