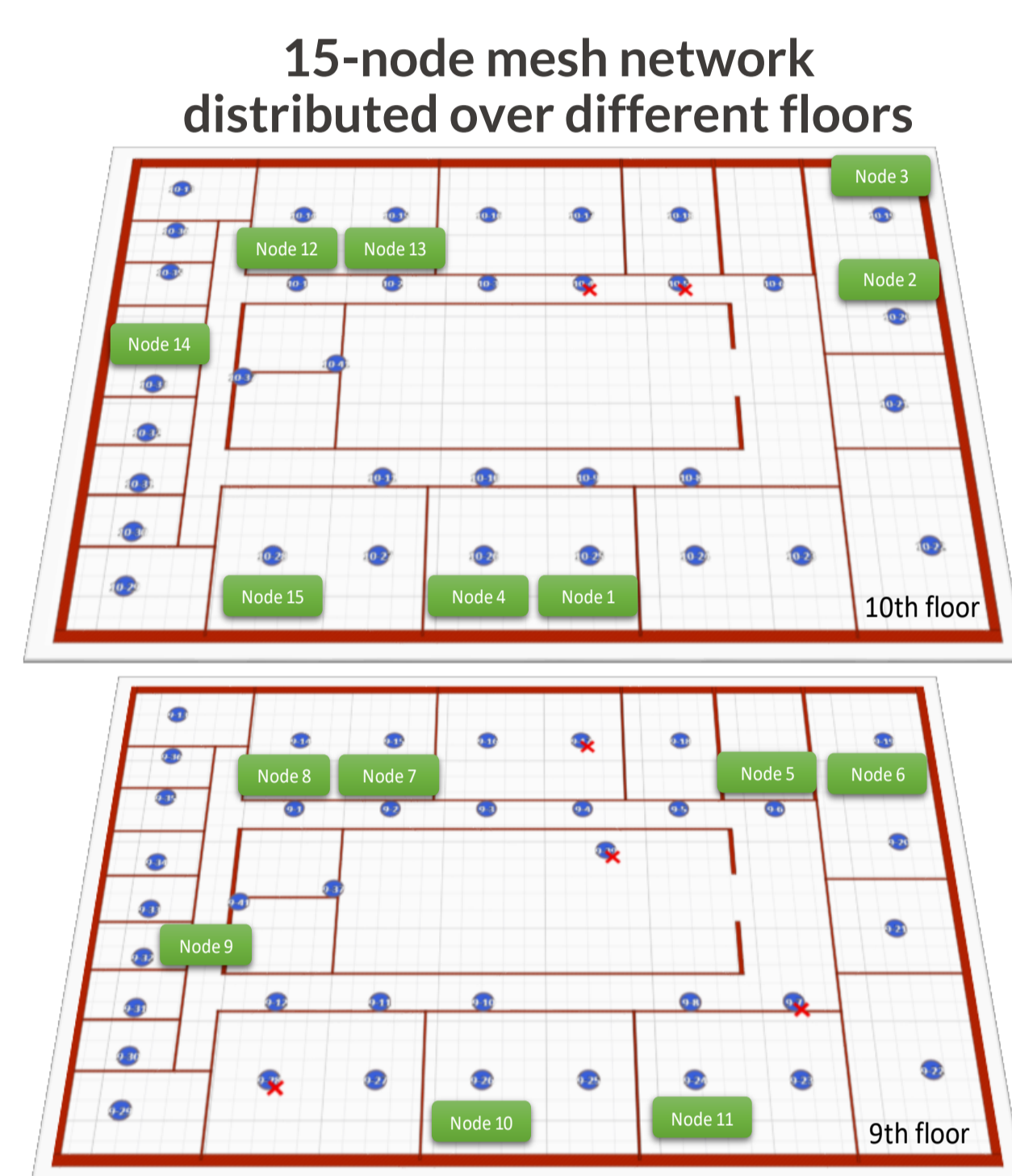
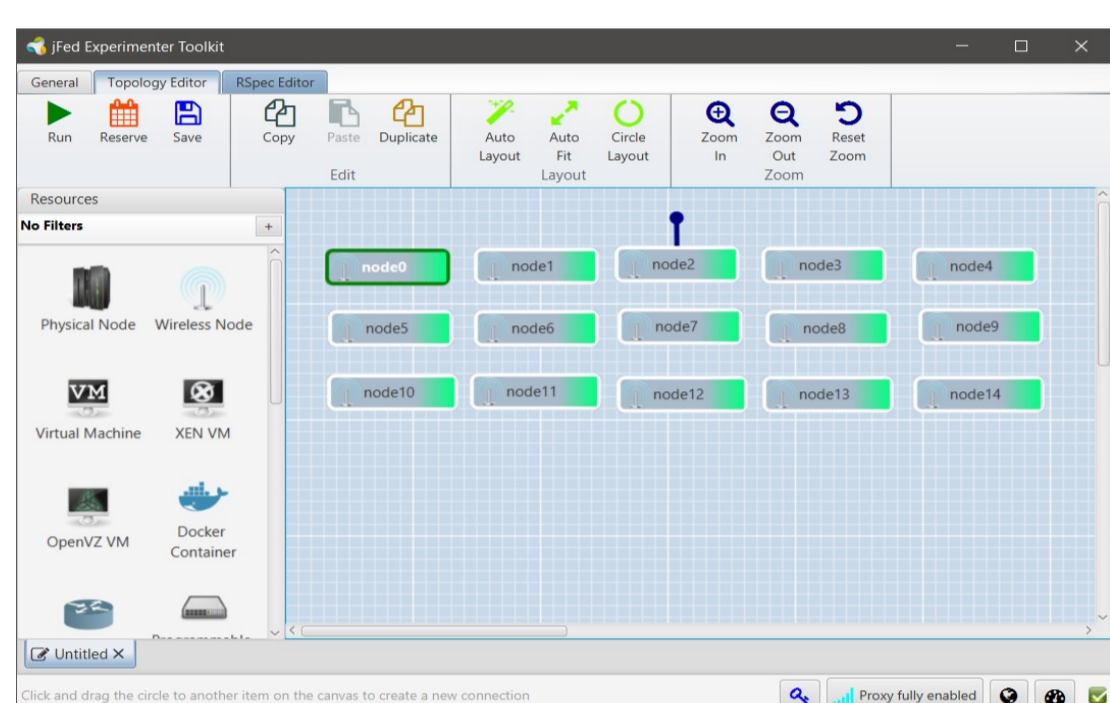
