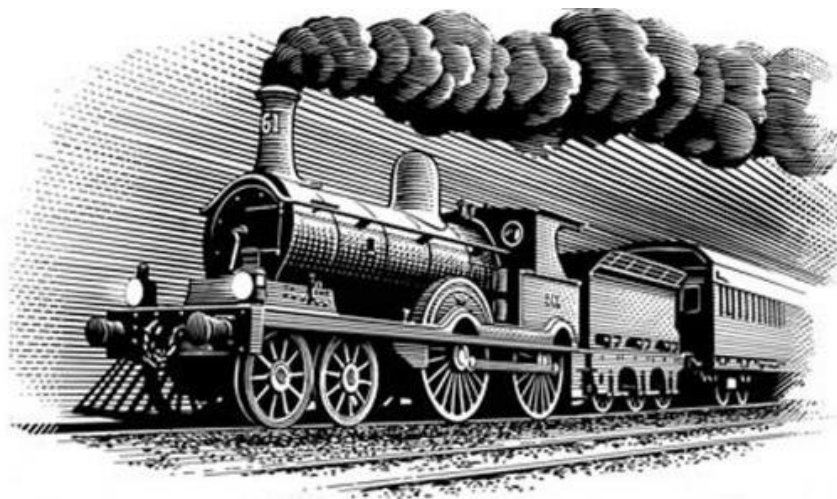


# Exploiting Packet Replication and Elimination in Complex Tracks in 6TiSCH LLNs

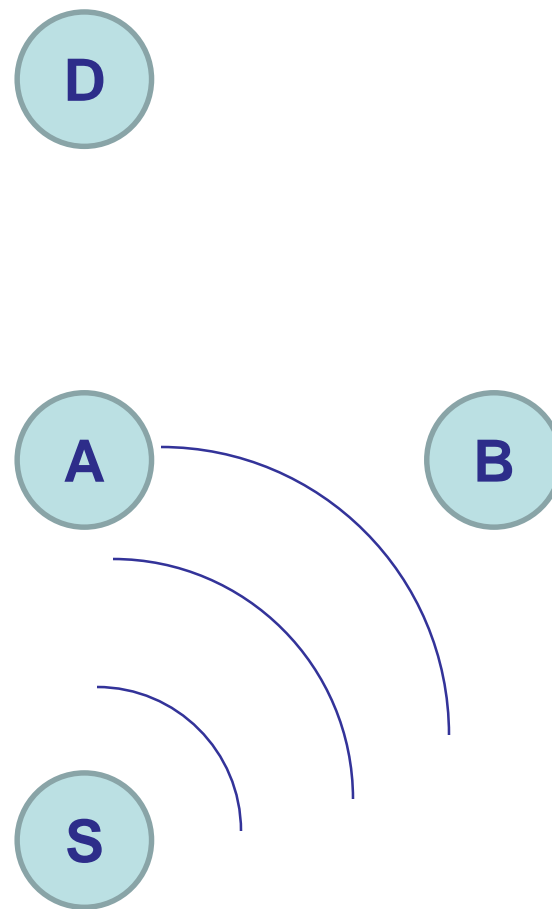
Georgios Z. Papadopoulos  
Nicolas Montavont  
Pascal Thubert

# Toward Determinism

- In addition to reliable communication;
- The information need to be carried out in a pre-defined and constant delay;
- Should exhibit ultra-low jitter performance;

