# 4G NETWORK USAGE OF MOBILE BETTERY LIFE

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**As the mobile devices are getting more and more powerful and the performance is also increasing, the more hardware and network performance is required .Thisperformance comes at a cost of high power consumption which leads to low battery life .4G is one of the sector which drown the battery of current generation mobile .This paper describes the 4G battery consumption and its solution.**

***Keywords-component;Mobile devices; 4G; 4G bettery consumption***

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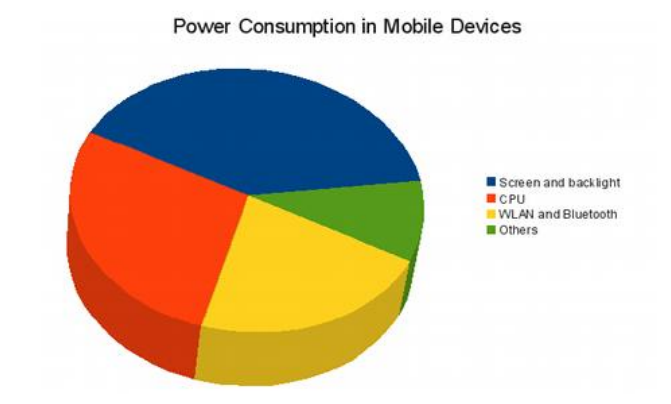
## I. INTRODUCTION

From years mobile phones are evolving and it has a great remarkable evolution .It started with just a wireless phone for calling purpose to a power full PDA, smart phone, it had become from a multimedia device to a device which can perform some of your desktop work. To perform such an operation heavy processing is required. So know a day's mobile phones are boost portability on the go, to get service to these multimedia and other high end applicationsa faster network service is required. To fulfill this requirement network of mobile phone is also been upgrading .It started from the first generation to 2G,3G and know to 4G.As the speed and bandwidth of the mobile network is growing it requires more power from these devices.Mobile devices became more and more energy-hungry reducing the operational time for the user. To extend the battery life of mobile phones is one of the top priorities for mobile phones manufacturers [1].This paper presents the energy consumption and its measurement used by the 4G network on a mobile device. The first section of the paper presents that how other factor eats the energy of mobile device. Next section presents that how 4G drains the energy of mobile device. Third section presents the list of current 4G mobile device that suffers from its battery life .The forth and the last section consist of solution and the future work.

## II. OTHER USAGE OF MOBILE BETTERY

Along with call quality, a cell phone's battery life is one of the most important considerations when choosing a handset. It's never fun to watch your cell phone die when you're in the middle of an important call. And it's no fun either to have little power when you're nowhere near a charger [2].Low power consumption is one of main hardware design goals with mobile devices because of the limited electric charge in their power supplies. If the hardware is designed correctly, it may itself contain logic and rules to enter different power saving states. To enter this power saving states the hardware requires that there is no activity in the system, in other words, there is no task ready to be run by the OS kernel scheduling mechanism. Even if power saving functionality is implemented in the hardware, activating it might not always be possible. If the applications running on the hardware are "misbehaving", then the system will be active all of the time and this makes it impossible for the power saving features to be activated at hardware level [3]. The battery of the movie device depends on its specs, a high end spec mobile device always suffers from its battery because of its more powerful CPU, GPU and LCDs. LCD screens required more battery all thorough the most of the manufacturer are going for the LED screen which require less

power but there are still smart phones which uses LCDscreens. If you are out on a sunny day you have to increase your brightness level of the screen to view clearly results more battery loss. Not only mobile device screen contributes to battery power loss but also the CPU .The CPU of mobile device are mostly ARM cortex based.ARM processor are well known for less power consumption but as their clock speed increases the battery life decreases . Some of the manufacturer of smart phone uses the same processor for their new smart phones but with over clocked processor result more battery consumption.




Last but not the least GPU also contributesto the battery of mobile device. A GPU inside a mobile device is typically integrated into the application processor system-on-a-chip (SoC) which also consists of one or several CPUs, DSP, and other application-specific accelerators, Instead of having its own graphics memory, an embedded GPU shares the system bus with other computing cores to access the external memory and therefore has much lower memory bandwidth than those of laptop and high-performance desktop systems [4].The major SoCs and the mobile GPUs available in the market include Qualcomm's SnapDragonSoC with the Adreno 200 GPU [5], TI's OMAP3 SoC with the PowerVR SGX 530/535 [1], and Nvidia's Tegra2 SoC with its own ultra-low-power (ULP) version of GeForce GPU [6].

GPU of mobile devices are good enough to render great 3d graphics, One of the leading GPU provider is PowerVR.,most rich 3d graphical environment have been seen on Power VR GPUs. SONY and APPLE both are using Power VR for their mobile device. SONY PSVITA using Power VR SGX543MP4+ for there portable gaming machine still don't have enough battery for long hours ,it can push the battery to max five hour of game play. Not even APPLE mobile devices have good enough battery to render rich 3d environment for hours.



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## III. 4G BATTERY CONSUMTION

As the service is getting faster it consumes more battery of mobile device .2G drains more battery life a first generation network, 3G drains more battery life than a 2G and so on to the 4G.Satisfaction levels with battery performance differ widely between owners of 3G and 4G enabled smart phones. Among owners of 4G enabled smart phones, battery performance ratings average 6.1 on a 10 point scale considerably lower than satisfaction among owners of 3G smart phones 6.7. Part of this difference stems from the fact that new 4G smart phones use substantial battery life searching for next generation network signals, which tend to be scarcer than 3G signals. In addition, owners of 4G enabled smart phones use their device more extensively they talk, text, email, and surf the Web more often than do customers with 3G smart phones or traditional handsets which puts a significantly higher demand on the battery.

Approximately 25 percent of 4G enabled Smartphone owners are highly satisfied with their battery ratings of 10 on a 10 point scale and say they "definitely will" repurchase a device from the same manufacturer. In comparison, among owners who are less satisfied with their battery ratings of 7-9 on a 10 point scale, only 13 percent say the same. The Biggest problem with 4G devices is that4G phones in areas with spotty 4G service spend an awful lot of battery power trying to hunt down a signal [7].Some of the mobile devices

“So you’ve got a situation where the phones are sending out their signals searching and searching for a 4G tower, and that eats up your battery,” says Carl Howe, a vice president for research firm Yankee Group [7].But as 4G becomes more readily available, you can expect people to use their phones for more battery-draining purposes like streaming video or browsing more web pages than they would on a slower network. Many of the latest phones have batteries that are not capable of handling such a workload for any extended period of time.

## IV. LISTOF 4G BATTERY ISSUE MOBILE DEVICE

The list consist of mobile device having battery problems in 4G, most of them are well know mobile devices.

- Samsung S3
- I phone 5
- I phone 4s
- I phone 4

- Samsung Galaxy S
- Samsung Galaxy S2
- HTC evo

## V. SOLUTION AND FUTURE WORK

These problems of battery can be overcome if the smart phone manufacturer can provide option to switch between generation of network (between 2G, 3G and 4G) or may me they can do it efficiently when there is no more data bandwidth required it can switch to the lower generation and when the bandwidth and speed is required it can move to 4G. So that if a user hassent a text message it doesn't required any high speed it is almost the same so it can send by using 3G or 2G.The future of smart phone depends on its battery life ,Most of the customers don't want to go with for 4G because of battery problem and the manufacturer are facing problem to sell their smart phones .Motorola MAX is the phone that declare that it is the longest battery smart phone with 4G .It shows the clear way where to go.

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