IoT ARCHITECTURE

Bluetooth

|	Bluetooth IEEE 802.15.1
Application	Cable replacement
Frequency bands	2.4GHz
Bandwidth	1Mbps
Range (meters)	1–10

Bluetooth

- Bluetooth networks referred to as **piconets** use a master/slave model to control.
- A single master device can be connected to up to seven different slave devices.
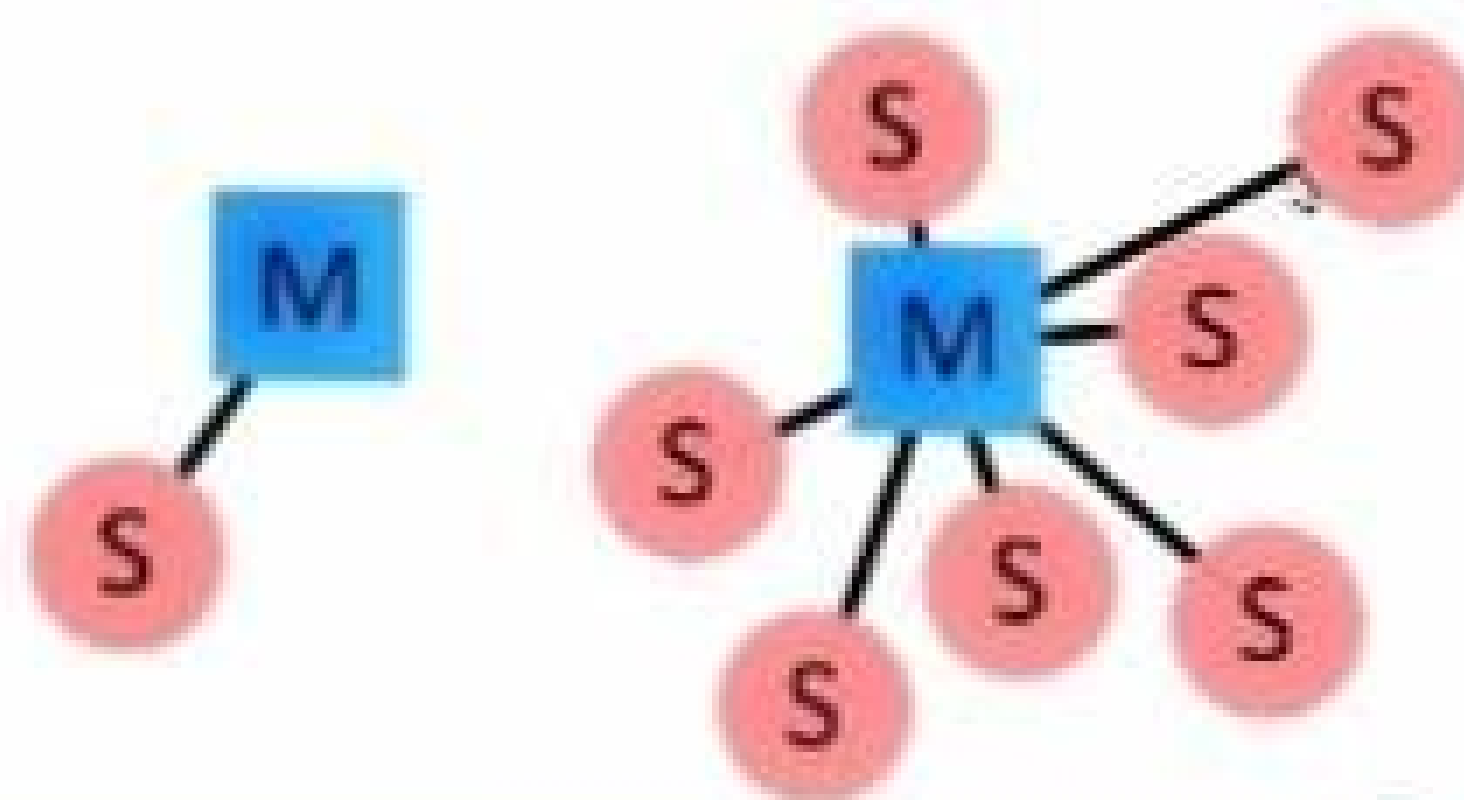
Bluetooth Addresses

