

GENERATING NORMAL & MALICIOUS TRAFFIC ON LORAWAN 1.0

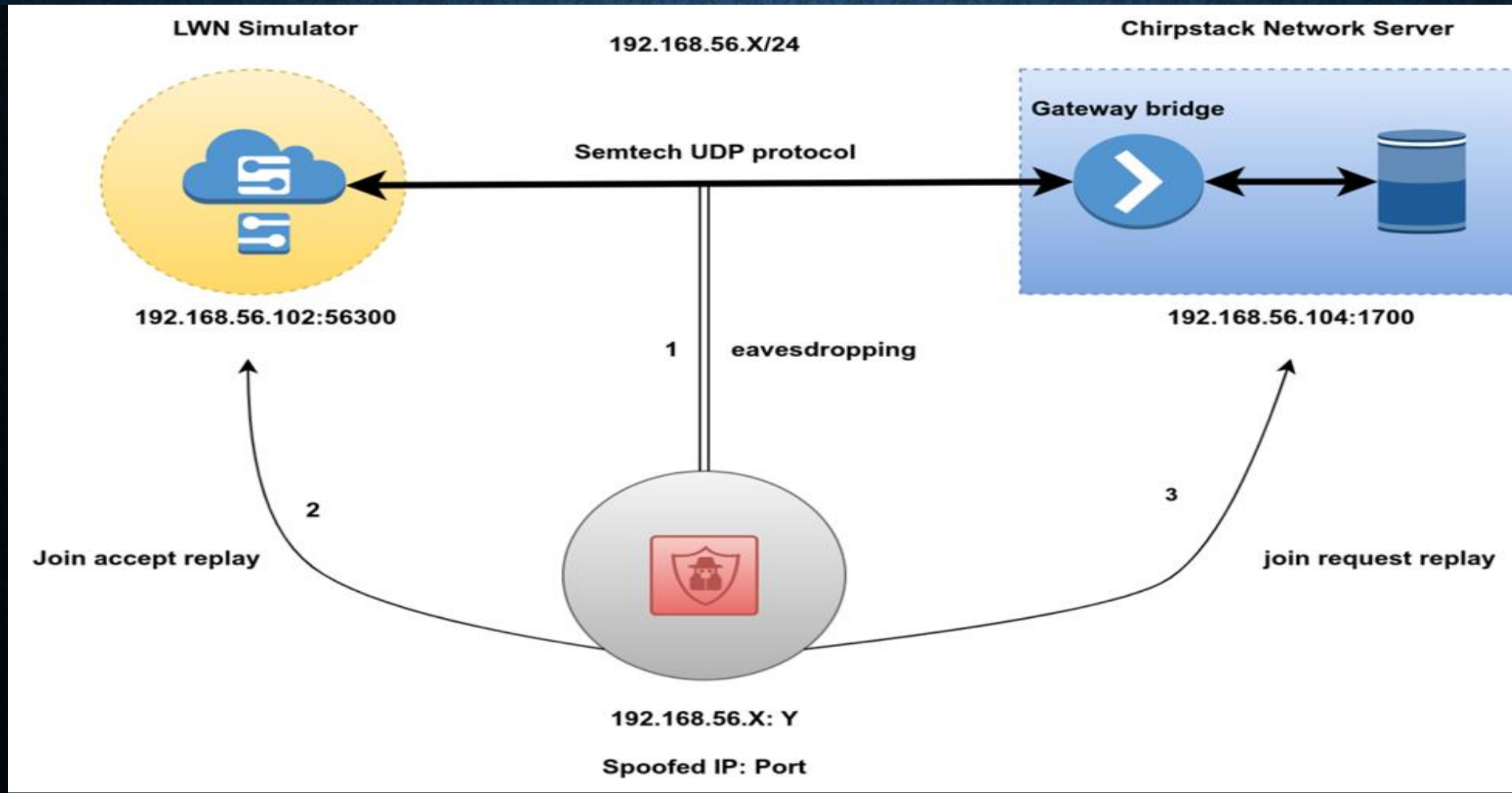
Master Thesis Progress Presentation

30/05/2023

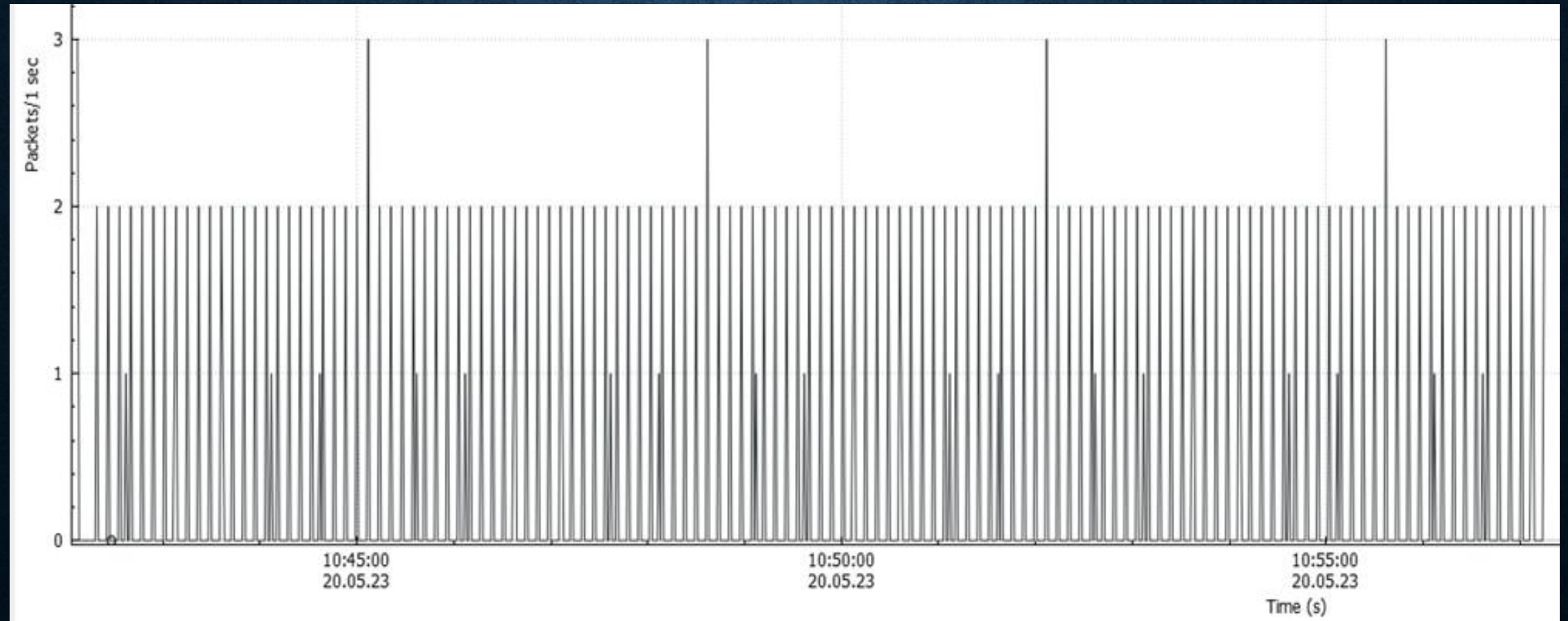
Ekeuh Axel

ATTACKS IMPLEMENTED :

- * JOIN ACCEPT REPLAY
- * JOIN REQUEST REPLAY
- * JOIN REQUEST FLOODING
- * KEEP ALIVE FLOODING



NORMAL TRAFFIC LOAD



JOIN REQUEST REPLAY

```
.  
Sent 1 packets.  
Join Request Replay D0S Statistics  
Packets sent: 200  
Start time: Sat May 20 15:09:19 2023  
End time: Sat May 20 15:11:08 2023  
Total execution time: 108.72718524932861 seconds  
seam@seam-malnode:~/Desktop$
```

```
429 [ May 20 15:10:05 ] DEV[loranode] |Activation| {A}: None downlink received  
430  
431 [ May 20 15:10:05 ] DEV[loranode] |Activation| {A}: Unjoined  
432  
433 [ May 20 15:10:05 ] DEV[loranode] |Activation| {A}: JOIN REQUEST sent  
434  
435 [ May 20 15:10:05 ] DEV[loranode] |Activation| {A}: Open RXs  
436
```

2023-05-20 10:42:06	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 15:09:53	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 10:42:06	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 10:42:06	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 10:42:06	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 10:42:06	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 10:42:06	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 10:42:06	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 15:09:21	JoinAccept	DevEUI: 83717b8a131c5173 Gateway ID: b4562d94afcd48d
2023-05-20 10:42:06	JoinRequest	DevEUI: 83717b8a131c5173









