



NATIONAL COMMUNICATIONS AUTHORITY

Quality of Service (QoS) Monitoring of Cellular Mobile Data Services- ASHANTI REGION

[March 2016]

**QUALITY OF SERVICE (QoS) MONITORING OF CELLULAR MOBILE DATA SERVICES IN ASHANTI
REGION, MARCH 2016**

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Background

In pursuance of obligations of the 3G Cellular Mobile Licence of Telecommunication Operators, the consumer perspective of the quality of data services are tested to ensure the compliance of Operators to the obligations on service quality to the user.

The report is based on findings on quality of data service in the Ashanti region between 13th March and 3rd April, 2016 for all Operators except for Expresso due to technical challenges.

What we measure

As per the 3G Cellular Mobile licence obligations, the QoS indicators and their respective threshold for compliance under assessment considering the user's perspective are as below;

- **Data Access Success Rate (DASR)**
- **Data Drop Rate (DDR)**
- **Data Throughput**

Findings

The results for the district capitals within Ashanti Region tested during the period are as below:

a. Data Access Success Rate

Data Access Success Rate is the probability of success in connecting to the public server.

Data Access Success Rate should be equal or better than *ninety five per cent (95%)*

For analysis and calculations,

$$\text{Packet Service Success Rate } [\%] = \frac{\text{Number of successful PDP Context Activations}}{\text{Total number of PDP Context Activation requests}} \times 100\%$$

The results for the district capitals tested during the period are as below:

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Table 1. Data Access Success Rate, March 2016

District Capital	MTN	Vodafone	Tigo	Airtel	Glo
Agogo	100	100	No 3G Coverage	100	100
Agona	100	100	100	100	100
Akumadan	100	100	100	77.78	No 3G Coverage
Asiwa	100	100	No 3G Coverage	100	No 3G Coverage
Bekwai	100	100	No 3G Coverage	100	100
Effiduase	98.33	100	100	100	100
Ejisu	100	100	100	100	98.15
Ejura	100	100	100	100	No 3G Coverage
Foase	100	100	No 3G Coverage	No 3G Coverage	No 3G Coverage
Fomena	100	100	100	100	No 3G Coverage
Jacobi	100	100	100	100	No 3G Coverage
Juaben	100	100	100	100	100
Juaso	100	94.74	100	100	100
Kodie	100	100	84.21	100	100
Konongo	100	100	100	100	100
Kumasi	100	100	100	96.59	100
Kumawu	100	100	100	100	No 3G Coverage
Kuntenase	100	100	100	100	100
Mampong	100	100	100	95.12	100
Mampong	100	100	100	97.44	100
Mankranso	100	100	No 3G Coverage	100	No 3G Coverage
Manso Nkwanta	100	100	No 3G Coverage	100	No 3G Coverage
New Edubiase	100	100	100	100	No 3G Coverage

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District Capital	MTN	Vodafone	Tigo	Airtel	Glo
Nkawie	100	100	94.44	No 3G Coverage	100
Nsuta	100	100	100	95.56	No 3G Coverage
Nyinahin	100	100	100	100	No 3G Coverage
Obuasi	100	100	100	100	99.5
Offinso	100	100	100	100	100
Tepa	100	100	100	100	No 3G Coverage

REMARKS:

- ❖ MTN and Glo complied with the Data Access Success Rate obligation in the available District Capitals tested.
- ❖ Vodafone failed to meet the Data Access Success Rate obligation at Juaso.
- ❖ Tigo failed to meet the Data Access Success Rate threshold at Kodie and Nkawie
- ❖ Airtel failed to comply with the Data Access Success Rate at Akumadan.

b. Data Drop Rate

Data Drop Rate is the probability to drop in connection to a public server without end user's intervention.

