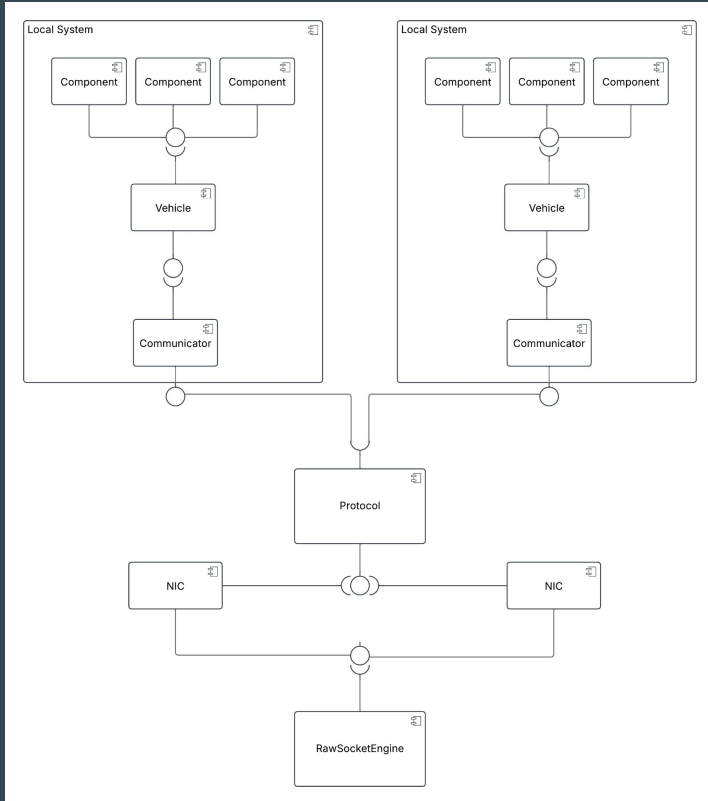


# Sistemas Operacionais II - P2



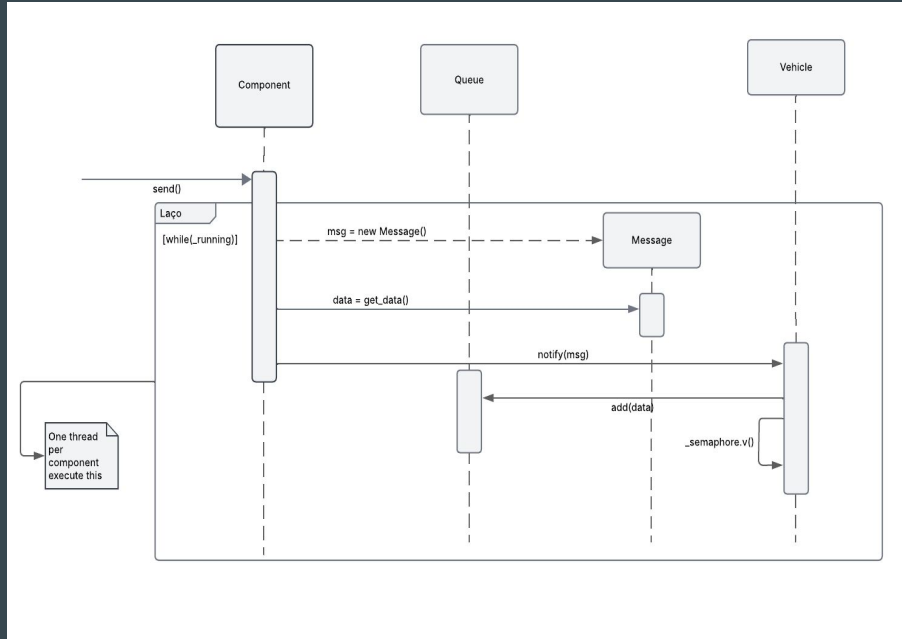
João Vitor dos Santos  
Pablo Lopes Teixeira  
Fábio Henrique Antunes Coelho  
Tiago Oliveira da Luz