Bluetooth Address (BD_ADDR)

11:22:33:44:55:66

| NAP | UAP | LAP |

OUI

Assigned by vendor
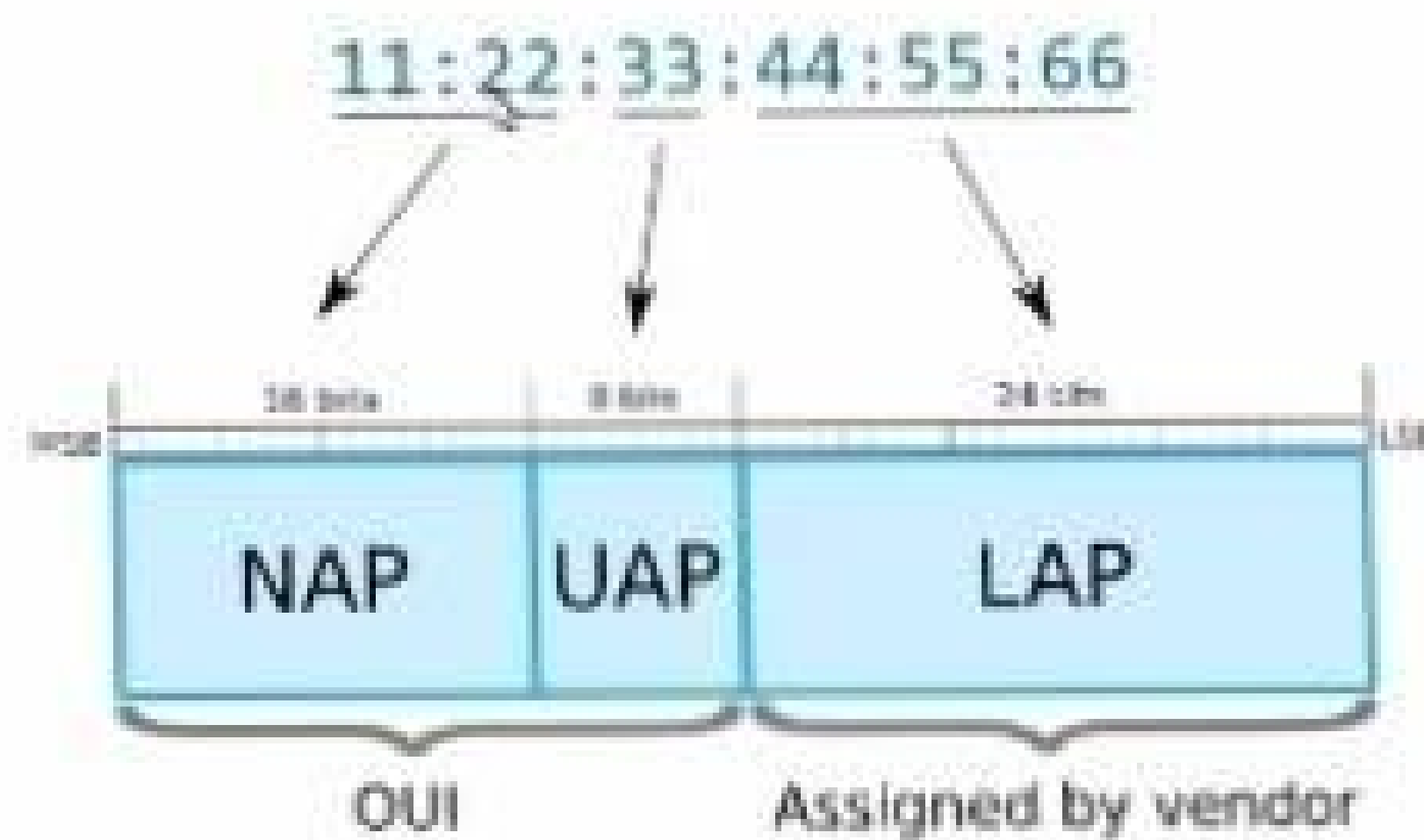
NAP-Non-significant Address Part -- used in Frequency Hopping Synchronization

