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Case Study of 4G Mobile Network in Kuwait

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ABSTRACT-
The 4G (fourth Generation)is the first step of mobile revolution and communication on the global world, as result the interoperability of various communication platforms emerge as a crucial necessity. This paper give a measured the speed of internet in various area in Kuwait using mobile application and explain the best area at download and upload then discuss the reason of variety of internet speed in Kuwait and I cmpress the all result on the table two tables for best and worstresult .

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I. INTRODUCTION.

(a) Mobile Network

Mobile or cellular network is a communication network meant for the use of common people. Here the network is distributed over number of land areas called cells. These cells consist at least one transceiver (repeater) per cell.

(b) **Concept of Network generations**.

Like other technological development, mobile phone technology also undergone evolution. Mobile communications network is commonly known by their 1G, 2G , 3G and 4G designations. At present 4G net work is widely employed and are seeing the initial deployment of 5Gas the next generations.

Download speed:

It is the measure of how fast you can data to the device in use. Connections are designed to download much faster than they up load. Download speed for 4G network can be as high as 300Mbps

Upload speed:

The upload speed is how fast you send data from your device to the device handled by other users. Upload speed is measured in mega bits per second. Upload speed is much lessthan the download speed.

Upload speed of 4G network can be as high as 150Mbps

Network latency:

It is an expression shows the magnitude of time takes for a packet of data to get from one designated point to another. Latency is measured by sending a packet that is returned to the sender; The round trip time is considered as latency.

Ping is the reaction time of your connection, in other words how fast you get a response after you have sent out a request. Fast ping stands for more responsive connection

Theoretical **speeds network** technology.

Network Type	Download Speed (Mbps)	Upload Speed (Mbps)
3G	7.2	2
3G HSPA+	42	22
4G LTE	150	50
4GLTE Advanced	300	150

To overcome the drawback of the 1G network, 2G network was introduced in Finland by the year 1991. This was the first attempt to introduce digital modulation technology in the mobile network.With

uplink band 890 - 915MHz and

downlink band 935 -960MHz

Digitally encrypted text message was introduced first time. 2G network onwards the technology used became digital.

After the step by step evolution it has reached the 4G(4^{th} generation) network. By 2020, 5^{th} generation will be introduced in Kuwait

Transceivers are installed in elevated tower with powerful antenna for to and for communication. Weak signals received are amplified by the amplifier and re-transmitted through the antenna as strong signals with data, voice and other types of contents. In brief, these base stations provide the cells with the network coverage. Maintaining quality service is an important factor. A cell typically uses a different set of frequencies from neighboring cells to avoid interference hence quality of service as well as frequency use in non – adjacent cell.

Joining of these cells together provide radio coverage over a wide area so as to enable the operation of portable transceivers like mobile, tab laptops etc. Using cellular technology, combined networks achieve more capacity compared to a powerful transmitter. Smaller cell size allo for the

use of mobile unit saving on battery lifetime and reducing the power consumption. This is what the reason the consumer of these devices can enjoy the facility of using compact handheld devices. Without using the cellular technology essentially allows the mobility the we take for granted in today's last moving life

4G Network Coverage

They are four reasons to developing the 4G networking High performance;Interoperability (easy roaming); Fully converged services and Low cost:

A: The performance can reach 100Mps and this is suitable to download the high quality multimedia (high definition) .

B: the Interoperabilitythat mean interoperability. The concept of interoperability will yield the necessity of (user transparent) configurability and cooperativeness in various communications systems paving the road towards the 4G paradigm.

C: Fully converged service: also called media convergence means many service can be done within 4G such as multimedia download , road map coexistence of telephone all of can be done in single network

D: Low cost:4G systems will prove far cheaper than 3G, since they
can be built atop existing networks and won't require
operators to completely retool and won't require carriers to
purchase costly extra spectrum.

