

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

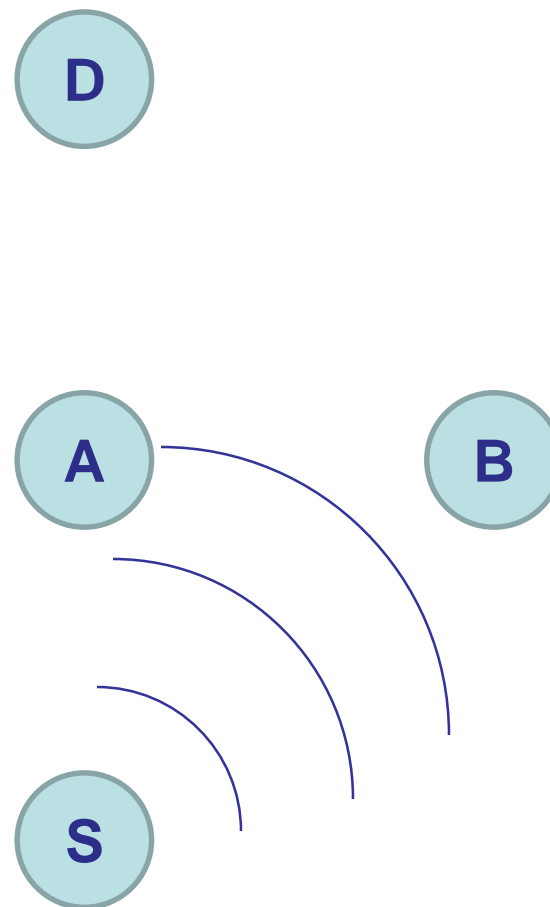
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Toward Determinism

- 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;