# Diagrama de Componente



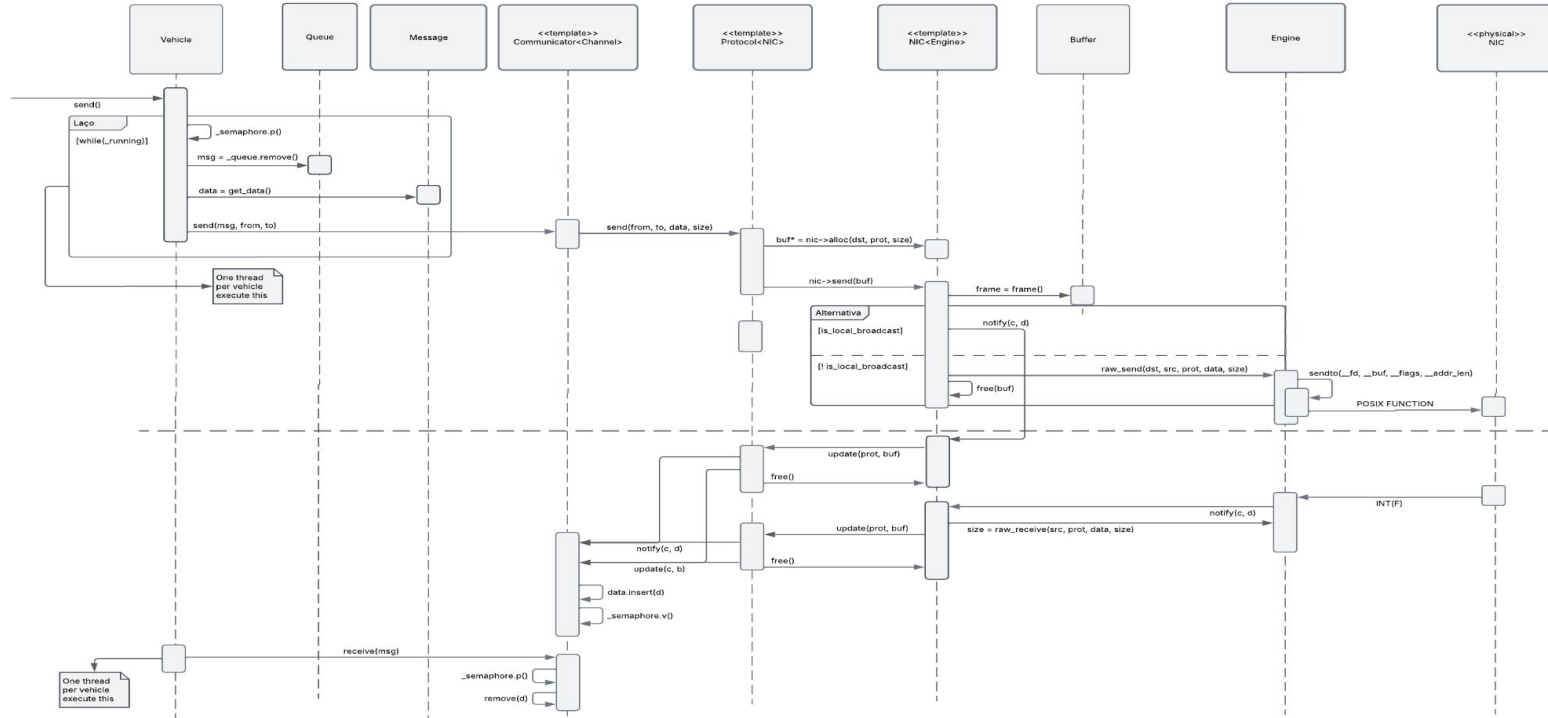
- Um único *Communicator* por sistema local
- *Vehicle* faz a multiplexação dos *Components* para o recebimento das mensagens
- Porta de destino = 0, envia para todos os componentes
- Porta de destino  $\neq 0$  e  $= n$ , envia para o componente  $n$

# Diagrama de Sequência: Component::send()

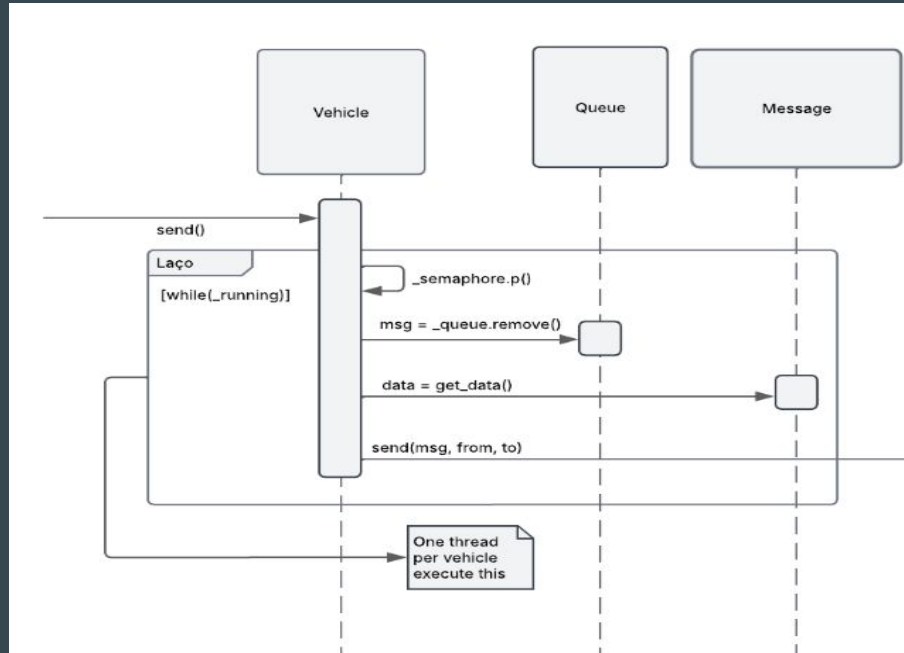


- Cada *Component* tem uma thread para envio de mensagens
- Cada *Component* notifica o *Vehicle* que possui uma mensagem a ser enviada
- O *Vehicle* armazena em uma *Queue* e incrementa seu *Semaphore*

