Specifications of 3 Handsets used for Experimentations:

3G vs HSPA+ <http://www.rcrwireless.com/20140509/wireless/hspa-lte>

If you have a perfect 3G coverage as opposed to poor 4G than 3G would perform far better than 4G and vice versa.

If you live between cell edges or where a coverage of 3G/4G ends then handovers will kill your battery.

4G generally means faster data rates and as a result users tend to consume more data, this could lead to battery draining much more.

Depends on the amount and type of usage, signal strength in the area and the kind of apps that are being used. Some apps require a channel to be established between the base station and the mobile phone at regular intervals which drains the battery. However, 3G and 4G use various techniques to avoid a battery drain in such scenarios.

Even in the case of existence of such techniques, using a data connection in tandem with GPS for navigation on the go in an area with a sparse signal strength with apps like messenger or hangouts or whatssap or any other mail server constantly refreshing and loading updates and notifications in the background will drain the battery quickly in both 3G and 4G.

There are many rumors that 4G is more energy effecient than 3G so that i takes less baterry than 3G. Surely it depends on 4G band, carrier and device.

your phone is constantly pining for the network. That means its periodically scans the airwaves around it to determine which tower it should tether itself to. The more networks there are to choose from the more scans it must make.

LTE phones are fast, but they can also suck a battery dry in a few hours. Nokia Siemens Networks did some preliminary studies on LTE phone’s power drain versus their HSPA (3G) counterparts and found that LTE devices consume from 5 percent to 20 percent more than previous-generation phones, depending on the application used.

Why is LTE so greedy? For starters, the radio in your LTE device is doing a lot more than it ever did in your old 3G handset. The radio is the single biggest source of power drain in any device apart from the LED screen, but unlike the display, the radio is always on. And LTE is particularly hungry.

All LTE devices sold today use a technology called MIMO, which doesn’t just send or receive a single signal, but rather multiple parallel transmissions. Today’s devices support two such paths – future devices will support more — which means each phone has two antennas, each of which requires its own power amplifier. It’s not quite as bad as the running two phones off of a single battery, but you get the idea.

LG G3

**PROCESSOR**

Clock Speed 2.5 GHz

Type QUALCOMM Snapdragon 801

**BATTERY**

Capacity 3000 mAh

Samsung Galaxy S4

SGH – I337

**PROCESSOR**

Clock Speed 1.9 GHz

Processor Core Qty quad-core

Quad-Core 1.9 GHz Krait 300 Processor, Chipset: Qualcomm APQ864T Snapdragon 6, Adreno 320 Graphics

**BATTERY**

Capacity 2600 mAh

LG Nexus

**Findings from the chapter Application oriented study**

Offloading the processing for matrix calculation on Cloud saves energy as the matrix size increases, but for small matrix operations (i.e. 3X3 and 4X4) the local processing is suitable as it saves both energy and time.

We have observed here that Cloud based web browsers are faster but expensive in terms of energy

Consumption. For small data transfers it is always suitable to use Local web browser to save both time and battery consumption. For a normal user overall data transfer during the browsing session does not go beyond 5-6 MBs for single session, which means we always will have small data transfers to the cloud and Local browsers show better results for those cases and that's why Cloud based web-browsers aren't very popular.

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**Conclusion and Future Work**