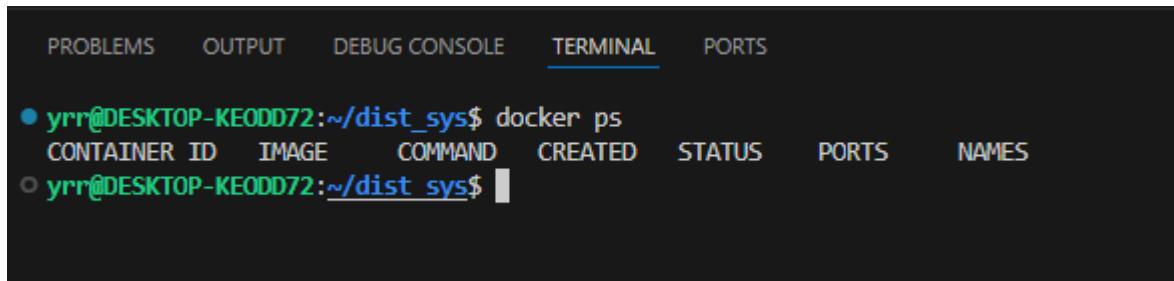
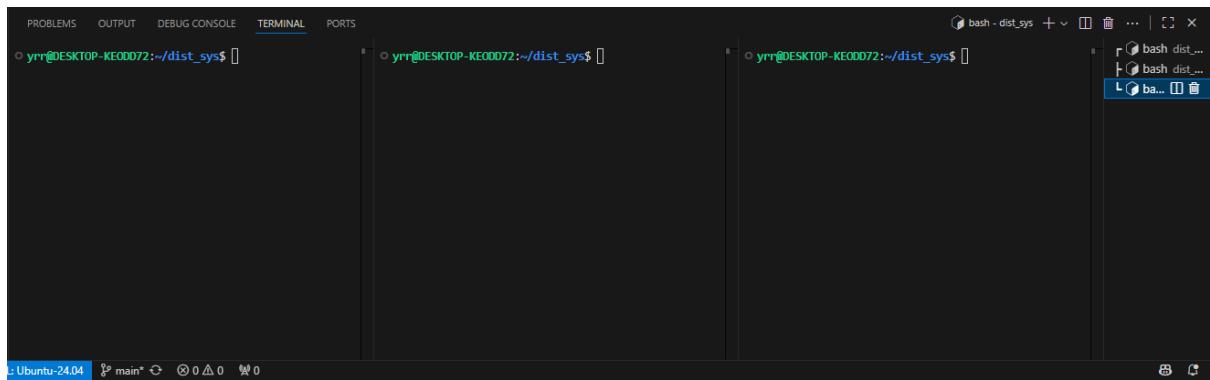


1. Protokol MQTT



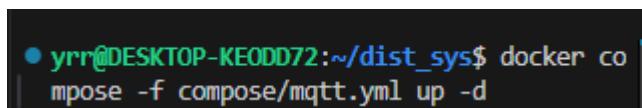
```
● yrr@DESKTOP-KE0DD72:~/dist_sys$ docker ps
CONTAINER ID        IMAGE       COMMAND       CREATED          STATUS          PORTS          NAMES
○ yrr@DESKTOP-KE0DD72:~/dist_sys$
```

List docker yang aktif



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
○ yrr@DESKTOP-KE0DD72:~/dist_sys$ bash - dist_sys
○ yrr@DESKTOP-KE0DD72:~/dist_sys$ bash dist...
○ yrr@DESKTOP-KE0DD72:~/dist_sys$ bash dist...
```

Buat 3 terminal, ctrl+shift+5, 3 kali



```
● yrr@DESKTOP-KE0DD72:~/dist_sys$ docker co
● yrr@DESKTOP-KE0DD72:~/dist_sys$ docker co
```

membaca file compose, membuat network internal, menjalankan container, -d berjalan pada background

```
● yrr@DESKTOP-KE0DD72:~/dist_sys$ docker ps
CONTAINER ID   IMAGE          COMMAND                  CREATED
TED           compose-mqtt-sub "tail -f /dev/null"   28 seconds ago
f21054b6ffc4  compose-mqtt-sub "tail -f /dev/null"   28 seconds ago
econds ago    Up 26 seconds   mqtt-subscriber
1fc07ffc99e4  compose-mqtt-pub "tail -f /dev/null"  28 seconds ago
econds ago    Up 26 seconds   mqtt-publisher
745ed7115369  eclipse-mosquitto:2.0   "/docker-entrypoint..."  28 seconds ago
econds ago    Up 27 seconds   1883/tcp
1883/tcp      mqtt-broker
○ yrr@DESKTOP-KE0DD72:~/dist_sys$
```

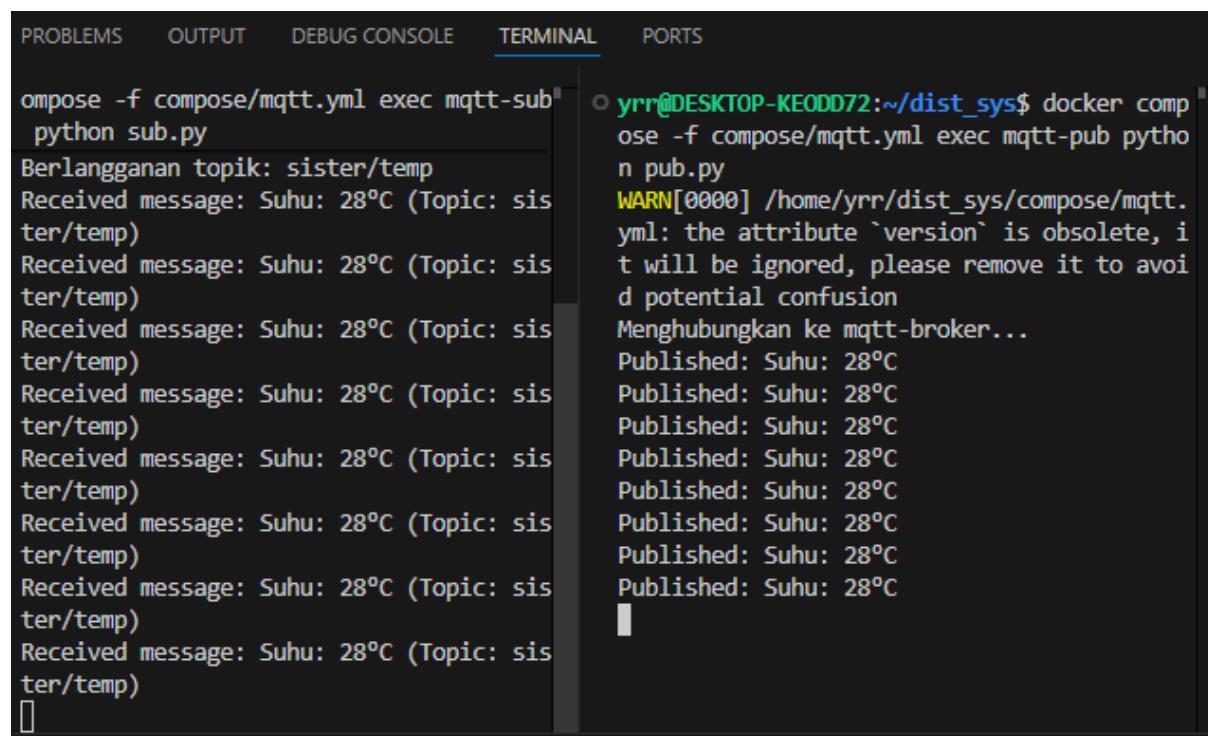
List docker

```
○ yrr@DESKTOP-KE0DD72:~/dist_sys$ docker c
ompose -f compose/mqtt.yml exec mqtt-sub
python sub.py
```

```
○ yrr@DESKTOP-KE0DD72:~/dist_sys$ docker comp
ose -f compose/mqtt.yml exec mqtt-pub pytho
n pub.py
```

Kiri (mengaktifkan program TCP server sesungguhnya (subscriber) di dalam container.)

Kanan (mengaktifkan program TCP server sesungguhnya (publisher.py) di dalam container.)



The terminal window shows two separate processes running in containers. The left side shows a subscriber container receiving messages from a topic 'sister/temp' and publishing them to the same topic. The right side shows a publisher container publishing messages to the 'sister/temp' topic. The messages all read 'Suhu: 28°C'.

