Bluetooth BLE Lab2 Report

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1. iPhone supports BLE but Android Mi does not, so we used conventional Bluetooth instead.
2. Code for raspberry pi

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# From  keithweaver/bluetooth-raspberry-pi-communication.py

import bluetooth

def receiveMessages():
    server_sock=bluetooth.BluetoothSocket( bluetooth.RFCOMM )

    port = 1
    server_sock.bind(("",port))
    server_sock.listen(1)

    client_sock,address = server_sock.accept()
    print "Accepted connection from " + str(address)

    data = client_sock.recv(1024)
    print "received [%s]" % data

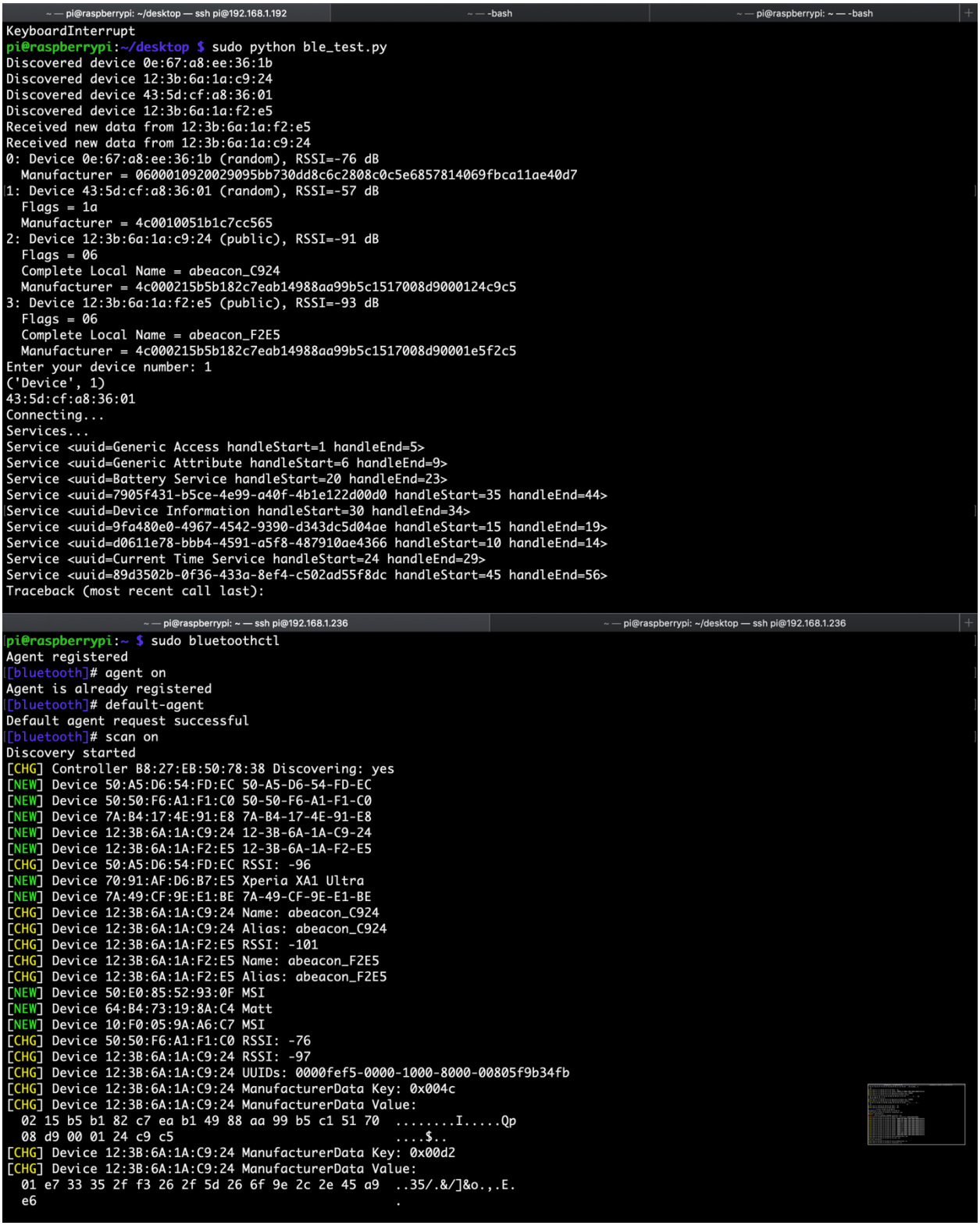
    client_sock.close()
    server_sock.close()

