1. PROTOKOL REST

```
ella@ELLA-PC:~/dist_sys$ sudo docker compose -f c
ompose/rest.yml up -d
```

```
ella@ELLA-PC:~/dist_sys$ sudo docker ps
[sudo] password for ella:
CONTAINER ID   IMAGE                   COMMAND                      CREATED            STATUS
          PORTS                                        NAMES
0317909b6709   compose-rest-client     "tail -f /dev/null"   About a minute ago   Up About
a minute   5151/tcp                                     rest-client
184145004aeb   compose-rest-server     "tail -f /dev/null"   About a minute ago   Up About
a minute   0.0.0.0:8080->5151/tcp, [::]:8080->5151/tcp   rest-server
7863d2777447   compose-reqresp-client  "tail -f /dev/null"   23 minutes ago       Up 23 min
utes       2222/tcp                                     reqresp-client
724a7b962e06   compose-reqresp-server  "tail -f /dev/null"   23 minutes ago       Up 23 min
utes       2222/tcp                                     reqresp-server
```

```
ella@ELLA-PC:~/dist_sys$ sudo docker compose -f compose/re
st.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 instea
d.
 * Running on all addresses (0.0.0.0)
 * Running on http://127.0.0.1:5151
 * Running on http://172.18.0.4:5151
Press CTRL+C to quit
 * Restarting with stat
 * Debugger is active!
 * Debugger PIN: 286-703-798
172.18.0.5 - - [20/Sep/2025 15:05:12] "GET /add?a=2&b=3 HT
TP/1.1" 200 -
172.18.0.5 - - [20/Sep/2025 15:05:12] "GET /mul?a=2&b=3 HT
TP/1.1" 200 -
```

```
ella@ELLA-PC:~/dist_sys$ sudo docker co
mpose -f compose/rest.yml exec rest-cli
ent python client.py --op both -a 2 -b
3
add(2,3) = 5
mul(2,3) = 6
```

```
ella@ELLA-PC:~/dist_sys$ ip a | grep inet
pe global eth0
    inet6 fe80::215:5dff:fed2:ff5e/64 scope link
    inet 172.17.0.1/16 brd 172.17.255.255 scope g
lobal docker0
    inet6 fe80::4c9e:7ff:fe7a:69e9/64 scope link
    inet 172.18.0.1/16 brd 172.18.255.255 scope g
lobal br-41ad81195328
    inet6 fe80::5075:1eff:fe2a:f065/64 scope link

    inet6 fe80::548b:c3ff:fe8f:179d/64 scope link

    inet6 fe80::8898:35ff:fe91:f606/64 scope link

