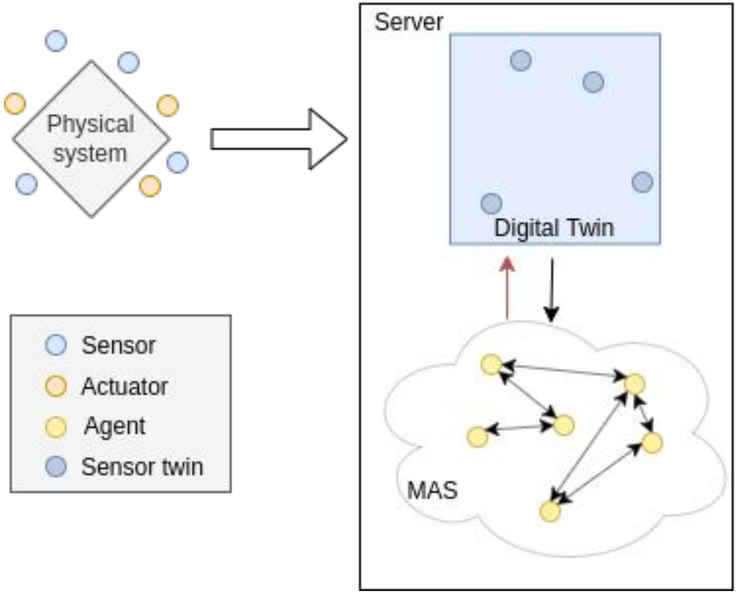
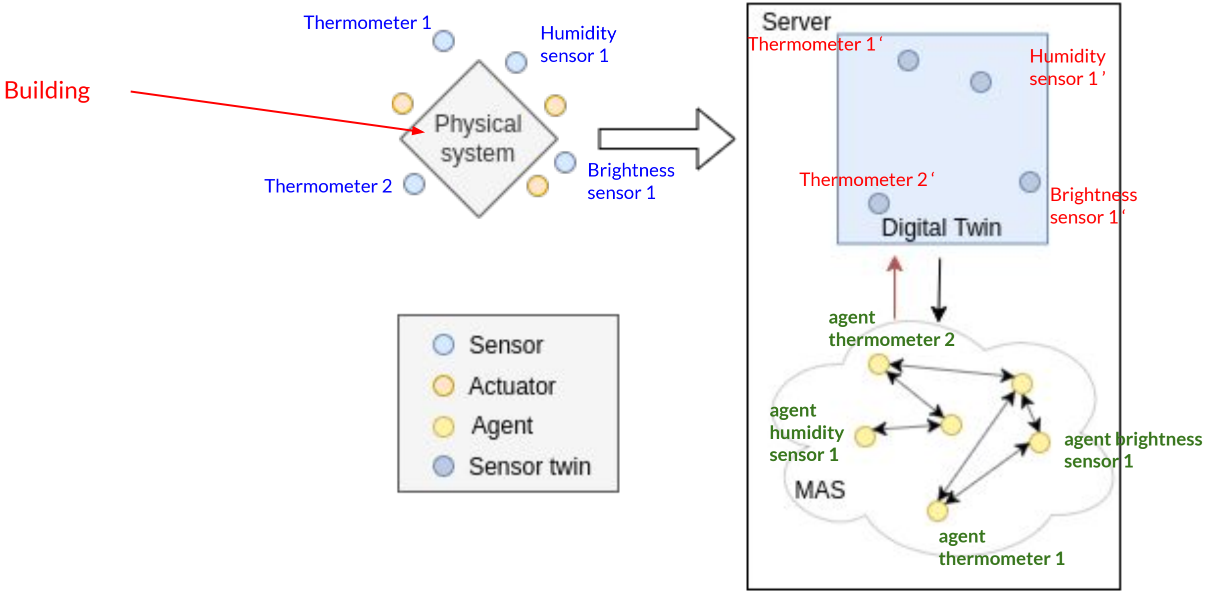
Meeting 12/09

