BLE Connection Details V1

Advertising Data

The device uses `ADV_IND` and `ADV_SCAN_IND` containing the following data:

- **Flags** with **General Discovery** and **BR/EDR Not Supported** flags set.
- **Local Name** which is a max length of 20 characters and for sOPEP has a default value of `sOPEP-WXYZ` where `WXYZ` are the hex encoded value of the 16 least significant bits of the **Device Serial Number**. For example if the **Device Serial Number** is `0x0123456789ABCDEF` , then the default **Local Name** would be `sOPEP-CDEF`.
- **Tx Power Level**.
- **128 Bit Service UUID** for the prinary service of the device. Each device class (e.g sOPEP, sVHC, sMESH, ...) will have a different primary service UUID. See Bluetooth LE Communication Protocol V3 for details on protocol used on the primary serivice used by sOPEP.
- **Manufacturer Data** with company ID of `0xffff` and data of length 8 containing the binary encoded 64 bit **Device Serial Number** in little endian byte order. E.g. if device serial number is `0x0123456789ABCDEF` then the manufacturer data will be `0xEF, 0xCD, 0xAB, 0x89, 0x67, 0x45, 0x23, 0x01`.

> NOTE: The primary service supports a single characteristic which is configured to support `WriteWithoutResponse` and `Notify`.
>
> NOTE: The 'split' of items between `ADV_IND` and `ADV_SCAN_IND` is TBD.

Advertising Interval

When the device is not connected to a phone, then the device will advertise periodically unless:

- The device is in travel mode.
- The device is in ship mode.
- The device battery charge state is too low.
- The device is in an active treatment session.

Upon exiting the above modes and returning to *idle mode*, the device will advertise at 20ms intervals for 30 seconds. If the device does not receive a connection request from a phone within 30s it will continue advertising at 417.5ms intervals until one of the above modes is entered.

> NOTE: If the device resets it behaves as though exited to *idle mode*.

Connection Parameters

After connecting to a phone, each time the status of queued data changes from pending to empty, or empty to pending, the device will initiate a L2CAP Connection Paraamter Update Request with the following details. :

- **Interval Min** of 15ms if there is queued data pending, otherwise 150ms
- **Intercal Max** of 15ms if there is queued data pending, otherwise 165ms
- **Peripheral Latency** of 4 connection intervals

- **Supervision Timeout** of 2.5s

Support for Optional Features of Bluetooth Low Energy

The device supports the following optional features of Bluetooth Low Energy:

- Data Packet Length Extension
- 2Mbps PHY
- LE Privacy
    - The device uses a differnt Random Device Address each new advertising packet.
    - The device is able to resolve a Resolvable Private Address in all situations.

Other Services

In addition to the device's primary service, the device supports the following services:

- **Generic Access Profile**
    - **Device Name** (max 20 characters) - read/write supported.
- **Generic Attibute Profile**
- **Device Information Service** with the following characteristcs:
    - **Manufacturer Name String** (26 characters max length) - read supported.
    - **Model Number String** (26 characters max length) - read supported.
    - **Firmware Revision String** (26 characters max length) - read supported.
    - **Software Revision String** (26 characters max length) - read supported.

Permissions

The device reports the following permissions flags for the primary service's single characteristic:

- Read | Write | Read Encrypt | Write Encrypt | Read Authenticate | Write Authenicate

The other service charactersitics will only have Read or Write (as appropraite for the characeterics use) permissions set. I.e. Encrypt/Autenticate permissions will not be set.

The device indicates that its IO Capability is **No Input/No Output**.

If a pairing/bonding procedure is initiated then the device will indicate to the user that a pair/bonding request is pending using the LEDs. It will then wait for the user to press the button on the device to accept the request, or timeout to reject the request.

There is enough space on the device for storing 5 pairing keys simultaineouly. Once 5 pairings have occured the 6th pairing will randomly replace one of the existing keys with the new keys. If the user performs a **Hard Reset** action on the device, all existing keys will be removed.

Phone Application Considerations

The phone application will need to implement the following:

- UI to allow the user to accept/reject the use of Bluetooth and associated Bluetooth backgound services.
- UI to allow the user to search for new devices and initiate connections to those devices.
- UI to allow changing the **Device Name**.

- Support connections to multiple devices simultaineously.
- Maintaining connections to all devices that are withing range using platform backgrounnd services to allow automatic re-connect to those devices and continue transfering any queued data in the background.
- Dealing with devices that have removed the pairing keys associated with the phone. This may require removing the pairing keys on the phoen for the associated device or informing the user that they should "forget" the device and then "re-pair/bond" with the device.