JOIN REQUEST FLOODING

[May 21 09:51:12] DEV[loro node] |Activation| {A}: None downlink received

[May 21 09:51:12] DEV[loro node] |Activation| {A}: Unjoined

[May 21 09:51:12] DEV[loro node] |Activation| {A}: JOIN REQUEST sent

[May 21 09:51:12] DEV[loro node] |Activation| {A}: Open RXs

2023-05-20 10:42:06	 JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 10:42:06	 JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 10:42:06	 JoinRequest	DevEUI: 83717b8a131c5173
2023-05-21 09:50:27	 JoinAccept	DevEUI: 83717b8a131c5173 Gateway ID: b4562d94afcda48d
2023-05-20 10:42:06	 JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 10:42:06	 JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 10:42:06	 JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 10:42:06	 JoinRequest	DevEUI: 83717b8a131c5173

JOIN ACCEPT REPLAY

```
.
Sent 1 packets.
Join Accept Replay DOS Statistics
Packets sent: 200
Start time: Sat May 20 14:40:18 2023
End time: Sat May 20 14:42:07 2023
Total execution time: 109.12681674957275 seconds
Transmission rate: 1.8 packets per second
seam@seam-malnode:~/Desktop$
```

```
457 [ May 20 14:41:06 ] GW[seam-gw]: TX ACK sent
458
459 [ May 20 14:41:07 ] DEV[lora node] |Activation| {A}: None downlink received
460
461 [ May 20 14:41:07 ] DEV[lora node] |Activation| {A}: Unjoined
462
463 [ May 20 14:41:07 ] DEV[lora node] |Activation| {A}: JOIN REQUEST sent
464
465 [ May 20 14:41:07 ] GW[seam-gw]: PUSH DATA send
466
```

2023-05-20 14:22:01	🔍 join	DevAddr: 009081de
2023-05-20 14:21:49	🔍 join	DevAddr: 01c0a711
2023-05-20 14:21:15	🔍 join	DevAddr: 01409879
2023-05-20 14:21:03	🔍 join	DevAddr: 000ac429
2023-05-20 14:20:51	🔍 join	DevAddr: 00bcab9e
2023-05-20 14:20:39	🔍 join	DevAddr: 00d0fd60
2023-05-20 14:20:29	🔍 log	Code: UPLINK_F_CNT_RETRANSMISSION Level: WARNING
2023-05-20 14:20:19	🔍 log	Code: UPLINK_F_CNT_RETRANSMISSION Level: WARNING