Data Drop Rate should be equal or less than **one per cent (1%)**.

$$\text{Data Drop Rate } [\%] = \frac{\text{Number of aborted PDP context activations}}{\text{Total number of PDP Context Activation requests}} \times 100\%$$

Table 2. Data Drop Rate, March 2016

District Capital	MTN	Vodafone	Tigo	Airtel	Glo
Agogo	0	0	No 3G Coverage	0	0
Agona	0	0	0	0	0
Akumadan	0	0	0	0	No 3G Coverage
Asiwa	0	0	No 3G Coverage	0	No 3G Coverage
Bekwai	0	0	No 3G Coverage	0	0

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District Capital	MTN	Vodafone	Tigo	Airtel	Glo
Effiduase	0	0	0	0	0
Ejisu	0	0	0	0	0
Ejura	0	0	0	0	No 3G Coverage
Foase	0	0	No 3G Coverage	No 3G Coverage	No 3G Coverage
Fomena	0	0	0	0	No 3G Coverage
Jacobi	0	0	0	0	No 3G Coverage
Juaben	0	0	0	0	0
Juaso	0	0	0	0	0
Kodie	0	0	0	0	0
Konongo	0	0	0	0	0
Kumasi	0	0	0	0	0
Kumawu	0	0	0	0	No 3G Coverage
Kuntense	0	0	0	0	0
Mampong	0	0	0	0	0
Mampong	0	0	0	0	0
Mankranso	0	0	No 3G Coverage	0	No 3G Coverage
Manso Nkwanta	0	0	No 3G Coverage	0	No 3G Coverage
New Edubiase	0	0	0	0	No 3G Coverage
Nkawie	0	0	0	No 3G Coverage	0
Nsuta	0	0	0	0	No 3G Coverage
Nyinahin	0	0	0	0	No 3G Coverage
Obuasi	0	0	0	0	0
Offinso	0	0	0	0	0
Tepa	0	0	0	0	No 3G Coverage

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REMARKS:

- ❖ All Operators complied with the licence threshold of less than one percent (1%) in the available District Capitals tested.

c. Data Throughput

Data Throughput is the rate of data transfer.

As per the 3G licence obligations, the minimum data transfer rate for 90% of data connections should be *256kbps or better*

Table 3. Data Throughput, March 2016

District Capital	MTN	Vodafone	Tigo	Airtel	Glo
Agogo	3460	1110	No 3G Coverage	3890	2640
Agona	4580	1230	620	2650	2320
Akumadan	4770	1500	1830	2310	No 3G Coverage
Asiwa	7540	1450	No 3G Coverage	3010	No 3G Coverage
Bekwai	4930	1130	No 3G Coverage	1540	1940
Effiduase	4400	1140	1130	3960	2670
Ejisu	4410	870	610	4440	2260
Ejura	3260	970	280	1260	No 3G Coverage
Foase	4930	1280	No 3G Coverage	No 3G Coverage	No 3G Coverage
Fomena	5650	1450	710	2610	No 3G Coverage
Jacobi	7080	1300	510	6520	No 3G Coverage
Juaben	5930	190	700	3380	2040
Juaso	5600	960	580	200	8100
Kodie	1400	870	530	170	2750
Konongo	2040	310	670	1700	1500
Kumasi	4230	1390	1050	1960	4630
Kumawu	7180	1120	350	5100	No 3G Coverage

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District Capital	MTN	Vodafone	Tigo	Airtel	Glo
Kuntense	4730	1250	360	440	5880
Mampong	1780	270	340	1830	2690
Mampong	2680	1380	660	1620	2220
Mankranso	5880	1580	No 3G Coverage	4090	No 3G Coverage
Manso Nkwanta	5150	1400	No 3G Coverage	7130	No 3G Coverage
New Edubiase	3760	1250	470	3360	No 3G Coverage
Nkawie	4550	1480	1390	No 3G Coverage	1490
Nsuta	4750	1270	490	2720	No 3G Coverage
Nyinahin	6510	1030	490	4090	No 3G Coverage
Obuasi	6160	970	590	2540	1980
Offinso	3220	1590	890	970	2790
Tepa	4060	1580	870	5520	No 3G Coverage

REMARKS:

- ❖ MTN, Tigo and Glo met the Data Throughput threshold in the available District Capitals tested.
- ❖ Airtel failed to attain the Data Throughput threshold at Juaso and Kodie
- ❖ Vodafone failed to attain the Data Throughput at Juaben.