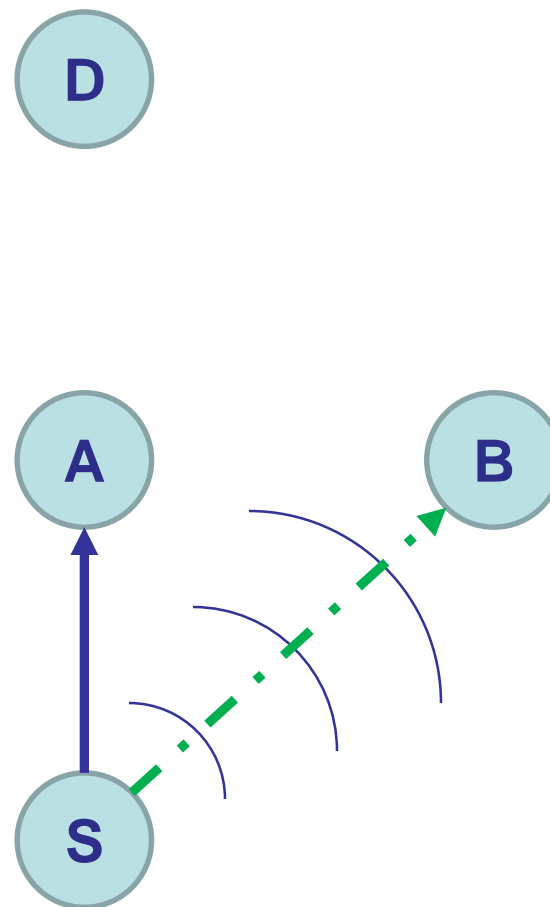


# Wireless Topology



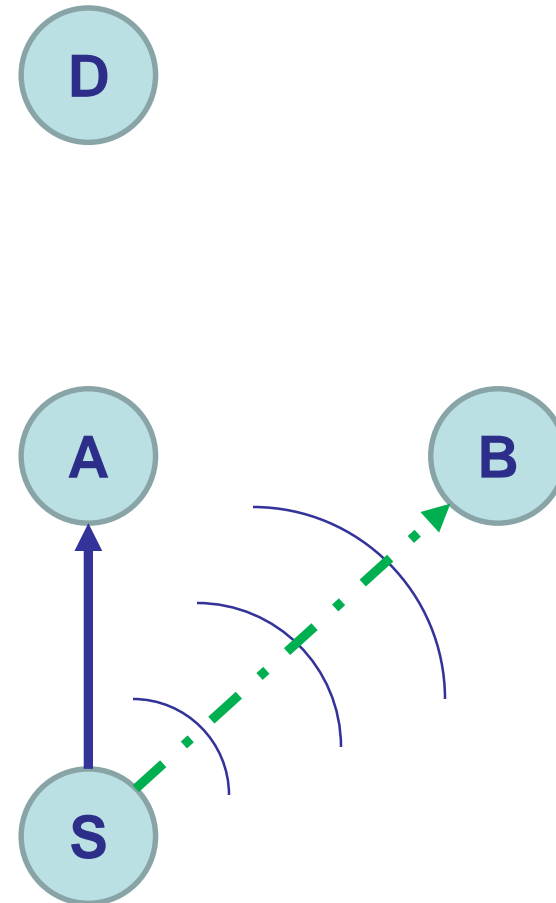
# Promiscuous Overhearing

- Overhearing
  - Wireless medium is broadcast
  - any neighbor of a transmitter may overhear a transmission
  