```
PROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS
compose -f compose/mqtt.yml exec mqtt-sub
python sub.py
Berlangganan topik: sister/temp
Received message: Suhu: 28°C (Topic: sister/temp)
○ yrr@DESKTOP-KE0DD72:~/dist_sys$ docker comp
ose -f compose/mqtt.yml exec mqtt-pub pytho
n pub.py
WARN[0000] /home/yrr/dist_sys/compose/mqtt.
yml: the attribute `version` is obsolete, i
t will be ignored, please remove it to avoi
d potential confusion
Menghubungkan ke mqtt-broker...
Published: Suhu: 28°C
```

Komunikasi berjalan

```
○ yrr@DESKTOP-KEODD72:~/dist_sys$ ip a
```

Terminal ke 3, cek ip

```
inet6 fe80::d4a2:5dff:fe70:8ee/64 scope link
      valid_lft forever preferred_lft forever
20: veth24c645b@if2: <BROADCAST,MULTICAST,UP,LOWER_UP>
  mtu 1500 qdisc noqueue master br-d22e66d8d792 state UP
    group default
```

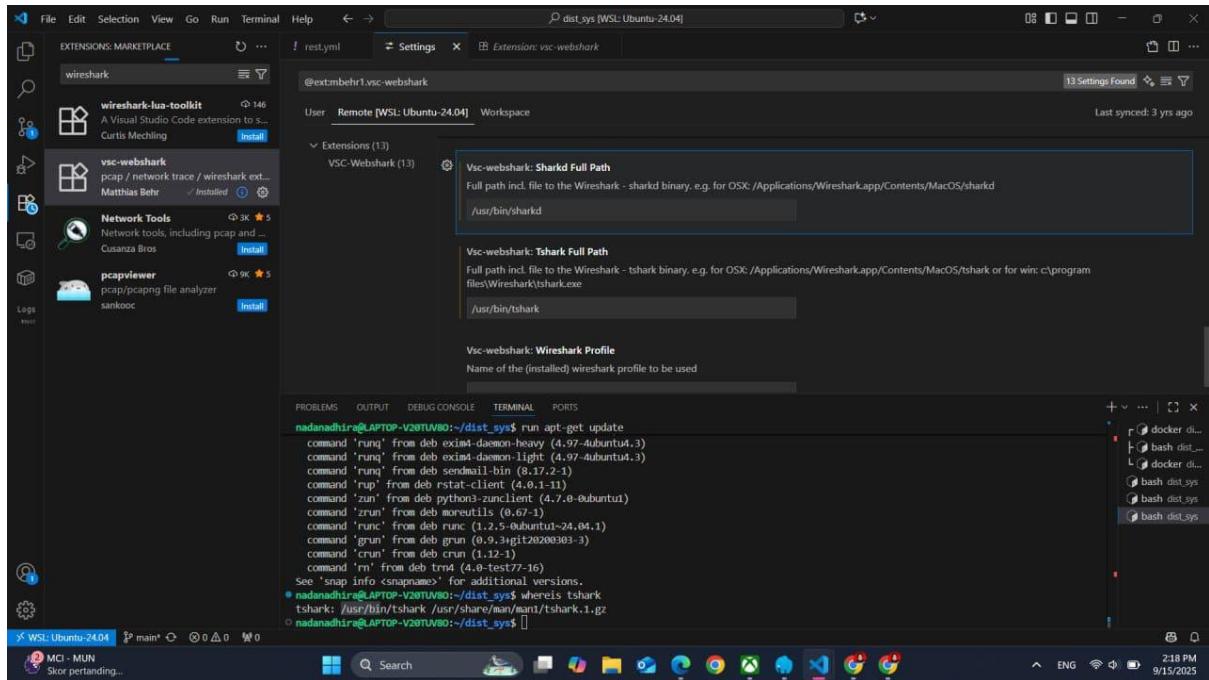
Ambil br-d22e66d8d792

sudo apt update

sudo apt install wireshark -y // install wireshark

install extension “vsc webshark”, lalu double click

arahkan full path nya ke /usr/bin/sharkd

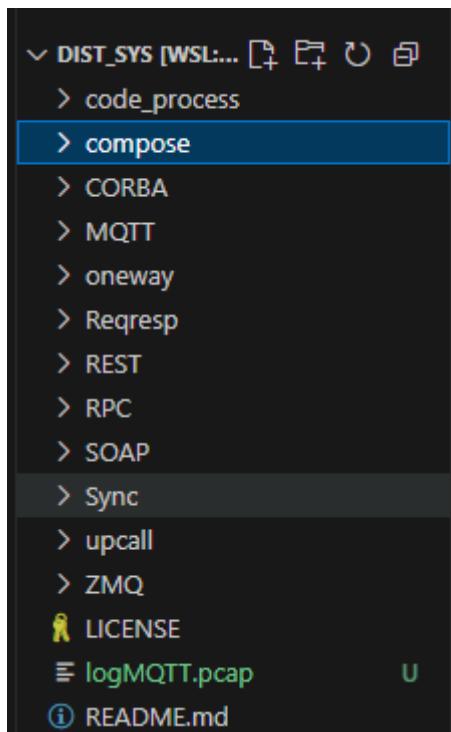