# Diagrama de Sequência: Vehicle::send()

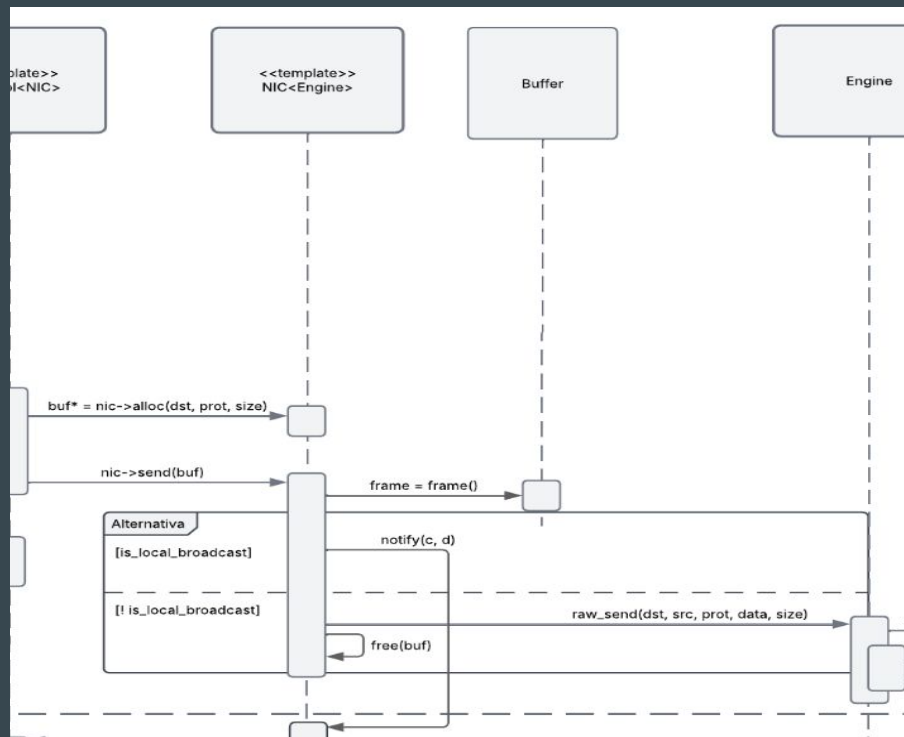


# Diagrama de Sequência: Vehicle::send()



- Cada *Vehicle* tem uma thread para envio de mensagens
- *Vehicle* tenta retirar uma mensagem da *Queue*, com o `_semaphore.p()`
- Caso consiga a mensagem é enviada

# Diagrama de Sequência: Vehicle::send()



- Verifica na NIC se a mensagem é entre os *Components* do mesmo *Vehicle* ou não
- Se MAC de destino == MAC de origem, envia para o *Vehicle* interno, não passa pelo *socket*
- Se não, envia para os *Vehicles* externos, através do *socket*

# nic.send()

```
int send(NICBuffer* buf) {
    ConsoleLogger::print("NIC: Sending frame.");
    std::cout << buf << std::endl;

    Ethernet::Frame* frame = buf->frame();
    Protocol_Number prot;
    prot = ntohs(frame->header()->h_proto);

    bool is_local_broadcast = memcmp(frame->data(), frame->data() + 8, 6) == 0;

    if (is_local_broadcast) {
        ConsoleLogger::log("IT'S EQUAL");
        notify(prot, buf);
        ConsoleLogger::print("NIC: Frame sent BROADCAST LOCAL.");
        return 0;
    } else {
        int result = Engine::raw_send(
            frame->header()->h_dest,
            prot,
            frame->data(),
            buf->size() - sizeof(Ethernet::Header)
        );

        free(buf);

        ConsoleLogger::print("NIC: Frame sent BROADCAST EXTERNAL.");
        return result;
    }
}
```

- Verifica diretamente na mensagem se os endereços MAC de origem e destino são iguais

8389_	1692.0892903_	LiteonTechno_20:1a:...	Broadcast	0x8888	52 Ethernet II
8389_	1692.0913368_	LiteonTechno_20:1a:...	Broadcast	0x8888	52 Ethernet II
8389_	1692.1050969_	LiteonTechno_20:1a:...	Broadcast	0x8888	52 Ethernet II