- **A scheduler for multiple receivers;**
- **ACK collisions?**



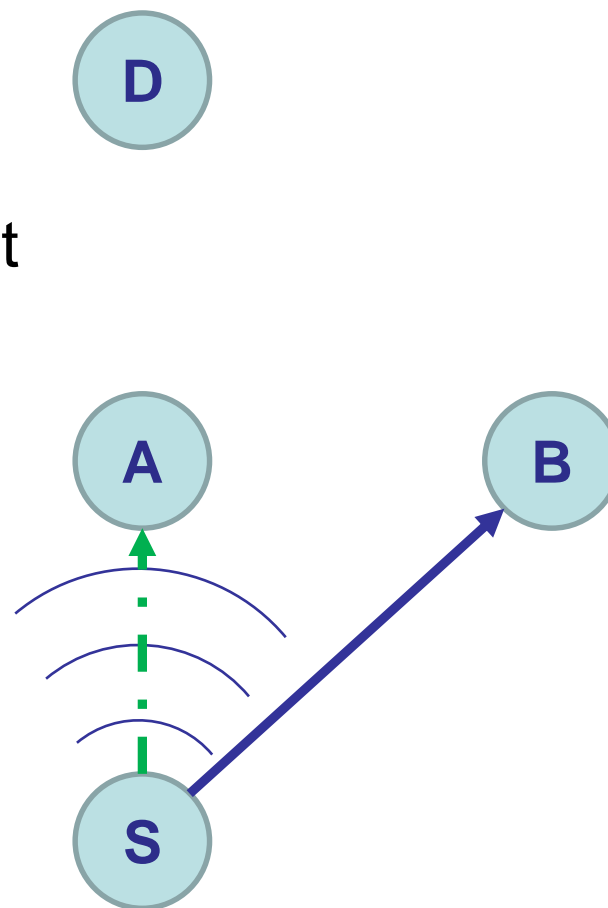
# Packet Replication

- Replication
  - Data packet is transmitted to both Default & “Alternate” Parent



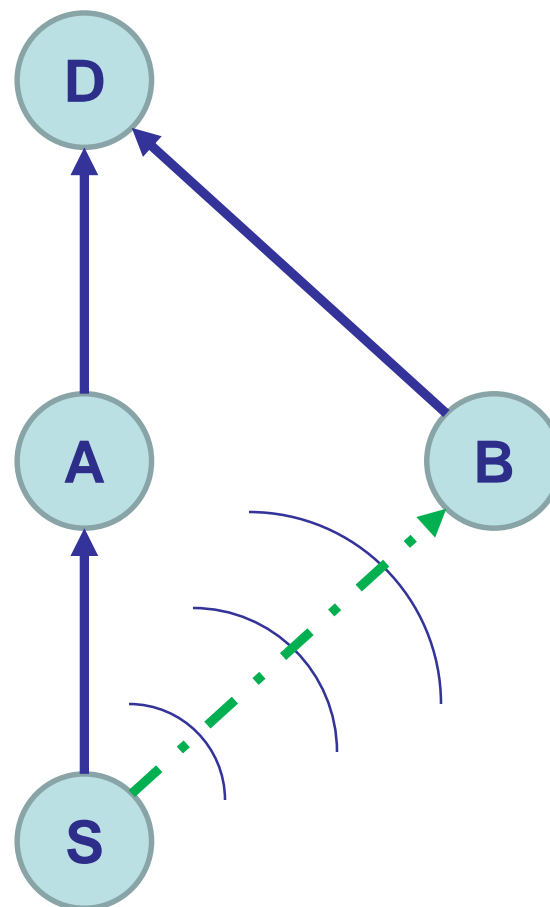
# Packet Replication

- Replication
  - Data packet is transmitted to both Default & “Alternate” Parent
  
- RPL DODAG Information Object (DIO) should be extended



# Packet Elimination

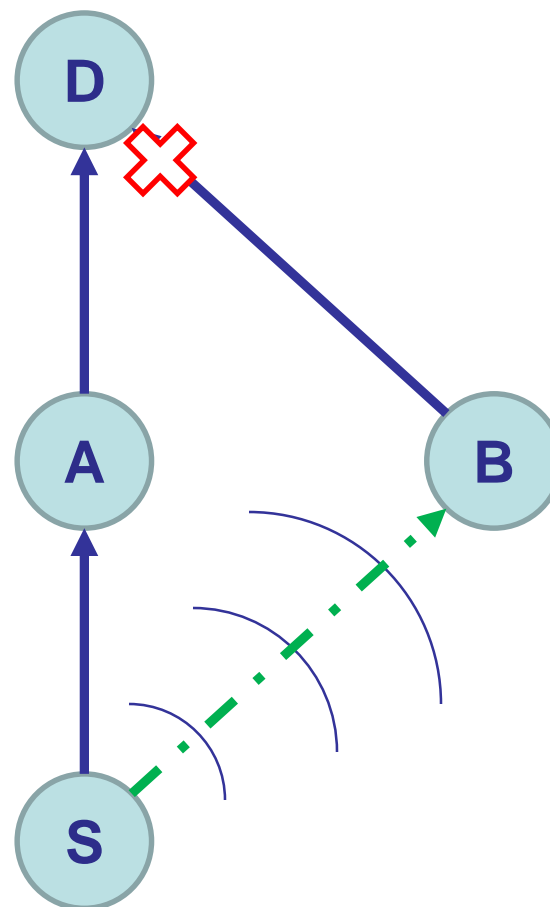
- Elimination
  - Discard the duplicated packet  
“previously received packet”