REMEDIES

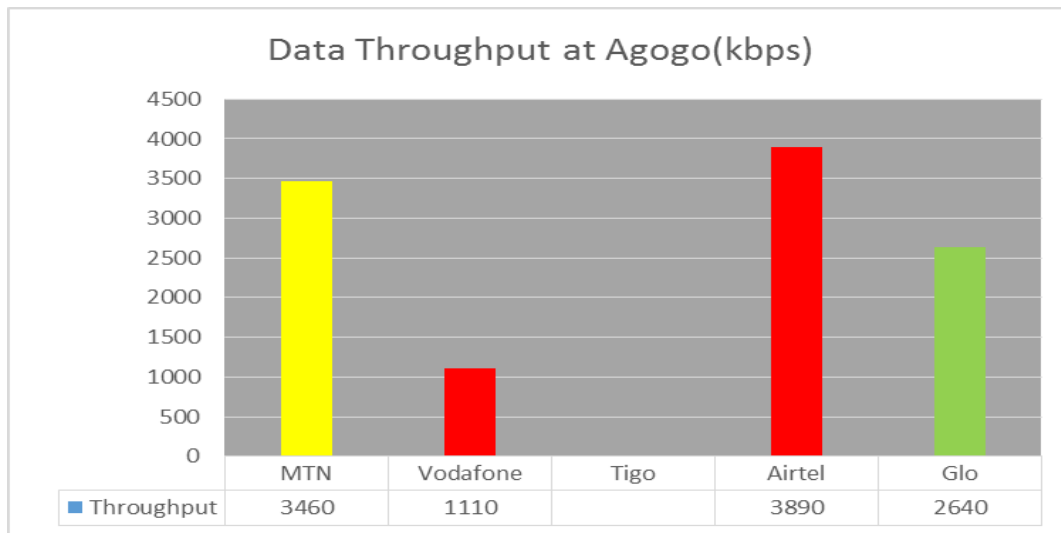
- ❖ The NCA has notified Operators of publication of these findings and directed all Operators to improve any obligation in default by June 2016.
- ❖ Sanctions will be applied to Operators on obligations in default after June 2016.
- ❖ All Operators were directed to improve their 3G service in some localities by August, 2016 and ensure continuous compliance in all areas at all times.

APPENDIX 1

The Graphs below show the Throughput levels attained by Operators in each location where monitoring was performed.

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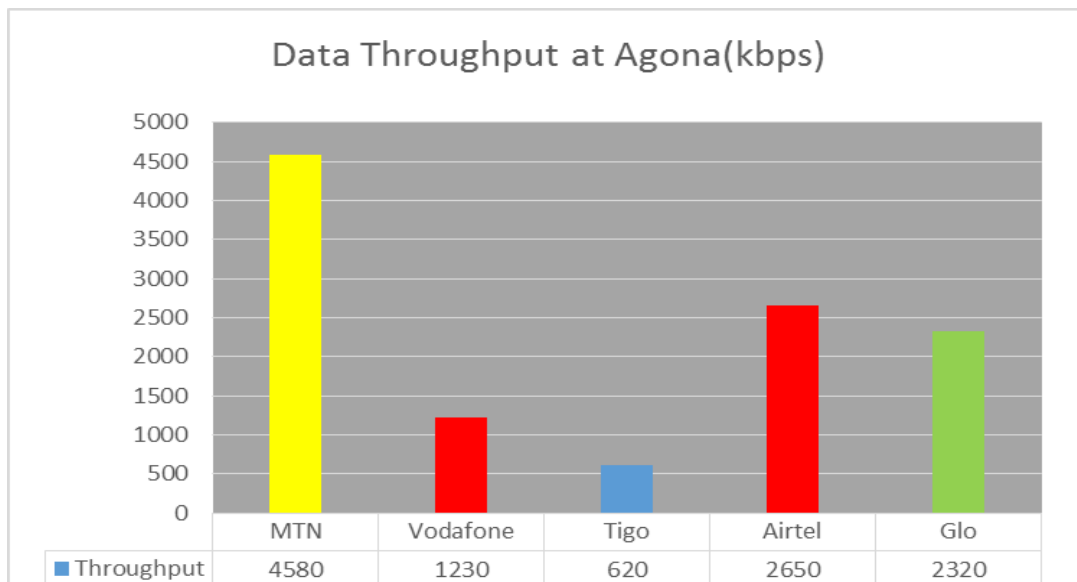
Figure 1. Data Throughput - March 2016, Agogo



