

PAW

About 6TiSCH

Enabling IPv6 over IEEE std. 802.15.4 TSCH

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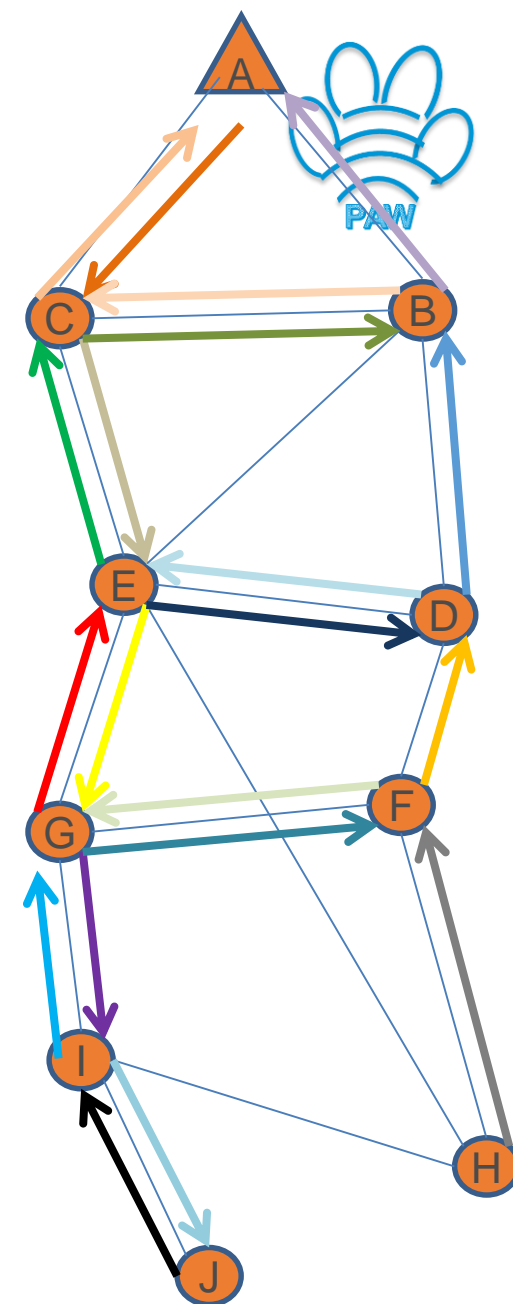
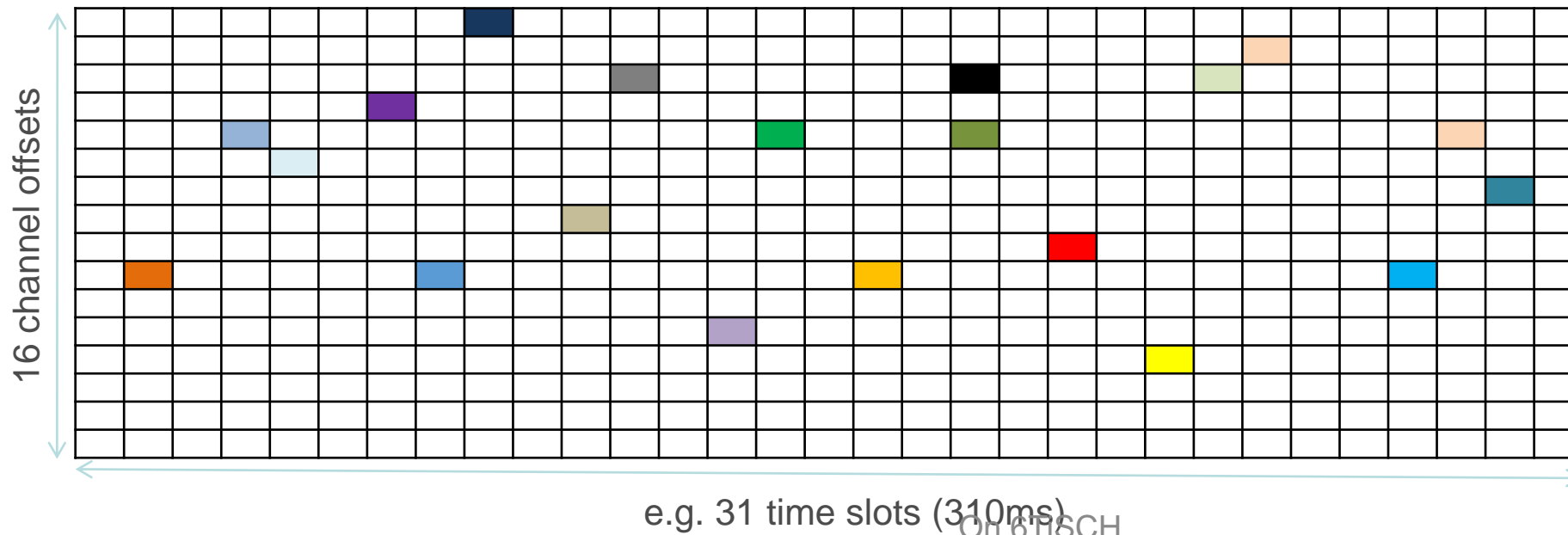
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PAW - IETF 104 - Prague

About TimeSlotted Channel Hopping

Introduced in amendment IEEE Std 802.15.4e

Schedule every transmission to maintain the medium free at critical times and achieve frequency and time Diversity



TSCH: A versatile technology



Low Power **TSCH mesh** is a complex technology adapted to:

- Mesh: Range extension with **Spatial reuse** of the spectrum
- **IPv6-based Industrial Internet**
 - ⇒ Stochastic routing for large scale monitoring (RPL)
 - ⇒ Separation of resources between deterministic and stochastic (TSCH)
 - ⇒ Leveraging IEEE/IETF standards (802.15.4, 6LoWPAN ...)
- Centralized optimization for **Deterministic flows**
 - ⇒ Mission-critical data streams (control loops)
 - ⇒ Reach Back to Fog deterministically for virtualized loops
 - ⇒ And limitations (mobility, scalability)

Sharing the medium with stochastic IP



Type of traffic	Deterministic (e.g. Control Loops)	Stochastic (e.g. classical IP)
Type of MAC		
Deterministic (e.g. TSCH)	<p>Good fit Adapted to centralized routing and fully scheduled operation All industrial protocols are here</p>	<p>Difficult but achievable: requires dynamic allocation of transmission resources (6TiSCH)</p>
Stochastic (e.g. CSMA-CA)	<p>Problems with channel access (guard time) Lead to gross over-provisioning CSMA cannot provide hard guarantees</p>	<p>Good fit Adapted for IP traffic, distributed routing and statistical multiplexing with RED</p>

6TiSCH WG: Enabling IPv6 over IEEE std. 802.15.4 TSCH



The Working Group was formed in 2013, focused on best effort IPv6:

- Published minimal (Slotted Aloha) IPv6 over TSCH
- Published 6top Protocol (6P) for Dynamic allocation of time slots
- Working on Minimal Scheduling Function to control 6P

The WG is now shipping the 6TiSCH Architecture through IESG

- discusses both best effort and deterministic types of traffic

Also produced a requirement draft for DetNet

- reissued as draft-thubert-paw-for-tisch for PAW consumption