    inet6 fe80::8074:73ff:fed6:6ca/64 scope link
    inet6 fe80::4c9b:cdff:fe24:bc3e/64 scope link
```
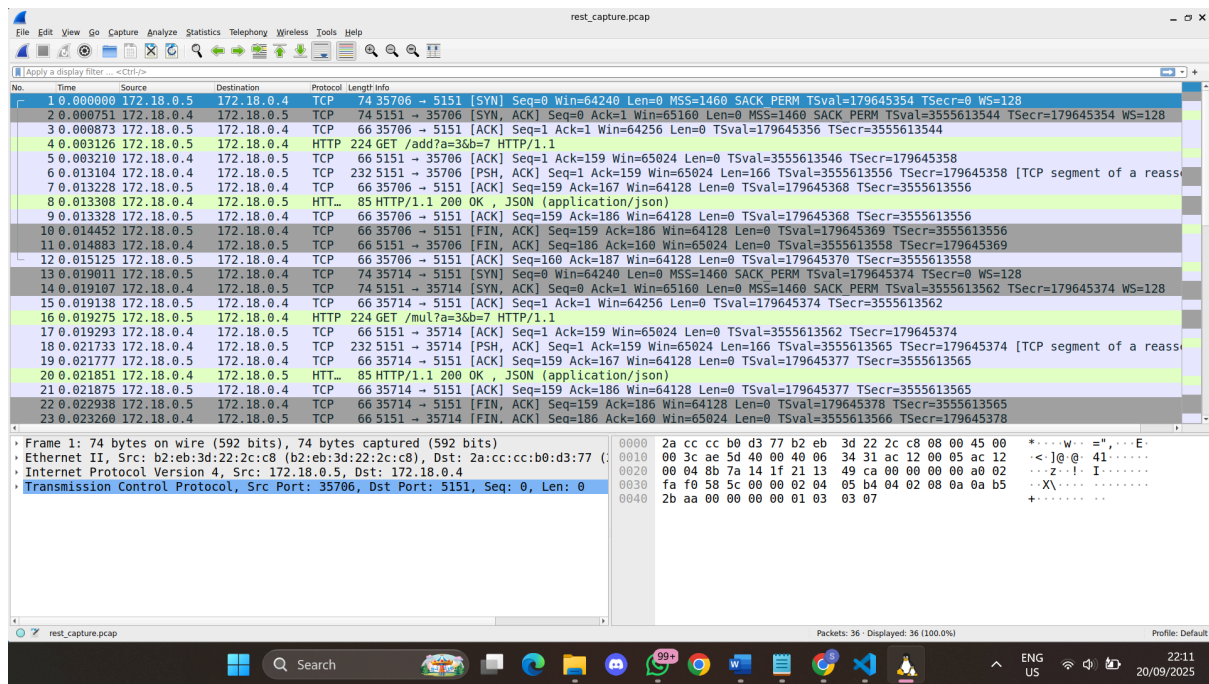
br-41ad81195328

```
ella@ELLA-PC:~/dist_sys$ sudo docker compose -f c
st.yml exec rest-server python server.py
 * Running on all addresses (0.0.0.0)
 * Running on http://127.0.0.1:5151
 * Running on http://172.18.0.4:5151
Press CTRL+C to quit
 * Restarting with stat
 * Debugger is active!
 * Debugger PIN: 286-703-798
172.18.0.5 - - [20/Sep/2025 15:05:12] "GET /add?a
=2&b=3 HTTP/1.1" 200 -
172.18.0.5 - - [20/Sep/2025 15:05:12] "GET /mul?a
=2&b=3 HTTP/1.1" 200 -
172.18.0.5 - - [20/Sep/2025 15:08:58] "GET /add?a
=3&b=7 HTTP/1.1" 200 -
172.18.0.5 - - [20/Sep/2025 15:08:58] "GET /mul?a
=3&b=7 HTTP/1.1" 200 -
```

```
ella@ELLA-PC:~/dist_sys$ docker compose
 -f compose/rest.yml exec rest-client p
ython client.py --op both -a 3 -b 7
Docker daemon socket at unix:///var/run/docker.so
ck: Get "http://%2Fvar%2Frun%2Fdocker.sock/v1.51/
containers/json?filters=%7B%221abel%22%3A%7B%22co
m.docker.compose.config-hash%22%3Atrue%2C%22com.d
ocker.compose.project%3Dcompose%22%3Atrue%2C%22co
m.docker.compose.service%3Drest-client%22%3Atrue%
7D%7D": dial unix /var/run/docker.sock: connect:
permission denied
ella@ELLA-PC:~/dist_sys$ sudo docker co
mpose -f compose/rest.yml exec rest-cli
ent python client.py --op both -a 3 -b
7
add(3,7) = 10
mul(3,7) = 21
ella@ELLA-PC:~/dist_sys$
```

```
ella@ELLA-PC:~/dist_sys$ ip a | grep inet
    inet6 fe80::4c9e:7ff:fe7a:69e9/64 scope link
    inet 172.18.0.1/16 brd 172.18.255.255 scope g
lobal br-41ad81195328
    inet6 fe80::5075:1eff:fe2a:f065/64 scope link

    inet6 fe80::548b:c3ff:fe8f:179d/64 scope link

    inet6 fe80::8898:35ff:fe91:f606/64 scope link

    inet6 fe80::8074:73ff:fed6:6ca/64 scope link
    inet6 fe80::4c9b:cdff:fe24:bc3e/64 scope link

ella@ELLA-PC:~/dist_sys$ sudo tcpdump -nvi br-41a
d81195328 -w rest_capture.pcap
tcpdump: listening on br-41ad81195328, link-type
EN10MB (Ethernet), snapshot length 262144 bytes
got 28
```