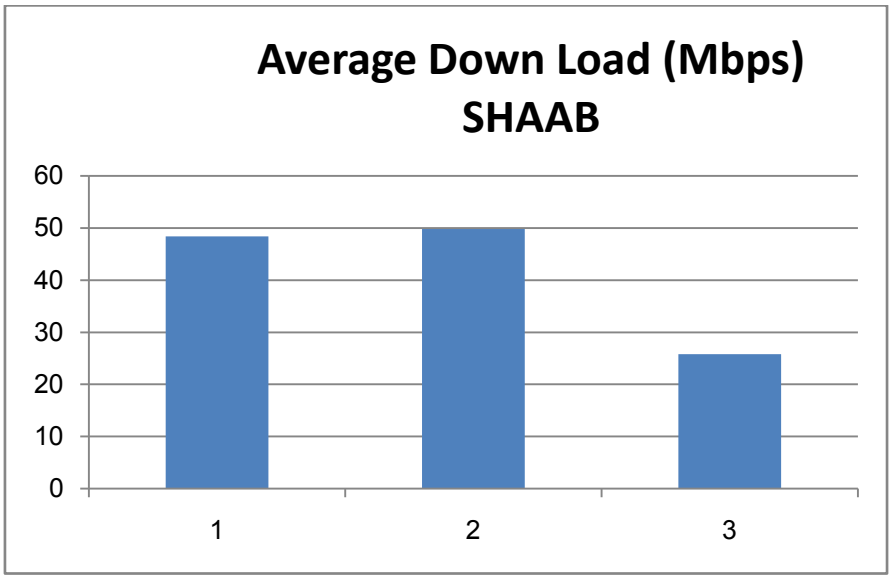
study

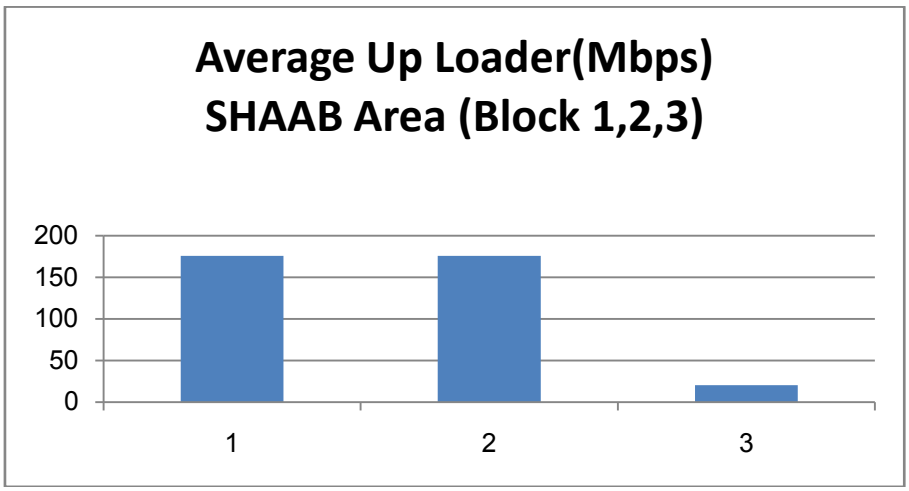
different areas of Kuwait were selected for the study the parametersused in the assessment of the networks were collected using Fast app. The four area are Ardia, Sheeb, Qadsia,Deeiah, this allows us to compare network performance of two governorate. The Capital and Farwaniya governoratesreadings were taken in open areas of the four placesmentioned above inside different areas in different blocks. Our target was to measure speed of the following parameters, down loader, up loader, latency with load(ms) and latency without load(ms)

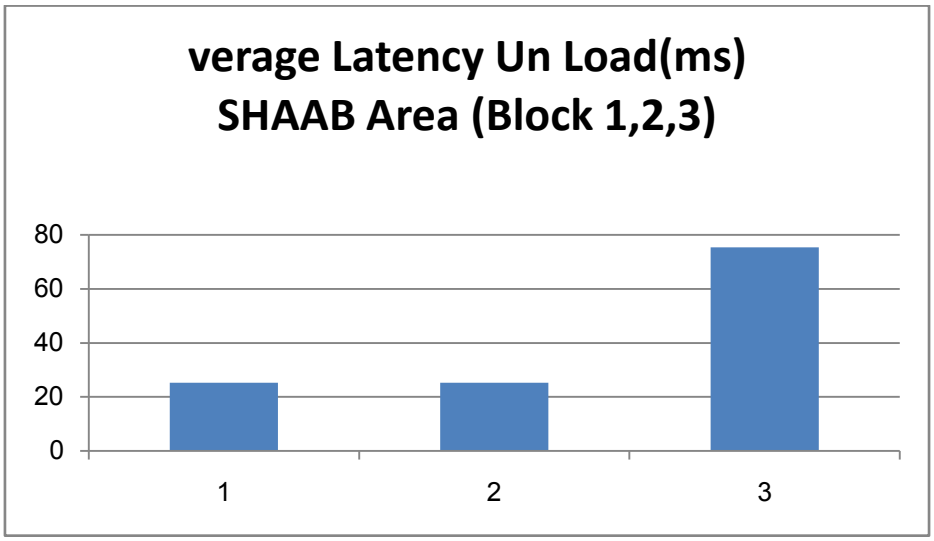
Five readings measured for the down load speed inShaabblocks 1, 2 and 3.