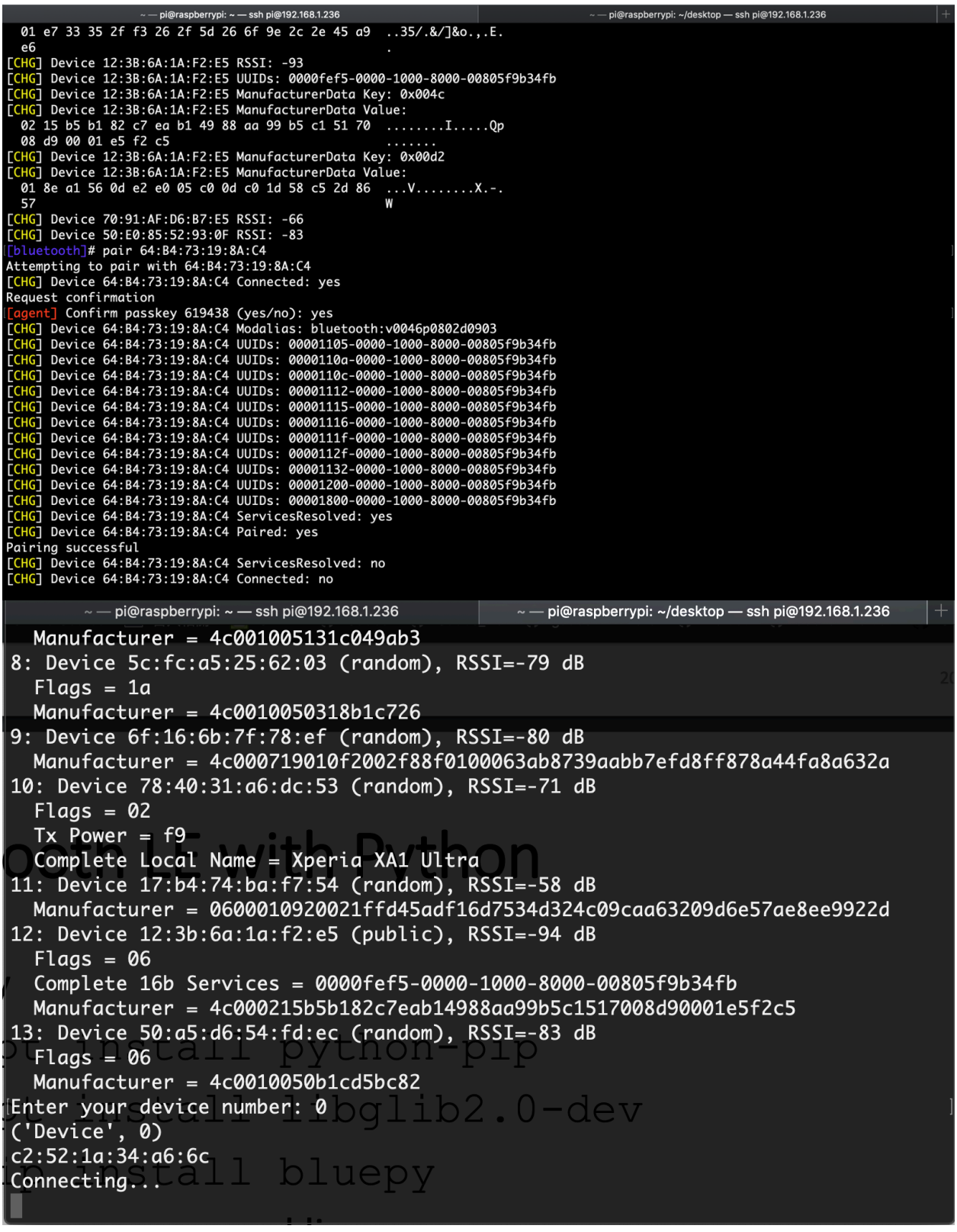
def sendMessageTo(targetBluetoothMacAddress):
    port = 1
    sock=bluetooth.BluetoothSocket( bluetooth.RFCOMM )
    sock.connect((targetBluetoothMacAddress, port))
    sock.send("Message sent!!")
    sock.close()

