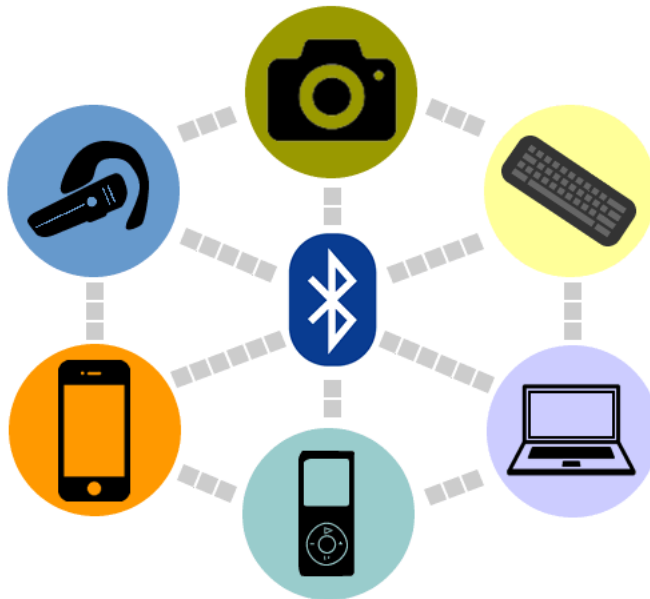# Programación Bluetooth en Java

Cristina Díaz García

Noviembre 2018

Índice

1. DISPOSITIVO DE COMUNICACIÓN BLUE-TOOTH

1.1. Ex1LocalInfo.java

Usando los métodos *getLocalDevice* y *getProperty* de la clase LocalDevice obtenemos una clase LocaDevice y las propiedades, respectivamente. Usando los métodos *getBluetoothAddress* y *getFriendlyName* mostramos la dirección bluetooth y el nombre (*friendly name*).

```
BlueCove version 2.1.0 on bluez
ACE0107D41AC
ladynightmare-E5-522-4154
null
BlueCove stack shutdown completed
```

2. DESCUBRIMIENTO DE DISPOSITIVOS RE-MOTOS

2.1. Ex2DiscoverNearDevices.java

Haciendo uso de un *listener*, hacemos una búsqueda de los dispositivos bluetooth visibles de alrededor, los guardamos en un vector e imprimimos su dirección bluetooh, y si fuera posible, su *friendly name*.

```
BlueCove version 2.1.0 on bluez
Wait for device inquiry to complete...
Device 501712219A99 found
     name Mpow Flame
Device Inquiry completed!
1 device(s) found
BlueCove stack shutdown completed
```

2.2. Ex3DiscoverKnownDevice.java

Haciendo uso de un *listener*, hacemos una búsqueda de los dispositivos bluetooth restringiéndola, ya sea a una dirección bluetooth o a un *friendly name* concretos, los guardamos en un vector si los encontraramos e imprimimos su dirección bluetooh, y si fuera posible, su *friendly name*.

```
BlueCove version 2.1.0 on bluez
Wait for device inquiry to complete...
Device 501712219A99 found with Mpow Flame as name
Device Inquiry completed!
1 device(s) found
BlueCove stack shutdown completed
```

3. DESCUBRIMIENTO DE SERVICIOS

3.1. Ex4ServicesKnownDevice.java

Primero hacemos una llamada a la clase *Ex3DiscoverKnownDevice.java* previamente creada, para así encontrar solo el dispositivo deseado, y entonces guardamos su dirección bluetooh, para después, usando el método *searchServices* de la clase *DiscoveryAgent* buscar los servicios del dispositivo que habíamos guardado.

```
BlueCove version 2.1.0 on bluez
Wait for device inquiry to complete...
Device 94652DD5496F found with OnePlus 5T as name
Device Inquiry completed!
1 device(s) found
search services on 94652DD5496F OnePlus 5T
service found btl2cap://94652DD5496F:001f;authenticate=false;encrypt=false;master=false
service found btl2cap://94652DD5496F:001f;authenticate=false;encrypt=false;master=false
service Headset Gateway found btspp://94652DD5496F:2;authenticate=false;encrypt=false;master=false
service Handsfree Gateway found btspp://94652DD5496F:3;authenticate=false;encrypt=false;master=false
service AV Remote Control Target found btl2cap://94652DD5496F:0017;authenticate=false;encrypt=false;master=false
service Advanced Audio found btl2cap://94652DD5496F:0019;authenticate=false;encrypt=false;master=false
service found btl2cap://94652DD5496F:0017;authenticate=false;encrypt=false;master=false
service Android Network Access Point found btl2cap://94652DD5496F:000f;authenticate=false;encrypt=false;master=false
service Android Network User found btl2cap://94652DD5496F:000f;authenticate=false;encrypt=false;master=false
service SMS/MMS found btgoep://94652DD5496F:4;authenticate=false;encrypt=false;master=false
service OBEX Phonebook Access Server found btgoep://94652DD5496F:5;authenticate=false;encrypt=false;master=false
service SIM Access found btspp://94652DD5496F:6;authenticate=false;encrypt=false;master=false
service OBEX Object Push found btgoep://94652DD5496F:7;authenticate=false;encrypt=false;master=false
service OBEX File Transfer found btgoep://94652DD5496F:20;authenticate=false;encrypt=false;master=false
service Dial up Networking found btspp://94652DD5496F:25;authenticate=false;encrypt=false;master=false
service search completed!
BlueCove stack shutdown completed
```