► Frame 838961: 52 bytes on wire (416 bits), 52 bytes captured (416 bits) on interface wlp4s0, id 0  
► Ethernet II, Src: LiteonTechno\_20:1a:7b (d0:39:57:20:1a:7b), Dst: Broadcast (ff:ff:ff:ff:ff:ff)  
▼ Data (38 bytes)  
Data: 5aba27b5f6260100ffffffffffff020014005aba27b5f6260100ffffffffffff02003e0a0000  
[Length: 38]

0000	ff ff ff ff ff d0 39	57 20 1a 7b 88 88	5a ba	.....9 W .{..Z.
0010	27 b5 f6 26 01 00 ff ff	ff ff ff ff 02 00 14 00		!..&.....
0020	5a ba 27 b5 f6 26 01 00	ff ff ff ff ff 02 00		Z.'..&.....
0030	3e 0a 00 00			>...

# Broadcast Local - logs

```
315 2025-04-30 03:33:33.884] - [PID:1060000] [THREAD ID:139705379170048] Buffer Pool: Freed Buffer
316 2025-04-30 03:33:33.884] - [PID:1060000] [THREAD ID:139705379170048] Buffer Pool: Buffer was in use - Semaphore V -> 31
317 2025-04-30 03:33:33.884] - [PID:1060000] [THREAD ID:139705379170048] MESSAGE RECEIVE FROM COMMUNICATOR
318 2025-04-30 03:33:33.884] - [PID:1060000] [THREAD ID:139705379170048] ARRIVED MESSAGE!
319 2025-04-30 03:33:33.884] - [PID:1060000] [THREAD ID:139705379170048] LOCAL BROADCAST
320 2025-04-30 03:33:33.884] - [PID:1060000] [THREAD ID:139705379170048] [COMPONENT ID: [1] Received notify.
321 2025-04-30 03:33:33.884] - [PID:1060000] [THREAD ID:139705379170048] [COMPONENT ID: [2] Received notify.
322 2025-04-30 03:33:33.884] - [PID:1060000] [THREAD ID:139705379170048] [COMPONENT ID: [3] Received notify.
323 2025-04-30 03:33:33.884] - [PID:1060000] [THREAD ID:139705379170048] [COMPONENT ID: [4] Received notify.
324 2025-04-30 03:33:33.885] - [PID:1060000] [THREAD ID:139705379170048] [COMPONENT ID: [5] Received notify.
325 2025-04-30 03:33:33.885] - [PID:1060000] [THREAD ID:139705379170048] RUNNING RECEIVE THREAD
326 2025-04-30 03:33:33.885] - [PID:1060000] [THREAD ID:139705421133568] [COMPONENT ID: [3] RECEIVED MESSAGE FROM: MAC = 19:a9:57:ad:5a:ab - ORIGIN COMPONENT ID = 1 - COUNT = 0
327 2025-04-30 03:33:33.885] - [PID:1060000] [THREAD ID:139705421133568] FREE REFERENCE BUFFER
328 2025-04-30 03:33:33.885] - [PID:1060000] [THREAD ID:139705660471040] [COMPONENT ID: [1] RECEIVED MESSAGE FROM: MAC = 19:a9:57:ad:5a:ab - ORIGIN COMPONENT ID = 1 - COUNT = 0
329 2025-04-30 03:33:33.885] - [PID:1060000] [THREAD ID:139705660471040] FREE REFERENCE BUFFER
330 2025-04-30 03:33:33.885] - [PID:1060000] [THREAD ID:139705643685632] [COMPONENT ID: [2] RECEIVED MESSAGE FROM: MAC = 19:a9:57:ad:5a:ab - ORIGIN COMPONENT ID = 1 - COUNT = 0
331 2025-04-30 03:33:33.885] - [PID:1060000] [THREAD ID:139705643685632] FREE REFERENCE BUFFER
332 2025-04-30 03:33:33.885] - [PID:1060000] [THREAD ID:139705395955456] [COMPONENT ID: [5] RECEIVED MESSAGE FROM: MAC = 19:a9:57:ad:5a:ab - ORIGIN COMPONENT ID = 1 - COUNT = 0
333 2025-04-30 03:33:33.885] - [PID:1060000] [THREAD ID:139705395955456] FREE REFERENCE BUFFER
334 2025-04-30 03:33:33.885] - [PID:1060000] [THREAD ID:139705412740864] [COMPONENT ID: [4] RECEIVED MESSAGE FROM: MAC = 19:a9:57:ad:5a:ab - ORIGIN COMPONENT ID = 1 - COUNT = 0
335 2025-04-30 03:33:33.885] - [PID:1060000] [THREAD ID:139705412740864] FREE REFERENCE BUFFER
```

```
335 2025-04-30 03:33:33.887] - [PID:1060001] [THREAD ID:139705370777344] Buffer Pool: Buffer was in use - Semaphore V -> 31
