

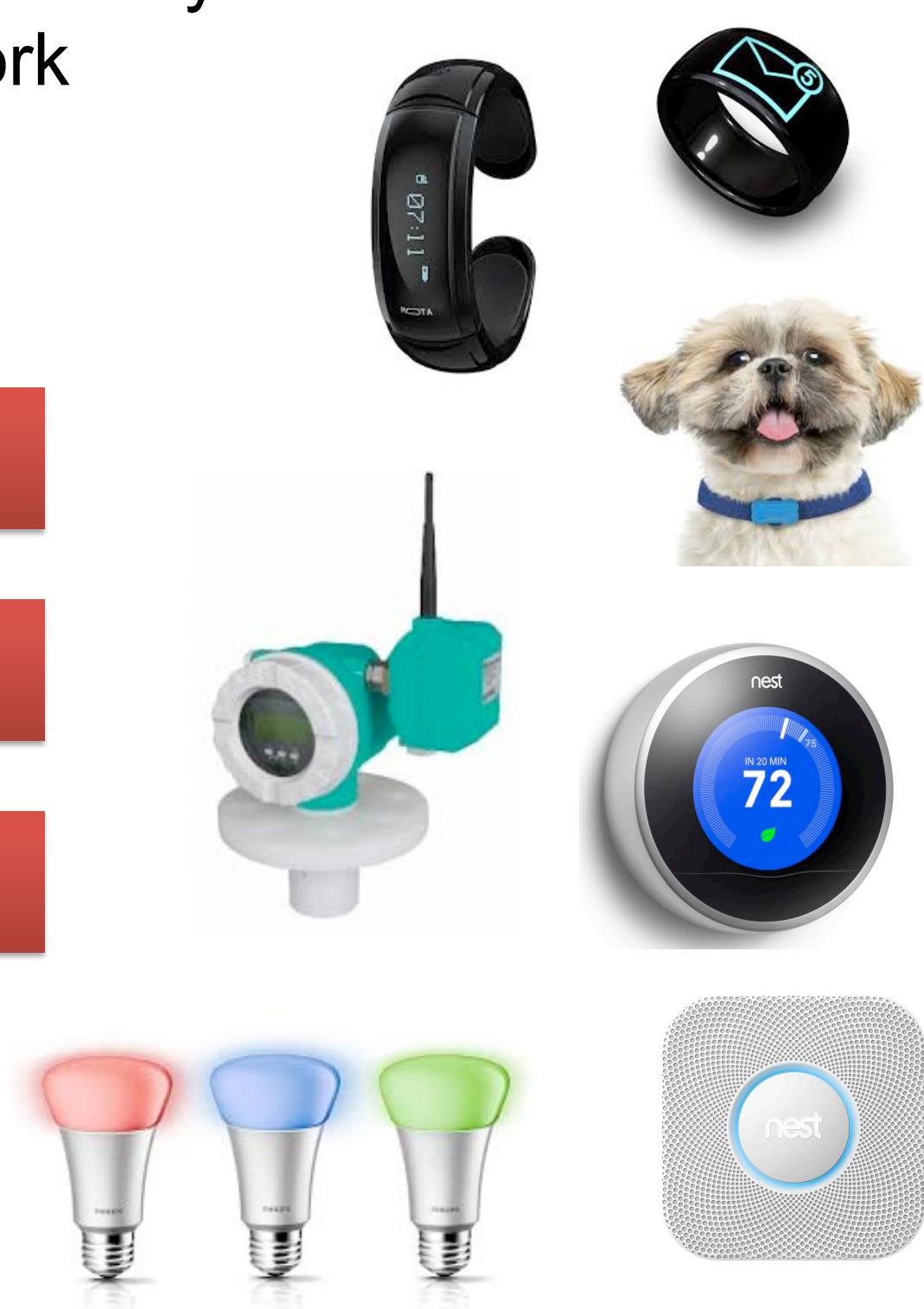
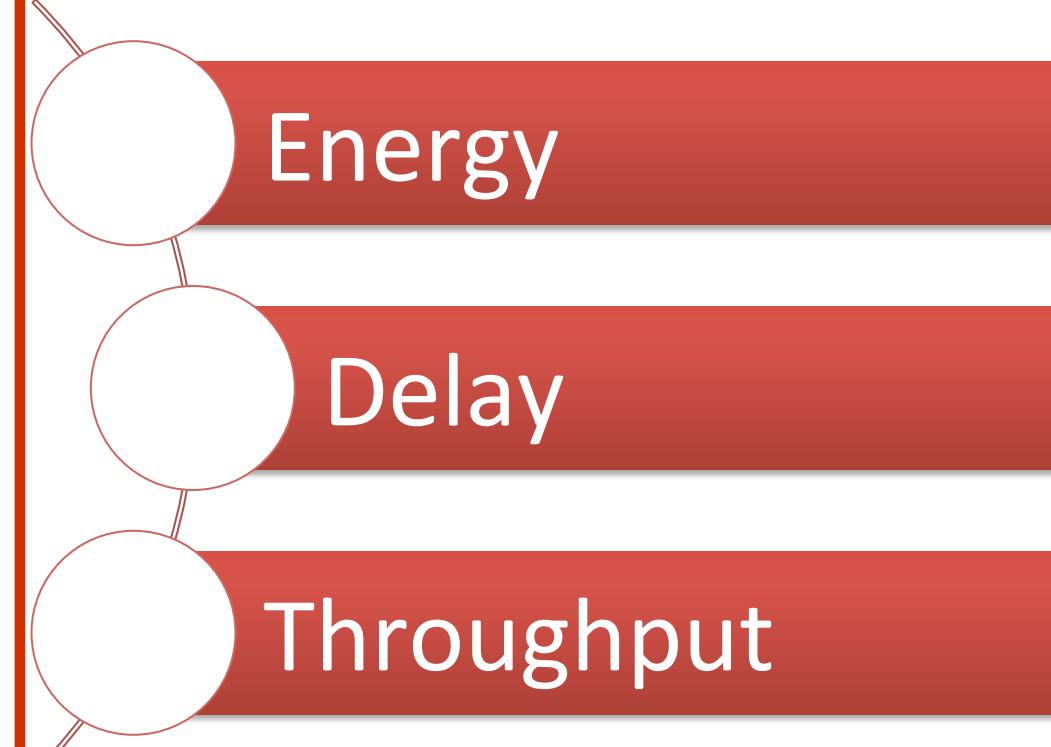
Efficient medium access protocols for the Internet of Things