3.2. Ex5ServicesNearDevices.java

Primero hacemos una llamada a la clase *Ex2DiscoverNearDevices.java* previamente creada, para así encontrar todos los dispositivos cercanos, y entonces guardamos sus direcciones bluetooh, para después, usando el método *searchServices* de la clase *DiscoveryAgent* recorrer el vector en el que habíamos guardado las direcciones buscando los servicios.

```
Wait for device inquiry to complete...
Device 94652DD5496F found
     name OnePlus 5T
Device 8035C1347B0D found
     name Redmi
Device Inquiry completed!
2 device(s) found
search services on 94652DD5496F name OnePlus 5T
service OBEX Object Push found btgoep://94652DD5496F:7;authenticate=false;encrypt=false;master=false
service search completed!
search services on 8035C1347B0D name Redmi
service OBEX Object Push found btgoep://8035C1347B0D:4;authenticate=false;encrypt=false;master=false
service search completed!
BlueCove stack shutdown completed
```

3.3. Ex6PublicServicesNearDevices.java

Primero hacemos una llamada a la clase *Ex2DiscoverNearDevices.java* previamente creada, para así encontrar todos los dispositivos cercanos, y entonces guardamos sus direcciones bluetooh, para después, usando el método *searchServices* de la clase *DiscoveryAgent* recorrer el vector en el que habíamos guardado las direcciones buscando los servicios públicos.

```
BlueCove version 2.1.0 on bluez
Wait for device inquiry to complete...
Device 94652DD5496F found
     name OnePlus 5T
Device 8035C1347B0D found
     name Redmi
Device Inquiry completed!
2 device(s) found
search services on 94652DD5496F
service found btl2cap://94652DD5496F:001f;authenticate=false;encrypt=false;master=false
service found btl2cap://94652DD5496F:001f;authenticate=false;encrypt=false;master=false
service Headset Gateway found btspp://94652DD5496F:2;authenticate=false;encrypt=false;master=false
service Handsfree Gateway found btspp://94652DD5496F:3;authenticate=false;encrypt=false;master=false
service AV Remote Control Target found btl2cap://94652DD5496F:0017;authenticate=false;encrypt=false;master=false
service Advanced Audio found btl2cap://94652DD5496F:0019;authenticate=false;encrypt=false;master=false
service found btl2cap://94652DD5496F:0017;authenticate=false;encrypt=false;master=false
service Android Network Access Point found btl2cap://94652DD5496F:000f;authenticate=false;encrypt=false;master=false
service Android Network User found btl2cap://94652DD5496F:000f;authenticate=false;encrypt=false;master=false
service SMS/MMS found btgoep://94652DD5496F:4;authenticate=false;encrypt=false;master=false
service OBEX Phonebook Access Server found btgoep://94652DD5496F:5;authenticate=false;encrypt=false;master=false
service SIM Access found btspp://94652DD5496F:6;authenticate=false;encrypt=false;master=false
service OBEX Object Push found btgoep://94652DD5496F:7;authenticate=false;encrypt=false;master=false
service OBEX File Transfer found btgoep://94652DD5496F:20;authenticate=false;encrypt=false;master=false
service Dial up Networking found btspp://94652DD5496F:25;authenticate=false;encrypt=false;master=false
service search completed!
search services on 8035C1347B0D
service found btl2cap://8035C1347B0D:001f;authenticate=false;encrypt=false;master=false
service found btl2cap://8035C1347B0D:001f;authenticate=false;encrypt=false;master=false
service Headset Gateway found btspp://8035C1347B0D:2;authenticate=false;encrypt=false;master=false
service Handsfree Gateway found btspp://8035C1347B0D:3;authenticate=false;encrypt=false;master=false
service AV Remote Control Target found btl2cap://8035C1347B0D:0017;authenticate=false;encrypt=false;master=false
service Advanced Audio found btl2cap://8035C1347B0D:0019;authenticate=false;encrypt=false;master=false
service found btl2cap://8035C1347B0D:0017;authenticate=false;encrypt=false;master=false
service Android Network Access Point found btl2cap://8035C1347B0D:000f;authenticate=false;encrypt=false;master=false
service Android Network User found btl2cap://8035C1347B0D:000f;authenticate=false;encrypt=false;master=false
service SIM Access found btspp://8035C1347B0D:5;authenticate=false;encrypt=false;master=false
service OBEX Object Push found btgoep://8035C1347B0D:4;authenticate=false;encrypt=false;master=false
service OBEX Phonebook Access Server found btgoep://8035C1347B0D:6;authenticate=false;encrypt=false;master=false
service SMS/MMS found btgoep://8035C1347B0D:7;authenticate=false;encrypt=false;master=false
service Spotify found btspp://8035C1347B0D:8;authenticate=false;encrypt=false;master=false
service Spotify found btspp://8035C1347B0D:9;authenticate=false;encrypt=false;master=false
service search completed!
BlueCove stack shutdown completed
```

