The power consumption

Business, Company

The power consumption for sending (or receiving) a single message in a mobile phone

Abstract: We measure overall SMS, Whatapps, and Wechat for the power consumption of a single message.

These results are validated by overall power measurements of two other devices: the BatteryDoctorand Battery Detective. We discuss the significance of the power drawn by the various length and times of text messages and identify the most promising areas to focus on for further improvements in power management. We also analyze the energy impact of dynamic voltage and frequency scaling of the device's application processor.

Introduction: In recent years, people have a mobile phone in their hands all day. At the same time, device functionality is increasing rapidly. In the number of applications, texting messages occupied an important part. Hence, optimal management of power consumption of devices such as SMS, WhatsApp, and WeChat is critical. In this paper we attempt to answer how much of the system's energy is consumed by sending (or receiving) a single message of the system and under what circumstances. And we will use IPhone5 as the experimental product. Furthermore, we validate the results with computing manually and the additional mobile device: Battery Doctor, Battery Detective.

Material: Experimental product: IPhone5

Timer Testing Applications: Messages, WhatsApp, WeChat Measuring

Application: Battery Doctor and Battery

Detective Formula:

1. The time of sending each message= The time of the usage of 1% power/ Number of messages.
2. Average electricity consumption of each message (with the Wifi usage)= 1% power of iPhone 5/ Number of messages.) Average electricity consumption of each message (without the Wifi usage) =(1% power of iPhone 5/ Number of messages) - (The time of sending each message x The power consumption rate of wifi function). Methodology: Device under test Experimental setup When an iPhone is not actively being used (the screen is off), the biggest power drain are the various radios: WiFi, 3G and Bluetooth. So the first tip is to turn off any service you don’t need. Settings are useful in doing so with one tap. There is some information you need to calculate before we collect the data. Therefore, after you turn off all the services that you do not use, you have to turn on the Battery Doctor and check out the battery usage of your phone and calculate how much usage if 1%power. In the case of the iPhone 5, the battery usage is 1430, therefore iPhone 5 1% power= 1430/100= 14. 30 mAh. Also, you can use the Battery Doctor to check out how long you still can use on that percentage of battery. Then, according to Doctor Battery, when iPhone 5 in 41% power, it can use 8hrs 15mins without the WiFi function. If used with the WiFi function, it can use 7hrs 13mins.

Therefore, you can calculate that: The power of the iPhone 5 in 41%: 14. 3mAh x 41 = 586. 3mAh. The power consumption rate of the iPhone 5 withoutthe WiFi function: 586. 3 mAh/[(60 x 8 +15) x 60] = 0. 0197 mAh s-1

The power consumption rate of iPhone 5 without the WiFi function: 586. 3 mAh/[(60 x7 +13) x 60] = 0. 0226 mAh s-1.

The power consumption rate of WiFi function: 0. 0226 – 0. 0197 = 0. 0029 mAh s-1 Then, you get all the basic information which you need, and you can turn off the Battery Doctor, and start to collect the data. Then, you need to let your phone naturally reduce 1% power. After it you can use the timer to count time and type your message and send it out. After you use 1% of power, you can stop the timer and count how many messages did u sent and record it. Then, you need to repeat to collect those data several times. However, you also need to do it in different power percentage, to collect more data. After u collect the data of time and number of messages sending, you can use those formula to calculate the information. Software Excel, Word, Battery Doctor, Battery Detective Results We had collected the data from 3 different power levels, high power (> 80%), general power (20-80%), and lower power.