Introduction

~~As we know, the Bluetooth would be invalid after a long sleep or hard restart. Because there're no driver for Intel Bluetooth in macOS, the Bluetooth hardware is not able to receive firmware from Hack. As a result, you need to warm restart from Windows to get Bluetooth run. There're three ways to get a better BT experience:~~

Thanks to zxystd for providing IntelBluetoothFirmware, which let the native Intel Bluetooth work. However, the current Intel BT driver may cause sleep problems and does not support some Bluetooth devices. Here are some suggestions for better BT experience:

- **Insert a USB Bluetooth / Disable the original one**
- **Solder D+ and D- wires to the WLAN_LTE slot**
- **Solder D+ and D- wires to the fingerprint slot**
- **Use VM to upload Bluetooth firmware**

Insert a USB Bluetooth / Disable the original one

- Buy and insert a supported BT dongle model from BrcmPatchRAM README

- **For Clover users:**

  - Replace /CLOVER/ACPI/patched/SSDT-USB.aml with SSDT-USB-USBBT.aml
  - Delete `IntelBluetoothFirmware.kext` and `IntelBluetoothInjector.kext` in /CLOVER/kexts/Other/
    * These steps are for disabling the internal Bluetooth
  - Download and add `BrcmPatchRAM3.kext`, `BrcmBluetoothInjector.kext`, and `BrcmFirmwareData.kext` to /CLOVER/kexts/Other/
  - Rebuild kextcache and restart

- **For OC users:**

  - Add SSDT-USB-USBBT.aml to `/OC/ACPI/`
  - Download and add `BrcmBluetoothInjector.kext`, `BrcmFirmwareData.kext`, and `BrcmPatchRAM3.kext` to `/OC/Kexts/` **(Don't need to do this step if you just want to disable the embedded Intel Bluetooth)**
  - Open `/OC/config.plist`, find the following code:

```
<dict>
<key>Comment</key>
<string>USB power injection and customization(Native Bluetooth)</string>
<key>Enabled</key>
<true/>
<key>Path</key>
<string>SSDT-USB.aml</string>
</dict>
```

  Replace with:

```
<dict>
<key>Comment</key>
<string>USB power injection and customization(Native Bluetooth)</string>
<key>Enabled</key>
<false/>
<key>Path</key>
<string>SSDT-USB.aml</string>
</dict>
```

  And then find the following code:

```
<dict>
<key>Comment</key>
<string>USB power injection and customization(Disable native Bluetooth)</string>
<key>Enabled</key>
<false/>
<key>Path</key>
<string>SSDT-USB-USBBT.aml</string>
</dict>
```

Replace with:

```
<dict>
<key>Comment</key>
<string>USB power injection and customization(Disable native Bluetooth)</string>
<key>Enabled</key>
<true/>
<key>Path</key>
<string>SSDT-USB-USBBT.aml</string>
</dict>
```

Don't forget to disable Intel Bluetooth kexts, find the following code:

```
<dict>
<key>BundlePath</key>
<string>IntelBluetoothFirmware.kext</string>
<key>Comment</key>
<string>Bluetooth</string>
<key>Enabled</key>
<true/>
<key>ExecutablePath</key>
<string>Contents/MacOS/IntelBluetoothFirmware</string>
<key>MaxKernel</key>
<string></string>
<key>MinKernel</key>
<string></string>
<key>PlistPath</key>
<string>Contents/Info.plist</string>
</dict>
<dict>
<key>BundlePath</key>
<string>IntelBluetoothInjector.kext</string>
<key>Comment</key>
<string>Bluetooth</string>
<key>Enabled</key>
<true/>
<key>ExecutablePath</key>
<string></string>
<key>MaxKernel</key>
<string></string>
<key>MinKernel</key>
<string></string>
<key>PlistPath</key>
<string>Contents/Info.plist</string>
</dict>
```

Change to:

```
<dict>
<key>BundlePath</key>
<string>IntelBluetoothFirmware.kext</string>
<key>Comment</key>
<string>Bluetooth</string>
<key>Enabled</key>
<false/>
<key>ExecutablePath</key>
<string>Contents/MacOS/IntelBluetoothFirmware</string>
<key>MaxKernel</key>
<string></string>
<key>MinKernel</key>
<string></string>
<key>PlistPath</key>
<string>Contents/Info.plist</string>
</dict>
<dict>
<key>BundlePath</key>
<string>IntelBluetoothInjector.kext</string>
<key>Comment</key>
<string>Bluetooth</string>
<key>Enabled</key>
<false/>
<key>ExecutablePath</key>
<string></string>
<key>MaxKernel</key>
<string></string>
<key>MinKernel</key>
<string></string>
<key>PlistPath</key>
<string>Contents/Info.plist</string>
</dict>
```

