Hes·so VALAIS WALLIS

Haute Ecole d'Ingénierie
Hochschule für Ingenieurwissenschaften

OT Security

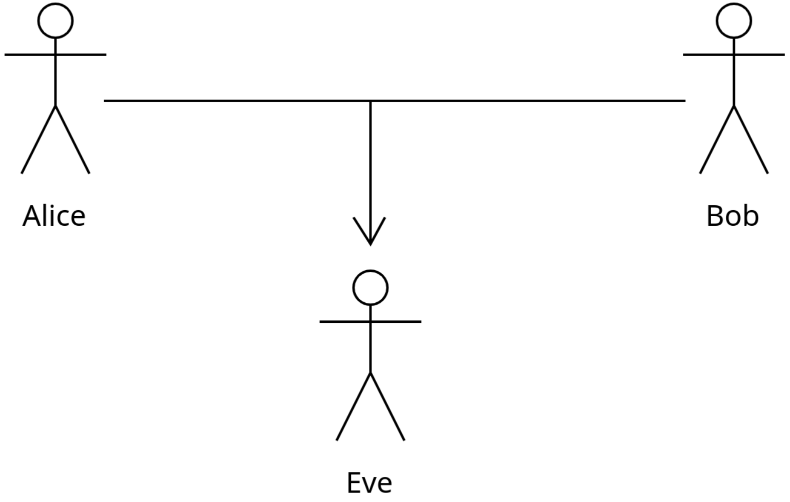
Presentation and choice of attack scenarios

Rémi Heredero

Monday, 3rd of June 2024

Sniffing

- Intercept packets and analyze them



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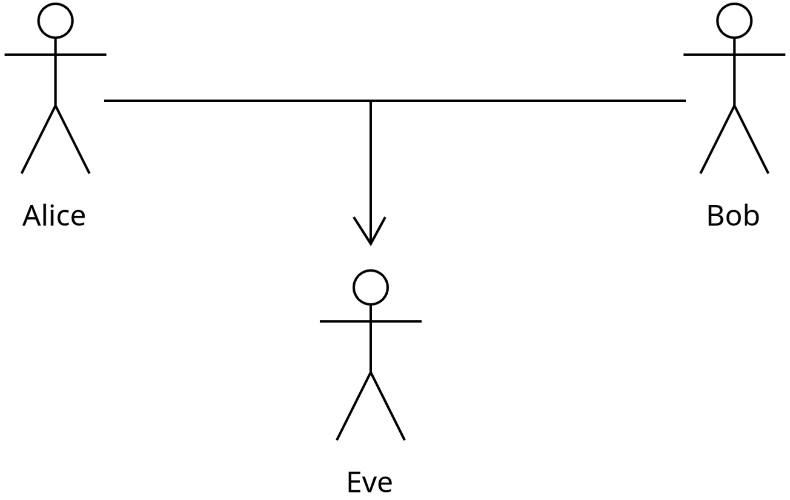

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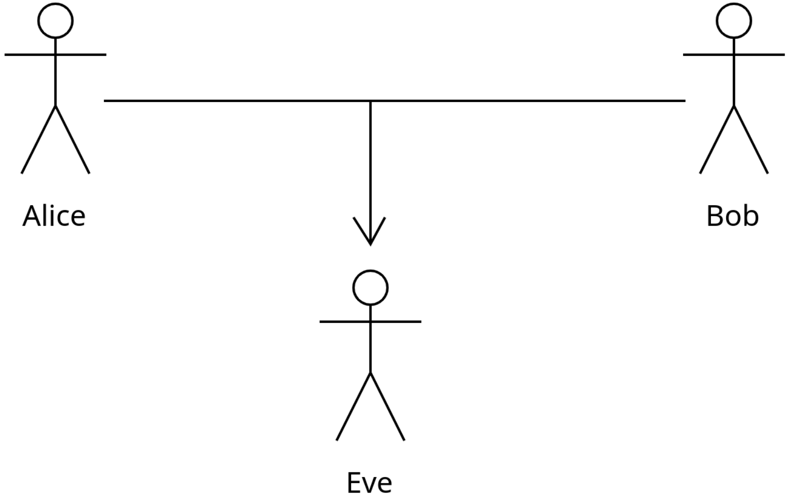
  - Or assume password is known