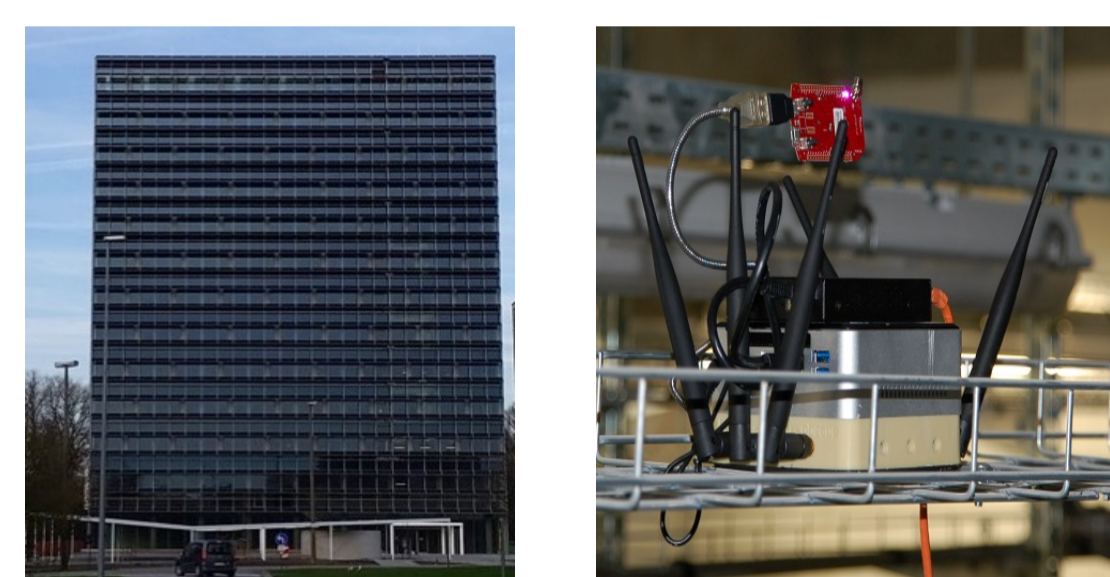


