

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

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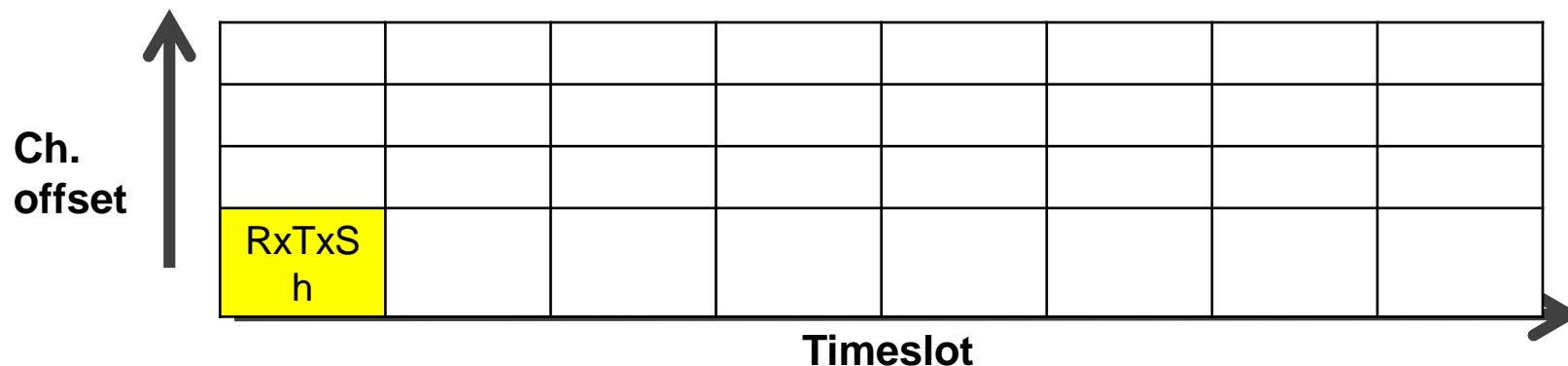
Application and Limitations

- 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

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1/3: Rendez-vous slotframe

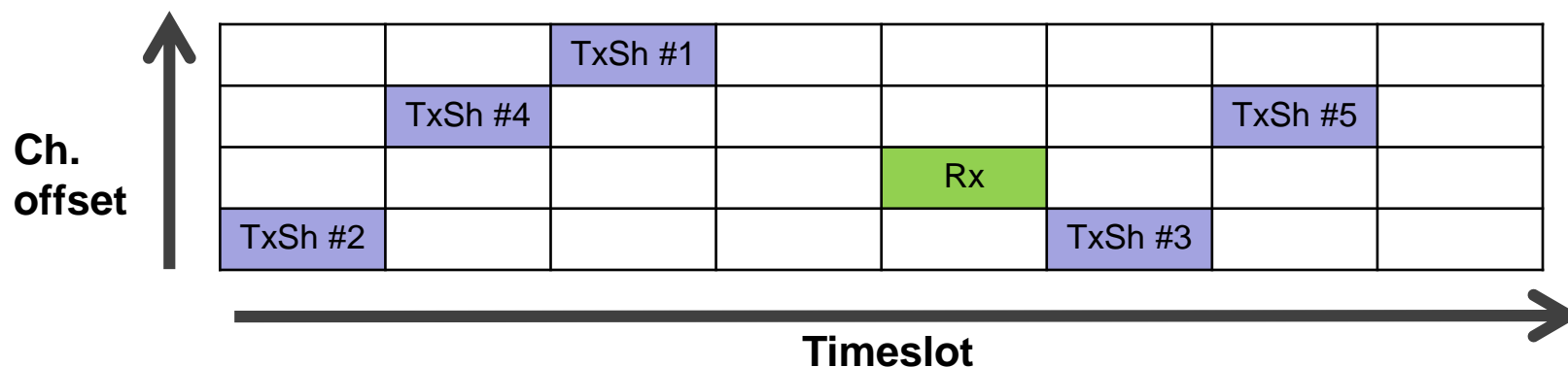
- Equivalent to 6tisch-minimal RFC 8180
- Used for rendez-vous
- E.g. RPL control, 6LoWPAN-ND, etc.



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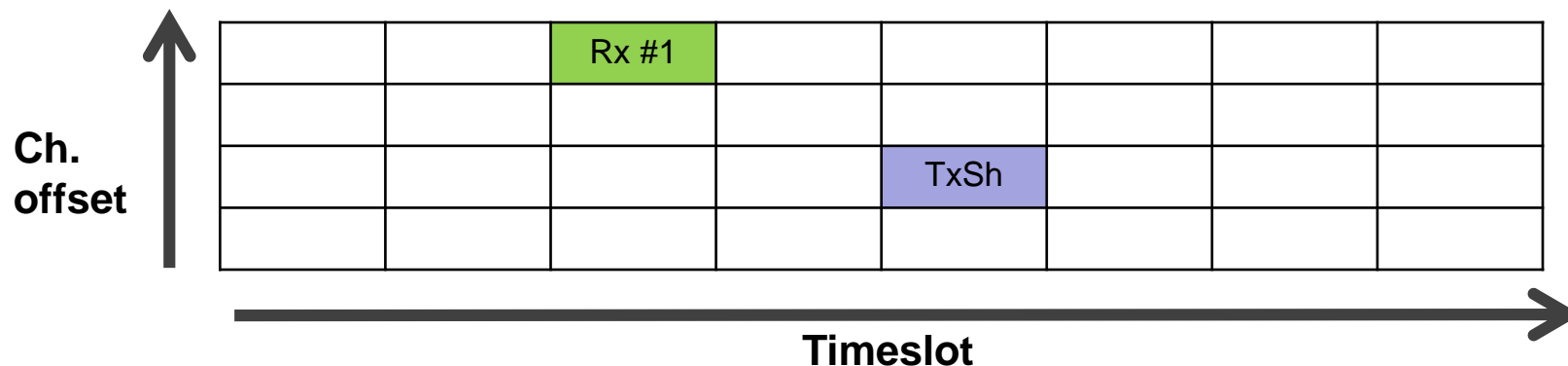
2/3 Receiver-based slotframe

- 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



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



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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)

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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?

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