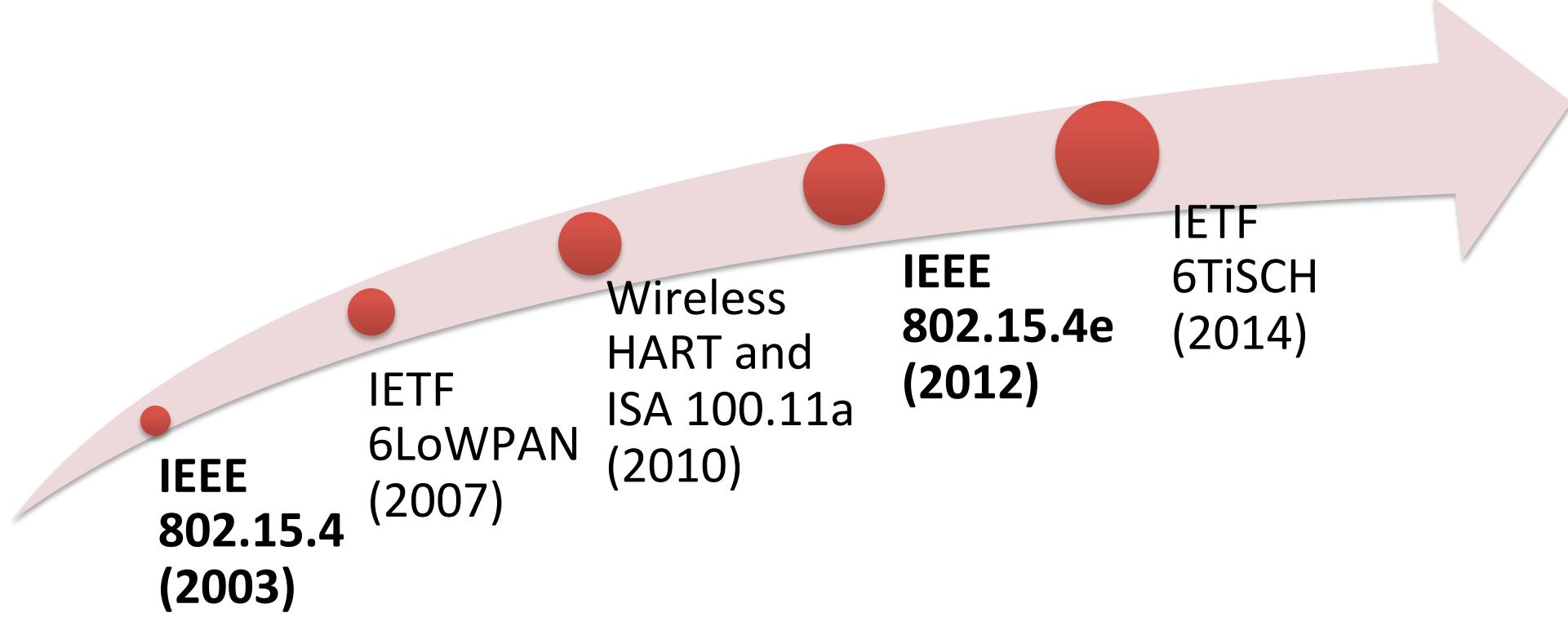
Pedro Henrique Gomes, Bhaskar Krishnamachari