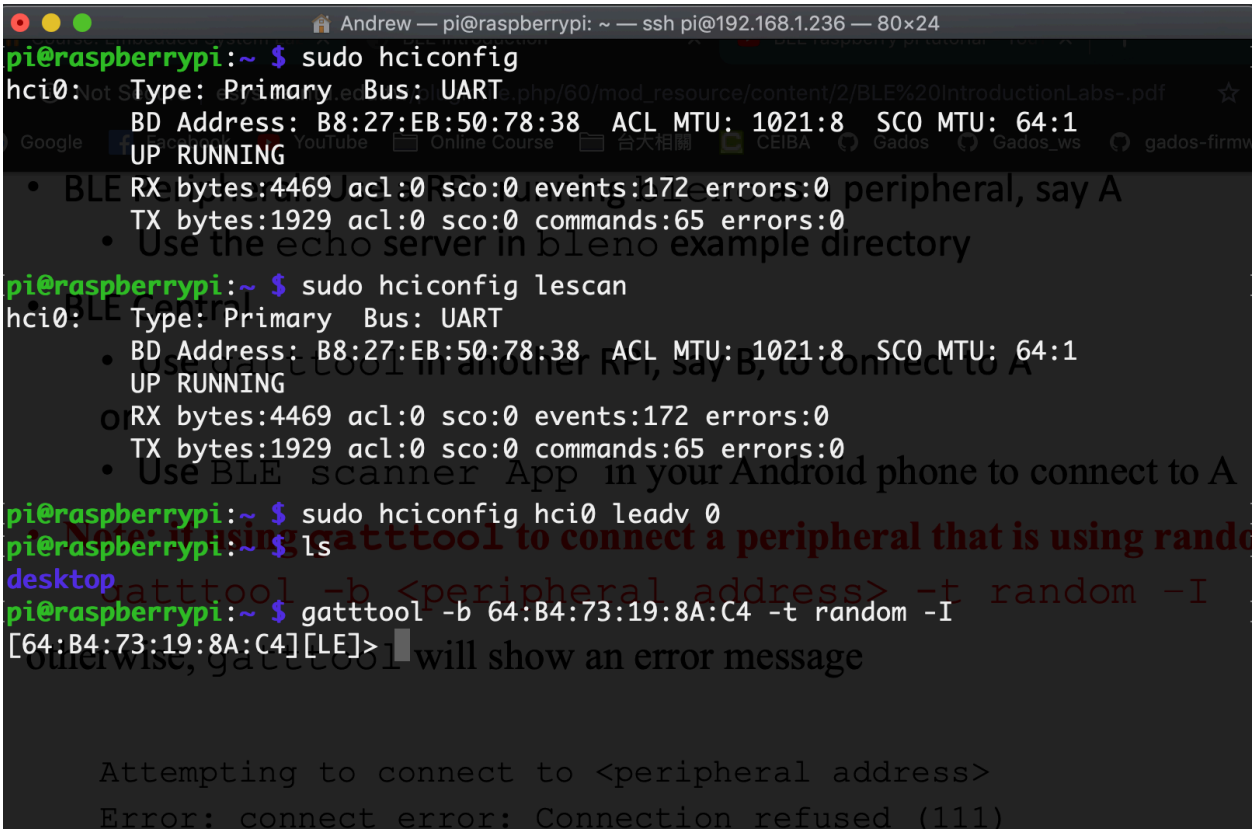
def lookUpNearbyBluetoothDevices():
    nearby_devices = bluetooth.discover_devices()
    for bdaddr in nearby_devices:
        print str(bluetooth.lookup_name( bdaddr )) + " [" + str(bdaddr) + "]"