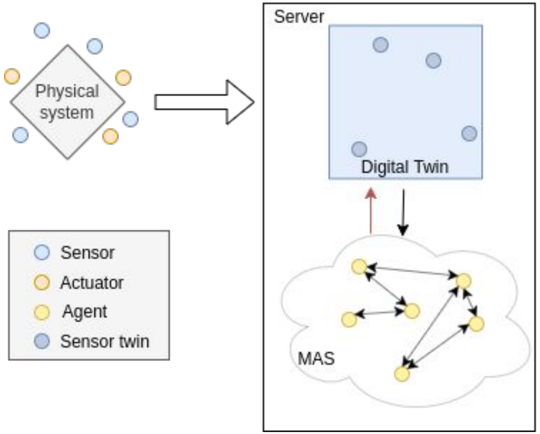
Project structure



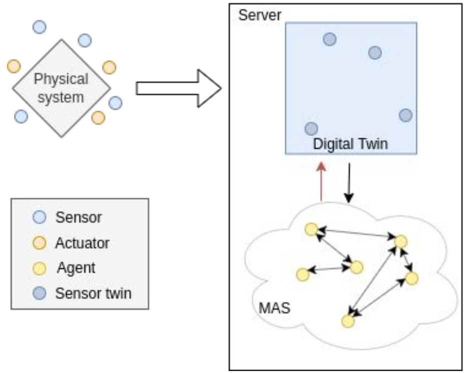
Example


Building
Thermometer 1
Humidity sensor 1
Physical system
Thermometer 2
Brightness sensor 1
Sensor
Actuator
Agent
Sensor twin
Server
Thermometer 1 ʻ
Humidity sensor 1 ʼ
Thermometer 2 ʻ
Brightness sensor 1ʻ
Digital Twin
agent thermometer 2
agent humidity sensor 1
agent brightness sensor 1
MAS
agent thermometer 1

- The DT works as an interface making easier:
  - Communication with real world
  - Data gathering
- Granularity between DT and MAS algorithm is up to us -> MAS can have any shape we want
- MAS algorithm does not represent reality, it studies it -> no malicious agent per se

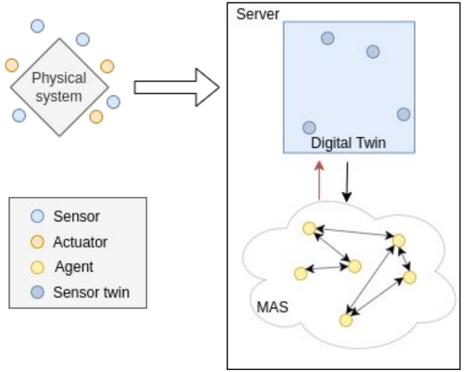


Attack model

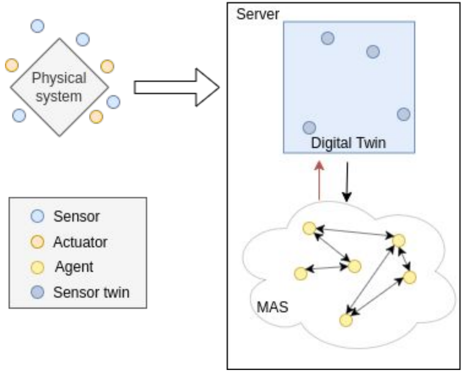


- Server attacks not in the scope
- Routing attacks: Blackholes, Wormholes
- Nodes can be corrupted nodes or intruder nodes -> attacker can add/remove or corrupt a node
- Attacker have no access to any cryptographic tool for the node

Detection conditions



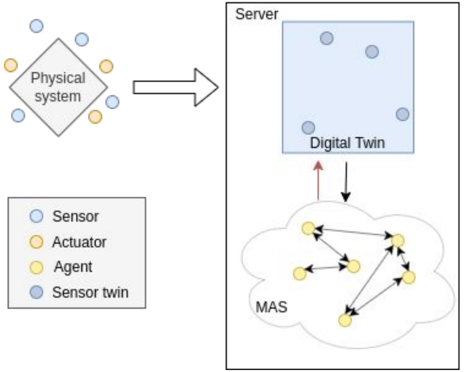
- Wireless communications
- All messages are broadcasted => all messages can be listened by all nodes in range



System specifications

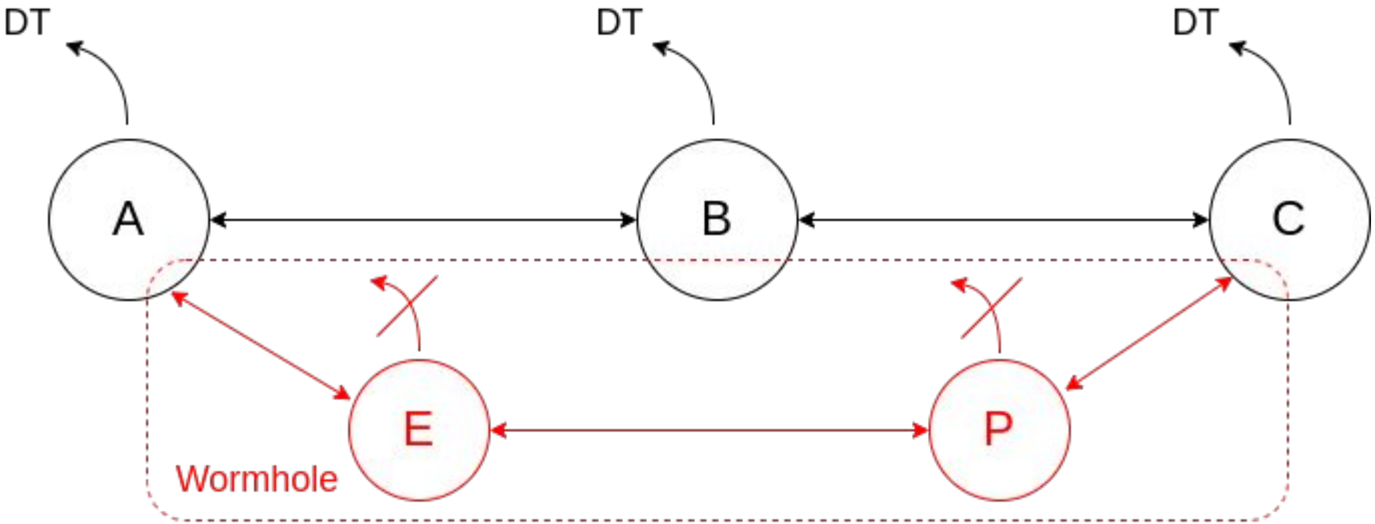
- Restrained or no cryptographic tools
- Open: nodes can be added or removed from the network
- No authentification
- From the DT perspective:
  - nodes are considered as part of the network if they cooperate with the DT (but outsider nodes can still be studied)

