draft-duquennoy-6tisch-asf

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Overview

• ASF: Autonomous Scheduling Function

• 1) Autonomous slotframes
  – Slots based on a hash of neighbor’s MAC address
  – Slots added/removed locally, no extra signaling

• 2) Slotframe per traffic plane
  – E.g. one for TSCH sync, one for RPL control, one for application
  – The length of each slotframe dictates per-plane capacity
Application and Limitations

• High reliability over distributed routing
  – Schedule adapts instantly to what e.g. RPL decides
  – 5 nines demonstrated in 100+ node testbeds

• No stringent energy/latency requirements
  – Cells are not cascaded along the path
  – Only shared slots
  – Schedule is provisioned for worst case
1/3: Rendez-vous slotframe

- Equivalent to 6tisch-minimal RFC 8180
- Used for rendez-vous
- E.g. RPL control, 6LoWPAN-ND, etc.

![Diagram of rendez-vous slotframe]

- Ch. offset
- RxTxS
- h

Timeslot
Nodes have one fixed Rx cell
Nodes have one Tx (Shared) cell for each neighbor (IPv6 nbr cache)
E.g. use for unicast to any neighbor

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<th>Ch. offset</th>
<th>Timeslot</th>
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- TxSh #1
- TxSh #2
- Rx
- TxSh #3
- TxSh #4
- TxSh #5
3/3 Sender-based slotframe

- Nodes have one fixed Tx (Shared) cell
- Nodes have one Rx cell for each neighbor (IPv6 nbr cache)
- E.g. use for received from a privileged neighbor, e.g. TSCH time source
Putting it all together

• Each slotframe takes care of a traffic plane (traffic filter)
• Each slotframe uses a different subset of ch. offset
• As slotframes repeat, cells will overlap
  – Apply standard IEEE slot precedence
  – Slotframe len that are co-prime are preferred
Draft Status

• Description of the slotframe types
• Definition of cell coordinates (hash of MAC)
• Example schedule with 4 slotframes
• Definition of configuration parameters
• Open issue: configuration discovery
  – Proposal: new EB IEs
  – Other option: 6P commands (not preferred because adds a transition state between minimal and ASF)
Feedback?

- On the nature of ASF and its slotframes?
- On what the draft should cover and not?
- On configuration parameters?
- On configuration discovery?
- Anything else?