```
○ yrr@DESKTOP-KE0DD72:~/dist_sys$ sudo tcpdump -nvi br-d22e66d8d792 -w logMQTT.pcap
```

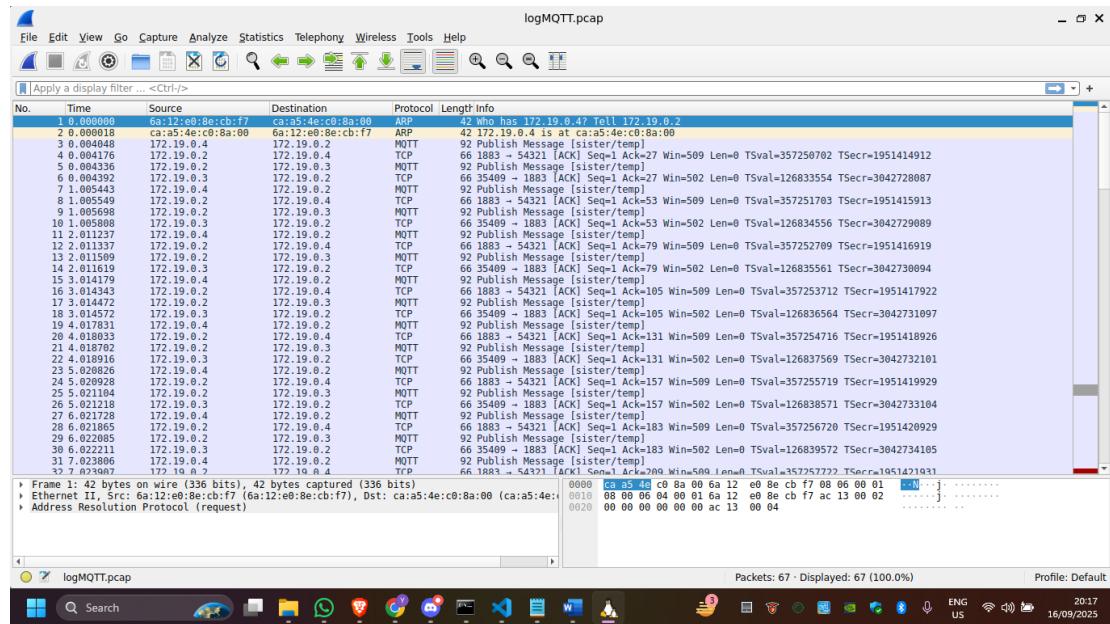
Perintah “sudo tcpdump -nvi [br nya samean] -w [namafile yang samwan mau].pcap”

```
○ yrr@DESKTOP-KE0DD72:~/dist_sys$ sudo tcpdump -nvi br-d22e66d8d792 -w logMQTT.pcap
p
tcpdump: listening on br-d22e66d8d792, link-type EN10MB (Ethernet), snapshot length 262144 bytes
Got 67
```

Proses log



Double click “logMQTT.pcap”



Tinggal Analisa

2. Protokol TCP (Req/Resp)

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
● yrr@DESKTOP-KEODD72:~/dist_sys$ docker compose -f
  compose/reqresp.yml up -d
```

Terminal 1, membaca file compose, membuat network internal, menjalankan container, -d berjalan pada background

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
● yrr@DESKTOP-KEODD72:~/dist_sys$ docker ps
CONTAINER ID IMAGE COMMAND
CREATED STATUS PORTS
NAMES
d5ab4ac66478 compose-reqresp-client "tail -f
/dev/null" 7 seconds ago Up 6 seconds 2222/
tcp reqresp-client
8a8f8067bf73 compose-reqresp-server "tail -f
/dev/null" 7 seconds ago Up 7 seconds 2222/
tcp reqresp-server
● yrr@DESKTOP-KEODD72:~/dist_sys$
```

List docker ps, tcp berjalan di port 2222

```
○ yrr@DESKTOP-KE0DD72:~/dist_sys$ docker compose -f
  compose/reqresp.yml exec reqresp-server python s
  erver.py
```

```
○ yrr@DESKTOP-KE0DD72:~/dist_sys$ docker compose -f compos
e/reqresp.yml exec reqresp-client python client.py
```

Kiri terminal 1 (bertindak sbg server)

Kanan terminal 2 (bertindak sbg client)

```
○ yrr@DESKTOP-KE0DD72:~/dist_sys$ docker compose -f
  compose/reqresp.yml exec reqresp-server python s
  erver.py
  WARN[0000] /home/yrr/dist_sys/compose/reqresp.yml
  : the attribute `version` is obsolete, it will be
  ignored, please remove it to avoid potential con
  fusion
  Server listening on 0.0.0.0:2222
  Connection from: ('172.19.0.3', 55726)
  
```

```
○ yrr@DESKTOP-KE0DD72:~/dist_sys$ docker compose -f compos
e/reqresp.yml exec reqresp-client python client.py
  WARN[0000] /home/yrr/dist_sys/compose/reqresp.yml: the a
ttribute `version` is obsolete, it will be ignored, please
remove it to avoid potential confusion
  Enter message: 
```

Mendapatkan connection 172.19.0.3

```
○ yrr@DESKTOP-KE0DD72:~/dist_sys$ docker compose -f
  compose/reqresp.yml exec reqresp-server python s
  erver.py
  WARN[0000] /home/yrr/dist_sys/compose/reqresp.yml
  : the attribute `version` is obsolete, it will be
  ignored, please remove it to avoid potential con
  fusion
  Server listening on 0.0.0.0:2222
  Connection from: ('172.19.0.3', 55726)
  
```

```
○ yrr@DESKTOP-KE0DD72:~/dist_sys$ docker compose -f compos
e/reqresp.yml exec reqresp-client python client.py
  WARN[0000] /home/yrr/dist_sys/compose/reqresp.yml: the attribute `version` is obsolete, it will be ignored, please remove it to avoid potential confusion
  Enter message: 
```

```
○ yrr@DESKTOP-KE0DD72:~/dist_sys$ ip addr
  24: br-524d7725c408: <NOQUEUE,BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP group default
    link/ether 8e:3b:01:42:81:0d brd ff:ff:ff:ff:ff:ff
    inet 172.19.0.1/16 brd 172.19.255.255 scope global br-524d7725c408
      valid_lft forever preferred_lft forever
  25: veth9140bd2@if2: <NOQUEUE,BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br-524d7725c408 state UP group default
    link/ether a6:4b:c5:f5:d5:7c brd ff:ff:ff:ff:ff:ff
    inet 172.19.0.2/16 brd 172.19.255.255 scope global br-524d7725c408
      valid_lft forever preferred_lft forever
  26: vetha474c1@if2: <NOQUEUE,BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue master br-524d7725c408 state UP group default
    link/ether 06:8f:e6:45:9e:30 brd ff:ff:ff:ff:ff:ff
    inet 172.19.0.3/16 brd 172.19.255.255 scope global br-524d7725c408
      valid_lft forever preferred_lft forever
  ○ yrr@DESKTOP-KE0DD72:~/dist_sys$ 
```

Hasil ip addr

24: br-524d7725c408: <...> mtu 1500 qdisc noqueue state UP group default

link/ether 8e:3b:01:42:81:0d brd ff:ff:ff:ff:ff:ff

- inet 172.19.0.1/16 brd 172.19.255.255 scope global br-524d7725c408

Interface br-524d7725c408 punya IP **172.19.0.1/16**

- Inilah gateway bridge untuk container 172.19.0.2 (server) dan 172.19.0.3 (client).
- Kode br yang harus dipantau adalah **br-524d7725c408**

```
◆ yrr@DESKTOP-KE0DD72:~/dist_sys$ sudo tcpdump -nvi br-
  524d7725c408 -w logTCP.pcap
  tcpdump: listening on br-524d7725c408, link-type EN10
  MB (Ethernet), snapshot length 262144 bytes
  Got 0
```

sudo tcpdump -nvi [br nya samean] -w [namafile yang samwan mau].pcap