Tools



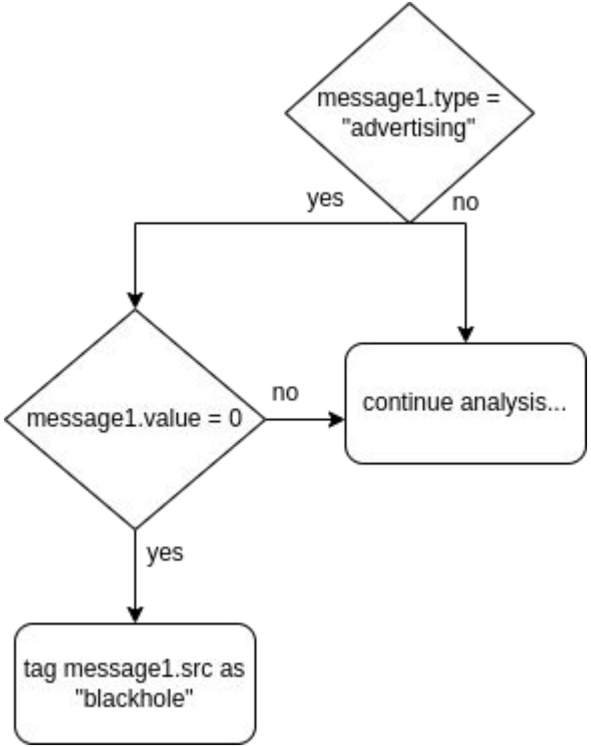
- MAS framework -> Mesa
  - Recent
  - Easy to use
  - Support at the laboratory
- DT tool -> not found yet (dataset? simulator? emulator? data generator?)

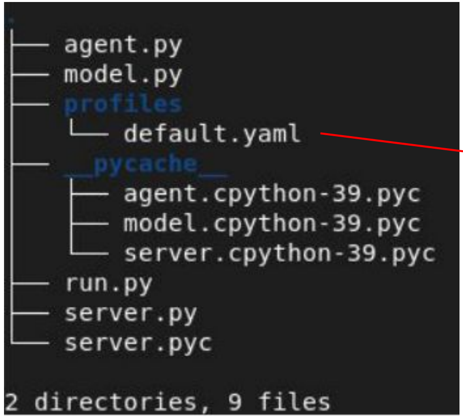
Questions ?


DT
DT
DT
A
B
C
E
P
Wormhole

Node:
- id :: Int
- x :: Float
- y :: Float

Message:
- type :: “advertising” | “data” | …
- src :: Node
- value:: Bytes

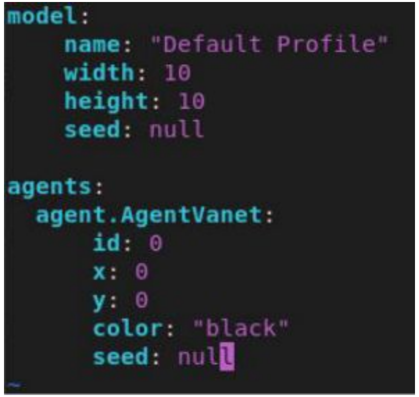

message1.type = "advertising"
yes
no
message1.value = 0
no
continue analysis...
yes
tag message1.src as "blackhole"



```
.
├── agent.py
├── model.py
├── profiles
│   └── default.yaml
├── __pycache__
│   ├── agent.cpython-39.pyc
│   ├── model.cpython-39.pyc
│   └── server.cpython-39.pyc
├── run.py
├── server.py
└── server.pyc

2 directories, 9 files
```

Mesa files structure



```
model:
    name: "Default Profile"
    width: 10
    height: 10
    seed: null

agents:
  agent.AgentVanet:
      id: 0
      x: 0
      y: 0
      color: "black"
      seed: null
~
```

YAML example