336 2025-04-30 03:33:33.887] - [PID:1060001] [THREAD ID:139705370777344] MESSAGE RECEIVE FROM COMMUNICATOR
337 2025-04-30 03:33:33.887] - [PID:1060001] [THREAD ID:139705370777344] ARRIVED MESSAGE!
338 2025-04-30 03:33:33.887] - [PID:1060001] [THREAD ID:139705370777344] LOCAL BROADCAST
339 2025-04-30 03:33:33.887] - [PID:1060001] [THREAD ID:139705370777344] [COMPONENT ID: [1] Received notify.
340 2025-04-30 03:33:33.887] - [PID:1060001] [THREAD ID:139705370777344] [COMPONENT ID: [2] Received notify.
341 2025-04-30 03:33:33.887] - [PID:1060001] [THREAD ID:139705370777344] [COMPONENT ID: [3] Received notify.
342 2025-04-30 03:33:33.887] - [PID:1060001] [THREAD ID:139705370777344] [COMPONENT ID: [4] Received notify.
343 2025-04-30 03:33:33.887] - [PID:1060001] [THREAD ID:139705370777344] [COMPONENT ID: [5] Received notify.
344 2025-04-30 03:33:33.887] - [PID:1060001] [THREAD ID:139705660471040] [COMPONENT ID: [1] RECEIVED MESSAGE FROM: MAC = 81:fc:b6:24:43:91 - ORIGIN COMPONENT ID = 1 - COUNT = 0
345 2025-04-30 03:33:33.887] - [PID:1060001] [THREAD ID:139705660471040] FREE REFERENCE BUFFER
346 2025-04-30 03:33:33.887] - [PID:1060001] [THREAD ID:139705643685632] [COMPONENT ID: [2] RECEIVED MESSAGE FROM: MAC = 81:fc:b6:24:43:91 - ORIGIN COMPONENT ID = 1 - COUNT = 0
347 2025-04-30 03:33:33.887] - [PID:1060001] [THREAD ID:139705643685632] FREE REFERENCE BUFFER
348 2025-04-30 03:33:33.887] - [PID:1060001] [THREAD ID:139705421133568] [COMPONENT ID: [3] RECEIVED MESSAGE FROM: MAC = 81:fc:b6:24:43:91 - ORIGIN COMPONENT ID = 1 - COUNT = 0
349 2025-04-30 03:33:33.887] - [PID:1060001] [THREAD ID:139705421133568] FREE REFERENCE BUFFER
350 2025-04-30 03:33:33.887] - [PID:1060001] [THREAD ID:139705370777344] RUNNING RECEIVE THREAD
351 2025-04-30 03:33:33.887] - [PID:1060001] [THREAD ID:139705404348160] [COMPONENT ID: [4] RECEIVED MESSAGE FROM: MAC = 81:fc:b6:24:43:91 - ORIGIN COMPONENT ID = 1 - COUNT = 0
352 2025-04-30 03:33:33.887] - [PID:1060001] [THREAD ID:139705404348160] FREE REFERENCE BUFFER
353 2025-04-30 03:33:33.887] - [PID:1060001] [THREAD ID:139705387562752] [COMPONENT ID: [5] RECEIVED MESSAGE FROM: MAC = 81:fc:b6:24:43:91 - ORIGIN COMPONENT ID = 1 - COUNT = 0
354 2025-04-30 03:33:33.888] - [PID:1060001] [THREAD ID:139705387562752] FREE REFERENCE BUFFER
355 2025-04-30 03:33:33.984] - [PID:1060001] [THREAD ID:139705652078336] [COMPONENT ID: [1] Notify vehicle.
356 2025-04-30 03:33:33.984] - [PID:1060001] [THREAD ID:139705652078336] NOTIFY VEHICLE
```



```
1 [2025-04-30 03:33:33.781] - [PID:1060001] [THREAD ID:139705668867904] Children process: 1060001
2 [2025-04-30 03:33:33.782] - [PID:1060001] [THREAD ID:139705668867904] Raw Socker Engine: Setting interface index.
3 [2025-04-30 03:33:33.783] - [PID:1060001] [THREAD ID:139705668867904] NIC NIC1060001: Starting...
4 [2025-04-30 03:33:33.783] - [PID:1060001] [THREAD ID:139705668867904] NIC NIC1060001: Logical MAC created
5 [2025-04-30 03:33:33.783] - [PID:1060001] [THREAD ID:139705668867904] NIC NIC1060001: MAC ADDRESS -> 81:fc:b6:24:43:91
6 [2025-04-30 03:33:33.783] - [PID:1060001] [THREAD ID:139705668867904] Protocol: Registering NIC
7 [2025-04-30 03:33:33.783] - [PID:1060001] [THREAD ID:139705668867904] Starting Vehicle -> 1060001