REMARKS:

- ❖ All Mobile Network Operators (MNOs) except Tigo exceeded the Throughput threshold of 256kbps.
- ❖ Tigo had no 3G Service at the time of the tests.

Figure 2. Data Throughput - March 2016, Agona

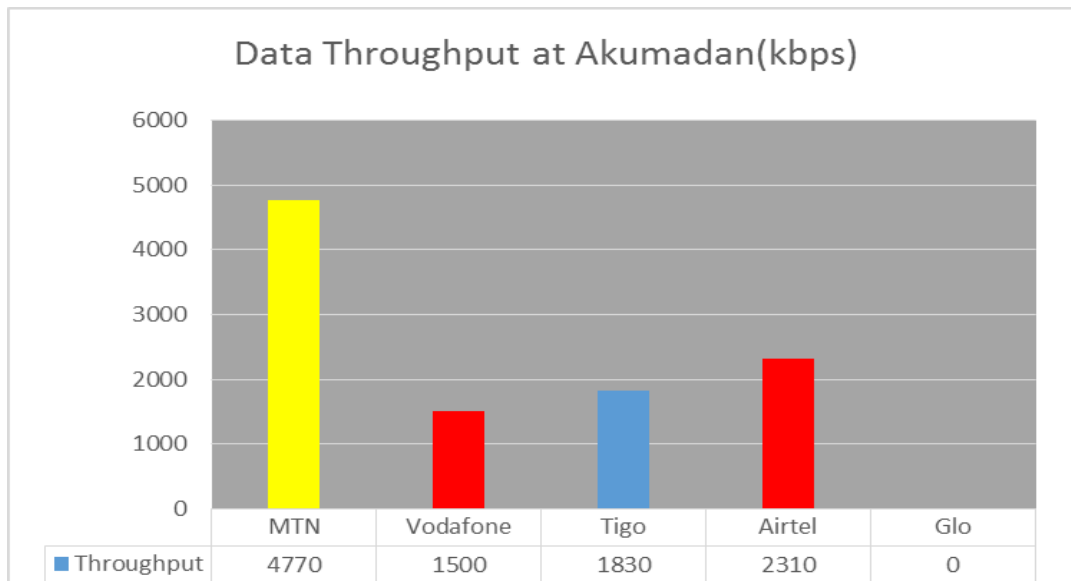


REMARKS:

- ❖ All MNOs exceeded the Throughput threshold of 256kbps.

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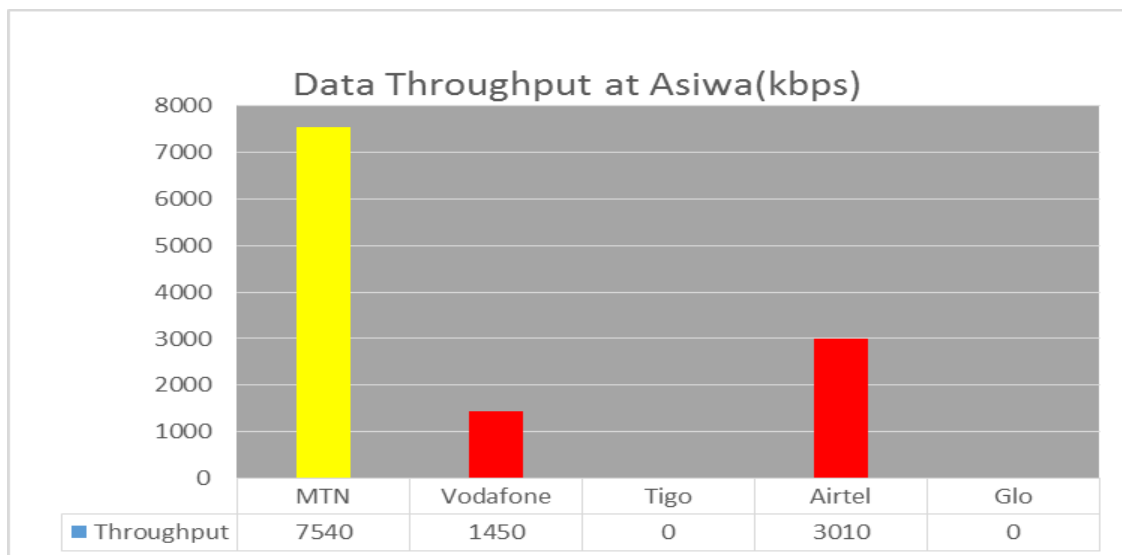
Figure 3. Data Throughput February-March 2016, Akumadan



