IPv6 Mesh over Bluetooth(R) Low Energy using IPSP

draft-ietf-6lo-blemesh-03

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Status (I)

- draft-ietf-6lo-blemesh-03
  - Last revision, July 2018

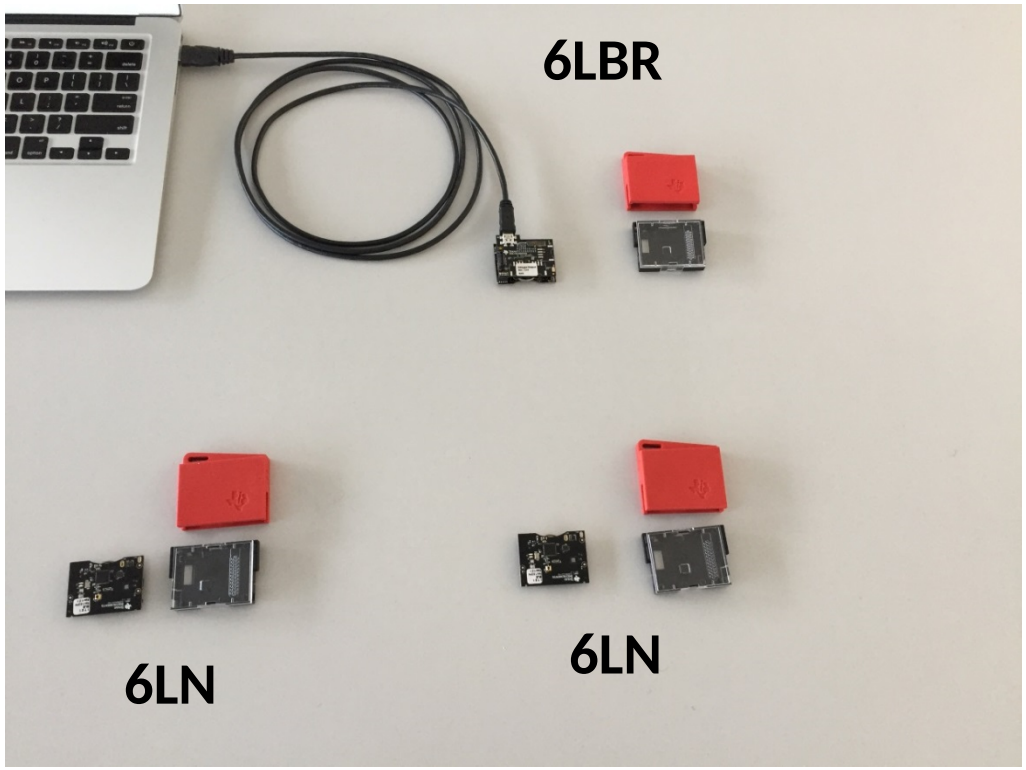
- Not updated between Sept 2017 – July 2018
  - -02 was considered stable
  - Need to validate the draft by means of running code before requesting WGLC
  - Slow progress since then
    - Several reasons

Status (II)

- Two paths for implementing the draft
  - 1. Using Raspberry PIs, BlueZ (Linux BLE stack) as basis
    - RFC 7668: One master (6LBR), single slave (6LN) running
    - RFC 7668: One master (6LBR), several slaves (6LNs) not working
      - » BlueZ issue
  - 2. Using BLEach as basis
    - RFC 7668 open source implementation for Contiki
    - One master (6LBR) and several slaves (6LNs) running!

Status (III)

- BLEach RFC 7668 scenario



- CC2650 devices, Contiki OS
- Basis for our implementation work

Updates in -03 (I/VIII)

- New author
  - Michael Spörk, Graz University of Technology (Austria)
  - Main author of BLEach
- New contributor
  - Carlo Alberto Boano, Graz University of Technology (Austria)