rest_capture.pcap

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/>

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	172.18.0.5	172.18.0.4	TCP	74	35706 → 5151 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 SACK_PERM TSval=179645354 TSecr=0 WS=128
2	0.000751	172.18.0.4	172.18.0.5	TCP	74	5151 → 35706 [SYN, ACK] Seq=0 Ack=1 Win=65160 Len=0 MSS=1460 SACK_PERM TSval=3555613544 TSecr=179645354 WS=128
3	0.000873	172.18.0.5	172.18.0.4	TCP	66	35706 → 5151 [ACK] Seq=1 Ack=1 Win=64256 Len=0 TSval=179645356 TSecr=3555613544
4	0.003126	172.18.0.5	172.18.0.4	HTTP	224	GET /add?a=3&b=7 HTTP/1.1
5	0.003210	172.18.0.4	172.18.0.5	TCP	66	5151 → 35706 [ACK] Seq=1 Ack=159 Win=65024 Len=0 TSval=3555613546 TSecr=179645358
6	0.013104	172.18.0.4	172.18.0.5	TCP	232	5151 → 35706 [PSH, ACK] Seq=1 Ack=159 Win=65024 Len=166 TSval=3555613556 TSecr=179645358 [TCP segment of a reass...
7	0.013228	172.18.0.5	172.18.0.4	TCP	66	35706 → 5151 [ACK] Seq=159 Ack=167 Win=64128 Len=0 TSval=179645368 TSecr=3555613556
8	0.013308	172.18.0.4	172.18.0.5	HTT...	85	HTTP/1.1 200 OK , JSON (application/json)
9	0.013328	172.18.0.5	172.18.0.4	TCP	66	35706 → 5151 [ACK] Seq=159 Ack=186 Win=64128 Len=0 TSval=179645368 TSecr=3555613556
10	0.014452	172.18.0.5	172.18.0.4	TCP	66	35706 → 5151 [FIN, ACK] Seq=159 Ack=186 Win=64128 Len=0 TSval=179645369 TSecr=3555613556
11	0.014883	172.18.0.4	172.18.0.5	TCP	66	5151 → 35706 [FIN, ACK] Seq=186 Ack=160 Win=65024 Len=0 TSval=3555613558 TSecr=179645369
12	0.015125	172.18.0.5	172.18.0.4	TCP	66	35706 → 5151 [ACK] Seq=160 Ack=187 Win=64128 Len=0 TSval=179645370 TSecr=3555613558
13	0.019011	172.18.0.5	172.18.0.4	TCP	74	35714 → 5151 [SYN] Seq=0 Win=64240 Len=0 MSS=1460 SACK_PERM TSval=179645374 TSecr=0 WS=128
14	0.019107	172.18.0.4	172.18.0.5	TCP	74	5151 → 35714 [SYN, ACK] Seq=0 Ack=1 Win=65160 Len=0 MSS=1460 SACK_PERM TSval=3555613562 TSecr=179645374 WS=128
15	0.019138	172.18.0.5	172.18.0.4	TCP	66	35714 → 5151 [ACK] Seq=1 Ack=1 Win=64256 Len=0 TSval=179645374 TSecr=3555613562
16	0.019275	172.18.0.5	172.18.0.4	HTTP	224	GET /mul?a=3&b=7 HTTP/1.1
17	0.019293	172.18.0.4	172.18.0.5	TCP	66	5151 → 35714 [ACK] Seq=1 Ack=159 Win=65024 Len=0 TSval=3555613562 TSecr=179645374
18	0.021733	172.18.0.4	172.18.0.5	TCP	232	5151 → 35714 [PSH, ACK] Seq=1 Ack=159 Win=65024 Len=166 TSval=3555613565 TSecr=179645374 [TCP segment of a reass...
19	0.021777	172.18.0.5	172.18.0.4	TCP	66	35714 → 5151 [ACK] Seq=159 Ack=167 Win=64128 Len=0 TSval=179645377 TSecr=3555613565
20	0.021851	172.18.0.4	172.18.0.5	HTT...	85	HTTP/1.1 200 OK , JSON (application/json)
21	0.021875	172.18.0.5	172.18.0.4	TCP	66	35714 → 5151 [ACK] Seq=159 Ack=186 Win=64128 Len=0 TSval=179645377 TSecr=3555613565
22	0.022938	172.18.0.5	172.18.0.4	TCP	66	35714 → 5151 [FIN, ACK] Seq=159 Ack=186 Win=64128 Len=0 TSval=179645378 TSecr=3555613565
23	0.023260	172.18.0.4	172.18.0.5	TCP	66	5151 → 35714 [FIN, ACK] Seq=186 Ack=160 Win=65024 Len=0 TSval=3555613566 TSecr=179645378

