

Quality of Service In Wireless Sensor Networks

Iacob JUC

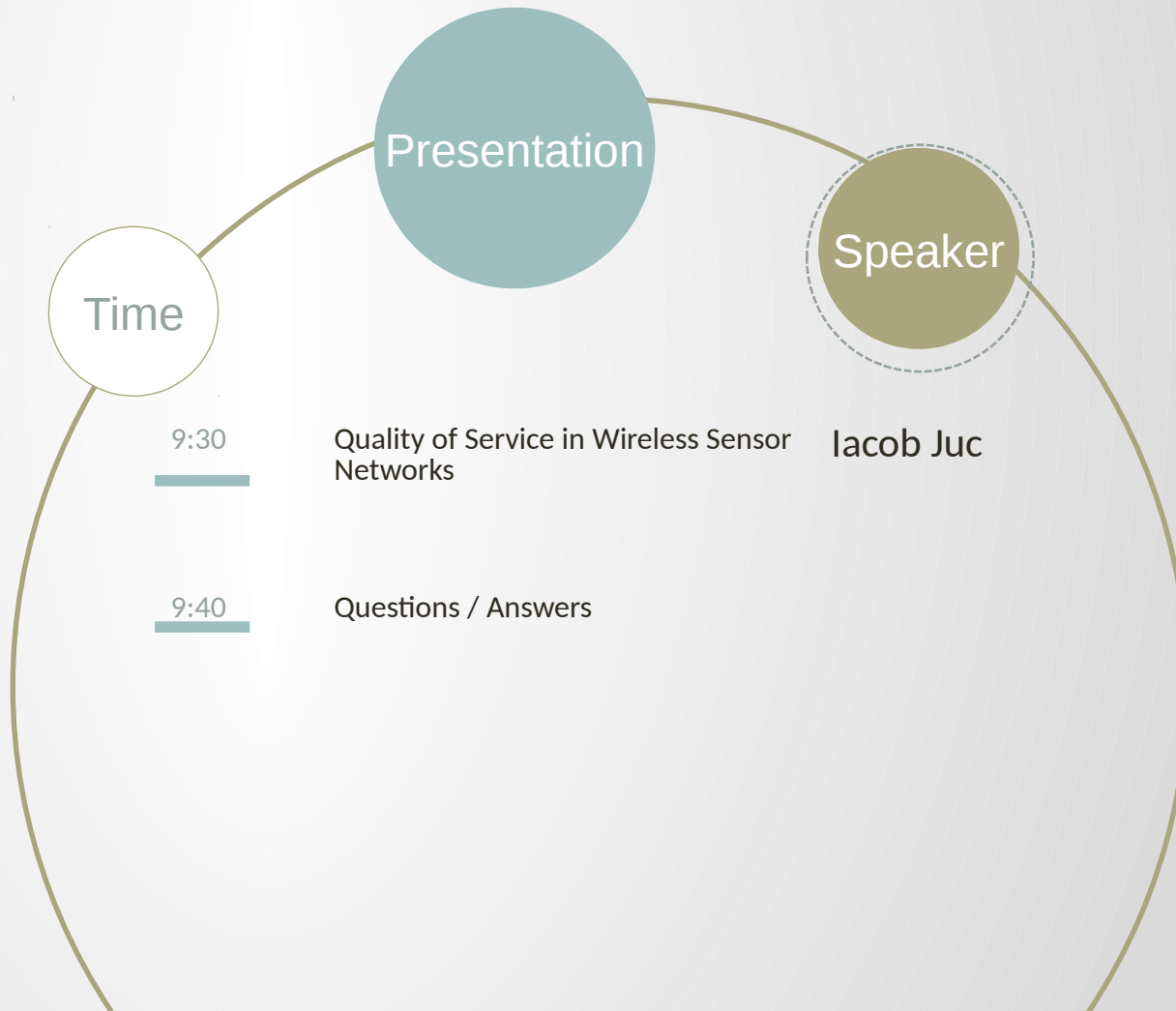
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Agenda



Summary

- Background
- My PhD Research Subject
 - Wireless Sensor Networks
 - Quality of Service
- Questions

Background

- 2013 – Degree in Electronic Engineering, INSA Lyon
- 2013 – march to august: internship at STMicroelectronics, GreenNet Project
- Since May 2014: PhD student, STMicroelectronics / LIG; Working on Quality of Service in Wireless Sensor Networks for the GreenNet Project

Wireless Sensor Networks

Wireless Sensor Networks

- Definition: A wireless sensor network (WSN) is a group of spatially distributed autonomous sensors working collectively to monitor physical or environmental conditions.
- The GreenNet project: a WSN built with harvesting nodes, featuring:
 - a photovoltaic cell
 - a small coin cell battery
 - a wide array of on-board sensors