8 [2025-04-30 03:33:33.783] - [PID:1060001] [THREAD ID:139705660471040] [COMPONENT ID: [1] Component receive started.
9 [2025-04-30 03:33:33.783] - [PID:1060001] [THREAD ID:139705652078336] [COMPONENT ID: [1] Component send started.
10 [2025-04-30 03:33:33.783] - [PID:1060001] [THREAD ID:139705643685632] [COMPONENT ID: [2] Component receive started.
11 [2025-04-30 03:33:33.783] - [PID:1060001] [THREAD ID:139705635292928] [COMPONENT ID: [2] Component send started.
12 [2025-04-30 03:33:33.783] - [PID:1060001] [THREAD ID:139705421133568] [COMPONENT ID: [3] Component receive started.
13 [2025-04-30 03:33:33.784] - [PID:1060001] [THREAD ID:139705412740864] [COMPONENT ID: [3] Component send started.
14 [2025-04-30 03:33:33.784] - [PID:1060001] [THREAD ID:139705404348160] [COMPONENT ID: [4] Component receive started.
15 [2025-04-30 03:33:33.784] - [PID:1060001] [THREAD ID:139705395955456] [COMPONENT ID: [4] Component send started.
16 [2025-04-30 03:33:33.784] - [PID:1060001] [THREAD ID:139705370777344] RUNNING RECEIVE THREAD
17+ [2025-04-30 03:33:33.784] - [PID:1060001] [THREAD ID:139705387562752] [COMPONENT ID: [5] Component receive started.
```

```
1 2025-04-30 03:33:33.781] - [PID:1060000] [THREAD ID:139705668867904] Children process: 1060000
2 2025-04-30 03:33:33.781] - [PID:1060000] [THREAD ID:139705668867904] Raw Socker Engine: Setting interface index.
3 2025-04-30 03:33:33.783] - [PID:1060000] [THREAD ID:139705668867904] NIC NIC1060000: Starting...
4 2025-04-30 03:33:33.783] - [PID:1060000] [THREAD ID:139705668867904] NIC NIC1060000: Logical MAC created
5 2025-04-30 03:33:33.783] - [PID:1060000] [THREAD ID:139705668867904] NIC NIC1060000: MAC ADDRESS -> 19:a9:57:ad:5a:ab
6 2025-04-30 03:33:33.783] - [PID:1060000] [THREAD ID:139705668867904] Protocol: Registering NIC
7 2025-04-30 03:33:33.783] - [PID:1060000] [THREAD ID:139705668867904] Starting Vehicle -> 1060000
8 2025-04-30 03:33:33.783] - [PID:1060000] [THREAD ID:139705660471040] [COMPONENT ID: [1] Component receive started.
9 2025-04-30 03:33:33.783] - [PID:1060000] [THREAD ID:139705652078336] [COMPONENT ID: [1] Component send started.
10 2025-04-30 03:33:33.783] - [PID:1060000] [THREAD ID:139705643685632] [COMPONENT ID: [2] Component receive started.
11 2025-04-30 03:33:33.783] - [PID:1060000] [THREAD ID:139705635292928] [COMPONENT ID: [2] Component send started.
12 2025-04-30 03:33:33.783] - [PID:1060000] [THREAD ID:139705421133568] [COMPONENT ID: [3] Component receive started.
13 2025-04-30 03:33:33.784] - [PID:1060000] [THREAD ID:139705286915840] [COMPONENT ID: [3] Component send started.
14 2025-04-30 03:33:33.784] - [PID:1060000] [THREAD ID:139705387562752] [COMPONENT ID: [5] Component send started.
15 2025-04-30 03:33:33.784] - [PID:1060000] [THREAD ID:139705404348160] [COMPONENT ID: [4] Component send started.
16 2025-04-30 03:33:33.784] - [PID:1060000] [THREAD ID:139705395955456] [COMPONENT ID: [5] Component receive started.
17 2025-04-30 03:33:33.784] - [PID:1060000] [THREAD ID:139705412740864] [COMPONENT ID: [4] Component receive started.
18 2025-04-30 03:33:33.784] - [PID:1060000] [THREAD ID:139705379170048] RUNNING RECEIVE THREAD
19 2025-04-30 03:33:33.784] - [PID:1060000] [THREAD ID:139705668867904] Threads running
```