▶ Frame 1: 74 bytes on wire (592 bits), 74 bytes captured (592 bits)
▶ Ethernet II, Src: b2:eb:3d:22:2c:c8 (b2:eb:3d:22:2c:c8), Dst: 2a:cc:cc:b0:d3:77 (...
▶ Internet Protocol Version 4, Src: 172.18.0.5, Dst: 172.18.0.4
▶ Transmission Control Protocol, Src Port: 35706, Dst Port: 5151, Seq: 0, Len: 0

```
0000  2a cc cc b0 d3 77 b2 eb  3d 22 2c c8 08 00 45 00   *····w·· =",···E·
0010  00 3c ae 5d 40 00 40 06  34 31 ac 12 00 05 ac 12   ·<·]@·@· 41·····
0020  00 04 8b 7a 14 1f 21 13  49 ca 00 00 00 00 a0 02   ···z·!· I·······
0030  fa f0 58 5c 00 00 02 04  05 b4 04 02 08 0a 0a b5   ··X\···· ·······
0040  2b aa 00 00 00 00 01 03  03 07                     +······ ··
```

rest_capture.pcap   Packets: 36 · Displayed: 36 (100.0%)   Profile: Default

2. PROTOKOL MQTT

```
ella@ELLA-PC:~/dist_sys$ sudo docker compose -f compose/mqtt.yml up -d
```

```
ella@ELLA-PC:~/dist_sys$ sudo docker ps
CONTAINER ID    IMAGE                  COMMAND                CREATED              STATUS
                PORTS          NAMES
a794a3346d99    compose-mqtt-pub       "tail -f /dev/null"    About a minute ago   Up About
 a minute                      mqtt-publisher
26b061f350ac    compose-mqtt-sub       "tail -f /dev/null"    About a minute ago   Up About
 a minute                      mqtt-subscriber
d10d0653bccd    eclipse-mosquitto:2.0  "/docker-entrypoint.…" About a minute ago   Up About
 a minute       1883/tcp       mqtt-broker
```

```
ella@ELLA-PC:~/dist_sys$ sudo docker compose -f com
pose/mqtt.yml exec mqtt-sub python sub.py
WARN[0000] /home/ella/dist_sys/compose/mqtt.yml: th
e attribute `version` is obsolete, it will be ignor
ed, please remove it to avoid potential confusion
Menghubungkan ke mqtt-broker...
Menunggu pesan... (Tekan Ctrl+C untuk keluar)
Berhasil terhubung ke broker MQTT mqtt-broker
Berlangganan topik: sister/temp
Received message: Suhu: 28°C (Topic: sister/temp)
Received message: Suhu: 28°C (Topic: sister/temp)
```

```
ella@ELLA-PC:~/dist_sys$
ella@ELLA-PC:~/dist_sys$ sudo docker compose -f
 compose/mqtt.yml exec mqtt-pub python pub.py
[sudo] password for ella:
WARN[0000] /home/ella/dist_sys/compose/mqtt.yml
: the attribute `version` is obsolete, it will
be ignored, please remove it to avoid potential
 confusion
Menghubungkan ke mqtt-broker...
Published: Suhu: 28°C
Published: Suhu: 28°C
```

ella@ELLA-PC:~/dist_sys$ ip a
23: br-082cdf0683ab: <BROADCAST,MULTICAST,UP,LOW
ER_UP> mtu 1500 qdisc noqueue state UP group def
ault
      link/ether 06:0d:2a:0c:c4:4c brd ff:ff:ff:ff
:ff:ff
      inet 172.18.0.1/16 brd 172.18.255.255 scope
global br-082cdf0683ab

ella@ELLA-PC:~/dist_sys$ sudo tcpdump -nvi br-082
cdf0683ab -w mqtt_capture.pcap
tcpdump: listening on br-082cdf0683ab, link-type
EN10MB (Ethernet), snapshot length 262144 bytes
Got 159