```
compose -f compose/reqresp.yml exec reqresp-client python client.py
Received from server: Echo: halo
Enter another message: ingin mencoba untuk mengirim pesan
<class 'bytes'>
Received from server: Echo: ingin mencoba untuk mengirim pesan
Enter another message: apakah berhasil
<class 'bytes'>
Received from server: Echo: apakah berhasil
Enter another message: 
```

Terminal 2, sebagai client berkirim pesan

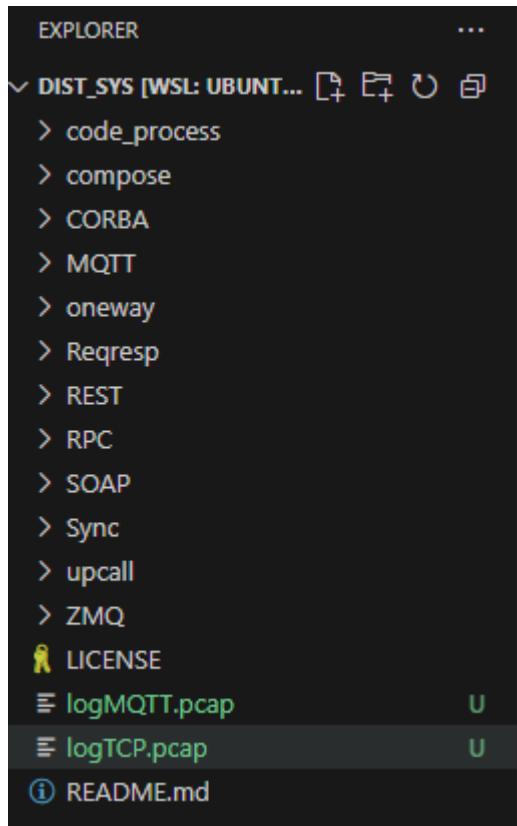
```
compose -f compose/reqresp.yml exec reqresp-server python server.py
reqresp.yml: the attribute `version` is obsolete, it will be ignored, please
remove it to avoid potential confusion
Server listening on 0.0.0.0:2222
Connection from: ('172.19.0.3', 55726)
Received from client: halo
Received from client: ingin mencoba untuk mengirim pesan
Received from client: apakah berhasil

```

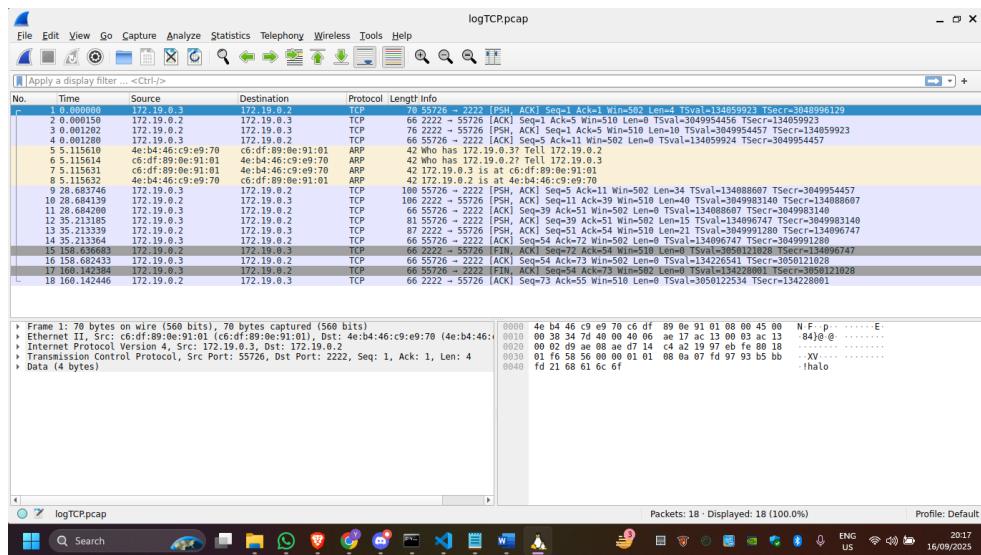
Terminal 1 sebagai server menerima pesan

```
(no such device)
yrr@DESKTOP-KEODD72:~/dist_sys$ sudo tcpdump -nvi br-542d7725c408 -w logTCP.pcap
tcpdump: listening on br-542d7725c408, link-type EN10MB (Ethernet), snapshot length 262144 bytes
Got 14
```

Terminal 3 mengcapture packet

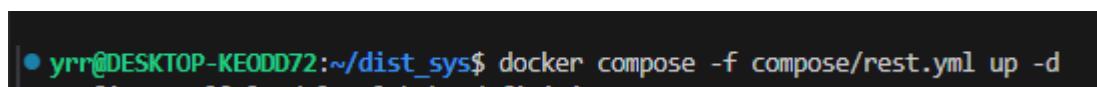


Buka logTCP.pcap



Hasil capture packet

3. Protokol REST



membaca file compose, membuat network internal, menjalankan container, -d berjalan pada background

```
#12 resolving provenance for metadata file
#12 DONE -1.1s
[+] Running 4/4
  ✓ compose-rest-client    Built      0.0s
  ✓ Network compose_default Created   0.3s
  ✓ Container rest-server  Started   0.9s
  ✓ Container rest-client  Started   1.4s
```

```
yrr@DESKTOP-KEODD72:~/dist_sys$ docker ps
CONTAINER ID        IMAGE               COMMAND             CREATED            STATUS              PORTS               NAMES
9b38fcda096        compose-rest-client "tail -f /dev/null"   About a minute ago   Up About a minute   5151/tcp
6394f05824a3        compose-rest-server "python server.py"    About a minute ago   Up About a minute   0.0.0.0:8080->5151/tcp, [::]:8080->5151/tcp   rest-client
yrr@DESKTOP-KEODD72:~/dist_sys$
```

```
yrr@DESKTOP-KEODD72:~/dist_sys$ docker compose -f compose/rest.yml exec rest-server python server.py
```

```
-f compose/rest.yml exec rest-server python server.py
 * Debug mode: on
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
 * Running on all addresses (0.0.0.0)
 * Running on http://127.0.0.1:5151
 * Running on http://172.18.0.2:5151
Press CTRL+C to quit
 * Restarting with stat
 * Debugger is active!
 * Debugger PIN: 879-840-764
```

```
yrr@DESKTOP-KEODD72:~/dist_sys$ docker compose -f compose/rest.yml exec rest-client python client.py --op both -a 7 -b 7
```