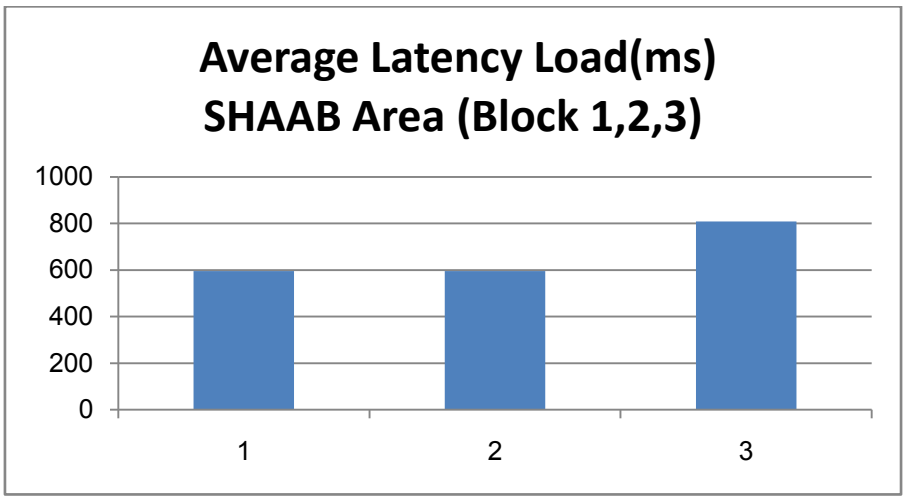
I found that the best block can be downloaded is No.1 and then No.3. No.2 being the worst