# Broadcast Externo - logs

```
1 [2025-04-30 04:19:10.139] - [PID:1063895] [THREAD ID:140380800554816] Children process: 1063895
2 [2025-04-30 04:19:10.139] - [PID:1063895] [THREAD ID:140380800554816] Raw Socker Engine: Setting interface index.
3 [2025-04-30 04:19:10.140] - [PID:1063895] [THREAD ID:140380800554816] NIC NIC1063895: Starting...
4 [2025-04-30 04:19:10.140] - [PID:1063895] [THREAD ID:140380800554816] NIC NIC1063895: Logical MAC created
5 [2025-04-30 04:19:10.140] - [PID:1063895] [THREAD ID:140380800554816] NIC NIC1063895: MAC ADDRESS -> be:d6:a6:9b:d3:16
6 [2025-04-30 04:19:10.140] - [PID:1063895] [THREAD ID:140380800554816] Protocol: Registering NIC
7 [2025-04-30 04:19:10.140] - [PID:1063895] [THREAD ID:140380800554816] Starting Vehicle -> 1063895
8 [2025-04-30 04:19:10.140] - [PID:1063895] [THREAD ID:140380792157952] [COMPONENT ID: [1] Component receive started.
9 [2025-04-30 04:19:10.140] - [PID:1063895] [THREAD ID:140380783765248] [COMPONENT ID: [1] Component send started.
10 [2025-04-30 04:19:10.141] - [PID:1063895] [THREAD ID:140380775372544] [COMPONENT ID: [2] Component receive started.
11 [2025-04-30 04:19:10.141] - [PID:1063895] [THREAD ID:140380766979840] [COMPONENT ID: [2] Component send started.
12 [2025-04-30 04:19:10.141] - [PID:1063895] [THREAD ID:140380758587136] [COMPONENT ID: [3] Component receive started.
13 [2025-04-30 04:19:10.141] - [PID:1063895] [THREAD ID:140380750194432] [COMPONENT ID: [3] Component send started.
14 [2025-04-30 04:19:10.141] - [PID:1063895] [THREAD ID:140380402087680] [COMPONENT ID: [4] Component receive started.
15 [2025-04-30 04:19:10.141] - [PID:1063895] [THREAD ID:140380393694976] [COMPONENT ID: [4] Component send started.
16+ [2025-04-30 04:19:10.141] - [PID:1063895] [THREAD ID:140380385302272] [COMPONENT ID: [5] Component receive started.
17 1063895] [THREAD ID:140380368516864] Vehicle receive started.
18 [2025-04-30 04:19:10.141] - [PID:1063895] [THREAD ID:140380800554816] Threads running
```

```
1 [2025-04-30 04:19:10.139] - [PID:1063896] [THREAD ID:140380800554816] Children process: 1063896
2 [2025-04-30 04:19:10.139] - [PID:1063896] [THREAD ID:140380800554816] Raw Socker Engine: Setting interface index.
3 [2025-04-30 04:19:10.140] - [PID:1063896] [THREAD ID:140380800554816] NIC NIC1063896: Starting...
4 [2025-04-30 04:19:10.140] - [PID:1063896] [THREAD ID:140380800554816] NIC NIC1063896: Logical MAC created
5 [2025-04-30 04:19:10.140] - [PID:1063896] [THREAD ID:140380800554816] NIC NIC1063896: MAC ADDRESS -> 84:02:5c:d1:75:dc
6 [2025-04-30 04:19:10.140] - [PID:1063896] [THREAD ID:140380800554816] Protocol: Registering NIC
7 [2025-04-30 04:19:10.140] - [PID:1063896] [THREAD ID:140380800554816] Starting Vehicle -> 1063896
8 [2025-04-30 04:19:10.140] - [PID:1063896] [THREAD ID:140380792157952] [COMPONENT ID: [1] Component receive started.
9 [2025-04-30 04:19:10.140] - [PID:1063896] [THREAD ID:140380783765248] [COMPONENT ID: [1] Component send started.
10 [2025-04-30 04:19:10.140] - [PID:1063896] [THREAD ID:140380775372544] [COMPONENT ID: [2] Component receive started.
11 [2025-04-30 04:19:10.141] - [PID:1063896] [THREAD ID:140380766979840] [COMPONENT ID: [2] Component send started.
12 [2025-04-30 04:19:10.141] - [PID:1063896] [THREAD ID:140380758587136] [COMPONENT ID: [3] Component receive started.
13 [2025-04-30 04:19:10.141] - [PID:1063896] [THREAD ID:140380750194432] [COMPONENT ID: [3] Component send started.
14 [2025-04-30 04:19:10.141] - [PID:1063896] [THREAD ID:140380393694976] [COMPONENT ID: [4] Component receive started.
15 [2025-04-30 04:19:10.141] - [PID:1063896] [THREAD ID:140380393694976] [COMPONENT ID: [4] Component send started.
16 [2025-04-30 04:19:10.141] - [PID:1063896] [THREAD ID:140380402087680] [COMPONENT ID: [4] Component receive started.
17 [2025-04-30 04:19:10.141] - [PID:1063896] [THREAD ID:140380385302272] [COMPONENT ID: [5] Component receive started.
18 [2025-04-30 04:19:10.141] - [PID:1063896] [THREAD ID:140380800554816] Threads running
```



```
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380800550656] Concurrent_Observed: Notifying concurrent observers.
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380368516864] [COMPONENT ID: [2] Received notify.
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380792157952] [COMPONENT ID: [1] RECEIVED MESSAGE FROM: MAC = 84:02:5c:d1:75:dc - ORIGIN COMPONENT ID = 1 - COUNT = 0
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380800550656] PROCESSING INCOMING DATA
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380792157952] FREE REFERENCE BUFFER
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380792157952] FREE REFERENCE BUFFER
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380800550656] 140380800550656
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380368516864] [COMPONENT ID: [3] Received notify.
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380775372544] [COMPONENT ID: [2] RECEIVED MESSAGE FROM: MAC = 84:02:5c:d1:75:dc - ORIGIN COMPONENT ID = 1 - COUNT = 0
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380368516864] [COMPONENT ID: [4] Received notify.
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380758587136] [COMPONENT ID: [3] RECEIVED MESSAGE FROM: MAC = 84:02:5c:d1:75:dc - ORIGIN COMPONENT ID = 1 - COUNT = 0
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380800550656] NIC: Allocating buffer.
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380800550656] Buffer Pool: Requesting Buffer - Semaphore P -> 31
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380800550656] Raw Socker Engine: Receive started.
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380775372544] FREE REFERENCE BUFFER
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380758587136] FREE REFERENCE BUFFER
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380368516864] [COMPONENT ID: [5] Received notify.
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380402087680] [COMPONENT ID: [4] RECEIVED MESSAGE FROM: MAC = 84:02:5c:d1:75:dc - ORIGIN COMPONENT ID = 1 - COUNT = 0
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380402087680] FREE REFERENCE BUFFER
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380368516864] RUNNING RECEIVE THREAD
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380385302272] [COMPONENT ID: [5] RECEIVED MESSAGE FROM: MAC = 84:02:5c:d1:75:dc - ORIGIN COMPONENT ID = 1 - COUNT = 0
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380385302272] [COMPONENT ID: [5] RECEIVED MESSAGE FROM: MAC = 84:02:5c:d1:75:dc - ORIGIN COMPONENT ID = 1 - COUNT = 0
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380800550656] Raw Socket Engine: Receive PROTO -> 34952
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380385302272] FREE REFERENCE BUFFER
[2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380368516864] NIC: Receiving frame.
+ [2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380800550656] SIZE RAW RECEIVE: 38
```