3. PROTOKOL TCP (REQ/RESP)

ella@ELLA-PC:~/dist_sys$ sudo docker comp
ose -f compose/reqresp.yml up -d

```
ella@ELLA-PC:~/dist_sys$ sudo docker ps
CONTAINER ID    IMAGE                         COMMAND               CRE
ATED               STATUS                PORTS      NAMES
7863d2777447    compose-reqresp-client    "tail -f /dev/null"   Abo
ut a minute ago    Up About a minute     2222/tcp   reqresp-client
724a7b962e06    compose-reqresp-server    "tail -f /dev/null"   Abo
ut a minute ago    Up About a minute     2222/tcp   reqresp-server
```

```
ella@ELLA-PC:~/dist_sys$ sudo docker comp
ose -f compose/reqresp.yml exec reqresp-s
erver python server.py
WARN[0000] /home/ella/dist_sys/compose/re
qresp.yml: the attribute `version` is obs
olete, it will be ignored, please remove
it to avoid potential confusion
Server listening on 0.0.0.0:2222
Connection from: ('172.18.0.3', 38842)
Received from client: halo
```

```
ella@ELLA-PC:~/dist_sys$ sudo docker compose
 -f compose/reqresp.yml exec reqresp-client
python client.py
WARN[0000] /home/ella/dist_sys/compose/reqre
sp.yml: the attribute `version` is obsolete,
 it will be ignored, please remove it to avo
id potential confusion
Enter message: halo
<class 'bytes'>
Received from server: Echo: halo
Enter another message:
```

```
ella@ELLA-PC:~/dist_sys$ docker compose -
f compose/reqresp.yml exec reqresp-server
 python server.py
ella@ELLA-PC:~/dist_sys$ sudo docker comp
ose -f compose/reqresp.yml exec reqresp-s
erver python server.py
WARN[0000] /home/ella/dist_sys/compose/re
qresp.yml: the attribute `version` is obs
olete, it will be ignored, please remove
it to avoid potential confusion
Server listening on 0.0.0.0:2222
Connection from: ('172.18.0.3', 38842)
Received from client: halo
```

```
724a7b962e06    compose-reqresp-server    "tai
l -f /dev/null"   About a minute ago   Up Ab
out a minute    2222/tcp   reqresp-server
ella@ELLA-PC:~/dist_sys$ sudo docker compose
 -f compose/reqresp.yml exec reqresp-client
python client.py
WARN[0000] /home/ella/dist_sys/compose/reqre
sp.yml: the attribute `version` is obsolete,
 it will be ignored, please remove it to avo
id potential confusion
Enter message: halo
<class 'bytes'>
Received from server: Echo: halo
Enter another message:
```

```
ella@ELLA-PC:~/dist_sys$ ip addr
30: br-41ad81195328: <BROADCAST,MULTICA
ST,UP,LOWER_UP> mtu 1500 qdisc noqueue
state UP group default
    link/ether 52:75:1e:2a:f0:65 brd ff
:ff:ff:ff:ff:ff
    inet 172.18.0.1/16 brd 172.18.255.2
55 scope global br-41ad81195328
       valid_lft forever preferred_lft
forever
    inet6 fe80::5075:1eff:fe2a:f065/64
scope link
       valid_lft forever preferred_lft
forever
```