GOALS

- Development of a peer-to-peer based mobile ad-hoc network solution
- Enablement of a completely decentralized self-organizing energy management systems
- Communication between different producers and consumer units

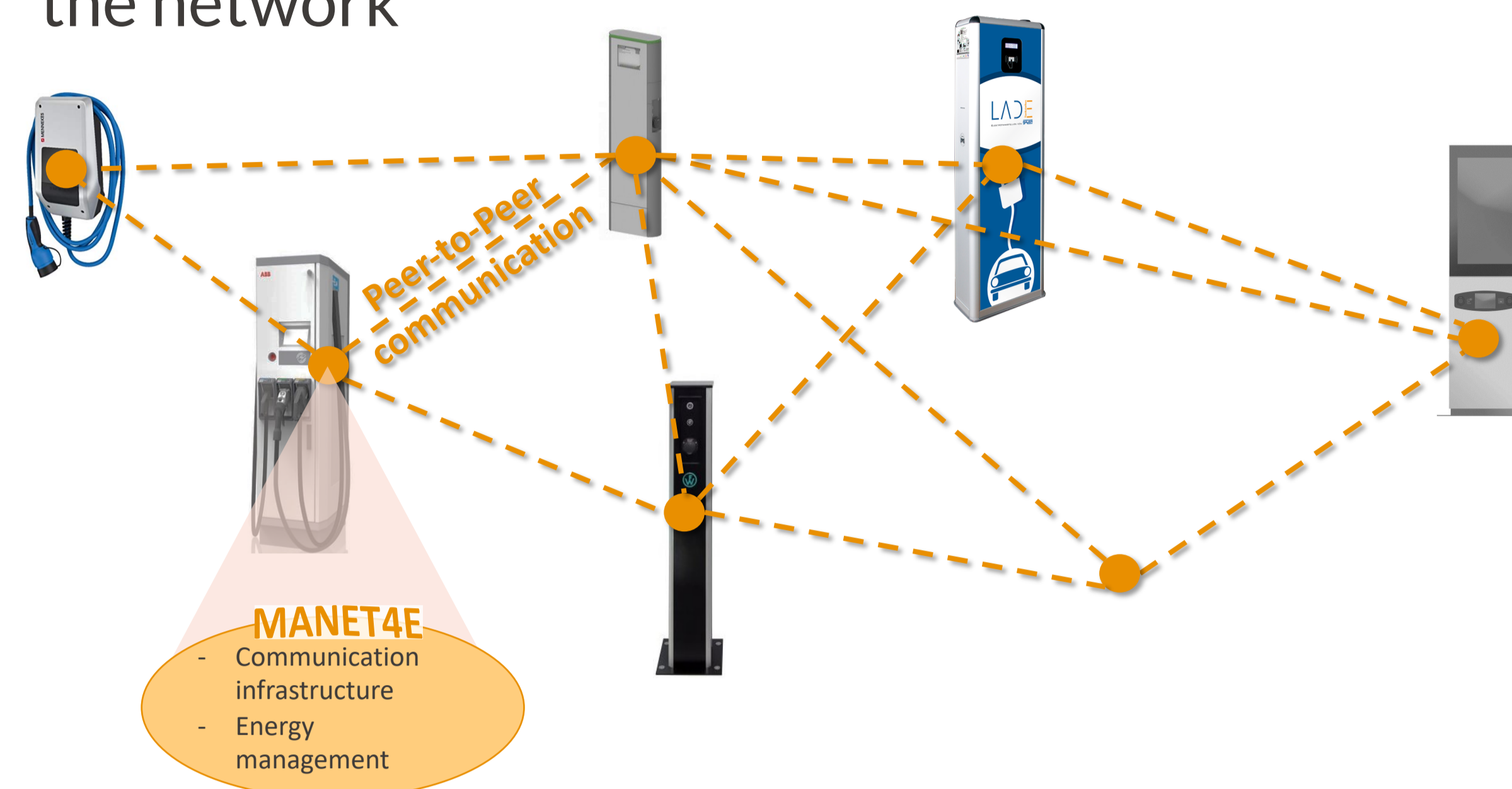
DEMO SETUP

- We used imec w-iLab.1 testbed to simulate a parking garage environment



CHALLENGES

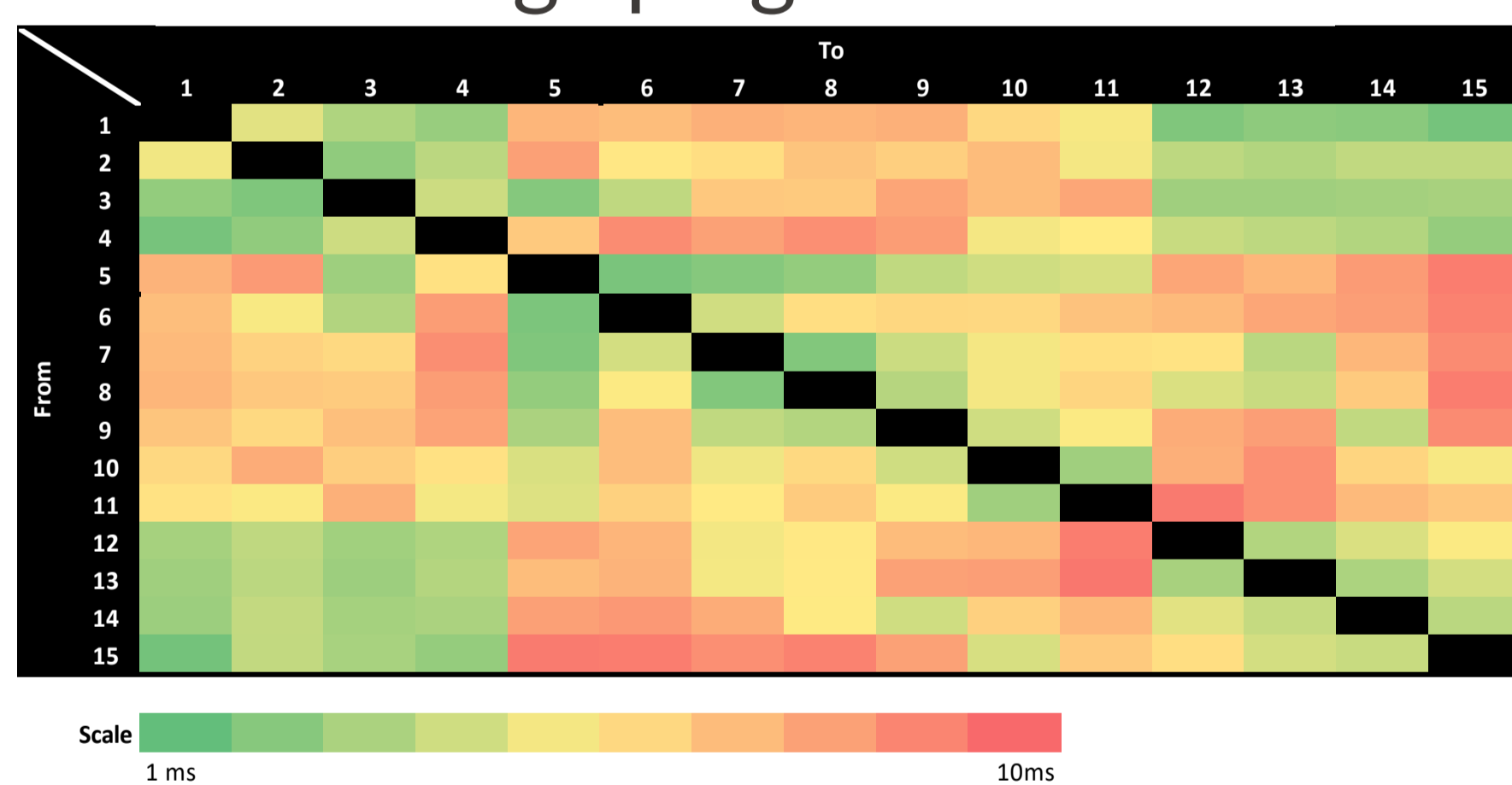
- Development of an intelligent energy management system for charging stations
- Requires the exchange of charging schedules across the network



- Guarantee of ad-hoc connection establishment (self-organization of nodes)
- Behavior of the ad-hoc network in structural dynamics (What happens if a node fails?)
- Mechanisms for updating and repairing the routing tables
- Securing the accessibility of all nodes in the network
- Evaluation of the performance and reliability of the MANET4E solution in a larger and more realistic testbed with 15 nodes

