Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: [LB40 Submission CID 281 and 301]
Date Submitted: [15 July, 2008]
Source: [Youngae Jeon, Sung-Woo Park, Seonghee Lee, Sangsung Choi] Company [ETRI/HNU]
Address [161, Gajeong-dong, Youseong-gu, Daejeon, Korea]
Voice: [+82-42-860-6497], FAX: [+82-42-860-5218], E-Mail: [yajeon@etri.re.kr, swpark@hnu.kr, slee003@etri.re.kr, sschoi@etri.re.kr]

Abstract: [This document describes the additional association process for optimal routing]

Purpose: [This document is submitted for consideration for revisions to the IEEE 802.15.5 draft]
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Issues for CID 281 and CID 301

Contents

- Related Comments
  - CID 259 and CID 279
- Association in HR-WPAN Mesh
- Optimal Routing

Related Comments (1)

Comment ID	Commenter Name	Clause	Subclause	Page	Line	Comment type
281	James P. K. Gilb	6	6.6.6.1	162	23	T

- Comment
  - You can't have more than one parent in a tree.
- Suggested Remedy
  - Change “to its parents” to be “to its parent”

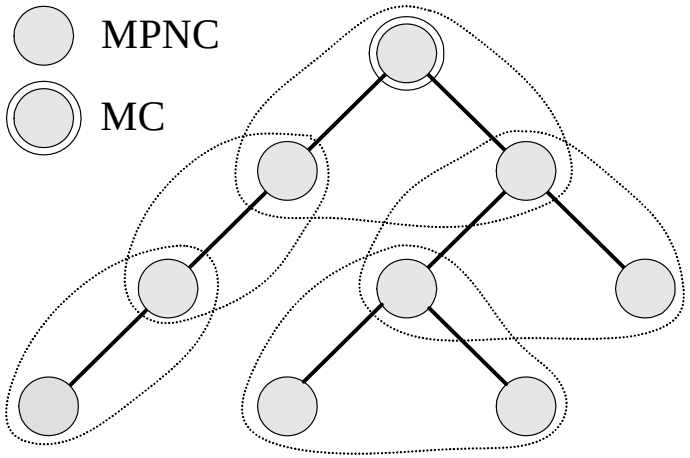
Related Comments (2)

Comment ID	Commenter Name	Clause	Subclause	Page	Line	Comment type
301	James P. K. Gilb	D2	7.4.11	179	20	T

- Comment
  - It isn't clear that it would even work for a child PNC to be a member of more than one piconet. In any event, it is irrelevant to the definition of child piconet. The important characteristic is that the child piconet gets its CTAs and timing from one parent piconet. (nothing else will work).
- Suggested Remedy

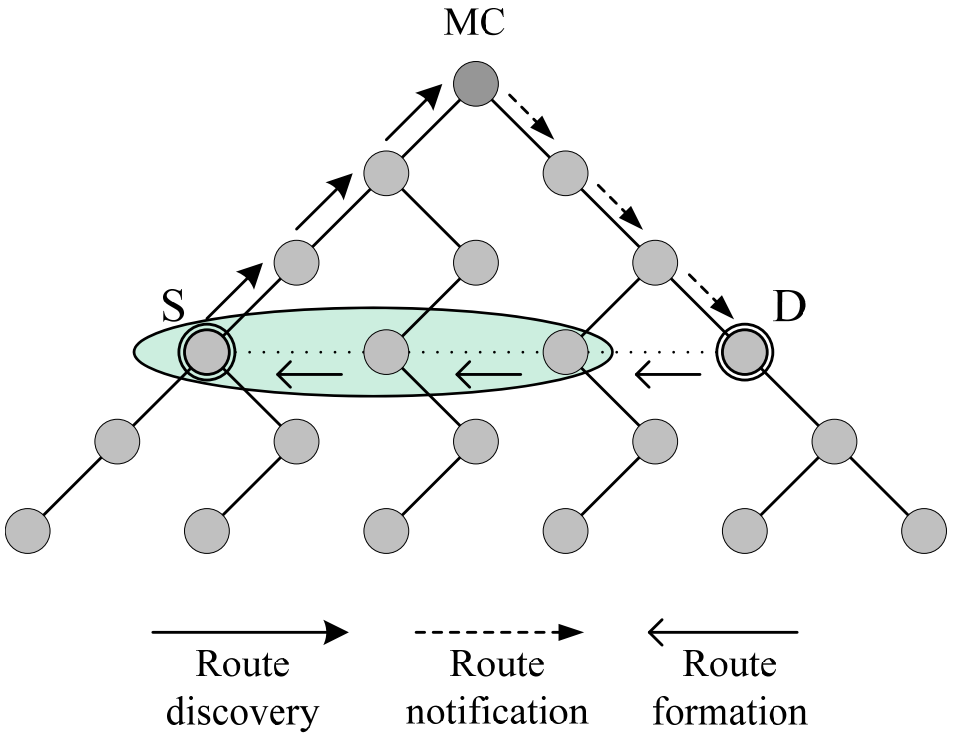
Association in high-rate Mesh (1)