REMARKS:

- ❖ All MNOs except Glo exceeded the threshold of 256kbps.
- ❖ Glo had no 3G Service at the time of the tests.

Figure 4. Data Throughput - March 2016, Asiswa

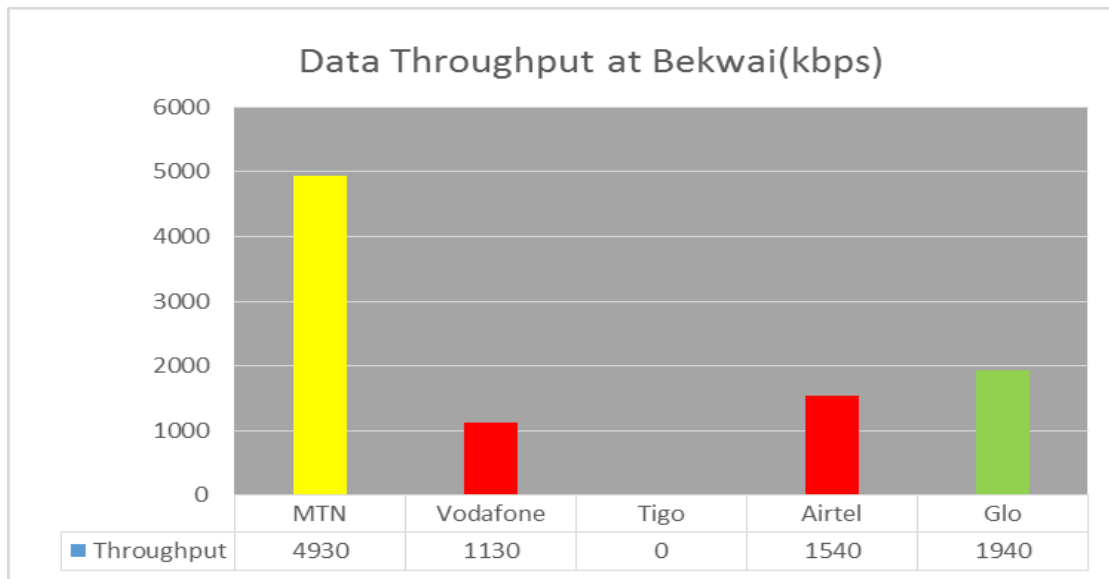


REMARKS:

- ❖ MTN, Vodafone and Airtel exceeded Data Throughput threshold.
- ❖ Tigo and Glo had no 3G Service at the time of the tests.