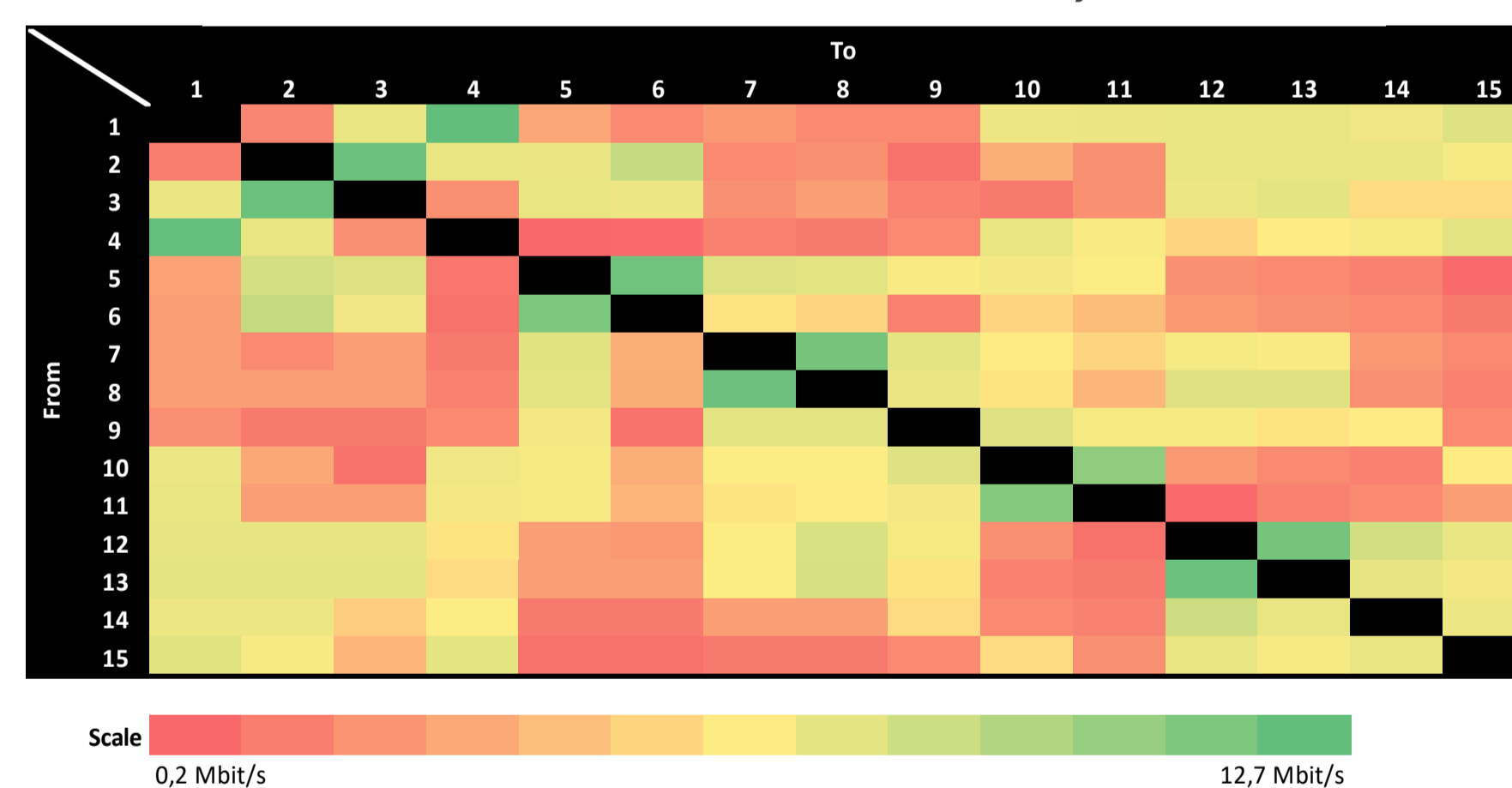
RESULTS

Average ping time in ms



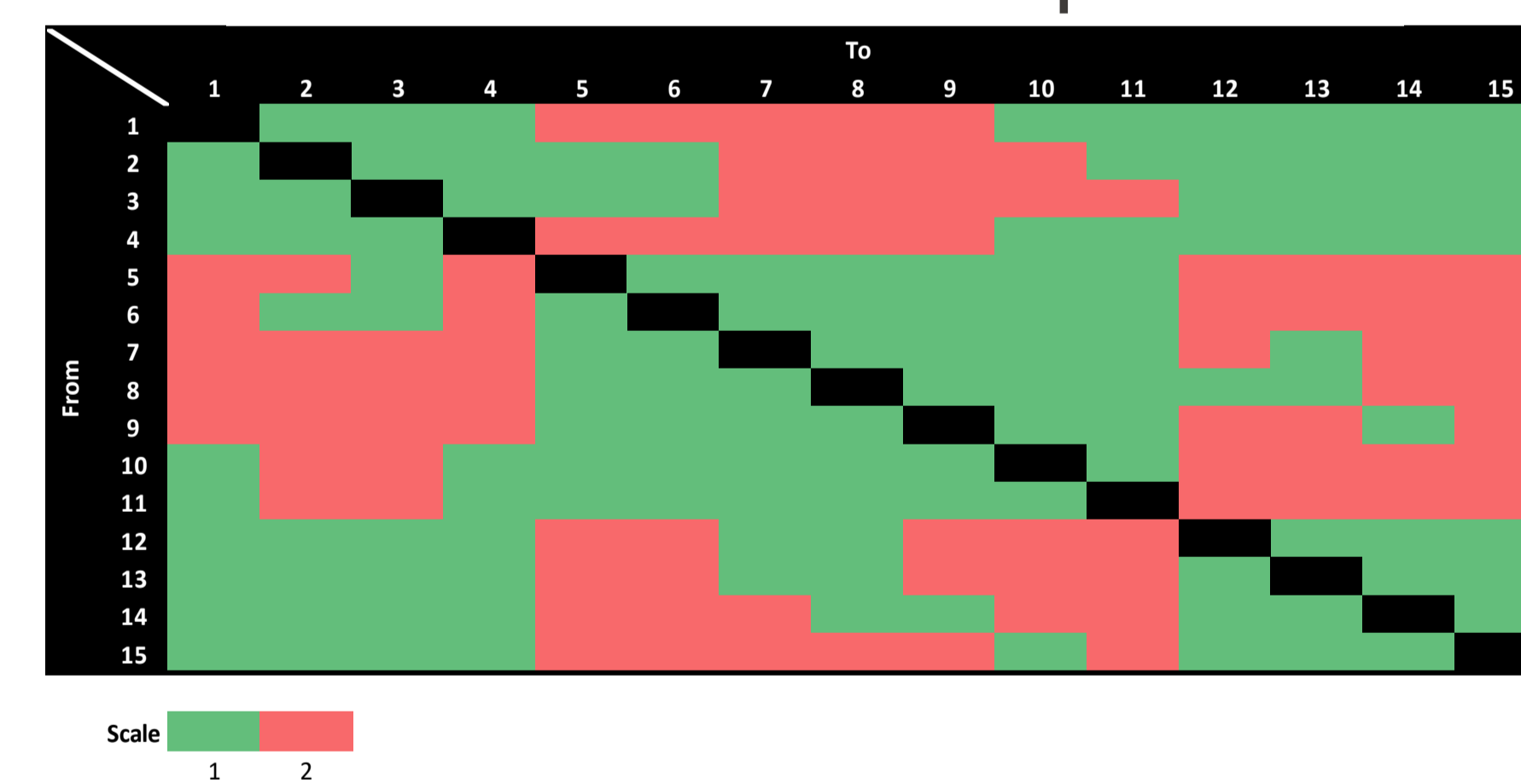
- MeshNet was between 1 and 8 ms
- For our use case fully sufficient

Bandwidth in Mbits/sec



- 0.2 – 12.7 Mbits/s
- Depends on WIFI signal
 - ▶ distance and walls between nodes

Traceroute hops



- Max 2 hops because close distance to each other
- Hops were between floor 9 & 10

CONCLUSIONS

- The experiment showed the strengths and weaknesses of our communication approach and helps us to better prepare our product for the market
- The developed routing mechanisms worked satisfactorily and the solution scaled as expected
- All nodes could be reached in the network
- The network reorganized itself as soon as a node was dropped/added or communication paths changed

POST MORTEM

- Fed4FIRE+ is a very useful environment for experiments
- “Hardware as a service” is very convenient, the Fed4FIRE+ experiment saved us a lot of time and money to setup our own laboratory environment
- Fed4FIRE+ offers excellent support and documentation
- DSI would like to continue using Fed4FIRE+ facilities in the future