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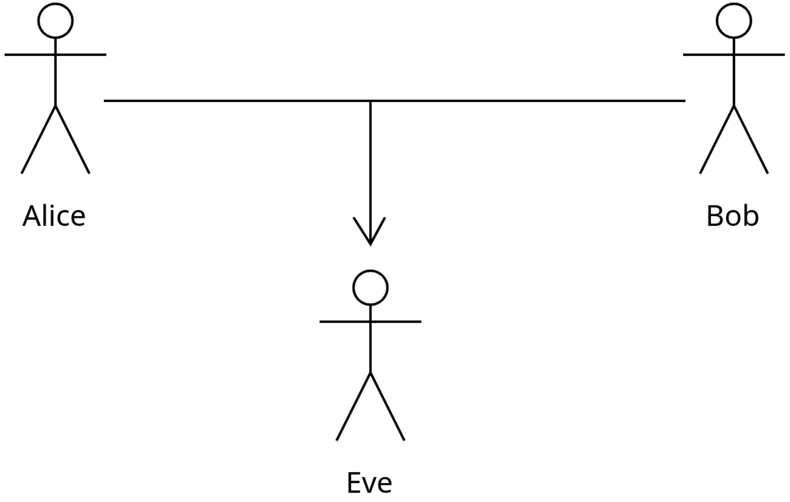
SOL : Use encryption like modbus over TLS



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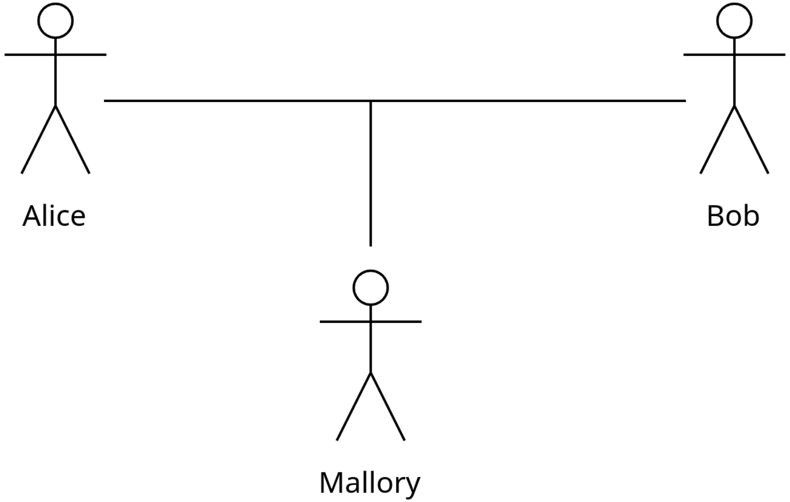
- More IT world