```
o yrr@DESKTOP-KE0DD72:~/dist_sys$ ip a | grep int
```

```
    inet 172.17.0.1/16 brd 172.17.255.255 scope
      global docker0
        inet6 fe80::90d1:38ff:fe60:cb9d/64 scope li
          nk
            inet 172.18.0.1/16 brd 172.18.255.255 scope
              global br-f8c6b823f5c9
                inet6 fe80::4461:97ff:fe63:7c3b/64 scope li
                  nk
                    inet6 fe80::28be:6aff:fed3:ca8c/64 scope li
                      nk
                        inet6 fe80::6ce0:a4ff:fedf:ada9/64 scope li
                          nk
o yrr@DESKTOP-KE0DD72:~/dist_sys$
```

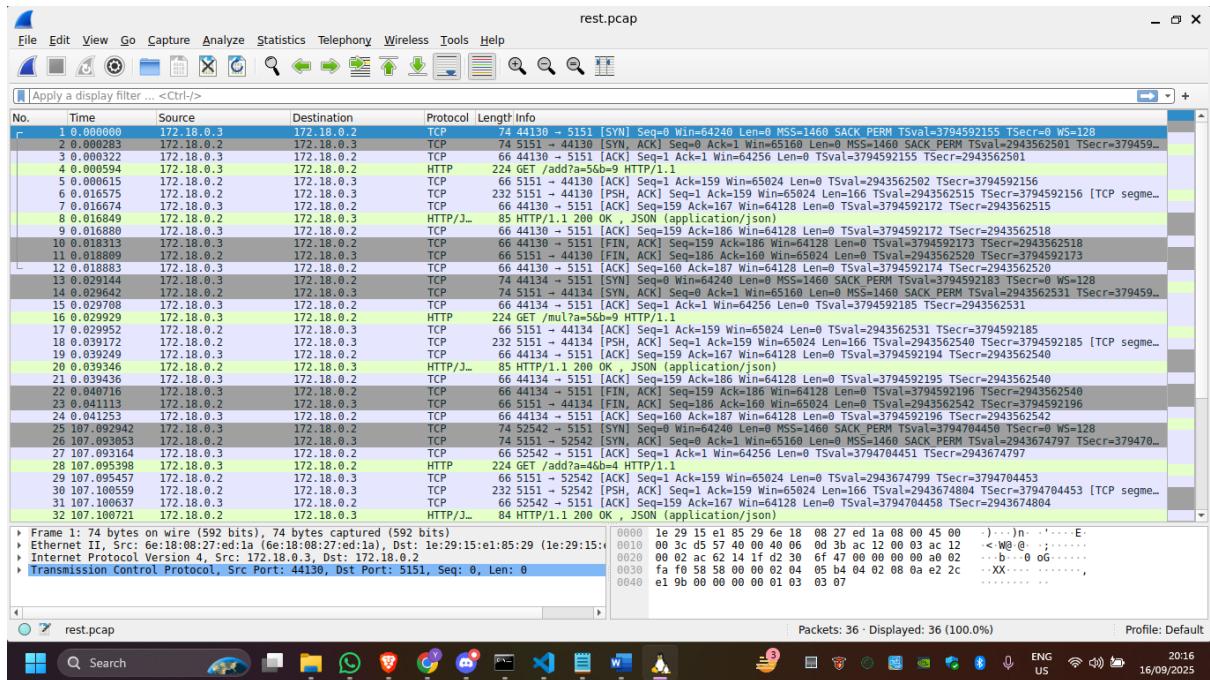
Dapet br-f8c6b823f5c9

```
o yrr@DESKTOP-KE0DD72:~/dist_sys$ sudo tcpdump -n
  vi br-f8c6b823f5c9 -w rest.pcap
```

```
o yrr@DESKTOP-KE0DD72:~/dist_sys$ docker compose
  -f compose/rest.yml exec rest-client python cli
  ent.py --op both -a 5 -b 9
```

Jalankan perintah Kembali agar data dapat di capture

```
o yrr@DESKTOP-KE0DD72:~/dist_sys$ sudo tcpdump -n
  vi br-f8c6b823f5c9 -w rest.pcap
  tcpdump: listening on br-f8c6b823f5c9, link-type
  EN10MB (Ethernet), snapshot length 262144 bytes
  Got 24
```



4. Protokol ZMQ

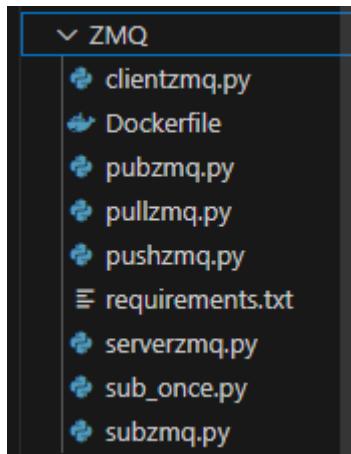
```
○ yrr@DESKTOP-KEODD72:~/dist_sys$ docker compose
-f compose/zmq.yml up -d
```

```
#22 DONE 0.1s
[+] Running 13/13
✓ compose-zmq-pub          Built      0.0s
✓ compose-zmq-sub          Built      0.0s
✓ compose-zmq-push          Built      0.0s
✓ compose-zmq-pull          Built      0.0s
✓ compose-zmq-req           Built      0.0s
✓ Network compose_default  Created    0.4s
✓ Container zmq-req        Started   6.0s
✓ Container zmq-push       Started   5.6s
✓ Container zmq-pub        Started   5.4s
✓ Container zmq-pull       Started   9.9s
✓ Container zmq-sub        Started   9.5s
✓ Container zmq-req        Started   9.6s
```

```
● yrr@DESKTOP-KE0DD72:~/dist_sys$ docker ps
CONTAINER ID        IMAGE               COMMAND
              CREATED        STATUS        PORTS
TS             NAMES
f14374efd31c    compose-zmq-req    "tail -f /dev
/null"        46 seconds ago   Up 39 seconds   555
5/tcp, 12345/tcp  zmq-req
03723103ba7c    compose-zmq-sub    "tail -f /dev
/null"        46 seconds ago   Up 40 seconds   555
5/tcp, 12345/tcp  zmq-sub
f0533843c1e9    compose-zmq-pull   "tail -f /dev
/null"        46 seconds ago   Up 39 seconds   555
5/tcp, 12345/tcp  zmq-pull
d53e3ab4f040    compose-zmq-pub   "python pubzm
q.py"        46 seconds ago   Up 43 seconds   555
5/tcp, 12345/tcp  zmq-pub
06d89fe7a66c    compose-zmq-rep   "python serve
rzmq.py"        46 seconds ago   Up 43 seconds   555
5/tcp, 12345/tcp  zmq-rep
214791e20ad6    compose-zmq-push  "python pushz
mq.py"        46 seconds ago   Up 43 seconds   555
5/tcp, 12345/tcp  zmq-push
○ yrr@DESKTOP-KE0DD72:~/dist_sys$
```

💡 Intinya ZMQ mendukung banyak pola komunikasi

1. **REQ/REP** → Request/Reply (mirip client-server).
2. **PUB/SUB** → Publish/Subscribe (broadcast pesan).
3. **PUSH/PULL** → Pipeline (distribusi kerja ke banyak worker).



Jadi pasangan lengkap:

- clientzmq.py ↔ serverzmq.py (**REQ/REP**)

- pubzmq.py ↔ subzmq.py / sub_once.py (**PUB/SUB**)
- pushzmq.py ↔ pullzmq.py (**PUSH/PULL**)

A. Client Server

```

5
6  @author: widhi
7  """
8
9  import zmq
10
11 context = zmq.Context()
12 socket = context.socket(zmq.REQ)
13 # Connect using docker service DNS name of the REP server
14 socket.connect("tcp://zmq-rep:5555")
15 q=20
16 for request in range(15):
17     print(f"Sending request {request} ...")
18     socket.send(b"hello "+str(q+request).encode())
19     message = socket.recv()
20     print(f"Received reply {request}: {message}")
21

```

Sisi client