Interface bridge: br-41ad81195328

Gateway bridge (IP host/bridge): 172.18.0.1/16

Container dalam jaringan ini kemungkinan punya IP seperti 172.18.0.2 (server) dan 172.18.0.3 (client), tergantung urutan saat docker compose up.
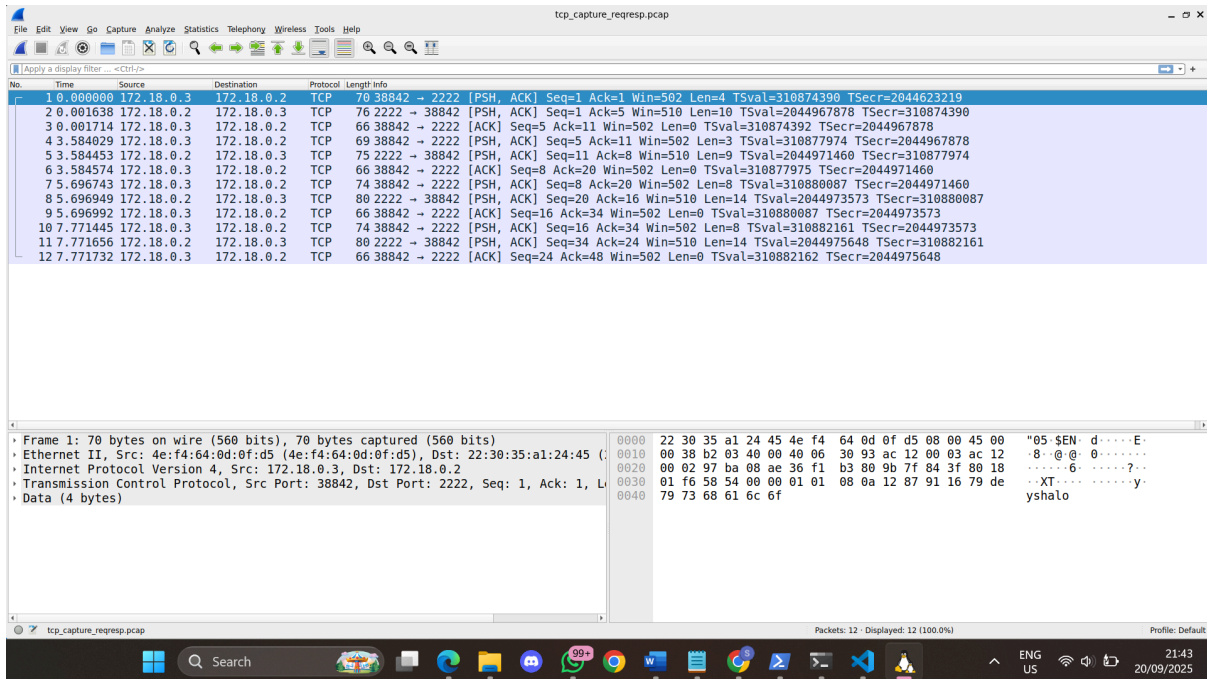
```
ella@ELLA-PC:~/dist_sys$ sudo docker comp
ose -f compose/reqresp.yml exec reqresp-s
erver python server.py
qresp.yml: the attribute `version` is obs
olete, it will be ignored, please remove
it to avoid potential confusion
Server listening on 0.0.0.0:2222
Connection from: ('172.18.0.3', 38842)
Received from client: halo
Received from client: halo
Received from client: hai
Received from client: hai halo
Received from client: halo hai
[]
```

```
ella@ELLA-PC:~/dist_sys$ sudo docker compose
 -f compose/reqresp.yml exec reqresp-client
python client.py
Received from server: Echo: halo
Enter another message: hai
<class 'bytes'>
Received from server: Echo: hai
Enter another message: hai halo
<class 'bytes'>
Received from server: Echo: hai halo
Enter another message: halo hai
<class 'bytes'>
Received from server: Echo: halo hai
Enter another message:
```

```
ella@ELLA-PC:~/dist_sys$ ip addr
:ff:ff:ff:ff:ff link-netnsid 1
    inet6 fe80::8898:35ff:fe91:f606/64
scope link
       valid_lft forever preferred_lft
forever
ella@ELLA-PC:~/dist_sys$ sudo tcpdump -
nvi br-41ad81195328 -w tcp_capture_reqr
esp.pcap
[sudo] password for ella:
tcpdump: listening on br-41ad81195328,
link-type EN10MB (Ethernet), snapshot l
ength 262144 bytes
got 12
```