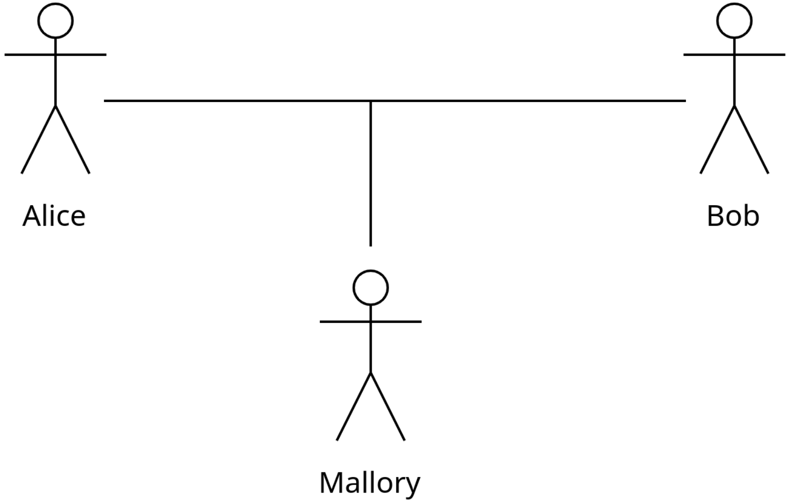
DoS

- Denial of Service



DoS

- Denial of Service
- Spam or Ping of Death



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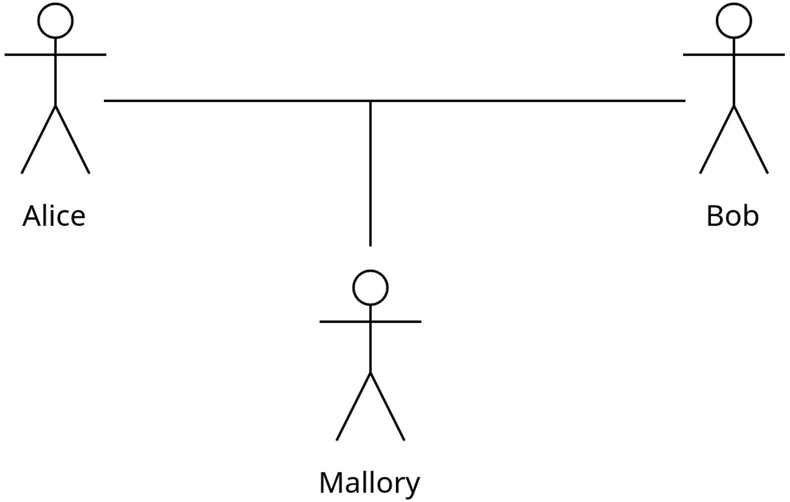

DoS

- Denial of Service
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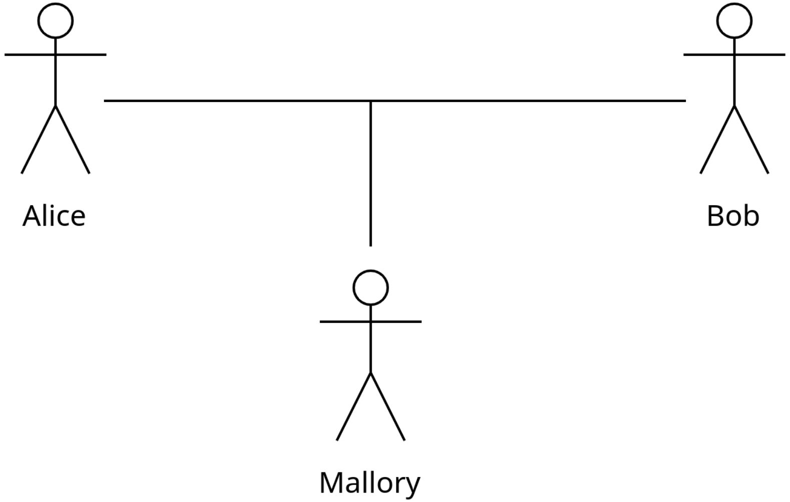
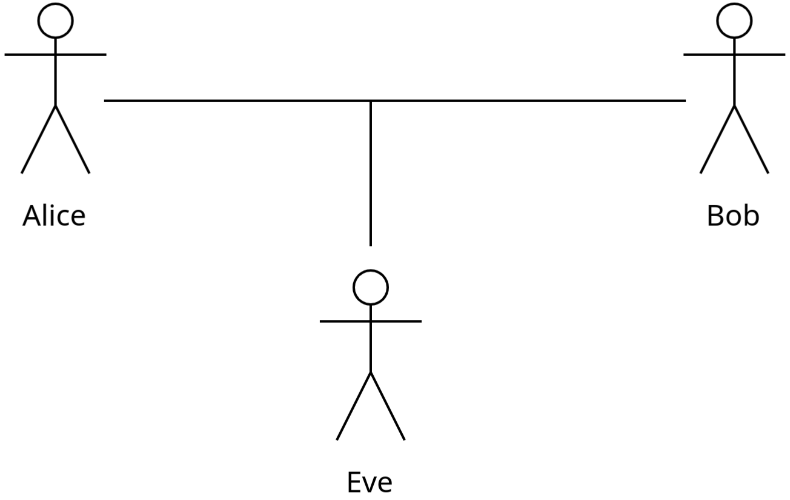
SOL : Ban IP by the transport layer (or lower)



