Bluetooth Protocol Specification

Summary:

Communication between the phone and DE1 will be facilitated via bluetooth communication. In this protocol, the DE1 is a slave which responds to requests issued by the phone.

There are seven different main messages that the phone can send and will need to be handled by the DE1. Note that the messages will be binary blobs that the DE1 will have to decode in order to process. The messages are as follows:

- Data upload / download
    1. Generate and display HEX code
        - Used when user wants to download or upload a file
    2. Verify DE1 master password and HEX code
        - Used to verify the DE1 master password and previously requested HEX code when the user wants to upload or download a file
    3. Upload new file data
        - Used to upload a binary blob of data which needs to be encrypted and saved to the server
        - The data will be uploaded in packets (as specified below) to allow arbitrary file sizes
        - Phone will wait to send another packet until the DE1 responds with 1 (aka. OK)
    4. Download existing file data
        - Used to request a previously uploaded file, returned as binary blobs which the phone will reassemble
        - Data is returned in packets (as specified below) to allow arbitrary file sizes
        - DE1 will wait to send another packet until the phone responds with 1 (aka. OK)

- DE1 settings configuration
    5. Set wifi configuration
        - Used to allow the phone to change the wifi configuration on the DE1
    6. Set DE1 master password
        - Used to allow the phone to set the DE1 master password

General Notes:
- Data message JSON objects will be transferred between the DE1 and phone in fragments of 16 bytes (14 data bytes + "\r\n") due to a DE1 bluetooth size limitation
- End of message (all fragments) will be terminated with a "\v\n" instead of "\r\n"

Message Specification:

General Fragment Received Response

```
{
        "status": {2 fragment received, 3 fragment error}
}
```

Generate and display HEX code

Request

```
{
        "type": 1
}
```

Response

```
{
        "status": {1 for successfully executed, 0 error executing, 9 password/wifi not set up}
}
```

Verify DE1 master password and HEX code

Request (multiple fragments)

```
{
        "type": 2,
        "password": {string},
        "hex": {string}
}
```

Response

```
{
        "status": {1 for successfully executed, 0 error executing, 9 password/wifi not set up}
}
```

Upload new file data

Requests (can be multiple as the data is uploaded in blobs, each separated by a response)

```
{
        "type": 3,
        "fileId": {uuid},
        "packetNumber": {int},
        "totalPackets": {int},
        "location": {latitude + "|" + longitude + "|" + altitude} (ex. "37.422|-122.084|5.285"),
        "fileData": {binary blob},
}
```

Response (multiple fragments)

```
{
```

```
        "status": {1 for successful else 0 : type int},
        "localEncryptionComponent": {some value}
}
```

Download existing file data

<u>Initial phone request</u>

```
{
        "type": 4,
        "localEncryptionComponent": {string},
        "fileId": {uuid}
        "location": {latitude + "|" + longitude + "|" + altitude} (ex. "37.422|-122.084|5.285")
}
```

<u>DE1 responses</u>

```
{
        "packetNumber": {int},
        "totalPackets": {int},
        "fileData": {binary blob}
}
```

<u>Phone responses to received packets</u>

```
{
        "status": {1 for successful else 0 : type int}
}
```

Set wifi configuration

<u>Request</u>

```
{
        "type": 6,
        "networkName": {string},
        "networkPassword": {string}
}
```

<u>Response</u>

```
{
        "status": {1 for successful else 0 : type int}
}
```

Set DE1 master password

<u>Request</u>

```
{
        "type": 7,
        "password": {string}
}
```

Response
```
{
        "status": {1 for successful else 0 : type int}
}
```