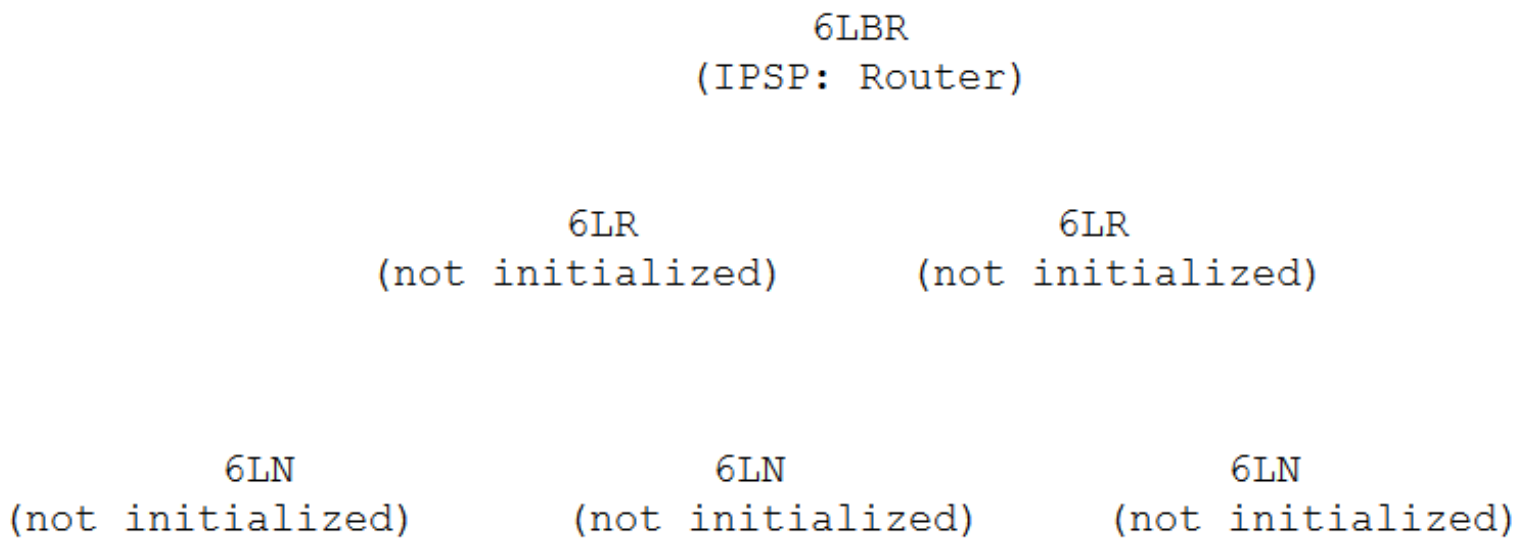
- In -02, we assumed already established BLE connections
- In -03, we detail relationship between 6LoWPAN roles and IPSP roles for connection establishment
  - Added text in 3.3.2 (Neighbor Discovery)
  - Added Appendix
    - Example of 3.3.2

Updates in -03 (II/VIII)

- 3.3.2. Neighbor Discovery, item 3.b)
  - Section 6.2 of RFC 6775, for dynamic config. scenarios
    - 6LR comes up as a non-router
    - 6LR waits for an RA to configure its own interface address first, and turns to a router
  - In order to support the same operation:
    - 6LR starts by using the IPSP Node role only
    - A previously existing IPSP Router establishes a BLE connection with the 6LR, which receives an RA from that router
    - The 6LR configures its interface address, it turns into a router, and runs as an IPSP Router
    - 6LBR runs as an IPSP Router from the beginning