Replay attack

- Replay a packet



Replay attack

- Replay a packet
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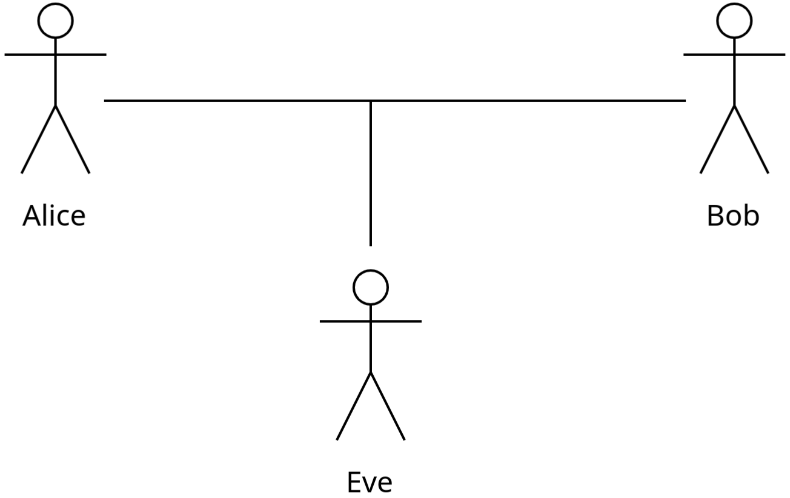
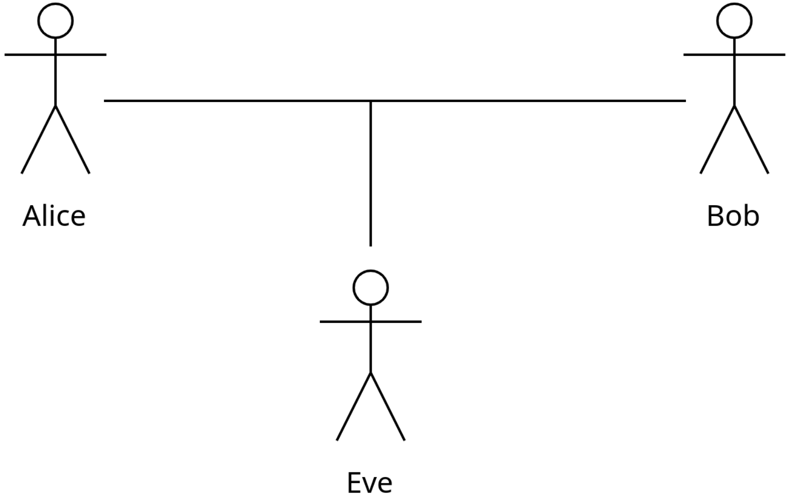


Replay attack

- Replay a packet
- Need sniffing
- Understand or not the packet



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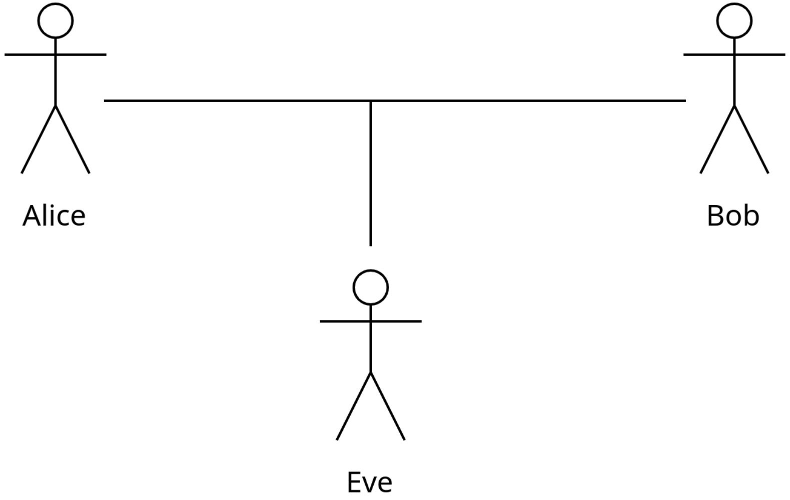
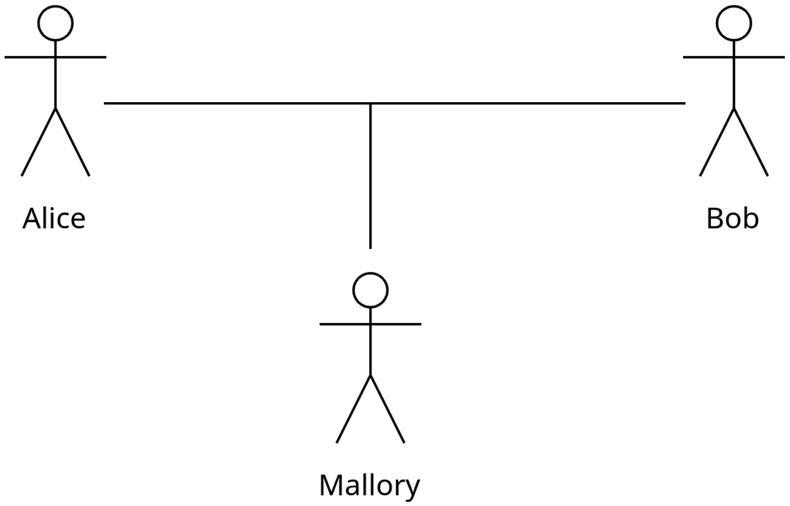
SOL : Add a signed timestamp