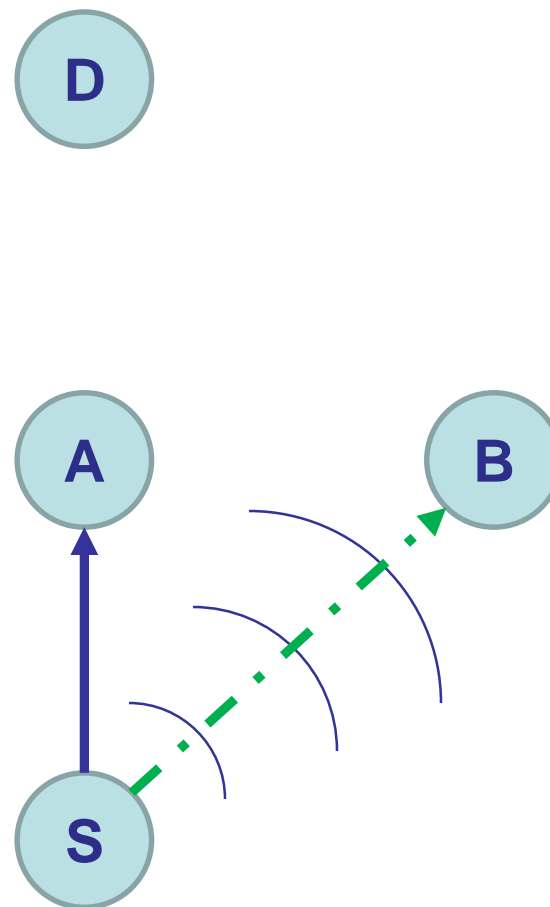
Wireless Topology



Promiscuous Overhearing

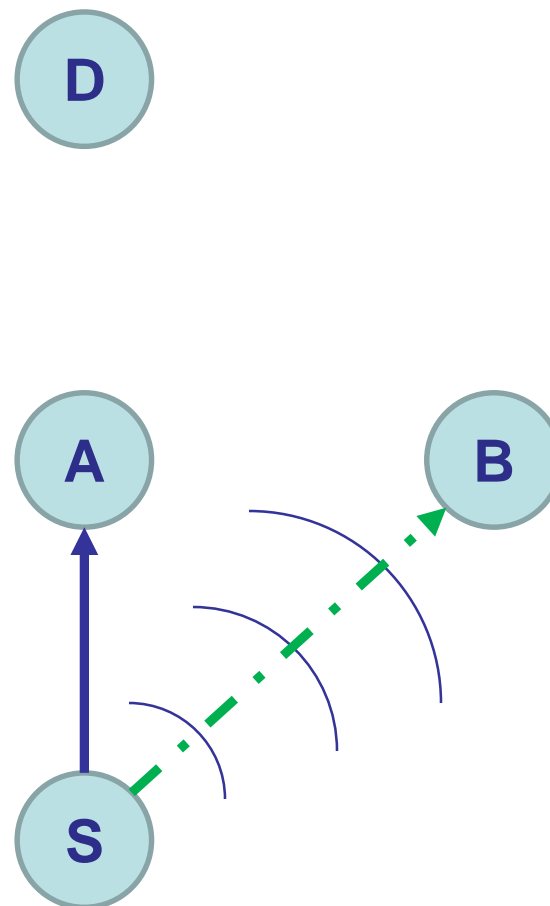
- Overhearing
 - Wireless medium is broadcast
 - any neighbor of a transmitter may overhear a transmission

- **A scheduler for multiple receivers;**
- **ACK collisions?**



Packet Replication

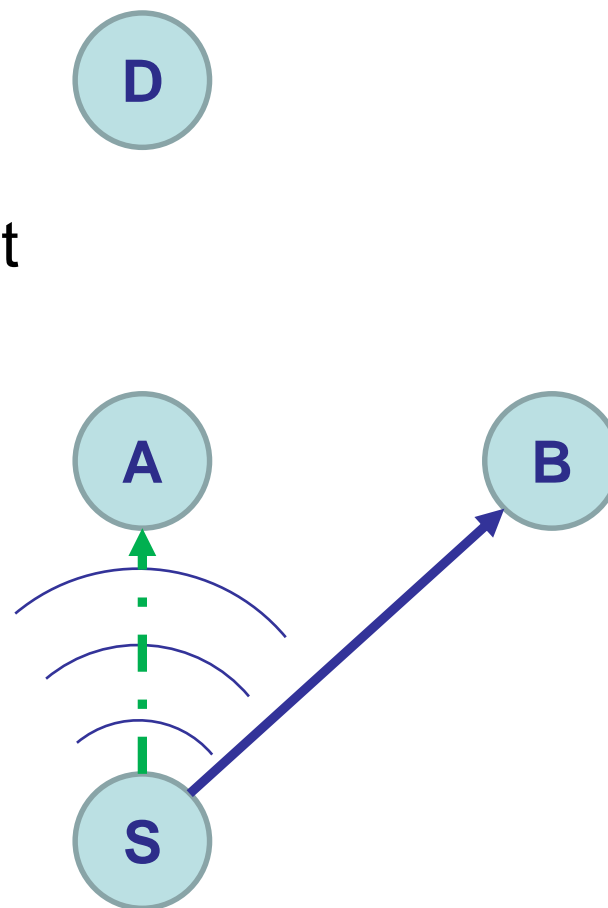
- Replication
 - Data packet is transmitted to both Default & “Alternate” Parent



Packet Replication

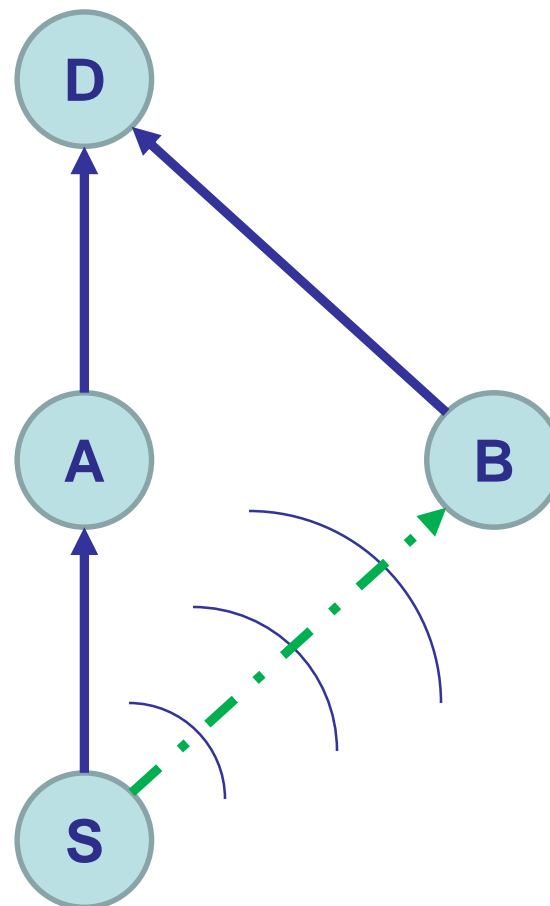
- Replication
 - Data packet is transmitted to both Default & “Alternate” Parent