Also, add these code into `Kernel - Add` section: **(Don't need to do this step if you just want to disable the embedded Intel Bluetooth)**

```
<dict>
<key>BundlePath</key>
<string>BrcmBluetoothInjector.kext</string>
<key>Comment</key>
<string></string>
<key>Enabled</key>
<true/>
<key>ExecutablePath</key>
<string></string>
<key>MaxKernel</key>
<string></string>
<key>MinKernel</key>
<string></string>
<key>PlistPath</key>
<string>Contents/Info.plist</string>
</dict>
<dict>
<key>BundlePath</key>
```

```
<string>BrcmFirmwareData.kext</string>
<key>Comment</key>
<string></string>
<key>Enabled</key>
<true/>
<key>ExecutablePath</key>
<string>Contents/MacOS/BrcmFirmwareData</string>
<key>MaxKernel</key>
<string></string>
<key>MinKernel</key>
<string></string>
<key>PlistPath</key>
<string>Contents/Info.plist</string>
</dict>
<dict>
<key>BundlePath</key>
<string>BrcmPatchRAM3.kext</string>
<key>Comment</key>
<string></string>
<key>Enabled</key>
<true/>
<key>ExecutablePath</key>
<string>Contents/MacOS/BrcmPatchRAM3</string>
<key>MaxKernel</key>
<string></string>
<key>MinKernel</key>
<string></string>
<key>PlistPath</key>
<string>Contents/Info.plist</string>
</dict>
```

Solder D+ and D- wires to the WLAN_LTE slot

- Buy and insert a supported internal wireless card(e.g. BCM943602CS) in M.2 slot

- Carefully solder D+ and D- wires to the WLAN_LTE slot as #7

- Go to Windows, run `Device Manager` to check whether the soldering is success or not

- **For Clover users:**
    - If success, replace `/CLOVER/ACPI/patched/SSDT-USB.aml` with SSDT-USB-WLAN_LTEBT.aml
    - Delete `IntelBluetoothFirmware.kext` and `IntelBluetoothInjector.kext` in `/CLOVER/kexts/Other/`

- **For OC users:**
    - Add SSDT-USB-WLAN_LTEBT.aml to `/OC/ACPI/`
    - Open `/OC/config.plist`, find the following code:

```
<dict>
<key>Comment</key>
<string>USB power injection and customization(Native Bluetooth)</string>
<key>Enabled</key>
<true/>
<key>Path</key>
```

```
<string>SSDT-USB.aml</string>
</dict>
```

Replace with:

```
<dict>
<key>Comment</key>
<string>USB power injection and customization(Native Bluetooth)</string>
<key>Enabled</key>
<false/>
<key>Path</key>
<string>SSDT-USB.aml</string>
</dict>
```

And then find the following code:

```
<dict>
<key>Comment</key>
<string>USB power injection and customization(WLAN_LTE Bluetooth)</string>
<key>Enabled</key>
<false/>
<key>Path</key>
<string>SSDT-USB-WLAN_LTEBT.aml</string>
</dict>
```

Replace with:

```
<dict>
<key>Comment</key>
<string>USB power injection and customization(WLAN_LTE Bluetooth)</string>
<key>Enabled</key>
<true/>
<key>Path</key>
<string>SSDT-USB-WLAN_LTEBT.aml</string>
</dict>
```

Don't forget to disable Intel Bluetooth kexts, find the following code:

```
<dict>
<key>BundlePath</key>
<string>IntelBluetoothFirmware.kext</string>
<key>Comment</key>
<string>Bluetooth</string>
<key>Enabled</key>
<true/>
<key>ExecutablePath</key>
<string>Contents/MacOS/IntelBluetoothFirmware</string>
<key>MaxKernel</key>
<string></string>
<key>MinKernel</key>
<string></string>
<key>PlistPath</key>
<string>Contents/Info.plist</string>
</dict>
<dict>
<key>BundlePath</key>
<string>IntelBluetoothInjector.kext</string>
```

```
<key>Comment</key>
<string>Bluetooth</string>
<key>Enabled</key>
<true/>
<key>ExecutablePath</key>
<string></string>
<key>MaxKernel</key>
<string></string>
<key>MinKernel</key>
<string></string>
<key>PlistPath</key>
<string>Contents/Info.plist</string>
</dict>
```