SOL : Rolling code



Man in the middle - Connected

- Send custom packets



Man in the middle - Connected

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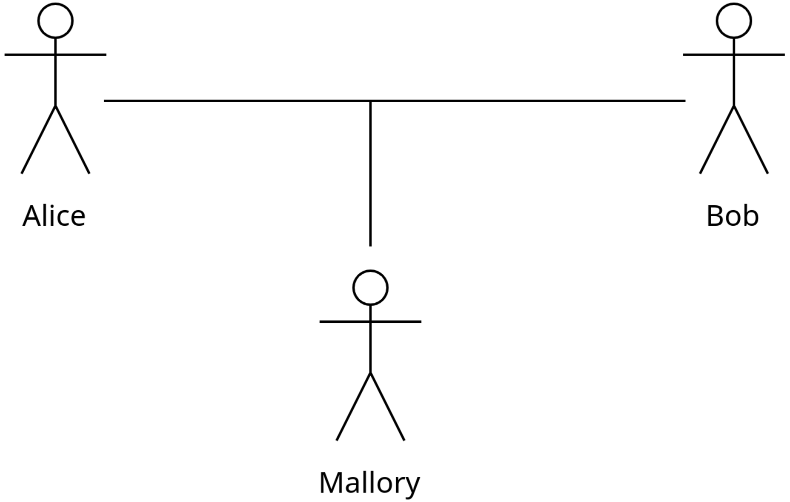

Man in the middle - Connected

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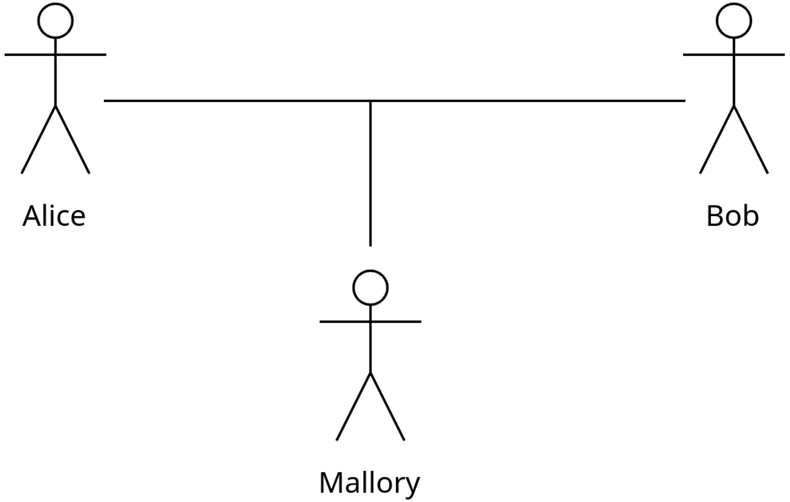
SOL : Use encryption with symetric key. Keys exchange with Diffie-Hellman