Internet of (many many) Things

- Tens of billions of devices by 2020
- Heterogeneous network
- Multi-hop topology
- Critical applications



What is the best protocol?

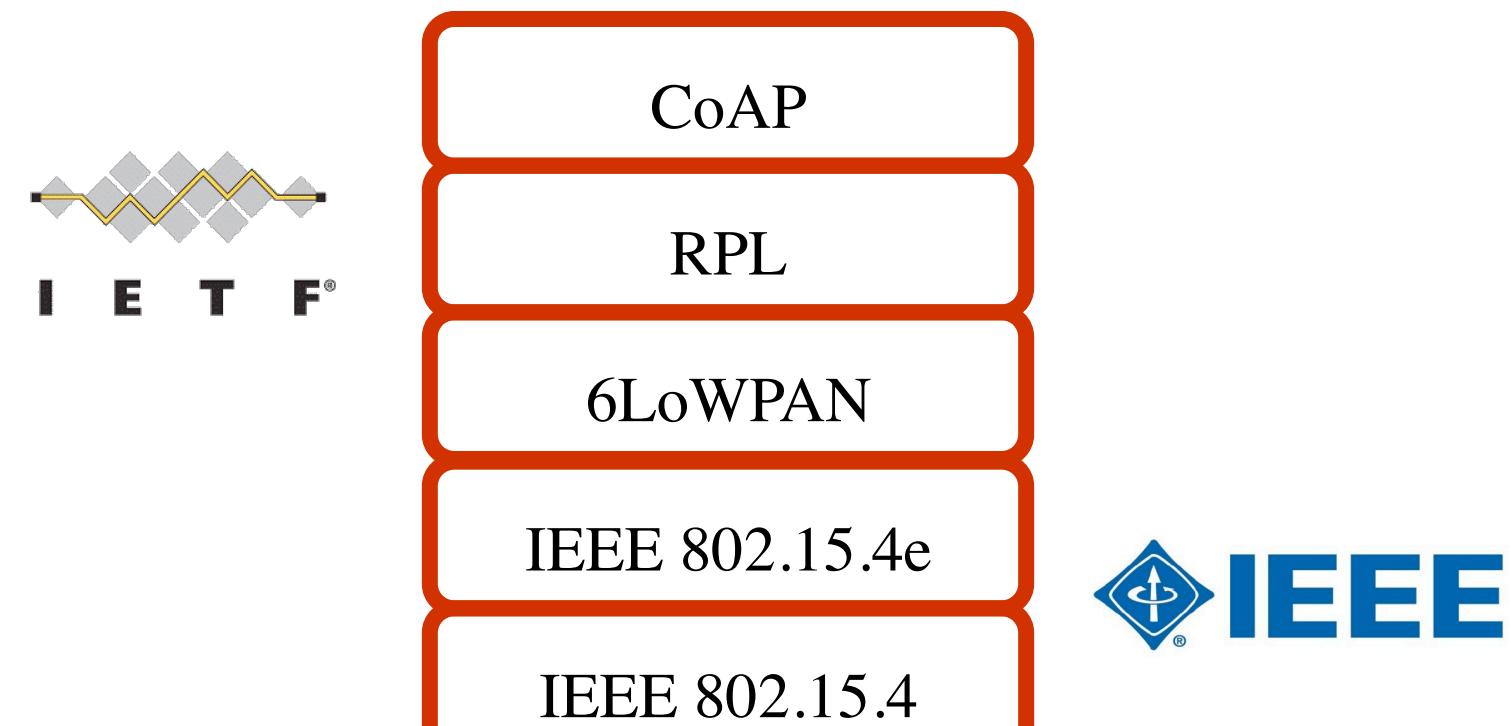


Goal

- Evaluate and compare existing protocols
- Propose enhancements

Assumptions

- Mesh network
- Compatible with IEEE/IETF protocols stack
- Dynamic environments