Change to:

```
<dict>
<key>BundlePath</key>
<string>IntelBluetoothFirmware.kext</string>
<key>Comment</key>
<string>Bluetooth</string>
<key>Enabled</key>
<false/>
<key>ExecutablePath</key>
<string>Contents/MacOS/IntelBluetoothFirmware</string>
<key>MaxKernel</key>
<string></string>
<key>MinKernel</key>
<string></string>
<key>PlistPath</key>
<string>Contents/Info.plist</string>
</dict>
<dict>
<key>BundlePath</key>
<string>IntelBluetoothInjector.kext</string>
<key>Comment</key>
<string>Bluetooth</string>
<key>Enabled</key>
<false/>
<key>ExecutablePath</key>
<string></string>
<key>MaxKernel</key>
<string></string>
<key>MinKernel</key>
<string></string>
<key>PlistPath</key>
<string>Contents/Info.plist</string>
</dict>
```

Solder D+ and D- wires to the fingerprint slot

- Buy and insert a supported internal wireless card(e.g. BCM943602CS) in M.2 slot
- Carefully solder D+ and D- wires to the fingerprint slot as #246

- Go to Windows, run `Device Manager` to check whether the soldering is success or not

- **For Clover users:**
  - If success, replace /CLOVER/ACPI/patched/SSDT-USB.aml with SSDT-USB-FingerBT.aml
  - Delete `IntelBluetoothFirmware.kext` and `IntelBluetoothInjector.kext` in /CLOVER/kexts/Other/

- **For OC users:**
  - Add SSDT-USB-FingerBT.aml to `/OC/ACPI/`
  - Open `/OC/config.plist`, find the following code:

```
<dict>
<key>Comment</key>
<string>USB power injection and customization(Native Bluetooth)</string>
<key>Enabled</key>
<true/>
<key>Path</key>
<string>SSDT-USB.aml</string>
</dict>
```

Replace with:

```
<dict>
<key>Comment</key>
<string>USB power injection and customization(Native Bluetooth)</string>
<key>Enabled</key>
<false/>
<key>Path</key>
<string>SSDT-USB.aml</string>
</dict>
```

And then find the following code (If you can't find it, please add manually):

```
<dict>
<key>Comment</key>
<string>USB power injection and customization(Fingerprint Bluetooth)</string>
<key>Enabled</key>
<false/>
<key>Path</key>
<string>SSDT-USB-FingerBT.aml</string>
</dict>
```

Replace with:

```
<dict>
<key>Comment</key>
<string>USB power injection and customization(Fingerprint Bluetooth)</string>
<key>Enabled</key>
<true/>
<key>Path</key>
<string>SSDT-USB-FingerBT.aml</string>
</dict>
```

Don't forget to disable Intel Bluetooth kexts, find the following code:

```
<dict>
<key>BundlePath</key>
<string>IntelBluetoothFirmware.kext</string>
<key>Comment</key>
```

```
<string>Bluetooth</string>
<key>Enabled</key>
<true/>
<key>ExecutablePath</key>
<string>Contents/MacOS/IntelBluetoothFirmware</string>
<key>MaxKernel</key>
<string></string>
<key>MinKernel</key>
<string></string>
<key>PlistPath</key>
<string>Contents/Info.plist</string>
</dict>
<dict>
<key>BundlePath</key>
<string>IntelBluetoothInjector.kext</string>
<key>Comment</key>
<string>Bluetooth</string>
<key>Enabled</key>
<true/>
<key>ExecutablePath</key>
<string></string>
<key>MaxKernel</key>
<string></string>
<key>MinKernel</key>
<string></string>
<key>PlistPath</key>
<string>Contents/Info.plist</string>
</dict>
```

Change to:

```
<dict>
<key>BundlePath</key>
<string>IntelBluetoothFirmware.kext</string>
<key>Comment</key>
<string>Bluetooth</string>
<key>Enabled</key>
<false/>
<key>ExecutablePath</key>
<string>Contents/MacOS/IntelBluetoothFirmware</string>
<key>MaxKernel</key>
<string></string>
<key>MinKernel</key>
<string></string>
<key>PlistPath</key>
<string>Contents/Info.plist</string>
</dict>
<dict>
<key>BundlePath</key>
<string>IntelBluetoothInjector.kext</string>
<key>Comment</key>
<string>Bluetooth</string>
<key>Enabled</key>
<false/>
```

```
<key>ExecutablePath</key>
<string></string>
<key>MaxKernel</key>
<string></string>
<key>MinKernel</key>
<string></string>
<key>PlistPath</key>
<string>Contents/Info.plist</string>
</dict>
```

Use VM to upload Bluetooth firmware

- Read #262