3.4. Ex7DeviceAndService.java

Primero hacemos una llamada a la clase *Ex3DiscoverKnownDevice.java* previamente creada, para así encontrar solo el dispositivo deseado, y entonces guardamos su dirección bluetooh, para después, usando el método *searchServices* de

la clase *DiscoveryAgent* buscar el servicio deseado del dispositivo que habíamos guardado.

```
BlueCove version 2.1.0 on bluez
Wait for device inquiry to complete...
Device 94652DD5496F found with OnePlus 5T as name
Device Inquiry completed!
1 device(s) found
search services on 94652DD5496F OnePlus 5T
service found btl2cap://94652DD5496F:001f;authenticate=false;encrypt=false;master=false
service found btl2cap://94652DD5496F:001f;authenticate=false;encrypt=false;master=false
service found btspp://94652DD5496F:2;authenticate=false;encrypt=false;master=false
service found btspp://94652DD5496F:3;authenticate=false;encrypt=false;master=false
service AV Remote Control Target found btl2cap://94652DD5496F:0017;authenticate=false;encrypt=false;master=false
service found btl2cap://94652DD5496F:0019;authenticate=false;encrypt=false;master=false
service found btl2cap://94652DD5496F:0017;authenticate=false;encrypt=false;master=false
service found btl2cap://94652DD5496F:000f;authenticate=false;encrypt=false;master=false
service found btl2cap://94652DD5496F:000f;authenticate=false;encrypt=false;master=false
service found btgoep://94652DD5496F:4;authenticate=false;encrypt=false;master=false
service found btgoep://94652DD5496F:5;authenticate=false;encrypt=false;master=false
service found btspp://94652DD5496F:6;authenticate=false;encrypt=false;master=false
service found btgoep://94652DD5496F:7;authenticate=false;encrypt=false;master=false
service found btgoep://94652DD5496F:20;authenticate=false;encrypt=false;master=false
service found btspp://94652DD5496F:25;authenticate=false;encrypt=false;master=false
service search completed!
BlueCove stack shutdown completed
```

4. COMUNICACIÓN A TRAVÉS DE RFCOMM DE BLUETOOTH

4.1. Aplicación Cliente-Servidor

Debido a problemas de compatibilidad con mi sistema operativo (Ubuntu Budgie) y las librerías, en mi ordenador da el fallo de la captura adjunta, pero he probado mi código en el ordenador de un compañero y funciona.

```
Setting up bluetooth emulator ...
javax.bluetooth.BluetoothStateException: BlueCove native library version mismatch
        at com.intel.bluetooth.BlueCoveImpl.detectStack(BlueCoveImpl.java:454)
        at com.intel.bluetooth.BlueCoveImpl.access$500(BlueCoveImpl.java:65)
        at com.intel.bluetooth.BlueCoveImpl$1.run(BlueCoveImpl.java:1020)
        at java.security.AccessController.doPrivileged(Native Method)
        at com.intel.bluetooth.BlueCoveImpl.detectStackPrivileged(BlueCoveImpl.java:1018)
        at com.intel.bluetooth.BlueCoveImpl.getBluetoothStack(BlueCoveImpl.java:1011)
        at com.intel.bluetooth.BlueCoveImpl$BluetoothStackHolder.getBluetoothStack(BlueCoveImpl.java:180)
        at com.intel.bluetooth.BlueCoveImpl$BluetoothStackHolder.access$300(BlueCoveImpl.java:173)
        at com.intel.bluetooth.BlueCoveImpl.getThreadBluetoothStackID(BlueCoveImpl.java:611)
        at com.intel.bluetooth.EmulatorTestsHelper.useThreadLocalEmulator(EmulatorTestsHelper.java:91)
        at com.intel.bluetooth.EmulatorTestsHelper.useThreadLocalEmulator(EmulatorTestsHelper.java:66)
        at EmulatorChatServer.setUp(EmulatorChatServer.java:42)
        at EmulatorChatServer.main(EmulatorChatServer.java:238)
```