4. PROTOKOL ZEROMQ (ZMQ)


```
ella@ELLA-PC:~/dist_sys$ sudo docker compose -f c
ompose/zmq.yml up -d
```

```
ella@ELLA-PC:~/dist_sys$ sudo docker ps
CONTAINER ID    IMAGE                   COMMAND                 CREATED             STATUS
                PORTS                   NAMES
379cb0a24d4e    compose-zmq-req         "tail -f /dev/null"     About a minute ago  Up Abo
ut a minute     5555/tcp, 12345/tcp     zmq-req
6222c9207c20    compose-zmq-pull        "tail -f /dev/null"     About a minute ago  Up Abo
ut a minute     5555/tcp, 12345/tcp     zmq-pull
7155f33f2ab8    compose-zmq-sub         "tail -f /dev/null"     About a minute ago  Up Abo
ut a minute     5555/tcp, 12345/tcp     zmq-sub
71761f94b1ee    compose-zmq-pub         "python pubzmq.py"      About a minute ago  Up Abo
ut a minute     5555/tcp, 12345/tcp     zmq-pub
80f86228bed2    compose-zmq-push        "python pushzmq.py"     About a minute ago  Up Abo
ut a minute     5555/tcp, 12345/tcp     zmq-push
82a904dc7be8    compose-zmq-rep         "python serverzmq.py"   About a minute ago  Up Abo
ut a minute     5555/tcp, 12345/tcp     zmq-rep
7863d2777447    compose-reqresp-client  "tail -f /dev/null"     41 minutes ago      Up 41
minutes         2222/tcp                reqresp-client
724a7b962e06    compose-reqresp-server  "tail -f /dev/null"     41 minutes ago      Up 41
minutes         2222/tcp                reqresp-server
```

```
ella@ELLA-PC:~/dist_sys$ sudo docker compose -f c
ompose/zmq.yml exec zmq-pull python pullzmq.py
WARN[0000] /home/ella/dist_sys/compose/zmq.yml: t
he attribute `version` is obsolete, it will be ig
nored, please remove it to avoid potential confus
ion
Worker 1 received work: 52
```

```
ella@ELLA-PC:~
ella@ELLA-PC:~/dist_sys$ sudo docker compose -f
compose/zmq.yml exec zmq-sub python subzmq.py
[sudo] password for ella:
WARN[0000] /home/ella/dist_sys/compose/zmq.yml:
the attribute `version` is obsolete, it will be
ignored, please remove it to avoid potential con
fusion
Received: WAKTU Sat Sep 20 15:17:01 2025
Received: WAKTU Sat Sep 20 15:17:02 2025
Received: WAKTU Sat Sep 20 15:17:03 2025
Received: WAKTU Sat Sep 20 15:17:04 2025
Received: WAKTU Sat Sep 20 15:17:05 2025
Received: WAKTU Sat Sep 20 15:17:06 2025
Received: WAKTU Sat Sep 20 15:17:07 2025
```

```
ella@ELLA-PC:~/dist_sys$ sudo docker compose -f c
ompose/zmq.yml exec zmq-req python clientzmq.py
WARN[0000] /home/ella/dist_sys/compose/zmq.yml: t
he attribute `version` is obsolete, it will be ig
nored, please remove it to avoid potential confus
ion
Sending request 0 ...
Received reply 0: b'World'
ella@ELLA-PC:~/dist_sys$
```