IoT Communication Technologies

Step 4: Program

```cpp
// Stream& input;

DynamicJsonDocument doc(2048);

DeserializationError error = deserializeJson(doc, input);

if (error) {
  Serial.print(F("deserializeJson() failed: "));
  Serial.println(error.f_str());
  return;
}

const char* cod = doc["cod"]; // "200"
int message = doc["message"]; // 0
int cnt = doc["cnt"]; // 2

for (JsonObject list_item : doc["list"].as<JsonArray>()) {

  long list_item_dt = list_item["dt"]; // 1620266400, 1620277200

  JsonObject list_item_main = list_item["main"];
  float list_item_main_temp = list_item_main["temp"]; // 32.62, 34.31
  float list_item_main_feels_like = list_item_main["feels_like"]; // 33.82, 35.2
  float list_item_main_temp_min = list_item_main["temp_min"]; // 32.62, 34.31
  float list_item_main_temp_max = list_item_main["temp_max"]; // 35.34, 37.69
  int list_item_main_pressure = list_item_main["pressure"]; // 1006, 1004
  int list_item_main_sea_level = list_item_main["sea_level"]; // 1006, 1004
  int list_item_main_grnd_level = list_item_main["grnd_level"]; // 954, 953
  int list_item_main_humidity = list_item_main["humidity"]; // 43, 37
  float list_item_main_temp_kf = list_item_main["temp_kf"]; // -2.72, -3.38
```

Step 4: Program

Copy

```cpp
// Stream& input;

DynamicJsonDocument doc(2048);

DeserializationError error = deserializeJson(doc, input);

if (error) {
  Serial.print(F("deserializeJson() failed: "));
  Serial.println(error.f_str());
  return;
}

const char* cod = doc["cod"]; // "200"
int message = doc["message"]; // 0
int cnt = doc["cnt"]; // 3

for (JsonObject list_item : doc["list"].as<JsonArray>()) {

  long list_item_dt = list_item["dt"]; // 1625266800, 1625277200

  JsonObject list_item_main = list_item["main"];
  float list_item_main_temp = list_item_main["temp"]; // 32.62, 34.31
  float list_item_main_feels_like = list_item_main["feels_like"]; // 33.82, 35.3
  float list_item_main_temp_min = list_item_main["temp_min"]; // 32.62, 34.31
  float list_item_main_temp_max = list_item_main["temp_max"]; // 35.34, 37.69
  int list_item_main_pressure = list_item_main["pressure"]; // 1006, 1004
  int list_item_main_sea_level = list_item_main["sea_level"]; // 1006, 1004
  int list_item_main_grnd_level = list_item_main["grnd_level"]; // 956, 953
  int list_item_main_humidity = list_item_main["humidity"]; // 43, 37
  float list_item_main_temp_kf = list_item_main["temp_kf"]; // -2.72, -3.38
```

Step 2: JSON

Examples: OpenWeatherMap, Reddit

Input

{"cod":"200","message":0,"cnt":2,"list":[{"dt":1629266400,"main":
{"temp":32.62,"feels_like":33.82,"temp_min":32.62,"temp_max":35.34,"pressure":1006,"sea_level":1006,"grnd_level":956,"humidity":43,"temp_kf":-2.72},
"weather":[{"id":801,"main":"Clouds","description":"few clouds","icon":"02d"}],"clouds":{"all":20},"wind":
{"speed":3.11,"deg":296,"gust":3.37},"visibility":10000,"pop":0,"sys":{"pod":"d"},"dt_txt":"2021-08-18 06:00:00"},{"dt":1629277200,"main":
{"temp":34.31,"feels_like":35.2,"temp_min":34.31,"temp_max":37.69,"pressure":1004,"sea_level":1004,"grnd_level":953,"humidity":37,"temp_kf":-3.38},"
weather":[{"id":801,"main":"Clouds","description":"few clouds","icon":"02d"}],"clouds":{"all":15},"wind":
{"speed":3.77,"deg":5,"gust":4.24},"visibility":10000,"pop":0,"sys":{"pod":"d"},"dt_txt":"2021-08-18 09:00:00"}],"city":
{"id":1269515,"name":"Jaipur","coord":
{"lat":26.9167,"lon":75.8167},"country":"IN","population":2711758,"timezone":19800,"sunrise":1629246586,"sunset":1629293506}}

Input length: 991

Prettify