SHAAB Area

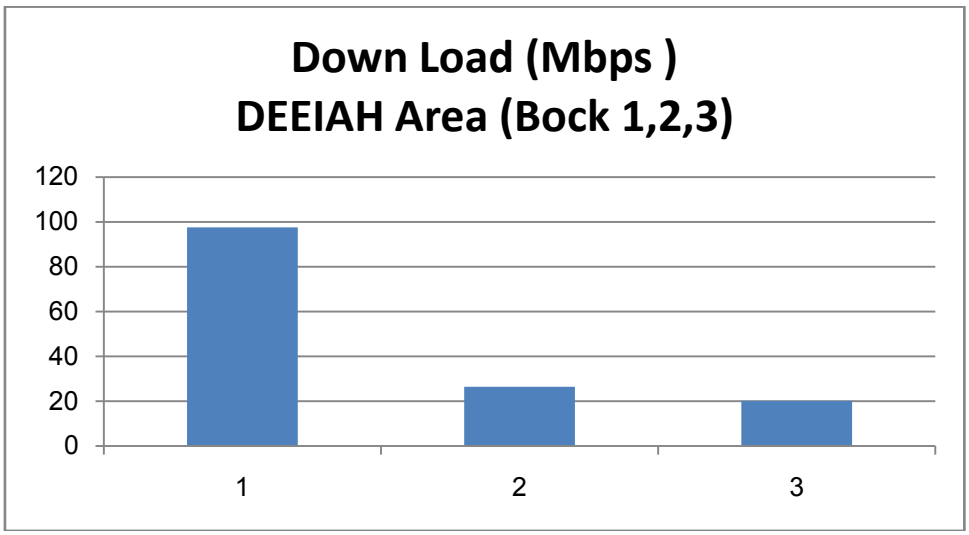


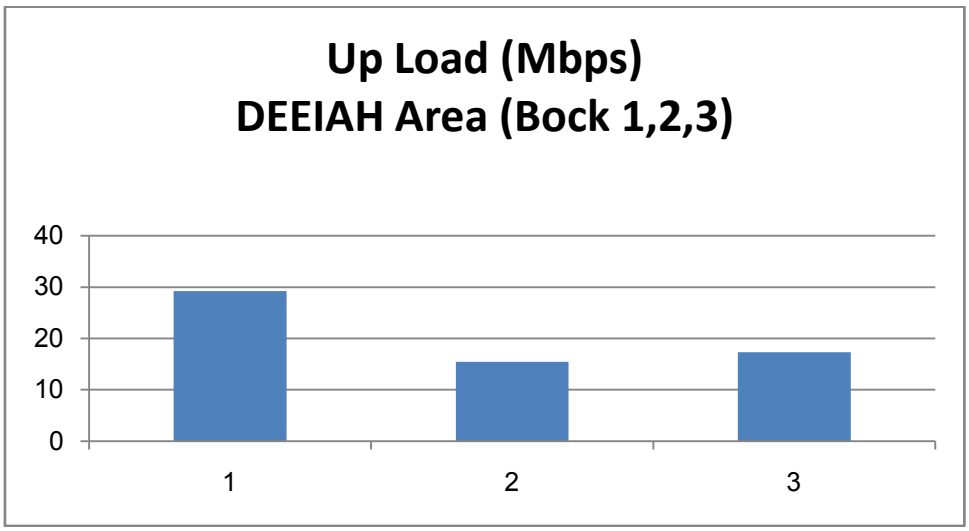

Average Up Loader(Mbps)
SHAAB Area (Block 1,2,3)
200
150
100
50
0
1
2
3

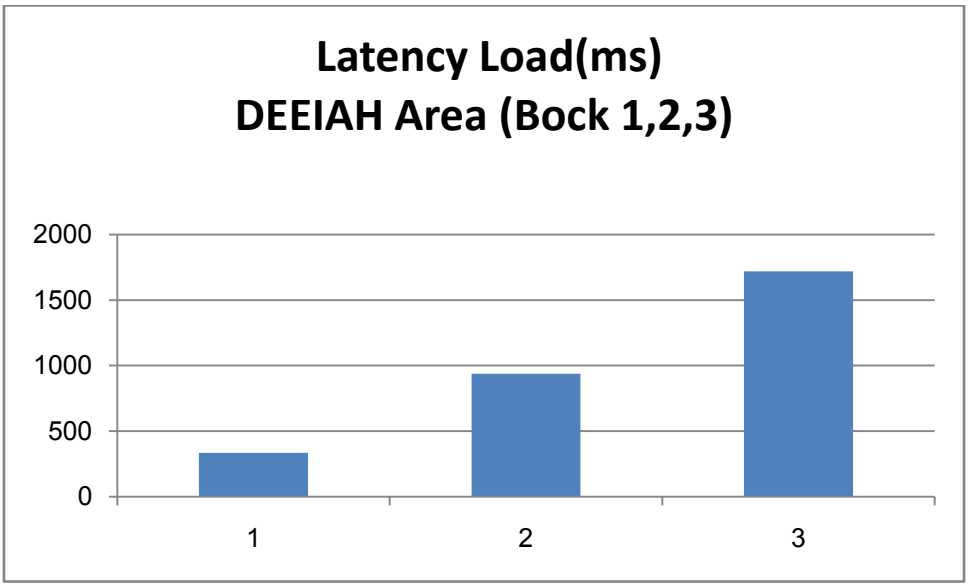

verage Latency Un Load(ms)
SHAAB Area (Block 1,2,3)
80
60
40
20
0
1
2
3

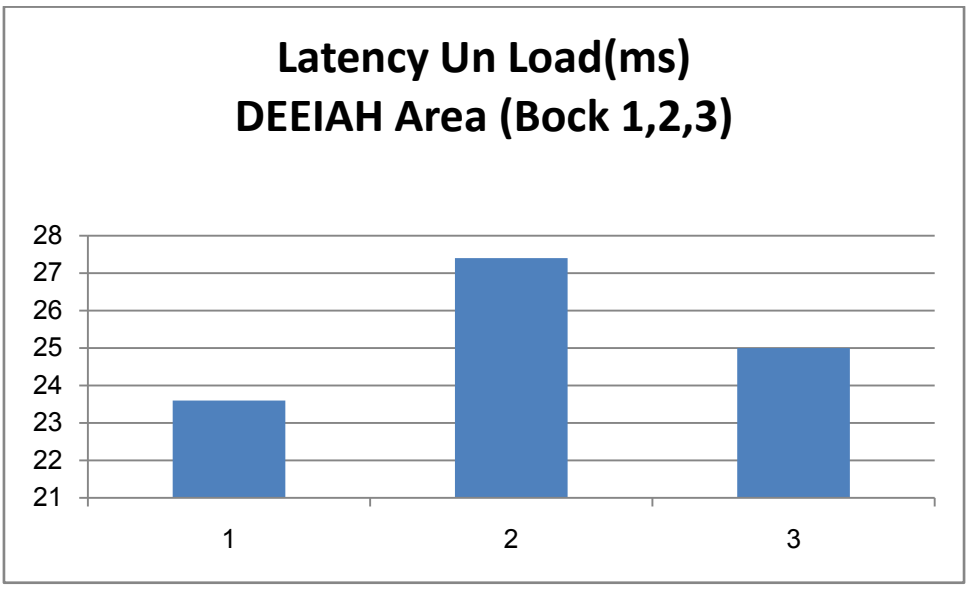

Average Latency Load(ms)
SHAAB Area (Block 1,2,3)
1000
800
600
400
200
0
1
2
3

DEEIAH AREA

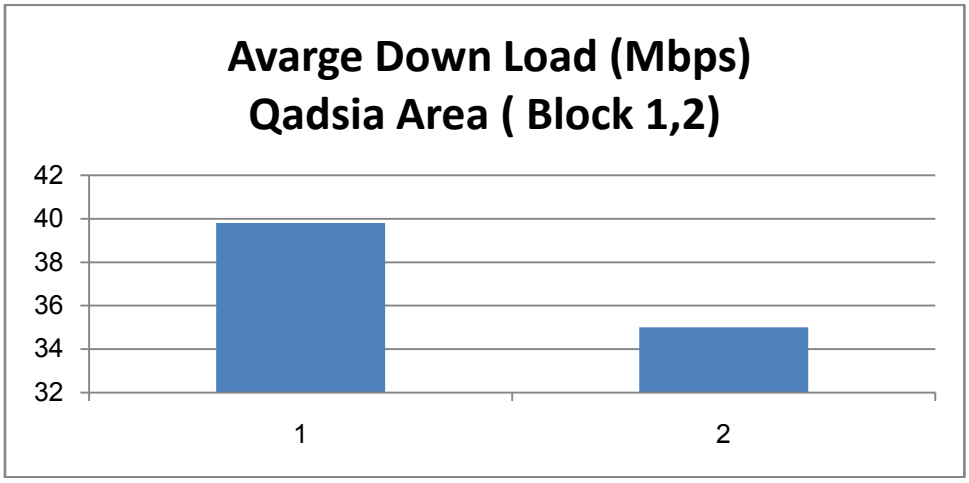

Down Load (Mbps)
DEEIAH Area (Bock 1,2,3)
120
100
80
60
40
20
0
1
2
3

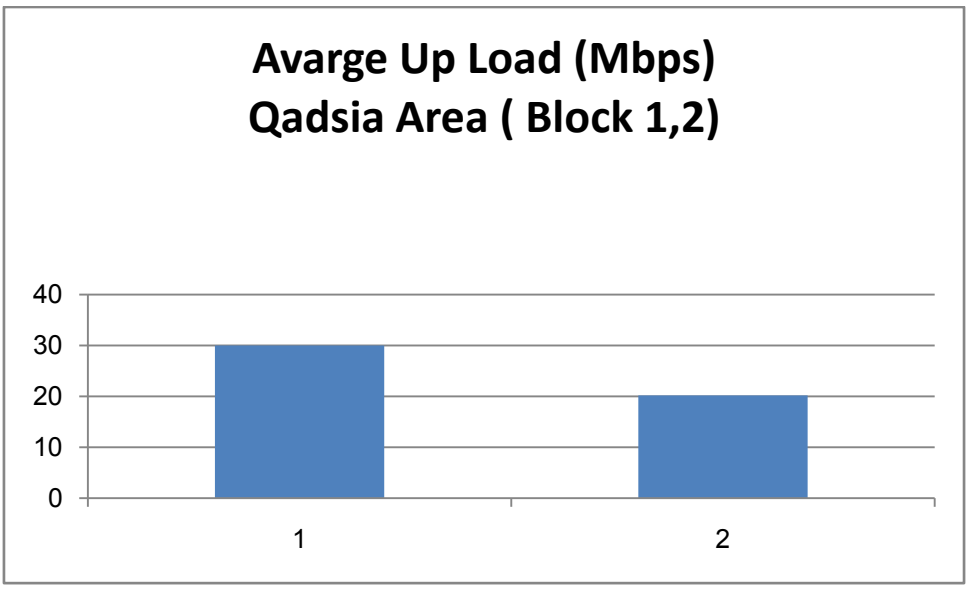