# Packet Elimination

- Elimination
  - Discard the duplicated packet “previously received packet”

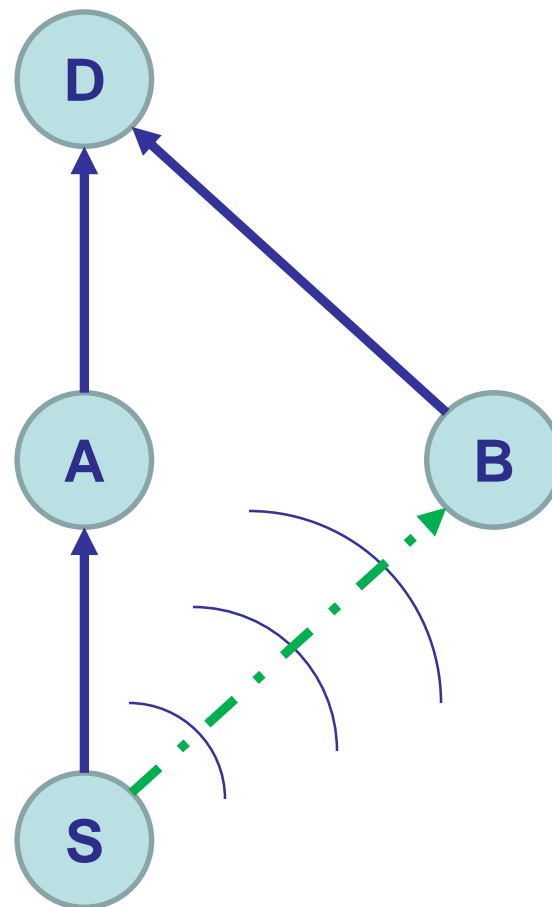
➤ **Tagging Packets for Flow Identification.**





# TSCH Schedule: example

Channel offset	3	S → A S → B			
	2			B → D	
	1				
	0	EB	A → D		
		0	1	2	3
	Slotframe				



- A scheduler for multiple receivers;
- 6P ADD Request Format.

# Requirements

- **Alternative Parent Selection;**
  - RPL DODAG Information Object (DIO) message format SHOULD be extended
  - routing protocol should be extended to allow for 6TiSCH nodes to select AP(s)
- **Promiscuous Overhearing;**
  - 6top Protocol should be extended to allow a cell reservation with two receivers
  - 6P ADD Request Format should be transmitted either twice or once in multicast
- **Cells without ACKs;**
  - only one parent MUST acknowledge the data packet
  - Or an efficient way for double ACKS
- **Packet Elimination.**
  - Tagging Packets for Flow Identification

# Feedback

- Volunteers to REVIEW the draft;
- Feedback for missed Requirements;
- Is PRE relevant in 6TiSCH WG?



# Questions?

Georgios PAPADOPOULOS

[georgios.papadopoulos@imt-atlantique.fr](mailto:georgios.papadopoulos@imt-atlantique.fr)

[georgiospapadopoulos.com](http://georgiospapadopoulos.com)