Man in the middle - Full interception

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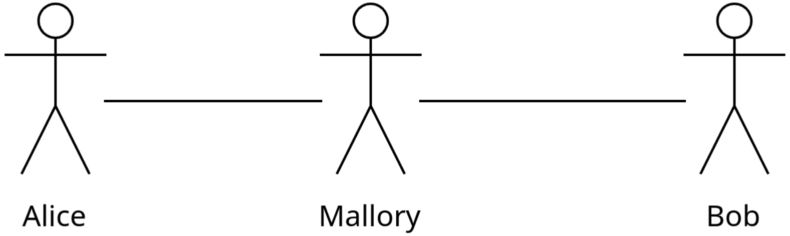
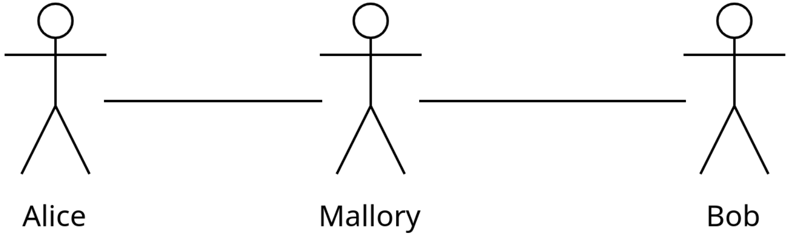


Man in the middle - Full interception

- Send custom packets
- Intercept everything



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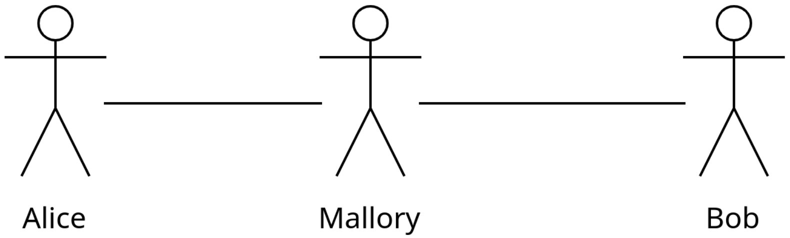

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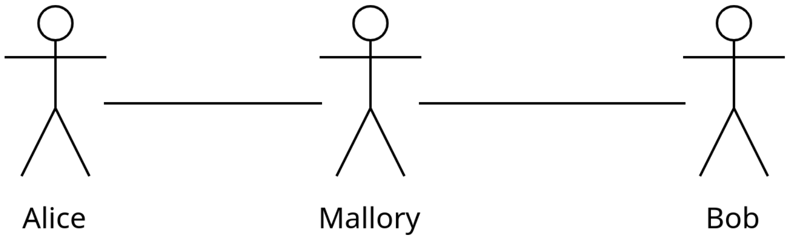

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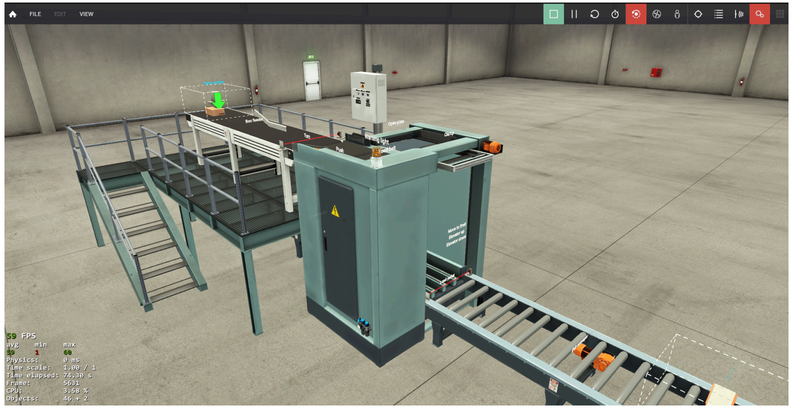
- Wireless Replay attack (868 MHz)
- Man in the middle on Modbus over TCP
- Man in the middle on Modbus over TCP with standard encryption

Simulation environnement

Factory I/O

- Simulation of a factory
- Realistic
- Some scenes already prepared



```
59 FPS
avg     min     max
59      1       60
Physics:        0 ms
Time scale:     1.00 / 1
Time elapsed:   74.30 s
Frame:          5631
CPU:            3.58 %
Objects:        46 + 2
```

Minecraft

- Simulation of anything
- Cross platforms
- Security in Open Computer