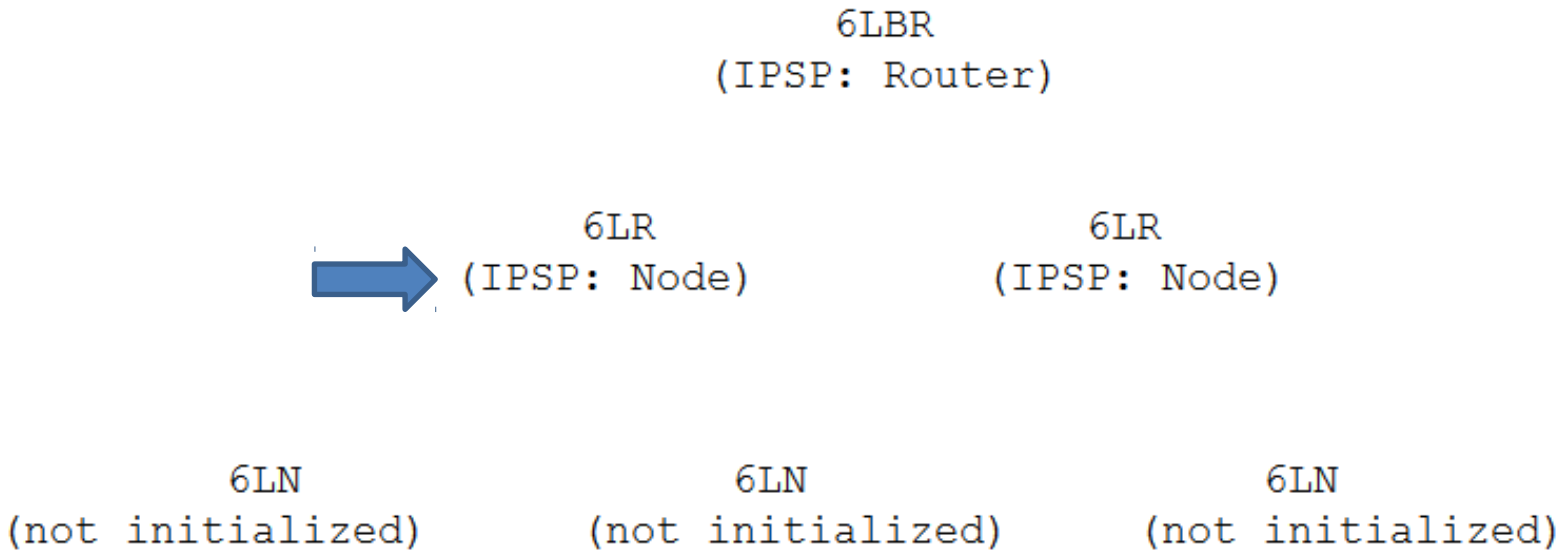
Updates in -03 (III/VIII)

- Appendix: example
  - Step 1



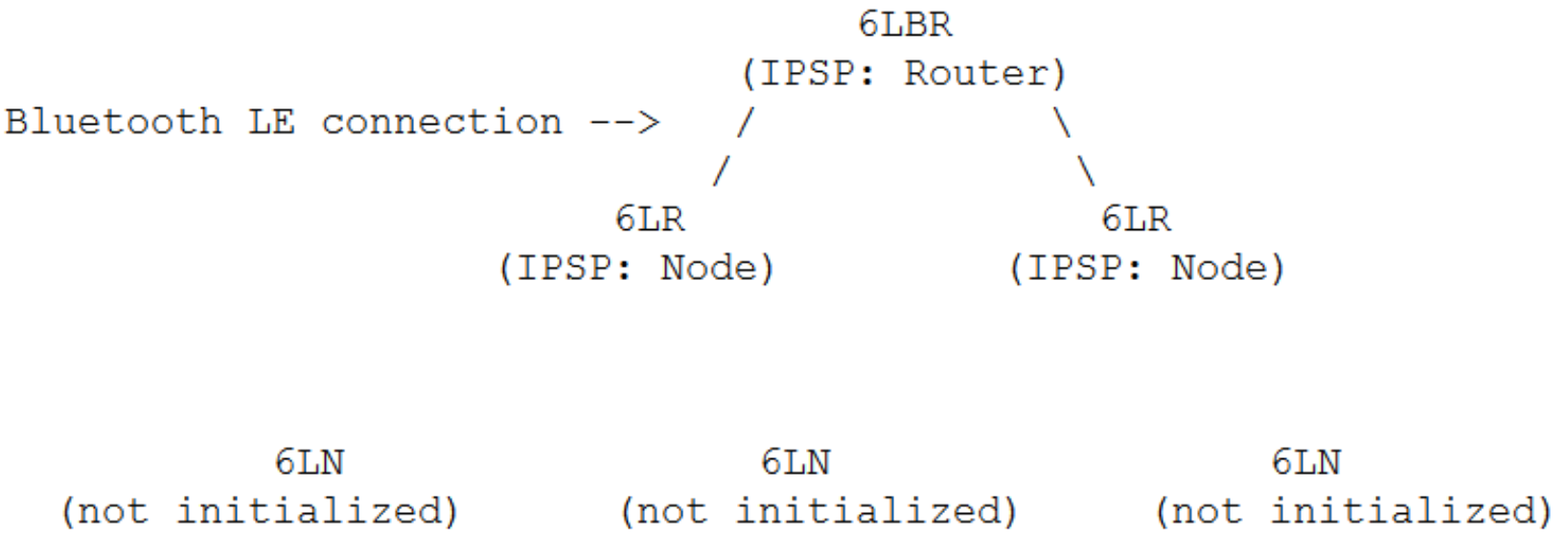
Updates in -03 (IV/VIII)

