

Working Title

A Hybrid Centralized and Distributed Time Slot
and Channel Hopping Scheme for 6TiSCH Wireless
Sensor Networks

Summary of 6TiSCH

Load-balanced Centralized Scheduling	<u>CoAP</u>
	UDP
Energy Aware load balanced Objective Function	RPL & IPv6 6LowPAN
<u>QoS Supervisor</u>	6top
	MAC
	PHY

Relevance to 6TiSCH

- RPL computes routes for scheduling
- CoAP – Application Layer protocol used for monitoring and Centralized scheduling
- 6TiSCH Operation Sublayer(6top): Provides set of commands for upper layers to set up schedules (Management of queues, buffer sizes, transmission failure behavior)

Main Objective

What is impact of a hybrid of a load-balanced centralized and distributed scheduling schemes on performance of 6TiSCH networks

Specific Objectives

Load-Balanced Objective Function for RPL to determine optimal routes

QoS Supervisor to monitor network Conditions and initiate switching between centralized and distributed scheduling

Minimal Idle-listening and Load-Balanced centralized Channel hopping and time slot scheduler

A hybrid of centralized and distributed scheduling schemes that outperforms both centralized and distributed scheduling schemes in 6TiSCH networks used in isolation.

Progress

Fair Load-balancing Objective function

- Completing Experiments and making an evaluation
 - Load equally distributed throughout nodes during deployment
 - Challenge: Issues when I introduce new nodes
 - Not completed
- Finishing paper
 - Waiting for experiments to be done

Centralized Minimal delay 6TiSCH Scheduling

- Simulation started
 - Acquired sample 6TiSCH with sample centralized scheduling algorithm (Orchestra)
 - Tested 6TiSCH on network with sink as scheduling agent
 - Optimized the code to fit on small devices

Free software development

Function	Status	Comment
Reading sensor values	Almost Done	Still to check accuracy
Transmitting	Almost Done	Yet to transmit actual sensor readings
Receiving	Done	
Date and Time	Done	
Shell	Done	Menu working well
Buffering	Not started	
Storing settings (node name, report interval,)	Done	

Plans

- Finish RPL experiment and paper
- Finish the Open source Application
- Develop a centralized scheduling scheme including
 - Get a full routing entry for the whole network at the sink/PCE
 - Generating schedules in terms of channel offsets and timeslots