Introdução ao mundo de IOT utilizando o OS Android Things
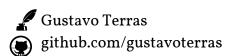
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Hardware

- NXP i.MX8M
- Qualcomm SDA212
- Qualcomm SDA624
- MediaTek MT8516
- Raspberry Pi 3 Model B
- NXP i.MX7D

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Raspberry Pi 3 Model B

- Processador 1.2GHz
- 1 GB RAM
- Wifi e Bluetooth integrados
- GPIO 40 pinos
- Adaptador micro SD
- HDMI
- 4 USB's
- Out Audio

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O que é uma GPIO?

GPIO Signal	Alternate Functions	
BCM2	I2C1 (SDA)	
BCM3	I2C1 (SCL)	
BCM7	SPI0 (SS1)	
BCM8	SPI0 (SS0)	
BCM9	SPI0 (MISO)	
BCM10	SPI0 (MOSI)	
BCM11	SPI0 (SCLK)	
BCM13	PWM1	
BCM14	UART0 (TXD)	MINIUART (TXD)
BCM15	UART0 (RXD)	MINIUART (RXD)
BCM18	I2S1 (BCLK)	PWM0
BCM19	I2S1 (LRCLK)	
BCM20	I2S1 (SDIN)	
BCM21	I2S1 (SDOUT)	

Uma GPIO é uma porta, de entrada ou saída genérica, digital, que possibilita ser controlada e programada para diversos fins, desde uma comunicação entre periféricos, controle de estado de entrada, como um botão ou saída com um LED, por exemplo.
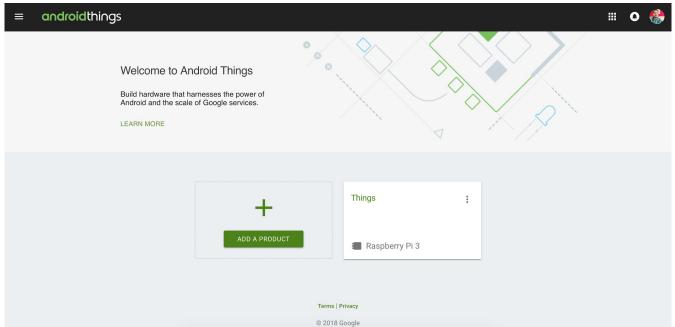
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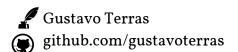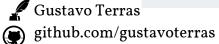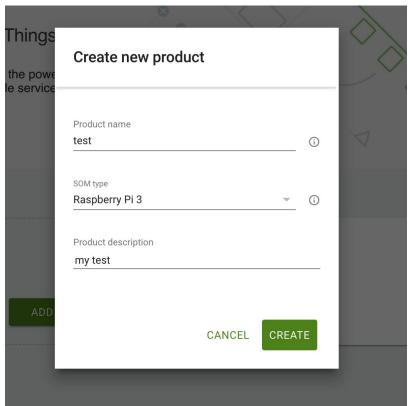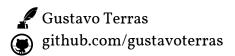
Placas de expansão de circuito impresso (PCB) ou Shields

Getting started

https://partner.android.com/things/console/

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Total Size ⓘ

4096 MiB

System partition (1339 MiB)

Oem Partition (512 MiB) ⓘ

Data Partition (1733 MiB)

buffer

⚪ OS Build
1339.164 MiB

512 MiB ⓘ

🔵 Google Play Services
200 MiB

🟢 Space remaining
1732.836 MiB

🔵 Hardware configurat...
0.008 MiB

CREATE BUILD   CANCEL

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ID	Name	Created	Tags	Actions	
	Build configuration list				NEW ▼
9	1.0.5	Oct 29, 2018	ADD TAGS	Download ▲	⋮
				Development	
8	update_test	Aug 28, 2018	ADD TAGS	Download	⋮
7	1.0.3	Aug 16, 2018	ADD TAGS	Download ▼	⋮
4	First Build Release-1.0.0	May 12, 2018	ADD TAGS	Download ▼	⋮
3	last build april	Apr 16, 2018	ADD TAGS	Download ▼	⋮

LOAD MORE

Getting started

RELEASE

Standard channels ⓘ

Channel	Current push	Last push started
canary-channel		
dev-channel		
beta-channel		
stable-channel		

Custom channels

CREATE NEW CHANNEL

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Let's start coding...