KEEP ALIVE FLOODING

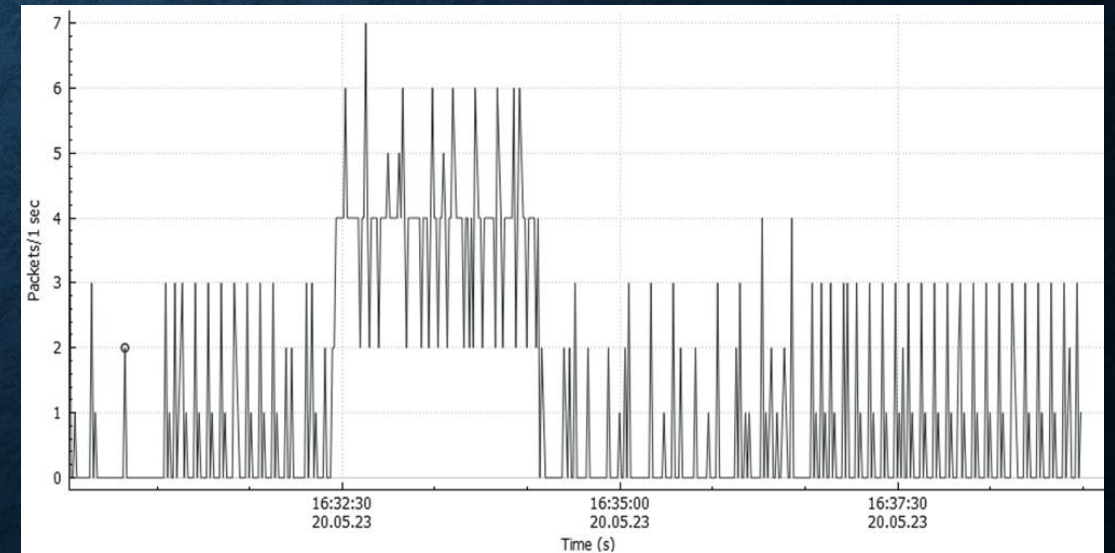
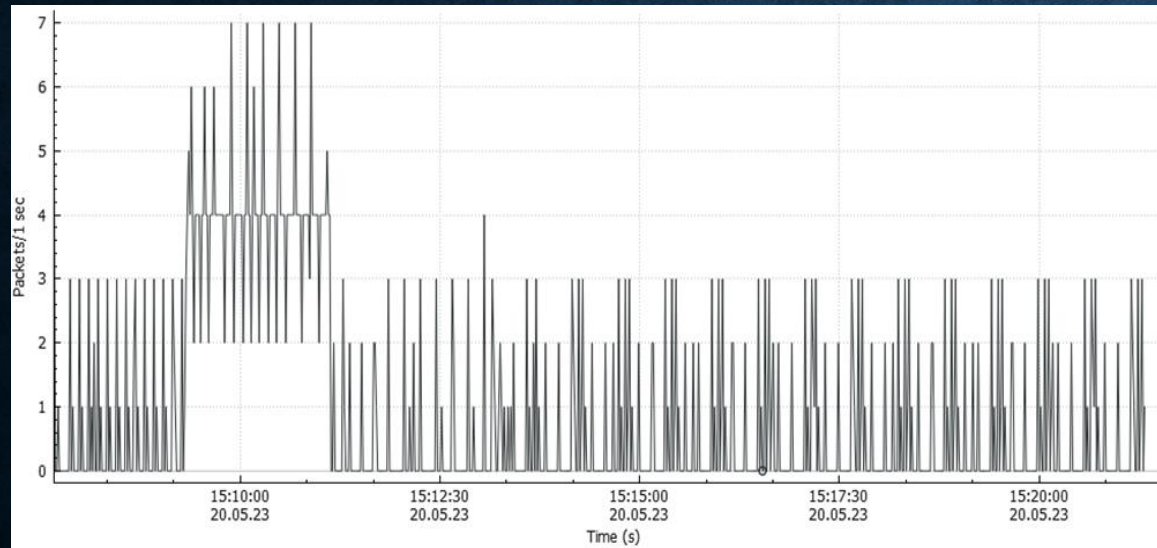
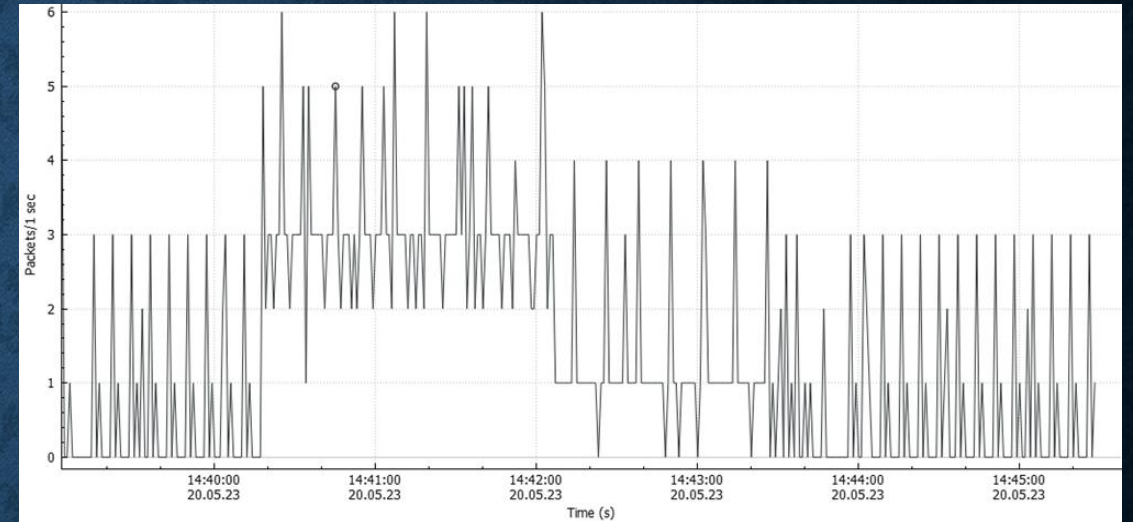
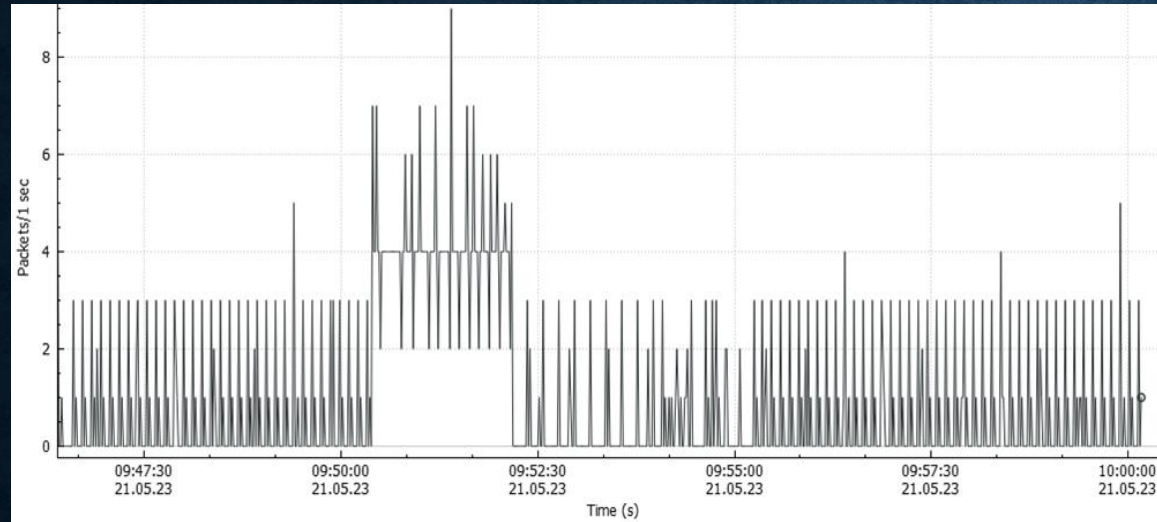
```
PULL DATA flooding Statistics
Packets sent: 200
Start time: Sat May 20 16:32:25 2023
End time: Sat May 20 16:34:16 2023
Total execution time: 111.23095083236694 seconds
Transmission rate: 1.8 packets per second
seam@seam-malnode:~/Desktop$
```

```
633 [ May 20 16:33:42 ] DEV[lora node] |Activation| {A}: None downlink received
634
635 [ May 20 16:33:42 ] DEV[lora node] |Activation| {A}: Unjoined
636
637 [ May 20 16:33:42 ] DEV[lora node] |Activation| {A}: JOIN REQUEST sent
638
639 [ May 20 16:33:42 ] DEV[lora node] |Activation| {A}: Open RXs
```

```
437 [ May 20 16:32:43 ] GW[seam-gw]: PULL ACK received
438
439 [ May 20 16:32:44 ] GW[seam-gw]: PULL ACK received
440
441 [ May 20 16:32:45 ] GW[seam-gw]: PULL ACK received
442
443 [ May 20 16:32:46 ] GW[seam-gw]: PULL ACK received
444
445 [ May 20 16:32:47 ] GW[seam-gw]: PULL ACK received
446
447 [ May 20 16:32:48 ] GW[seam-gw]: PULL ACK received
```

2023-05-20 16:36:43	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 16:36:29	JoinAccept	DevEUI: 83717b8a131c5173 Gateway ID: b4562d94afcda48d
2023-05-20 16:36:16	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 16:36:04	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 16:35:52	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 16:35:28	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 16:35:16	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 16:35:04	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 16:34:30	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 16:34:18	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 16:34:06	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 16:33:54	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 16:33:42	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 16:33:30	JoinRequest	DevEUI: 83717b8a131c5173
2023-05-20 16:32:54	JoinRequest	DevEUI: 83717b8a131c5173

TRAFFIC GRAPHS FOR DOS ATTACKS



WORK PROGRESS

Current :

- Master Thesis Draft : with all sections written
- All attack scripts and scenarios updated
- Github repository updated

Next :

- Waiting for review and feedback
- Update implementation and result analysis chapters