lookUpNearbyBluetoothDevices()
```

3.Pictures


~ — pi@raspberrypi: ~/desktop — ssh pi@192.168.1.192
~ — -bash
~ — pi@raspberrypi: ~ — -bash
KeyboardInterrupt
pi@raspberrypi:~/desktop $ sudo python ble_test.py
Discovered device 0e:67:a8:ee:36:1b
Discovered device 12:3b:6a:1a:c9:24
Discovered device 43:5d:cf:a8:36:01
Discovered device 12:3b:6a:1a:f2:e5
Received new data from 12:3b:6a:1a:f2:e5
Received new data from 12:3b:6a:1a:c9:24
0: Device 0e:67:a8:ee:36:1b (random), RSSI=-76 dB
Manufacturer = 0600010920029095bb730dd8c6c2808c0c5e6857814069fbca11ae40d7
1: Device 43:5d:cf:a8:36:01 (random), RSSI=-57 dB
Flags = 1a
Manufacturer = 4c0010051b1c7cc565
2: Device 12:3b:6a:1a:c9:24 (public), RSSI=-91 dB
Flags = 06
Complete Local Name = abeacon_C924
Manufacturer = 4c000215b5b182c7eab14988aa99b5c1517008d9000124c9c5
3: Device 12:3b:6a:1a:f2:e5 (public), RSSI=-93 dB
Flags = 06
Complete Local Name = abeacon_F2E5
Manufacturer = 4c000215b5b182c7eab14988aa99b5c1517008d90001e5f2c5
Enter your device number: 1
('Device', 1)
43:5d:cf:a8:36:01
Connecting...
Services...
Service <uuid=Generic Access handleStart=1 handleEnd=5>
Service <uuid=Generic Attribute handleStart=6 handleEnd=9>
Service <uuid=Battery Service handleStart=20 handleEnd=23>
Service <uuid=7905f431-b5ce-4e99-a40f-4b1e122d00d0 handleStart=35 handleEnd=44>
Service <uuid=Device Information handleStart=30 handleEnd=34>
Service <uuid=9fa480e0-4967-4542-9390-d343dc5d04ae handleStart=15 handleEnd=19>
Service <uuid=d0611e78-bbb4-4591-a5f8-487910ae4366 handleStart=10 handleEnd=14>
Service <uuid=Current Time Service handleStart=24 handleEnd=29>
Service <uuid=89d3502b-0f36-433a-8ef4-c502ad55f8dc handleStart=45 handleEnd=56>
Traceback (most recent call last):
~ — pi@raspberrypi: ~ — ssh pi@192.168.1.236
~ — pi@raspberrypi: ~/desktop — ssh pi@192.168.1.236
pi@raspberrypi:~ $ sudo bluetoothctl
Agent registered
[bluetooth]# agent on
Agent is already registered
[bluetooth]# default-agent
Default agent request successful
[bluetooth]# scan on
Discovery started
[CHG] Controller B8:27:EB:50:78:38 Discovering: yes
[NEW] Device 50:A5:D6:54:FD:EC 50-A5-D6-54-FD-EC
[NEW] Device 50:50:F6:A1:F1:C0 50-50-F6-A1-F1-C0
[NEW] Device 7A:B4:17:4E:91:E8 7A-B4-17-4E-91-E8
[NEW] Device 12:3B:6A:1A:C9:24 12-3B-6A-1A-C9-24
[NEW] Device 12:3B:6A:1A:F2:E5 12-3B-6A-1A-F2-E5
[CHG] Device 50:A5:D6:54:FD:EC RSSI: -96