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- Gradle

```
androidTestImplementation 'com.android.support.test.espresso:espresso-core:3.0.2
compileOnly 'com.google.android.things:androidthings:+'
implementation"org.jetbrains.kotlin:kotlin-stdlib-jdk7:$kotlin_version"
```

- Manifest

```
<application android:label="My Application">
    <uses-library android:name="com.google.android.things"/>

    <activity android:name=".MainActivity">
        <intent-filter>
            <action android:name="android.intent.action.MAIN"/>

            <category android:name="android.intent.category.LAUNCHER"/>
        </intent-filter>
    </activity>
</application>

</manifest>
```
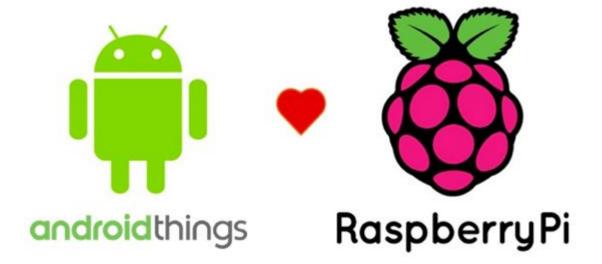
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Let's start coding...

- Init GPIO

```java
public class MainActivity extends Activity {
    private static final String TAG = MainActivity.class.getSimpleName();
    private Gpio mLedGpio;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        Log.i(TAG, "Starting ButtonActivity");
        PeripheralManagerService pioService = new PeripheralManagerService();
        try {
            Log.i(TAG, "Configuring GPIO pins");
            mLedGpio = pioService.openGpio(BoardDefaults.getGPIOForLED());
            mLedGpio.setDirection(Gpio.DIRECTION_OUT_INITIALLY_LOW);
        } catch (IOException e) {
            Log.e(TAG, "Error configuring GPIO pins", e);
        }
    }
```

- Other thread

```java
@Override
    protected void onStart() {
        super.onStart();
        Runnable ledBlinker = new Runnable() {
            @Override
            public void run() {
                while(true) {
                    // Turn on the LED
                    setLedValue(true);
                    sleep(3000);
                    // Turn off the LED
                    setLedValue(false);
                    sleep(3000);
                }
            }
        };
        new Thread(ledBlinker).start();
    }
```

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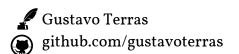android

Let's start coding...

- Input or Output

```java
private void sleep(int milliseconds){
    try {
        Thread.sleep(milliseconds);
    } catch (InterruptedException e) {
        e.printStackTrace();
    }
}
/**
 * Update the value of the LED output.
 */
private void setLedValue(boolean value) {
    try {
        mLedGpio.setValue(value);
    } catch (IOException e) {
        Log.e(TAG, "Error updating GPIO value", e);
    }
}
```
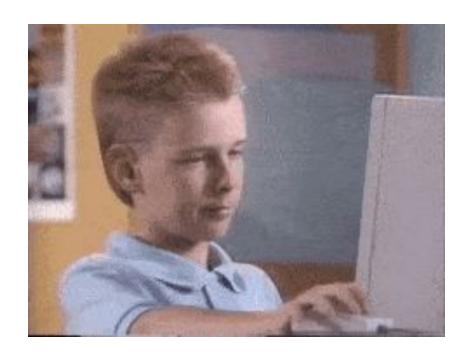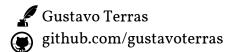
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Done

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Referências

Android Things
<https://developer.android.com/things/>

Build with Android Things
<https://androidthings.withgoogle.com/#!/>

Hackster
<https://www.hackster.io>

Git Android Things
<https://github.com/androidthings>

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