- A child MPNC basically associates with a parent MPNC when forming a tree topology
  - Starting from the MC, a tree topology is constructed by creating child piconets recursively
  - Private CTAs assigned to child with MPNCs do not overlap and beacons never collide each other over the whole tree
  - No changes to the 15.3 MAC needed.



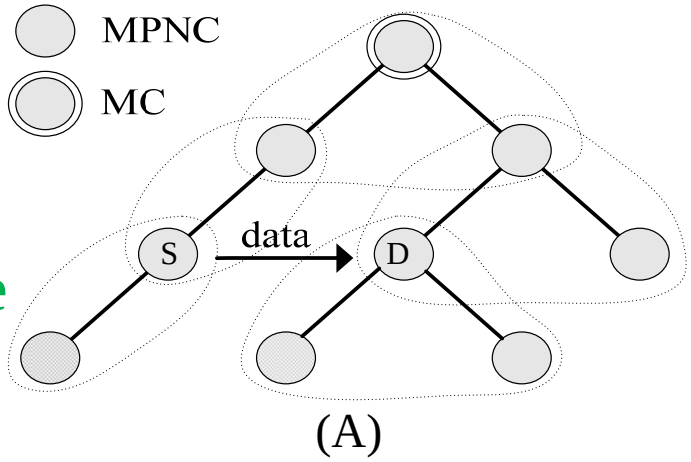
Association in high-rate Mesh (2)

- An MPNC is also allowed to associate temporarily with another neighboring MPNC when forwarding data frames on the non-tree (optimal) route



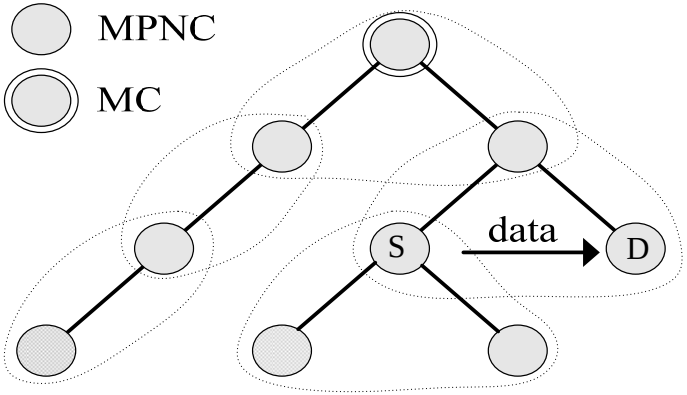
Optimal routing (1)

- Case A
  - Source and destination MPNC have different parent MPNCs
  - Multiple associations (one with the current parent MPNC and the other with the destination MPNC) needed



(A)

- Case B
  - Source and destination MPNC have a common parent MPNC
  - Multiple associations not needed



(B)

Optimal routing (2)

- IEEE 802.15.3 MAC Header
  - Case A
    - SrcID: source MPNC's DEVID (assigned by Destination MPNC)
    - DestID: destination MPNC's DEVID (0x0)
    - PNID: destination MPNC's Piconet ID (assigned by the destination's parent MPNC)
  - Case B
    - SrcID: source DEV's DEVID
    - DestID: destination DEV's DEVID
    - PNID: source/destination DEV's Piconet ID

1	3	1	1	2	2
Stream index	Fragmentation control	SrcID	DestID	PNID	Frame control
MAC header					

Optimal routing (3)

- 1. Association
  - Source MPNC associates with the destination MPNC
- 2. CTA assignment
  - A CTA is assigned by the destination MPNC
  - This CTA never overlap with others
- 3. Data forwarding
  - Source MPNC sends data frames as a member of the destination MPNC
- 4. Disassociation