[NEW] Device 70:91:AF:D6:B7:E5 Xperia XA1 Ultra
[NEW] Device 7A:49:CF:9E:E1:BE 7A-49-CF-9E-E1-BE
[CHG] Device 12:3B:6A:1A:C9:24 Name: abeacon_C924
[CHG] Device 12:3B:6A:1A:C9:24 Alias: abeacon_C924
[CHG] Device 12:3B:6A:1A:F2:E5 RSSI: -101
[CHG] Device 12:3B:6A:1A:F2:E5 Name: abeacon_F2E5
[CHG] Device 12:3B:6A:1A:F2:E5 Alias: abeacon_F2E5
[NEW] Device 50:E0:85:52:93:0F MSI
[NEW] Device 64:B4:73:19:8A:C4 Matt
[NEW] Device 10:F0:05:9A:A6:C7 MSI
[CHG] Device 50:50:F6:A1:F1:C0 RSSI: -76
[CHG] Device 12:3B:6A:1A:C9:24 RSSI: -97
[CHG] Device 12:3B:6A:1A:C9:24 UUIDs: 0000fef5-0000-1000-8000-00805f9b34fb
[CHG] Device 12:3B:6A:1A:C9:24 ManufacturerData Key: 0x004c
[CHG] Device 12:3B:6A:1A:C9:24 ManufacturerData Value:
02 15 b5 b1 82 c7 ea b1 49 88 aa 99 b5 c1 51 70 ....I.....Qp
08 d9 00 01 24 c9 c5 ....$..
[CHG] Device 12:3B:6A:1A:C9:24 ManufacturerData Key: 0x00d2
[CHG] Device 12:3B:6A:1A:C9:24 ManufacturerData Value:
01 e7 33 35 2f f3 26 2f 5d 26 6f 9e 2c 2e 45 a9 ..35/.&/]&o.,.E.
e6 .


~ — pi@raspberrypi: ~ — ssh pi@192.168.1.236
~ — pi@raspberrypi: ~/desktop — ssh pi@192.168.1.236
01 e7 33 35 2f f3 26 2f 5d 26 6f 9e 2c 2e 45 a9 ..35/.&/]&o.,.E.
e6 .
[CHG] Device 12:3B:6A:1A:F2:E5 RSSI: -93
[CHG] Device 12:3B:6A:1A:F2:E5 UUIDs: 0000fef5-0000-1000-8000-00805f9b34fb
[CHG] Device 12:3B:6A:1A:F2:E5 ManufacturerData Key: 0x004c
[CHG] Device 12:3B:6A:1A:F2:E5 ManufacturerData Value:
02 15 b5 b1 82 c7 ea b1 49 88 aa 99 b5 c1 51 70 ....I.....Qp
08 d9 00 01 e5 f2 c5 ....
[CHG] Device 12:3B:6A:1A:F2:E5 ManufacturerData Key: 0x00d2
[CHG] Device 12:3B:6A:1A:F2:E5 ManufacturerData Value:
01 8e a1 56 0d e2 e0 05 c0 0d c0 1d 58 c5 2d 86 ...V........X.-.
57 W
[CHG] Device 70:91:AF:D6:B7:E5 RSSI: -66
[CHG] Device 50:E0:85:52:93:0F RSSI: -83
[bluetooth]# pair 64:B4:73:19:8A:C4
Attempting to pair with 64:B4:73:19:8A:C4
[CHG] Device 64:B4:73:19:8A:C4 Connected: yes
Request confirmation
[agent] Confirm passkey 619438 (yes/no): yes
[CHG] Device 64:B4:73:19:8A:C4 Modalias: bluetooth:v0046p0802d0903
[CHG] Device 64:B4:73:19:8A:C4 UUIDs: 00001105-0000-1000-8000-00805f9b34fb
[CHG] Device 64:B4:73:19:8A:C4 UUIDs: 0000110a-0000-1000-8000-00805f9b34fb
[CHG] Device 64:B4:73:19:8A:C4 UUIDs: 0000110c-0000-1000-8000-00805f9b34fb
[CHG] Device 64:B4:73:19:8A:C4 UUIDs: 00001112-0000-1000-8000-00805f9b34fb
