Embedded Systems

Lab 4: Multi-Hop Bluetooth Chat

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Goals of Lab 4

- Communication using Bluetooth
  - Task 1: One-to-one connection between two nodes
  - Task 2: Multi-hop communication to a base station
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- Application
  - RFCOMM
  - Connection Manager
  - Multi-Hop
  - RPC
    - L2CAP
    - L2CAP connectionless
      - Link Manager Protocol
      - Audio
      - Baseband
      - Bluetooth Radio
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Translation between Bits and RF Signals
(e.g. frequency hopping, modulation and demodulation, etc.)
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Packet Structure
Defines addressing scheme, packet format, timing and power control, etc.

Diagram:
- Application
  - RFCOMM
  - Connection Manager
  - Multi-Hop
  - RPC
- L2CAP
  - L2CAP connectionless
- Link Manager Protocol
- Audio
- Baseband
- Bluetooth Radio

Swiss Federal Institute of Technology
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Link Establishment
The setup and maintenance of links between two devices.
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Logical Link Control and Adaption Protocol
Provides an abstract interface between user data and communication link.
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![Diagram of Bluetooth protocol layers]

- **Basic L2CAP header**
  - Length
  - Channel ID
  - Information payload

- **Basic information frame (B-frame)**

- **L2CAP connectionless**

- **Layer Stack**
  - Bluetooth Radio
  - Baseband
  - Link Manager Protocol
  - Audio
  - Application
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Task 1:
send_msg(...)
receive_msg(...)

Task 2:
chat(…)
Notes

- Compile and upload: `make btnode3 upload`

- Base Station Bluetooth MAC address: `00:04:3F:00:00:45`

```c
// address of the base station
bt_addr_t sink_addr = {0x45, 0x00, 0x00, 0x3F, 0x04, 0x00};
```