Up Load (Mbps)
DEEIAH Area (Bock 1,2,3)
40
30
20
10
0
1
2
3

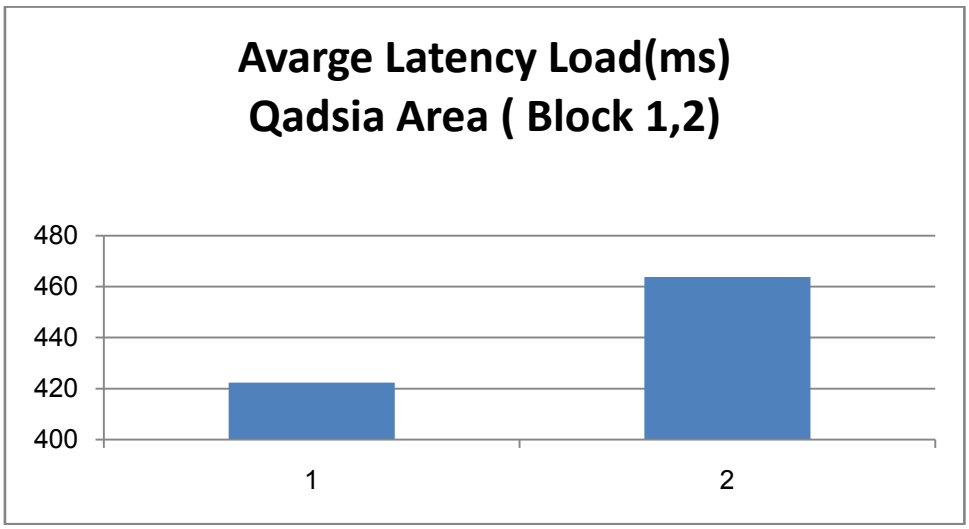

Latency Load(ms)
DEEIAH Area (Bock 1,2,3)
2000
1500
1000
500
0
1
2
3

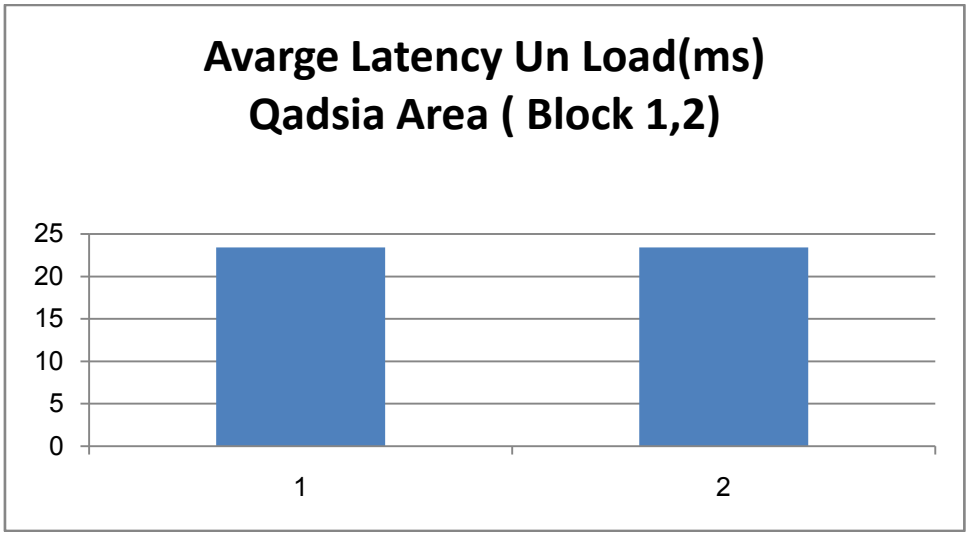

Latency Un Load(ms)
DEEIAH Area (Bock 1,2,3)
28
27
26
25
24
23
22
21
1
2
3

Qadsia AREA

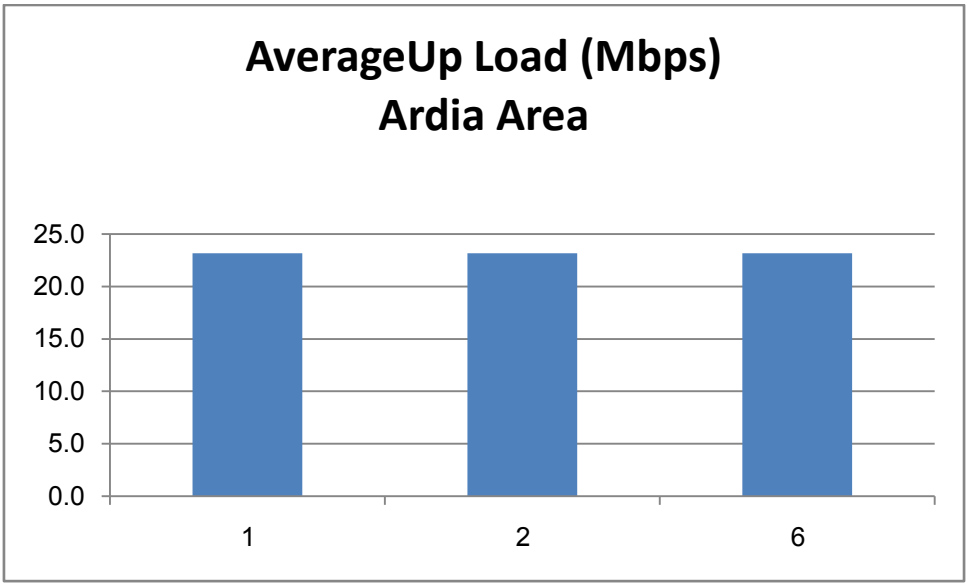

Avarge Down Load (Mbps)
Qadsia Area (Block 1,2)
42
40
38
36
34
32
1
2

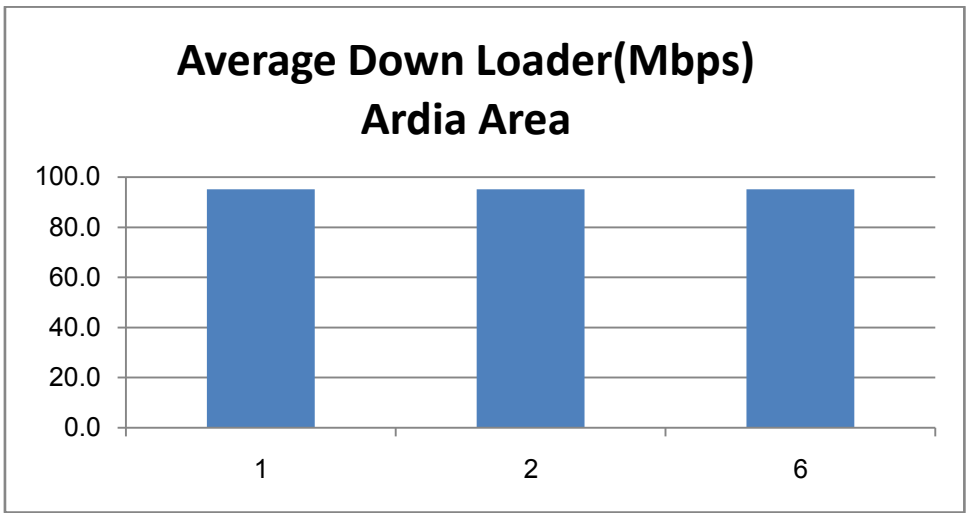

Avarge Up Load (Mbps)
Qadsia Area (Block 1,2)
40
30
20
10
0
1
2