```

5
6  @author: widhi
7  """
8
9  import zmq
10
11 context = zmq.Context()
12 socket = context.socket(zmq.REQ)
13 # Connect using docker service DNS name of the REP server
14 socket.connect("tcp://zmq-rep:5555")
15 q=20
16 for request in range(15):
17     print(f"Sending request {request} ...")
18     socket.send(b"hello "+str(q+request).encode())
19     message = socket.recv()
20     print(f"Received reply {request}: {message}")
21

```

Sisi server

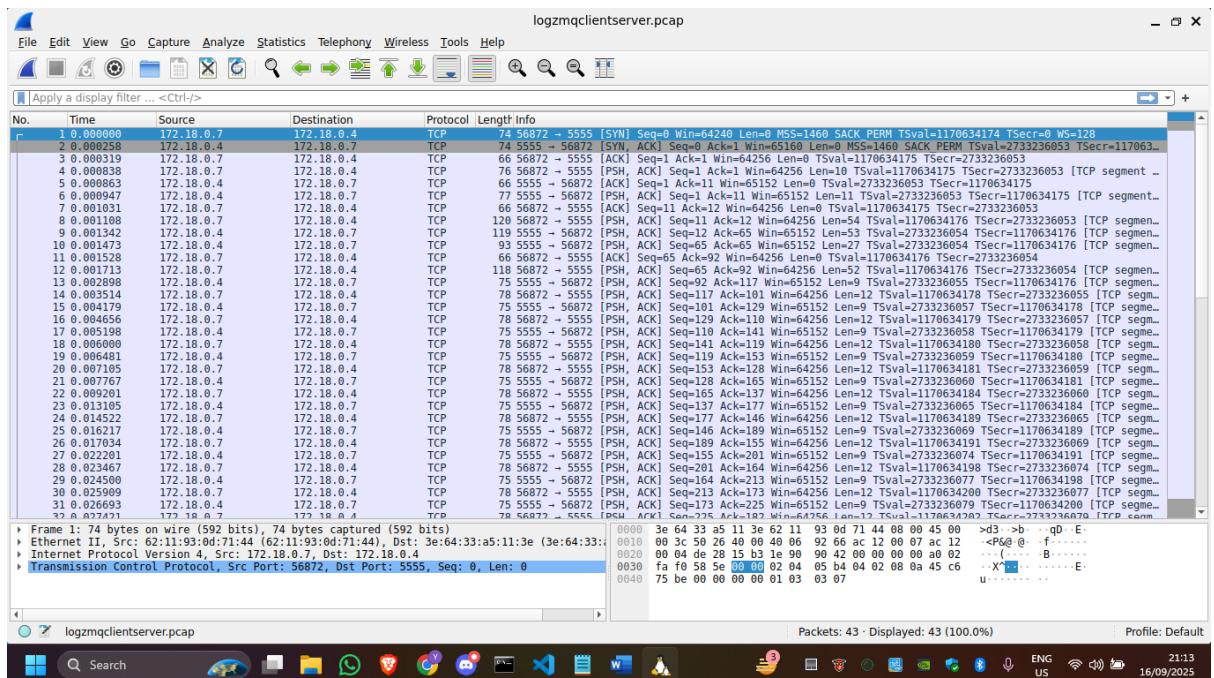
```
● yrr@DESKTOP-KEODD72:~/dist_sys$ ip a | grep int
  inet 127.0.0.1/8 scope host lo
  inet 10.255.255.254/32 brd 10.255.255.254 scope global lo
  inet6 ::1/128 scope host
    inet 172.28.34.158/20 brd 172.28.47.255 scope global eth0
    inet6 fe80::215:5dff:fe06:bb27/64 scope link
      inet 172.17.0.1/16 brd 172.17.255.255 scope global docker0
      inet6 fe80::90d1:38ff:fe60:cb9d/64 scope link
        inet 172.18.0.1/16 brd 172.18.255.255 scope global br-7b2205ccd30f
        inet6 fe80::34e4:1dff:fee5:ed57/64 scope link
        inet6 fe80::9cb7:60ff:fe62:c4c3/64 scope link
        inet6 fe80::5c4a:e8ff:fed0:db78/64 scope link
        inet6 fe80::844a:bbff:fe9d:9079/64 scope link
        inet6 fe80::e810:2dff:fe9a:989e/64 scope link
        inet6 fe80::a057:9ff:fe71:c631/64 scope link
        inet6 fe80::ccf8:82ff:fedf:8cf0/64 scope link
  ○ yrr@DESKTOP-KEODD72:~/dist_sys$
```

Dapat br-7b2205ccd30f

```
● yrr@DESKTOP-KEODD72:~/dist_sys$ sudo tcpdump -nvi br-7b2205ccd30f -w logzmqclientserver.pcap
tcpdump: listening on br-7b2205ccd30f, link-type EN10MB (Ethernet), snapshot length 262144 bytes
Got 0
```

```
○ yrr@DESKTOP-KEODD72:~/dist_sys$ docker logs -f zmq-rep
```

```
◆ yrr@DESKTOP-KEODD72:~/dist_sys$ docker compose -f compose/zmq.yml exec zmq-req python clientzmq.py
```



B. Push Pull

```
○ yrr@DESKTOP-KEODD72:~/dist_sys$ docker compose -f compose/zma.yml down
```

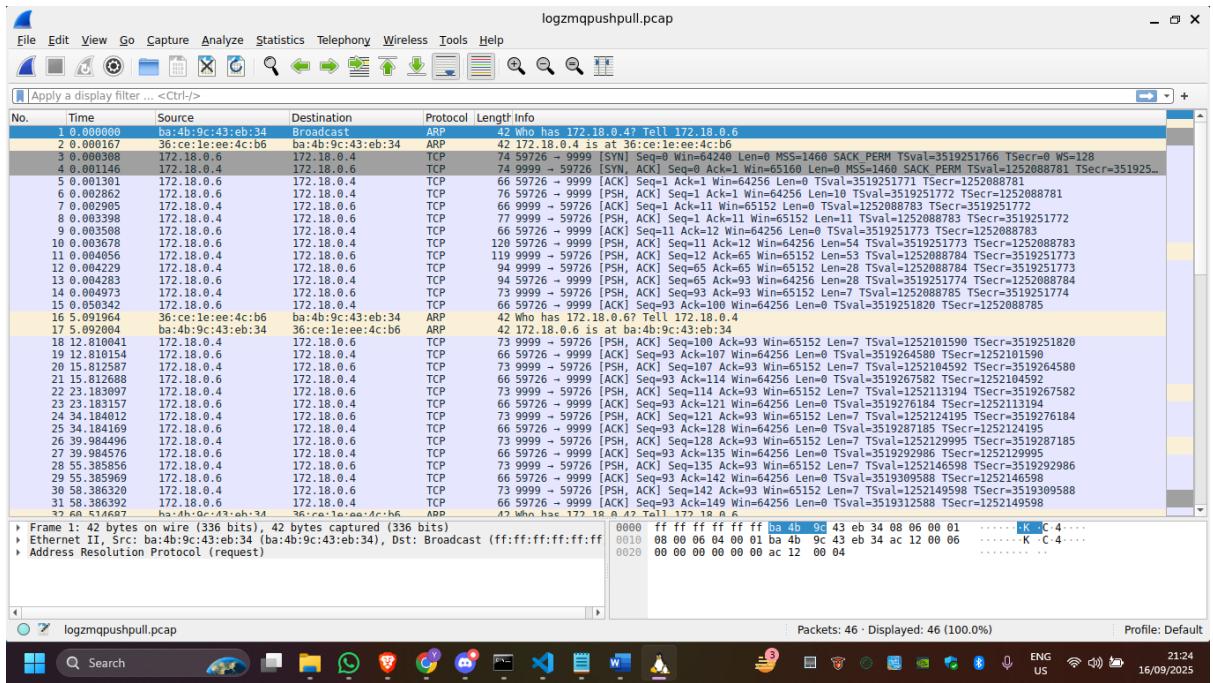
Di down dulu biar dapet br yang berbeda