- RPL DODAG Information Object (DIO) should be extended



Packet Elimination

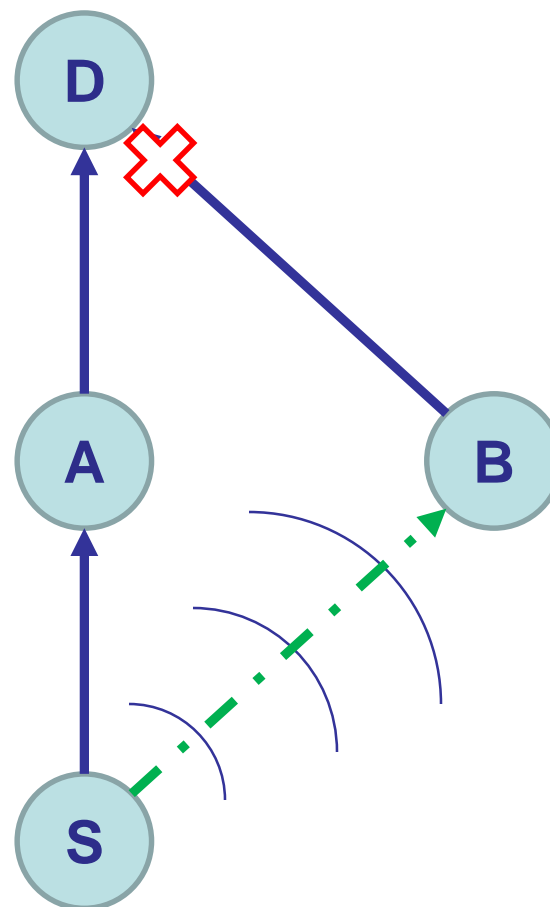
- Elimination
 - Discard the duplicated packet
“previously received packet”



Packet Elimination

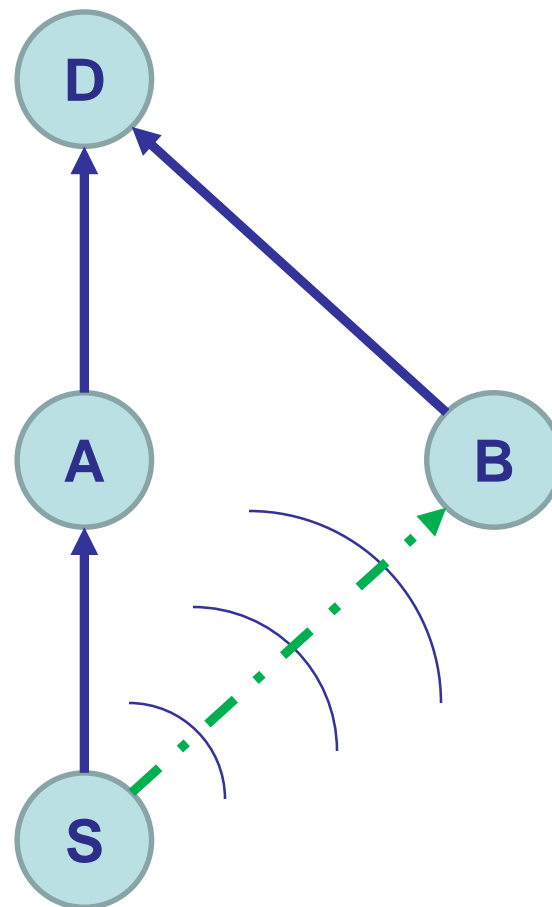
- Elimination
 - Discard the duplicated packet
“previously received packet”

➤ **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?

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