Protocols evaluated

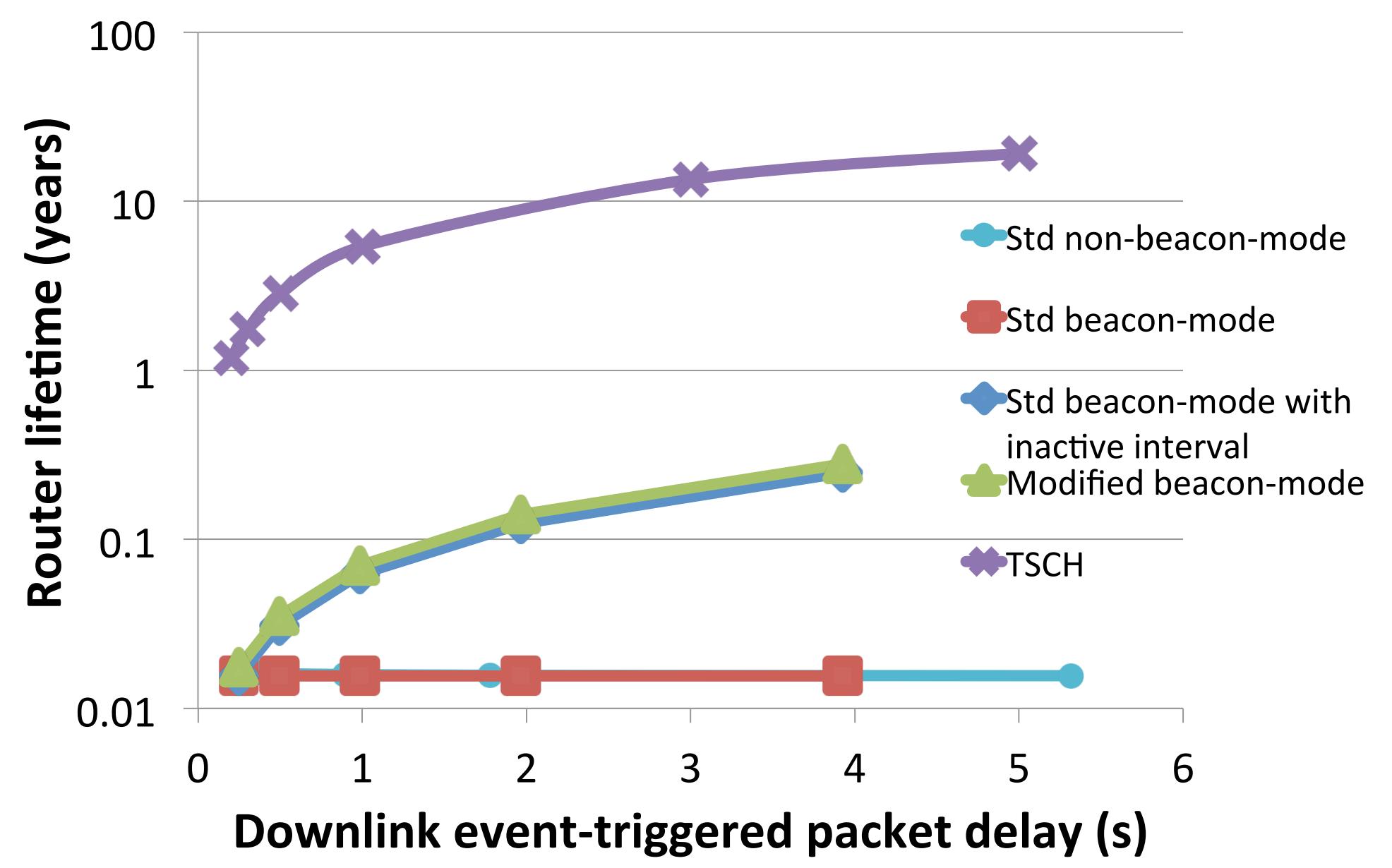
1. IEEE 802.15.4 non-beacon-mode
2. IEEE 802.15.4 beacon-mode
3. IEEE 802.15.4 beacon-mode modified
4. IEEE 802.15.4e TSCH (Timeslotted Channel Hopping)