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549 [2025-04-30 04:19:10.248] - [PID:1063895] [THREAD ID:140380800550656] Buffer Pool: Requesting Buffer - Semaphore P -> 31
550 [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380368516864] [COMPONENT ID: [2] Received notify.
551 [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380792157952] [COMPONENT ID: [1] RECEIVED MESSAGE FROM: MAC = be:d6:a6:9b:d3:16 - ORIGIN COMPONENT ID = 1 - COUNT = 0
552 [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380800550656] Raw Socker Engine: Receive started.
553 [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380368516864] [COMPONENT ID: [3] Received notify.
554 [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380775372544] [COMPONENT ID: [2] RECEIVED MESSAGE FROM: MAC = be:d6:a6:9b:d3:16 - ORIGIN COMPONENT ID = 1 - COUNT = 0
555 [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380800550656] Raw Socket Engine: Receive PROTO -> 34952
556 [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380800550656] SIZE RAW RECEIVE: 38
557 [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380368516864] [COMPONENT ID: [4] Received notify.
558 [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380792157952] FREE REFERENCE BUFFER
559 [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380758587136] [COMPONENT ID: [3] RECEIVED MESSAGE FROM: MAC = be:d6:a6:9b:d3:16 - ORIGIN COMPONENT ID = 1 - COUNT = 0
560 [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380800550656] Conditionally Data Observed: Notifying observers.
561 [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380758587136] FREE REFERENCE BUFFER
562 [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380800550656] 34952 - 34952
563 [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380775372544] FREE REFERENCE BUFFER
564 [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380368516864] [COMPONENT ID: [5] Received notify.
565 [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380402087680] [COMPONENT ID: [4] RECEIVED MESSAGE FROM: MAC = be:d6:a6:9b:d3:16 - ORIGIN COMPONENT ID = 1 - COUNT = 0
566 [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380368516864] RUNNING RECEIVE THREAD
567 [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380385302272] [COMPONENT ID: [5] RECEIVED MESSAGE FROM: MAC = be:d6:a6:9b:d3:16 - ORIGIN COMPONENT ID = 1 - COUNT = 0
568 [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380402087680] FREE REFERENCE BUFFER
569 [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380800550656] Protocol: Update observers.
570+ [2025-04-30 04:19:10.249] - [PID:1063896] [THREAD ID:140380368516864] NIC: Receiving frame.
```