- Appendix: example
  - Step 2



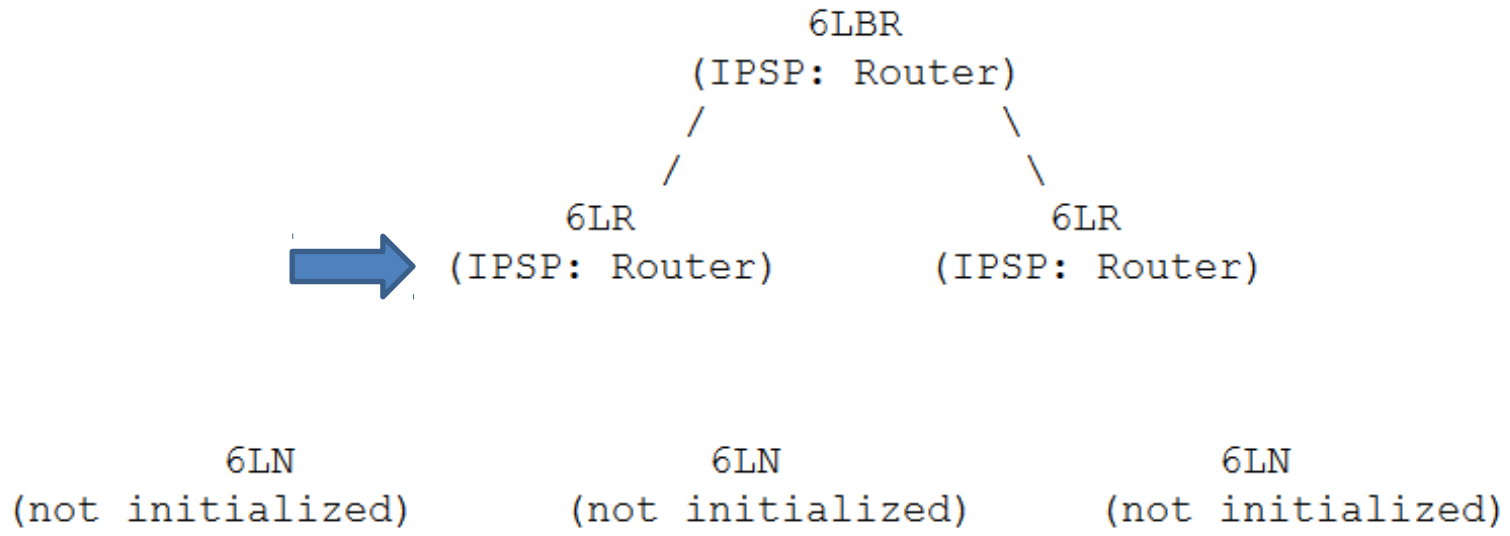
Updates in -03 (V/VIII)

- Appendix: example
  - Step 3



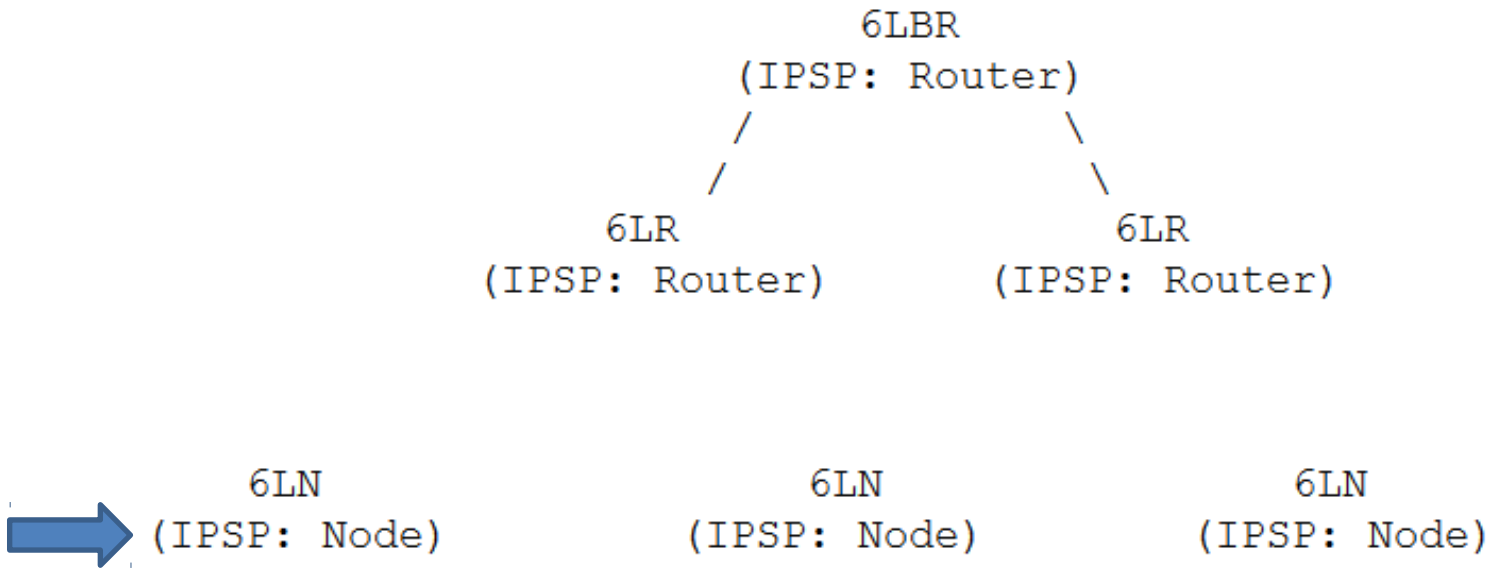
Updates in -03 (VI/VIII)