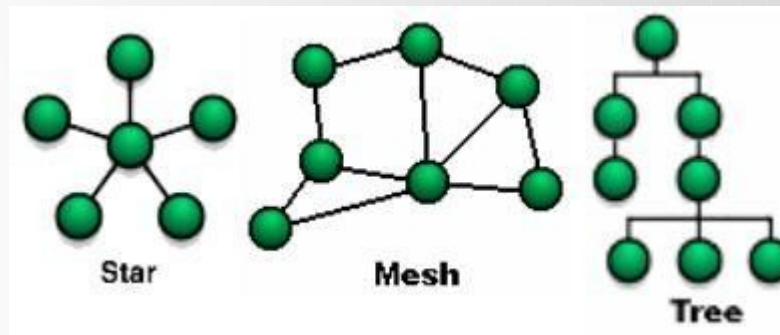


A GreenNet node

Wireless Sensor Networks

- Network protocols running inside an WSN can be classified under several criteria.

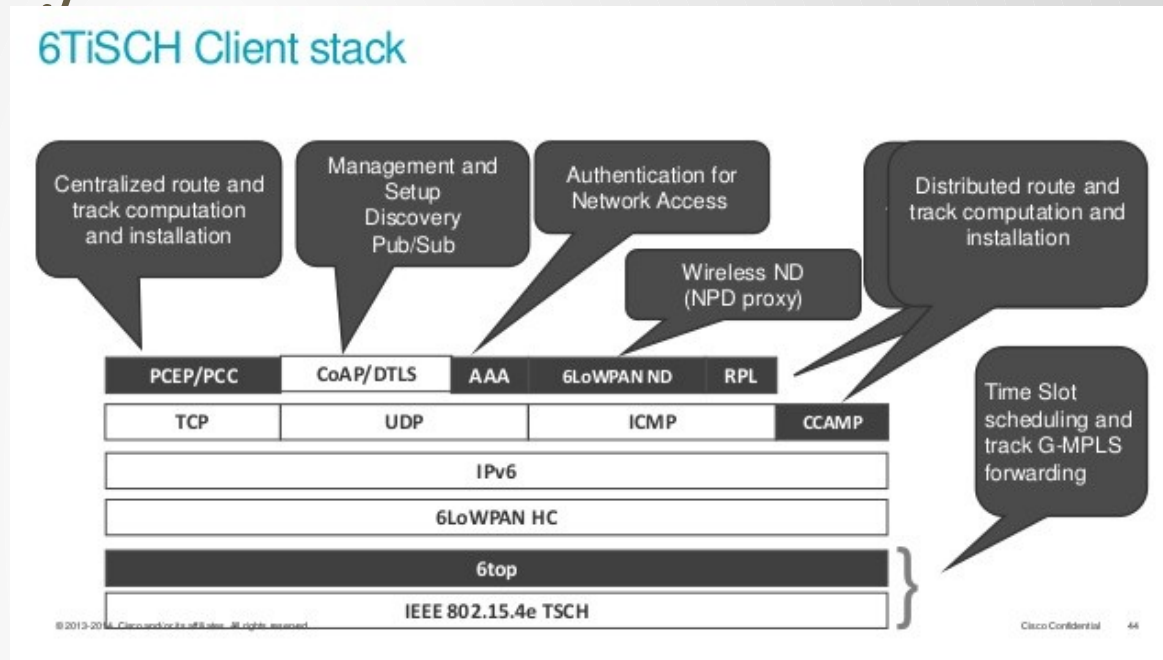
- topology:



- medium access policy: synchronized or unsynchronized
- duty-cycle
- throughput
- ...