zmq_capture.pcap — Wireshark

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/>

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000	172.18.0.6	172.18.0.9	TCP	98	12345 → 57138 [PSH, ACK] Seq=1 Ack=1 Win=510 Len=32 TSval=1152845615 TSecr=554881023
2	0.000034	172.18.0.9	172.18.0.6	TCP	66	57138 → 12345 [ACK] Seq=1 Ack=33 Win=502 Len=0 TSval=554882023 TSecr=1152845615
3	1.000420	172.18.0.6	172.18.0.9	TCP	98	12345 → 57138 [PSH, ACK] Seq=33 Ack=1 Win=510 Len=32 TSval=1152846616 TSecr=554882023
4	1.000502	172.18.0.9	172.18.0.6	TCP	66	57138 → 12345 [ACK] Seq=1 Ack=65 Win=502 Len=0 TSval=554883024 TSecr=1152846616
5	2.001766	172.18.0.6	172.18.0.9	TCP	98	12345 → 57138 [PSH, ACK] Seq=65 Ack=1 Win=510 Len=32 TSval=1152847617 TSecr=554883024
6	2.002179	172.18.0.9	172.18.0.6	TCP	66	57138 → 12345 [ACK] Seq=1 Ack=97 Win=502 Len=0 TSval=554884025 TSecr=1152847617
7	3.002676	172.18.0.6	172.18.0.9	TCP	98	12345 → 57138 [PSH, ACK] Seq=97 Ack=1 Win=510 Len=32 TSval=1152848618 TSecr=554884025
8	3.002812	172.18.0.9	172.18.0.6	TCP	66	57138 → 12345 [ACK] Seq=1 Ack=129 Win=502 Len=0 TSval=554885026 TSecr=1152848618
9	4.004615	172.18.0.6	172.18.0.9	TCP	98	12345 → 57138 [PSH, ACK] Seq=129 Ack=1 Win=510 Len=32 TSval=1152849620 TSecr=554885026
10	4.005093	172.18.0.9	172.18.0.6	TCP	66	57138 → 12345 [ACK] Seq=1 Ack=161 Win=502 Len=0 TSval=554886028 TSecr=1152849620
11	5.004832	172.18.0.6	172.18.0.9	TCP	98	12345 → 57138 [PSH, ACK] Seq=161 Ack=1 Win=510 Len=32 TSval=1152850620 TSecr=554886028
12	5.004932	172.18.0.9	172.18.0.6	TCP	66	57138 → 12345 [ACK] Seq=1 Ack=193 Win=502 Len=0 TSval=554887028 TSecr=1152850620
13	6.005169	172.18.0.6	172.18.0.9	TCP	98	12345 → 57138 [PSH, ACK] Seq=193 Ack=1 Win=510 Len=32 TSval=1152851620 TSecr=554887028
14	6.005259	172.18.0.9	172.18.0.6	TCP	66	57138 → 12345 [ACK] Seq=1 Ack=225 Win=502 Len=0 TSval=554888028 TSecr=1152851620
15	7.005756	172.18.0.6	172.18.0.9	TCP	98	12345 → 57138 [PSH, ACK] Seq=225 Ack=1 Win=510 Len=32 TSval=1152852621 TSecr=554888028
16	7.005881	172.18.0.9	172.18.0.6	TCP	66	57138 → 12345 [ACK] Seq=1 Ack=257 Win=502 Len=0 TSval=554889029 TSecr=1152852621
17	8.006147	172.18.0.6	172.18.0.9	TCP	98	12345 → 57138 [PSH, ACK] Seq=257 Ack=1 Win=510 Len=32 TSval=1152853621 TSecr=554889029
18	8.006227	172.18.0.9	172.18.0.6	TCP	66	57138 → 12345 [ACK] Seq=1 Ack=289 Win=502 Len=0 TSval=554890029 TSecr=1152853621
19	9.006731	172.18.0.6	172.18.0.9	TCP	98	12345 → 57138 [PSH, ACK] Seq=289 Ack=1 Win=510 Len=32 TSval=1152854622 TSecr=554890029
20	9.006835	172.18.0.9	172.18.0.6	TCP	66	57138 → 12345 [ACK] Seq=1 Ack=321 Win=502 Len=0 TSval=554891030 TSecr=1152854622
21	9.250706	4e:d7:8d:13...	6e:37:c0:d8...	ARP	42	Who has 172.18.0.6? Tell 172.18.0.9
22	9.250729	6e:37:c0:d8...	4e:d7:8d:13...	ARP	42	172.18.0.6 is at 6e:37:c0:d8:11:61
23	9.430981	172.18.0.5	172.18.0.8	TCP	73	9999 → 53404 [PSH, ACK] Seq=1 Ack=1 Win=509 Len=7 TSval=1771963561 TSecr=3065624512

▸ Frame 1: 98 bytes on wire (784 bits), 98 bytes captured (784 bits)
▸ Ethernet II, Src: 6e:37:c0:d8:11:61 (6e:37:c0:d8:11:61), Dst: 4e:d7:8d:13:fc:02 (4...
▸ Internet Protocol Version 4, Src: 172.18.0.6, Dst: 172.18.0.9
▸ Transmission Control Protocol, Src Port: 12345, Dst Port: 57138, Seq: 1, Ack: 1, ...
▸ Data (32 bytes)

```
0000  4e d7 8d 13 fc 02 6e 37  c0 d8 11 61 08 00 45 00   N·····n7 ···a··E·
0010  00 54 55 f0 40 00 40 06  8c 80 ac 12 00 06 ac 12   ·TU·@·@· ········
0020  00 09 30 39 df 32 9c 13  62 c2 b1 12 5e 7f 80 18   ··09·2·· b···^···
0030  01 fe 58 7a 00 00 01 01  08 0a 44 b7 07 2f 21 12   ··Xz···· ··D··/!·
0040  cf ff 00 1e 57 41 4b 54  55 20 53 61 74 20 53 65   ····WAKT U Sat Se
0050  70 20 32 30 20 31 35 3a  31 38 3a 35 33 20 32 30   p 20 15: 18:53 20
0060  32 35                                              25
```

zmq_capture.pcap   Packets: 86 · Displayed: 86 (100.0%)   Profile: Default