```
○ yrr@DESKTOP-KEODD72:~/dist_sys$ docker compose -f compose/zmq.yml up -d
```

Di up lagi

Dapet br br-766158c96a56

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS docker - dist_sys + - | [ ]  
yrr@DESKTOP-KE0DD72:~/dist_sys$ docker logs -f  
-f compose/zmq.yml exec zmq-pull python pullzmq  
zmq-push  
Produced workload: 64  
Produced workload: 15  
Produced workload: 43  
Produced workload: 55  
Produced workload: 29  
Produced workload: 83  
Produced workload: 15  
Produced workload: 18  
-f compose/zmq.yml exec zmq-pull python pullzmq  
.py  
WARN[0000] /home/yrr/dist_sys/compose/zmq.yml:  
the attribute 'version' is obsolete, it will be  
ignored, please remove it to avoid potential c  
onfusion  
Worker 1 received work: 64  
Worker 1 received work: 15  
Worker 1 received work: 43  
t  
nk  
inet6 fe80::40e3:84ff:fe8f:507e/64 scope li  
nk  
yrr@DESKTOP-KE0DD72:~/dist_sys$ sudo tcpdump -n  
vi br-766158c96a56 -w logzmqpushpull.pcap  
tcpdump: listening on br-766158c96a56, link-type  
EN10MB (Ethernet), snapshot length 262144 bytes  
got 37
```



C. PUB SUB

```

○ yrr@DESKTOP-KEODD72:~/dist_sys$ docker compose
  -f compose/zmq.yml down

```

```

○ yrr@DESKTOP-KEODD72:~/dist_sys$ docker compose
  -f compose/zmq.yml up -d

```

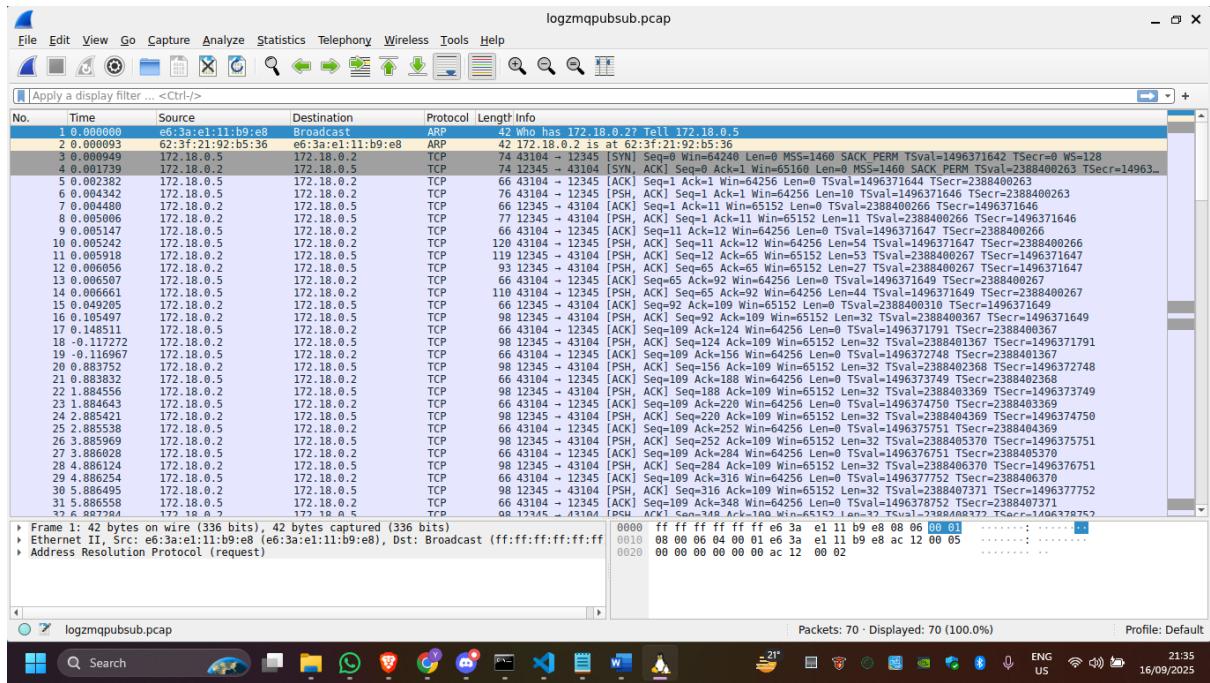
```
● yrr@DESKTOP-KE0DD72:~/dist_sys$ ip a | grep int
    inet 127.0.0.1/8 scope host lo
        inet 10.255.255.254/32 brd 10.255.255.254 scope global lo
            inet6 ::1/128 scope host
                inet 172.28.34.158/20 brd 172.28.47.255 scope global eth0
                    inet6 fe80::215:5dff:fe06:bb27/64 scope link
                        inet 172.17.0.1/16 brd 172.17.255.255 scope global docker0
                            inet6 fe80::90d1:38ff:fe60:cb9d/64 scope link
                                inet 172.18.0.1/16 brd 172.18.255.255 scope global br-0cd875ac60e4
                                    inet6 fe80::dc3f:fdff:fe53:3f0f/64 scope link
                                        inet6 fe80::54e5:c2ff:fef3:abd2/64 scope link
                                            inet6 fe80::80ea:b1ff:fe49:331a/64 scope link
                                                inet6 fe80::4c85:f9ff:feba:d750/64 scope link
                                                    inet6 fe80::b42e:d3ff:feab:47d9/64 scope link tentative
● yrr@DESKTOP-KE0DD72:~/dist_sys$
```

br-0cd875ac60e4

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS bash - dist_sys + □ ... [C]

④ yrr@DESKTOP-KE0DD72:~/dist_sys$ docker logs -f
zmq-pub
Published: WAKTU Tue Sep 16 14:28:13 2025
Published: WAKTU Tue Sep 16 14:28:14 2025
Published: WAKTU Tue Sep 16 14:28:15 2025
Published: WAKTU Tue Sep 16 14:28:16 2025
Published: WAKTU Tue Sep 16 14:28:17 2025
Published: WAKTU Tue Sep 16 14:28:18 2025
Published: WAKTU Tue Sep 16 14:28:19 2025
Published: WAKTU Tue Sep 16 14:28:20 2025
Published: WAKTU Tue Sep 16 14:28:21 2025
Published: WAKTU Tue Sep 16 14:28:22 2025
Published: WAKTU Tue Sep 16 14:28:23 2025
Published: WAKTU Tue Sep 16 14:28:24 2025
Published: WAKTU Tue Sep 16 14:28:25 2025
Published: WAKTU Tue Sep 16 14:28:26 2025
Published: WAKTU Tue Sep 16 14:28:27 2025
Published: WAKTU Tue Sep 16 14:28:28 2025