[CHG] Device 64:B4:73:19:8A:C4 UUIDs: 00001115-0000-1000-8000-00805f9b34fb
[CHG] Device 64:B4:73:19:8A:C4 UUIDs: 00001116-0000-1000-8000-00805f9b34fb
[CHG] Device 64:B4:73:19:8A:C4 UUIDs: 0000111f-0000-1000-8000-00805f9b34fb
[CHG] Device 64:B4:73:19:8A:C4 UUIDs: 0000112f-0000-1000-8000-00805f9b34fb
[CHG] Device 64:B4:73:19:8A:C4 UUIDs: 00001132-0000-1000-8000-00805f9b34fb
[CHG] Device 64:B4:73:19:8A:C4 UUIDs: 00001200-0000-1000-8000-00805f9b34fb
[CHG] Device 64:B4:73:19:8A:C4 UUIDs: 00001800-0000-1000-8000-00805f9b34fb
[CHG] Device 64:B4:73:19:8A:C4 ServicesResolved: yes
[CHG] Device 64:B4:73:19:8A:C4 Paired: yes
Pairing successful
[CHG] Device 64:B4:73:19:8A:C4 ServicesResolved: no
[CHG] Device 64:B4:73:19:8A:C4 Connected: no
~ — pi@raspberrypi: ~ — ssh pi@192.168.1.236
~ — pi@raspberrypi: ~/desktop — ssh pi@192.168.1.236
Manufacturer = 4c001005131c049ab3
8: Device 5c:fc:a5:25:62:03 (random), RSSI=-79 dB
Flags = 1a
Manufacturer = 4c0010050318b1c726
9: Device 6f:16:6b:7f:78:ef (random), RSSI=-80 dB
Manufacturer = 4c000719010f2002f88f0100063ab8739aabb7efd8ff878a44fa8a632a
10: Device 78:40:31:a6:dc:53 (random), RSSI=-71 dB
Flags = 02
Tx Power = f9
Complete Local Name = Xperia XA1 Ultra
11: Device 17:b4:74:ba:f7:54 (random), RSSI=-58 dB
Manufacturer = 0600010920021ffd45adf16d7534d324c09caa63209d6e57ae8ee9922d
12: Device 12:3b:6a:1a:f2:e5 (public), RSSI=-94 dB
Flags = 06
Complete 16b Services = 0000fef5-0000-1000-8000-00805f9b34fb
Manufacturer = 4c000215b5b182c7eab14988aa99b5c1517008d90001e5f2c5
13: Device 50:a5:d6:54:fd:ec (random), RSSI=-83 dB
Flags = 06
Manufacturer = 4c0010050b1cd5bc82
Enter your device number: 0
('Device', 0)
c2:52:1a:34:a6:6c
Connecting...


Andrew — pi@raspberrypi: ~ — ssh pi@192.168.1.236 — 80×24
pi@raspberrypi:~ $ sudo hciconfig
hci0: Type: Primary Bus: UART
BD Address: B8:27:EB:50:78:38 ACL MTU: 1021:8 SCO MTU: 64:1
UP RUNNING
RX bytes:4469 acl:0 sco:0 events:172 errors:0
TX bytes:1929 acl:0 sco:0 commands:65 errors:0
pi@raspberrypi:~ $ sudo hciconfig lescan
hci0: Type: Primary Bus: UART
BD Address: B8:27:EB:50:78:38 ACL MTU: 1021:8 SCO MTU: 64:1
UP RUNNING
RX bytes:4469 acl:0 sco:0 events:172 errors:0
TX bytes:1929 acl:0 sco:0 commands:65 errors:0
pi@raspberrypi:~ $ sudo hciconfig hci0 leadv 0
pi@raspberrypi:~ $ ls
desktop
pi@raspberrypi:~ $ gatttool -b 64:B4:73:19:8A:C4 -t random -I
[64:B4:73:19:8A:C4][LE]>