Background

• Bluetooth Low-Energy (BLE): popular radio technology for constrained devices
• Resources of BLE devices can be accessed over IP (RFC7668) or via gateways
• How about locally connected devices and web technologies?
• This draft: straw man proposal of BLE URI scheme and media types
BLE attributes, characteristics, etc.

• An **attribute** is a piece of labeled addressable data, handled by the Attribute Protocol
• A **characteristic** is a grouping of attributes, handled by the Generic Attribute Profile
• A **service** is a grouping of characteristics, handled by the Generic Attribute Profile
• A **profile** is a set of rules on how to setup/use services at the client
Example

• Passive scan for nodes:

```
GET ble:/gap/nodes/passive
```

• Results in node list (here with two nodes, second having GAP attributes):

```
[
  {
    href: "ble:/blnodes/42",
    bdaddr: "Zm9vYmFy"
  },
  {
    href: "ble:/blnodes/16",
    bdaddr: "GfEgeD21",
    ad: [
      ["foo", "Zm8"],
      ["bar", "Zg"]
    ]
  }
]
```
Example (contd.)

• GET for one node's services:

  GET ble:/blnodes/16/services

• Results in service list (here two services):

  [{
    href: "ble:/blnodes/16/s1",
    uuid: "fEgeZm9vGfEGyMYF"
  },{
    href: "ble:/blnodes/16/s7",
    uuid: "gGhrdgE32FgaFFga"
  }]
Example (contd.)

- GET for one service's characteristics:

  ```
  GET ble:/blnodes/16/s7/characteristics
  ```

- Results in (here only one characteristic):

  ```
  [
  
  {
  
  href: "ble:/blnodes/16/c5",
  
  uuid: "m9vGmyFffEgeZEGy",
  
  properties: "K"
  
  }
  
  ]
  ```
Example (contd.)

- GET for characteristic's value:
  
  \[
  \text{GET ble:/blnodes/16/c5}
  \]

- Result: data
  
  \[
  \ldots?
  \]
Data types

• Many characteristics have simple data
  – conserving bits
  – uint8, uint16, utf8, ...

• Some simple bitmaps

• Some more complex
  – e.g., "body composition measurement" and "feature" characteristics: 1, 3, and 4 –bit fields; several uints, time stamps, etc.
Questions

• Sensible approach to pursue?
  – "locally useful" URI scheme

• How do we get data in and out?
  – Bluetooth details needed by client?
  – Abstractions by BLE layer?

• (How to structure URIs)