④ yrr@DESKTOP-KE0DD72:~/dist_sys$ docker compose -f compose/zmq.yml exec zmq-sub python subzmq.py
WARN[0000] /home/yrr/dist_sys/compose/zmq.yml: the attribute `version` is obsolete, it will be ignored, please remove it to avoid potential confusion
Received: WAKTU Tue Sep 16 14:31:05 2025
Received: WAKTU Tue Sep 16 14:31:05 2025
Received: WAKTU Tue Sep 16 14:31:06 2025
Received: WAKTU Tue Sep 16 14:31:07 2025
Received: WAKTU Tue Sep 16 14:31:08 2025
Received: WAKTU Tue Sep 16 14:31:09 2025
Received: WAKTU Tue Sep 16 14:31:10 2025
Received: WAKTU Tue Sep 16 14:31:11 2025
Received: WAKTU Tue Sep 16 14:31:12 2025
Received: WAKTU Tue Sep 16 14:31:12 2025
^CTraceback (most recent call last):
  File "/app/subzmq.py", line 22, in <module>
                                             t
                                             global br-0cd875ac60e4
                                             inet6 fe80::dc3f:fdff:fe53:3f0f/64 scope li
                                             nk
                                             inet6 fe80::54e5:c2ff:fef3:abd2/64 scope li
                                             nk
                                             inet6 fe80::80ea:b1ff:fe49:331a/64 scope li
                                             nk
                                             inet6 fe80::4c85:f9ff:feba:d750/64 scope li
                                             nk
                                             inet6 fe80::b42e:d3ff:feab:47d9/64 scope li
                                             nk tentative
④ yrr@DESKTOP-KE0DD72:~/dist_sys$ sudo tcpdump -nvi br-0cd875ac60e4 -w logzmqpubsub.pcap
tcpdump: listening on br-0cd875ac60e4, link-type EN10MB (Ethernet), snapshot length 262144 bytes
[0] 36
```



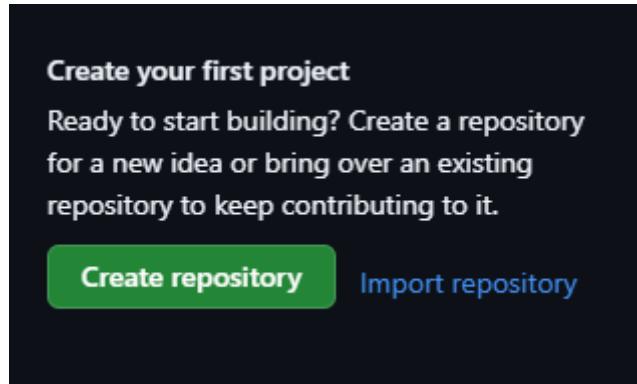
Intinya

REQ/REP → client-server sederhana.

PUB/SUB → broadcast ke banyak subscriber.

PUSH/PULL → distribusi task ke worker.

Menambahkan Repository



Create a new repository

Repositories contain a project's files and version history. Have a project elsewhere? [Import a repository](#).
Required fields are marked with an asterisk (*).

1 General

Owner *  **Repository name ***
Your new repository will be created as `Sistem-Terdistribusi_Lingkungan-Praktik-Mandiri_15.09.25`.
The repository name can only contain ASCII letters, digits, and the characters ., -, and _.

Great repository names are short and memorable. How about `symmetrical-octo-funicular`?

Description

40 / 350 characters

2 Configuration

Choose visibility *  **Public** Choose who can see and commit to this repository

github.com/yayanrr-cmyk/Sistem-Terdistribusi_Lingkungan-Praktik-Mandiri_15.09.25

Sistem-Terdistribusi_Lingkungan-Praktik-Mandiri_15.09.25 (Public)

Start coding with Codespaces
Add a README file and start coding in a secure, configurable, and dedicated development environment.
[Create a codespace](#)

Add collaborators to this repository
Search for people using their GitHub username or email address.
[Invite collaborators](#)

Cannot fork because you own this repository and are not a member of any organizations.

Quick setup — if you've done this kind of thing before
Set up in Desktop or HTTPS SSH https://github.com/yayanrr-cmyk/Sistem-Terdistribusi_Lingkungan-Praktik-Mandiri_15.09.25.git
Get started by [creating a new file](#) or [uploading an existing file](#). We recommend every repository include a [README](#), [LICENSE](#), and [.gitignore](#).

...or create a new repository on the command line

```
yrr@DESKTOP-KEODD72:~/dist_sys$ rm -rf .git
```

Untuk menghapus profile github sebelumnya

...or create a new repository on the command line

```
echo "# Sistem-Terdistribusi_Lingkungan-Praktik-Mandiri_15.09.25" >> README.md
git init
git add README.md
git commit -m "first commit"
git branch -M main
git remote add origin https://github.com/yayanrr-cmyk/Sistem-Terdistribusi_Lingkungan-Praktik-Mandiri_15.09.25.git
git push -u origin main
```

Note:

Git add .

```
④ yrr@DESKTOP-KE0DD72:~/dist_sys$ git commit -m "first commit"
Author identity unknown

*** Please tell me who you are.

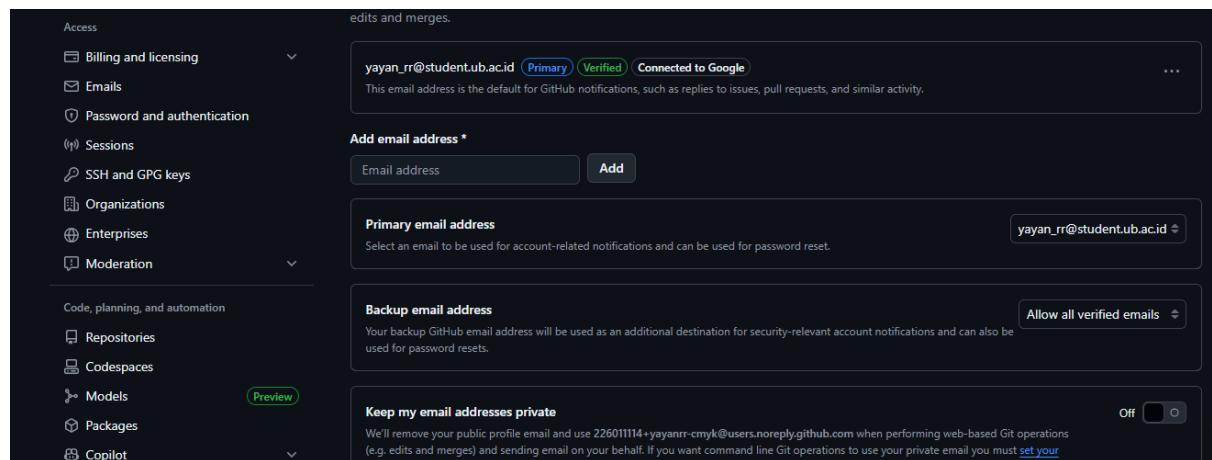
Run

git config --global user.email "you@example.com"
git config --global user.name "Your Name"

to set your account's default identity.
Omit --global to set the identity only in this repository.

fatal: empty ident name (for cyrr@DESKTOP-KE0DD72.localdomain) not allowed
● yrr@DESKTOP-KE0DD72:~/dist_sys$ git config --global user.email "yayan_rr@student.ub.ac.id"
● yrr@DESKTOP-KE0DD72:~/dist_sys$ git config --global user.name "yayanrr-cmyk"
  git: command not found
● yrr@DESKTOP-KE0DD72:~/dist_sys$ git config --global user.name "yayanrr-cmyk"
● yrr@DESKTOP-KE0DD72:~/dist_sys$ git branch -M main
● yrr@DESKTOP-KE0DD72:~/dist_sys$ git remote add origin https://github.com/yayanrr-cmyk/Sistem-Terdistribusi_Lingkungan-Praktik-Mandiri_15.09.25.git
```

Jika masih awal, akan memasukkan identitas email dan id



Keep email private off

Lalu git push