Quality of Service

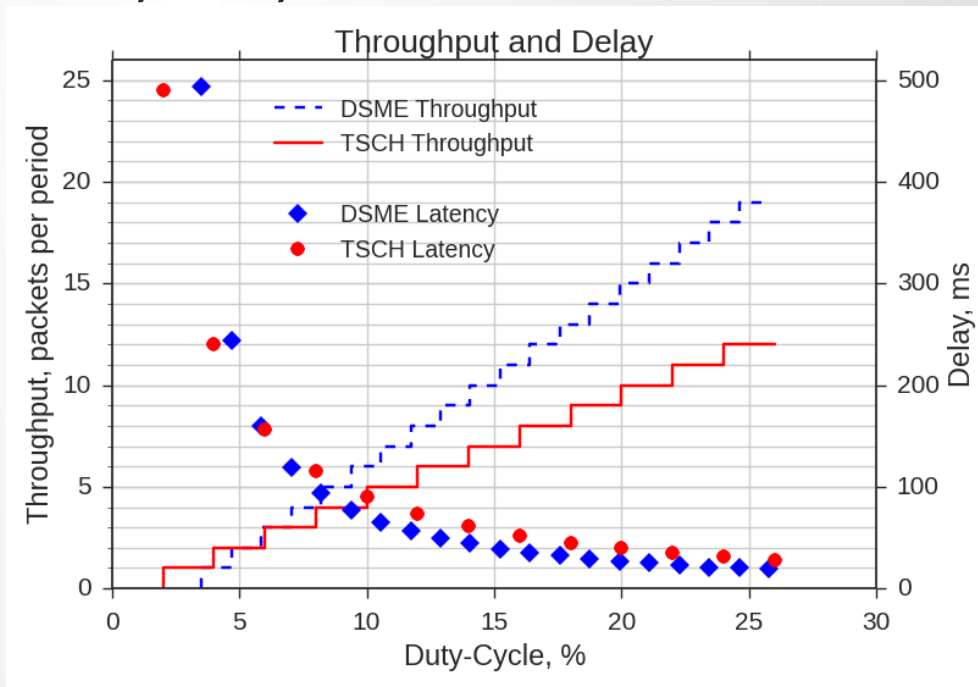
Quality of Service



- Each layer provides a set of services to upper layers and to the user.
- The term “Quality “ in “Quality of Service” implies a quantification and measurement of the services each layer provides.
- Quality of Service = Measurement of network performance

Quality of Service

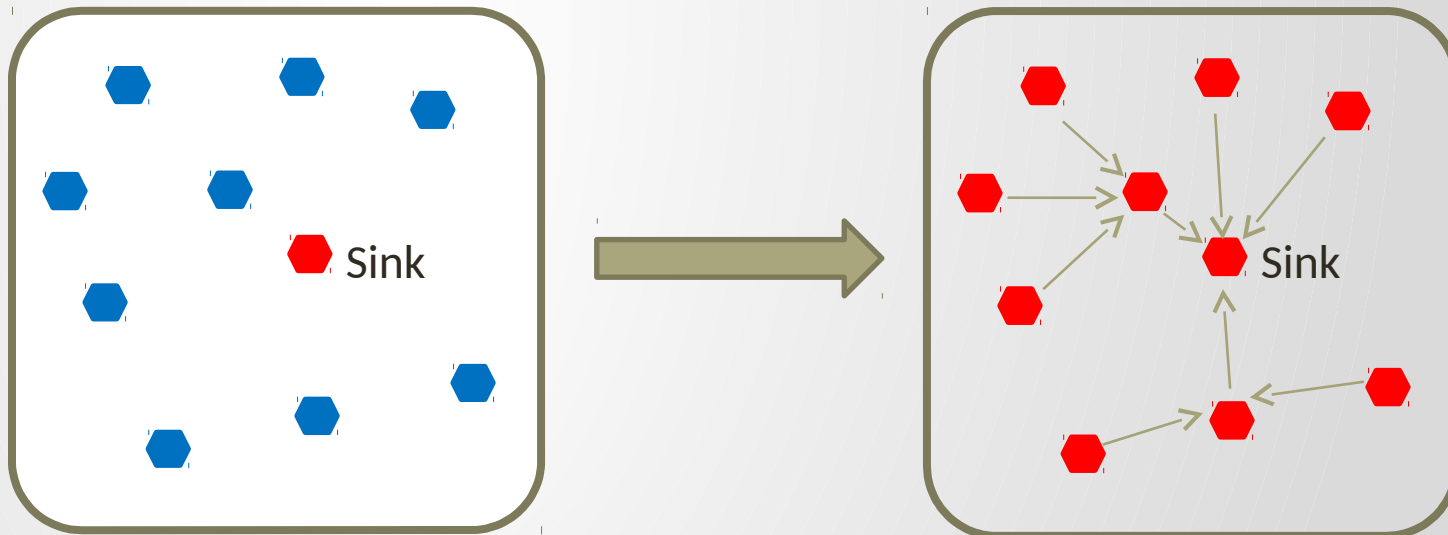
- Example of measurable parameters:
 - packet throughput
 - expected end-to-end delay
- Measurement by analytical calculation, simulation, experimental



Deterministic Slotted Multichannel Extension and Time Slotted Channel Hopping introduced in IEEE 802.15.4e standard

Quality of Service

- Network bootstrapping: how to arrive from a set of independent nodes to a fully functioning network?
 - neighbor discovery
 - synchronization
 - scheduling communications



References

- network topologies:
<https://wellness.wikispaces.com/Network%20Architectures>
- 6TiSCH network stack:
<http://www.slideshare.net/pascalhubert/6tosch-telecom-bretagne-2015>

Questions