Traffic models

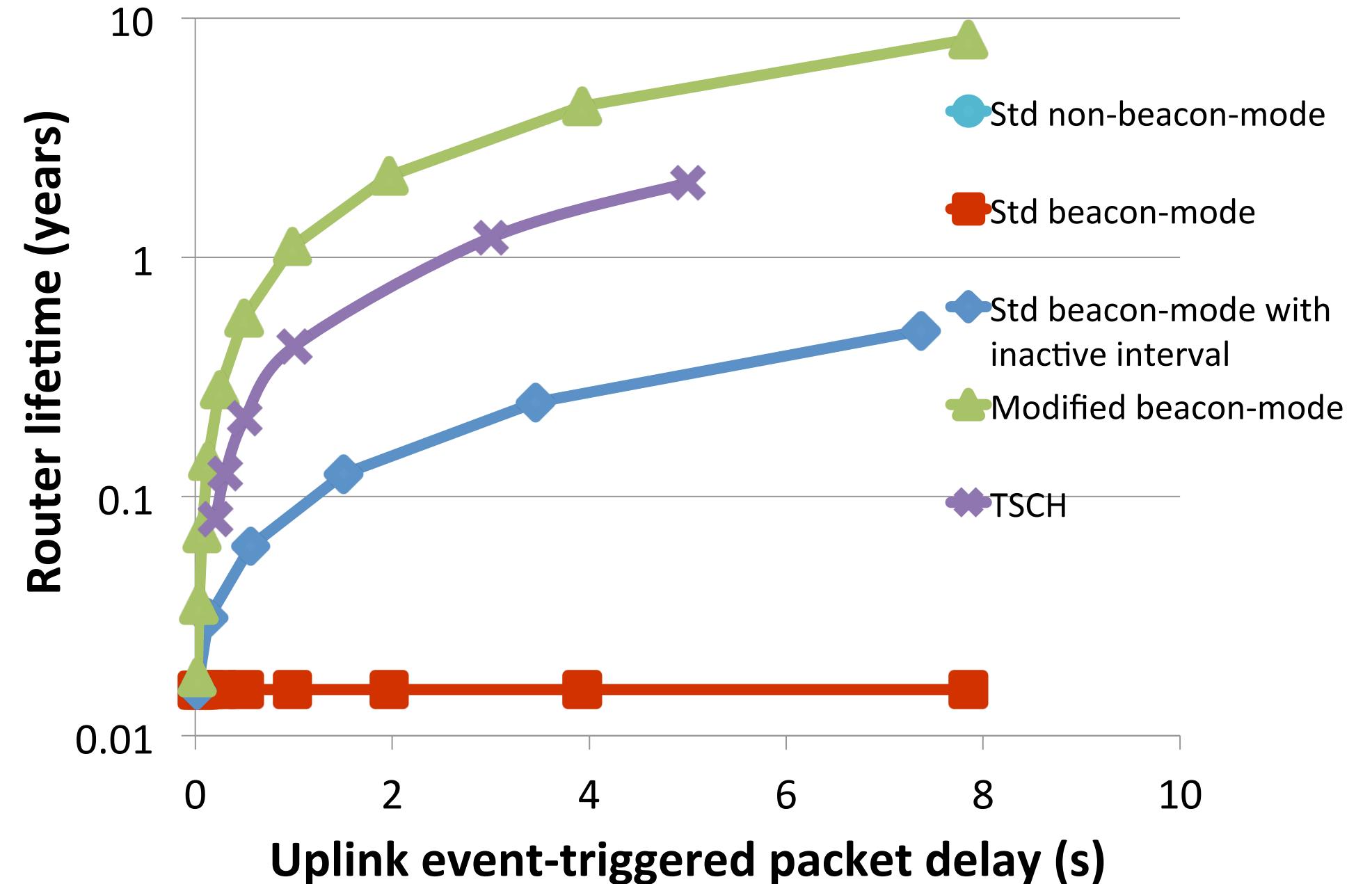
1. Uplink periodic data (collection)
2. Uplink event-triggered (alarm)
3. Downlink event-triggered (command)

Results

Router lifetime Vs Downlink event-triggered



Router lifetime Vs Uplink event-triggered



Future works

- Focus on IEEE 802.15.4e TSCH
- Propose new schedulers for energy and delay-constrained applications, distributed scheduling, and channel-aware algorithms