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

Submission Title: [Modification and complement of the HR frame formats]
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Abstract: [Many parts of the current HR draft are missing or incomplete. As a result of the joint effort of ETRI and KWU, many parts of frame formats are filled and updated. The remaining parts, however, requires a continuing efforts.]
Purpose: [The document describes the recent effort on the modification and complement of the HR part o the current draft.]

Frame Format Description

General Mesh Frame Format (1)

- MAC Frame Body Format

Octets: 0 or 4	14	L_n
FCS	Mesh header	Mesh frame payload
	MAC frame payload	
MAC frame body		

Octets: 0 or 4	L_n	12
FCS	Mesh frame payload	Mesh header
	MAC frame payload	
MAC frame body		

General Mesh Frame Format (2)

- Mesh Header Format

Octets: 1	1	1	1	1	2	1	4
Mesh frame control	Source MDEVID	Source DEVID	Destination MDEVID	Destination DEVID	Mesh seqnum	TTL	Routing assistant
Mesh header							

- Mesh frame control
- Source MDEVID
- Source DEVID
- Destination MDEVID
- Destination DEVID
- Mesh seqnum
- TTL
- Routing assistant

General Mesh Frame Format (3)

- Mesh Frame Control Subfield

Bits: b7-b5	b4-b3	b2-b0
Reserved	Frame type	Transmission method
Mesh frame control		

  - Transmission method
  - Frame type

Mesh Data Frame Format

- Mesh Data Frame Format

Octet: 18	L
Mesh header	Mesh data payload

- Mesh Command Frame Format

Octet: 10	L	1	1
Mesh header	Mesh command payload	Length	Command type

Mesh Command Frame Format

Tree Association Command (1)

- Tree Association Request Command

Octet: 2	1	1
Descendant number	Length = 2	Command type

  - Command type (0x00)
  - Length
  - Descendant number
    - The actual descendant number
    - 0x00 : non clear descendant number

Tree Association Command (2)

- Tree Association Response Command

Octet: 1	1	1
Association status	Length = 1	Command type

  - Command type (0x01)
  - Length
  - Association status

Tree Association Command (3)

- Association Status Subfield

Octet: b4-b7	b3	b2	b1	b0
Reserved	Address server available	Topology server available	TREEID available	Accept/Reject

  - Address server available
  - Topology server available
  - TREEID available
  - Accept/Reject

Tree Disassociation Command (1)

- Tree Disassociation Request Command

Octet: 1	1	1
Disassociation reason	Length = 1	Command type

  - Command type (0x02)
  - Length
  - Disassociation Reason

Tree Disassociation Command (2)

- Tree Disassociation Confirmation Command

1	1
Length = 0	Command type

  - Command type (0x03)
  - Length

Tree Topology Discovery Command

- Tree Topology Discovery Command

Octet: 1	1
Length = 0	Command type

  - Command type (0x04)
  - Length

Tree Topology Update Command

- Tree Topology Update Command

Octet: 1	1	2	1	1
Initiator MDEVID	Terminator MDEVID	Descendant num	Length = 4	Command type

  - Command type (0x05)
  - Length
  - Descendant num
  - Terminator MDEVID
  - Initiator MEDVID

TREEID Assignment Command

- TREEID Assignment Command

Octet: 2	2	2	1	1
Source TREEID	TREEID	TREEID block size	Length = 6	Command type

  - Command type (0x06)
  - Length
  - TREEID block size
  - TREEID
  - Source TREED

Server Notification Command

- Server Notification Command

Octet: 1	1	2	1	1
Server type	Server MDEVID	Server TREEID	Length = 4	Command type

  - Command type (0x07)
  - Length
  - Server TREEID
  - SERVER MDEVID
  - Server type

Server Inquiry Command

- Server Inquiry Command

Octet: 1	1	1
Server type	Length = 1	Command type

  - Command type (0x08)
  - Length
  - Server type

Address Update Command

- Address Update Command

Octet: 2	1	1
Source TREEID	Length = 2	Command type

  - Command type (0x09)
  - Length
  - Source TREEID

Link State Registration Command (1)

- Link State Registration Command

Octet: 4*N	1	1
Link status list	Length = 2*N	Command type

  - Command type (0x0A)
  - Length
  - Link status list

Link State Registration Command (2)

- Link Status List Subfield

Octet: 1	1	1	1	…	1
Neighbor #1 MDEVID	Neighbor #1 link cost	Neighbor #2 MDEVID	Neighbor #2 link cost	…	Neighbor #N MDEVID

  - Neighbor MDEVID
  - Neighbor link cost

Route Discovery Command

- Route Discovery Command

Octet: 2	1	1	1	1	1	1
Sequence Num	Initiator MDEVID	Terminator MDEVID	Route destination MDEVID	Route cost	Length = 6	Command type

– Command type (0x0B)
– Length
– Route cost
– Route destination MDEVID
– Terminator MDEVID
– Initiator MDEVID
– Sequence Num

Route Notification Command (1)

- Route Notification Command

Octet: 2	1	2*N	1	1	1
Seq Num	Route Source MDEVID	Relay list	Route cost	Length = 4+2*N	Command type

  - Command type (0x0C)
  - Length
  - Route cost
  - Relay list
  - Route Source MDEVID
  - Seq Num

Route Notification Command (2)

- Relay List Subfield

Octet: 1	1	1	1	…	1	1
Relay #1 MDEVID	Relay #1 route cost	Relay #2 MDEVID	Relay #2 route cost	…	Relay #N MDEVID	Relay #N route cost

  - Relay MDEVID
  - Relay route cost

Route Formation Command

- Route Formation Command

Octet: 2	1	1	2*N	1	1	1
Seq Num	Initiator MDEVID	Terminator MDEVID	Relay list	Route cost	Length = 5+2*N	Command type

- Command type (0x0D)
- Length
- Route cost
- Relay list
- Terminator MDEVID
- Initiator MDEVID
- Sequence Num

Route Error Command

- Route Error Command

Octet:1	1	1	1	1	1
Initiator MDEVID	Terminator MDEVID	Route destination MDEVID	Error Reason	Length = 4	Command type

– Command type (0x0E)
– Length
– Error Reason
– Route destination MDEVID
– Terminator MDEVID
– Initiator Num

Mesh Information Elements (1)

- Mesh Capacity

Octet: 2	1	1	1	1
Mesh ID	Mesh capacity	Route cost to MC	Length = 4	Element ID

  - Element ID
  - Length
  - Route Cost to MC
  - Mesh capacity
  - Mesh ID

Mesh Information Elements (2)

- Mesh Capacity Subfield

Bit: b7 – b4	b3	b2	b1 – b0
Reserved	Relay	Child support	Mesh topology

  - Mesh topology
  - Relay
  - Child support