

Course title: Wireless Machine-to-Machine (M2M) communications


Organizer: Prof. Petar Popovski, Aalborg University, Denmark

e-mail: petarp@es.aau.dk

Abstract

Techno-economic forecasts indicate that in the coming years wireless M2M communication will become massive, connecting tens of billions devices. Wireless chips have grown in capability and power efficiency, while shrinking in size and cost. Wireless M2M networks are instrumental to manage the complexity of tracking, fleet, and asset management. The industrial sector can widely apply M2M in monitoring and control of processes and equipment. The M2M showcase is the smart grid: the evolved power grid where a rich information flow is used to balance the electricity production (e. g. windmills), distribution, storage, and consumption (e. g. large industrial capacities).

The characteristic of the M2M traffic and performance requirements are very different from the ones defined for the phones, tablets and other human-driven services that are dominant in wireless cellular networks. For example, the data size for an M2M connection can be rather small, comparable to the size of the signaling overhead, which requires a careful interplay between the protocol design and the transmission parameters. Furthermore, there may be applications that do not require high data rate, but high percentage of delivery of their data chunks.

This is a 1-day course in  which the following topics will be covered:

- System requirements and architectures for M2M communication
- Traffic characteristics and performance requirements for M2M traffic
- Radio access protocols and scheduling algorithms for M2M traffic
- Overview of the 3GPP standardization process related to M2M or Machine-Type Communication (MTC)
- Smart Grid Communications as a case study.