- Appendix: example
  - Step 4



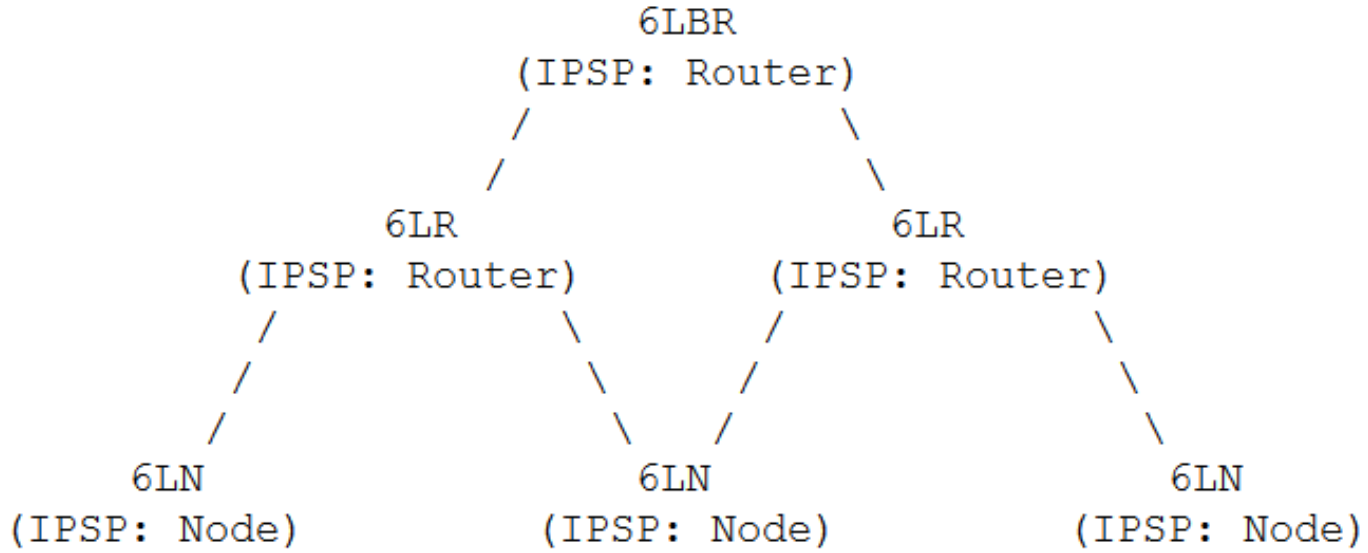
Updates in -03 (VII/VIII)

- Appendix: example
  - Step 5



Updates in -03 (VIII/VIII)

- Appendix: example
  - Step 6



Related work: Bluetooth SIG

- “Bluetooth Mesh” specification
  - Published in July 2017
  - BLE Mesh networking
  - (Controlled) Flooding over advertising channels
    - Note: RFC 7668 assumes link-layer connections over data channels for IPv6 over BLE