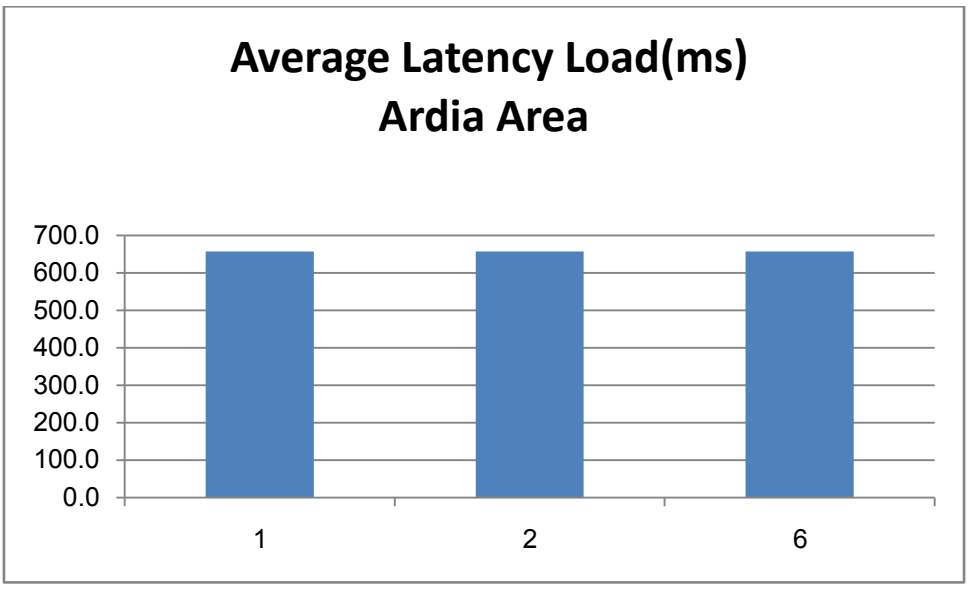

Avarge Latency Load(ms)
Qadsia Area (Block 1,2)
480
460
440
420
400
1
2


Avarge Latency Un Load(ms)
Qadsia Area (Block 1,2)
25
20
15
10
5
0
1
2

Ardia AREA


AverageUp Load (Mbps)
Ardia Area
25.0
20.0
15.0
10.0
5.0
0.0
1
2
6





	Best Area			
	download	Up Load	Latency Load	Latency un Load
Area	Shaab Bl.2	Shaab Bl.2	Shaab Bl.3	Shaab Bl.3
	Deeiah Bl.1	Deeiah Bl.1	Deeiah Bl.3	Deeiah Bl.2
	Qadsia Bl.1	Qadsia Bl.1	Qadsia Bl.2	Qadsia Bl.1&2
	Ardia Bl.1	Ardia Bl.2	Ardia Bl.2&6	Ardia Bl.2

Bl=Block

	Worst Area			
	down load	Up Load	Latency Load	Latency un Load
Area	Shaab Bl.3	Shaab Bl.3	Shaab Bl.1&2	Shaab Bl.1&2
	Deeiah Bl.3	Deeiah Bl.2	Deeiah Bl.1	Deeiah Bl.1
	Qadsia Bl.2	Qadsia Bl.2	Qadsia Bl.1	**********
	Ardia Bl.6	Ardia Bl.6	Ardia Bl.1	Ardia Bl.1&6

Bl=Block

Reason for the bad result:

From the data presentedobserved that the speed of the network is effected by the following parameters.

(a) Population density is one of the factors effecting the speed adversely as the number of consumers under the same cell is more.

(b) Location of the consumer staying is also a factor effecting the speed of the network

(c) Size of the area coming under the same repeater is also a factor effecting the speed of the network.

(d) Interference of the signals belongs to other network can be a factor up to an extent to effect the network speed.

II. CONCLUSION:

booster is the best choice for the elimination of the network speed problem. Choosing a closer area near to the tower area also can be treated as a solution.By using a mobile with higher speed also can be treated as a solution.

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