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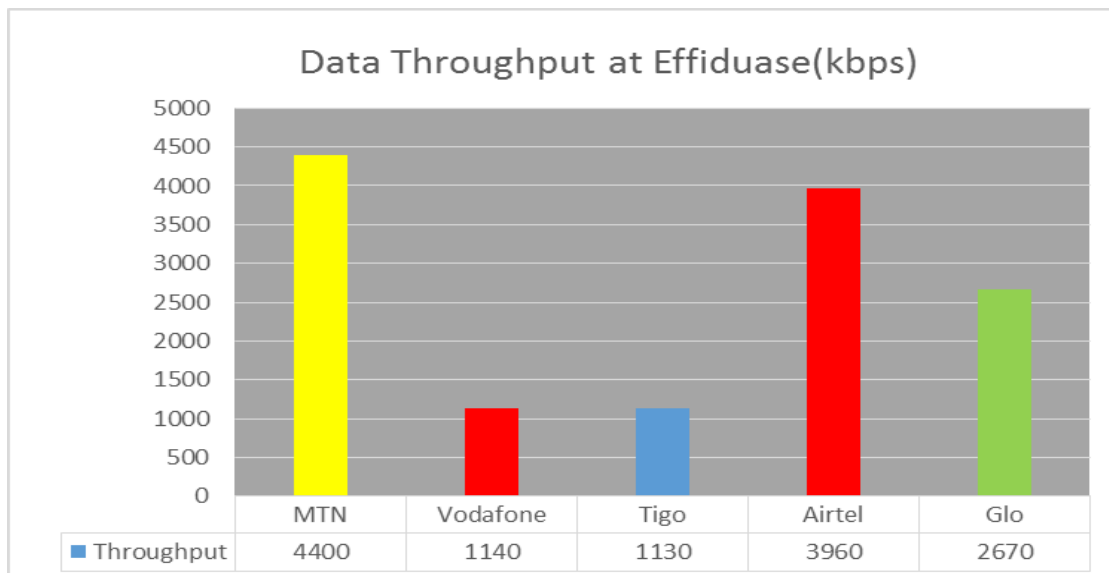
Figure 5. Data Throughput - March 2016, Bekwai



REMARKS:

- ❖ All MNOs except Tigo exceeded Data Throughput threshold.
- ❖ Tigo had no 3G Service at the time of the tests.

Figure 6. Data Throughput - March 2016, Effiduase

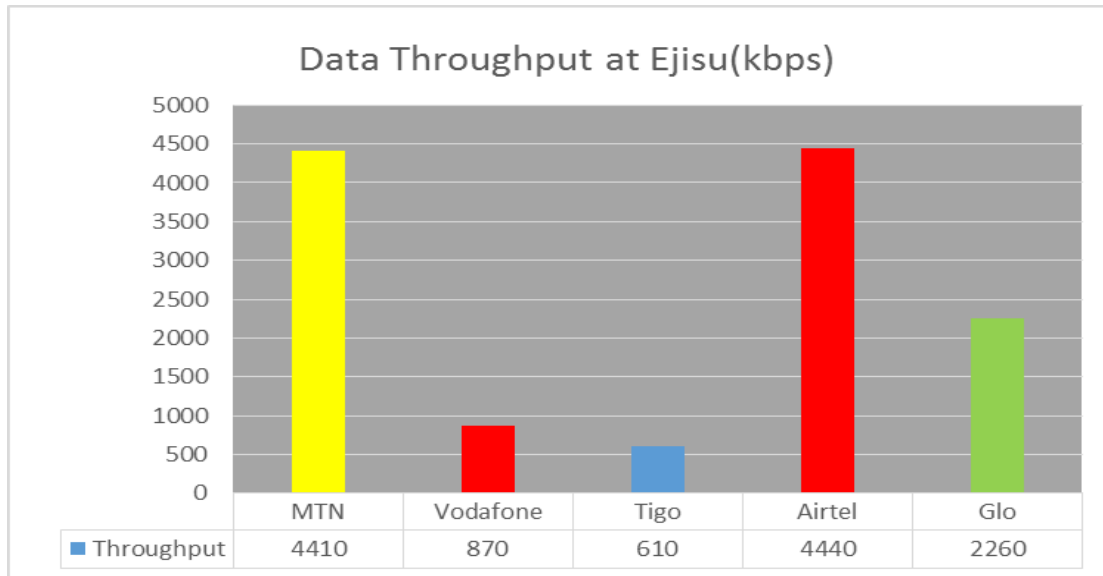


REMARKS:

- ❖ All the Operators exceeded the Data Throughput Threshold of 256kbps.

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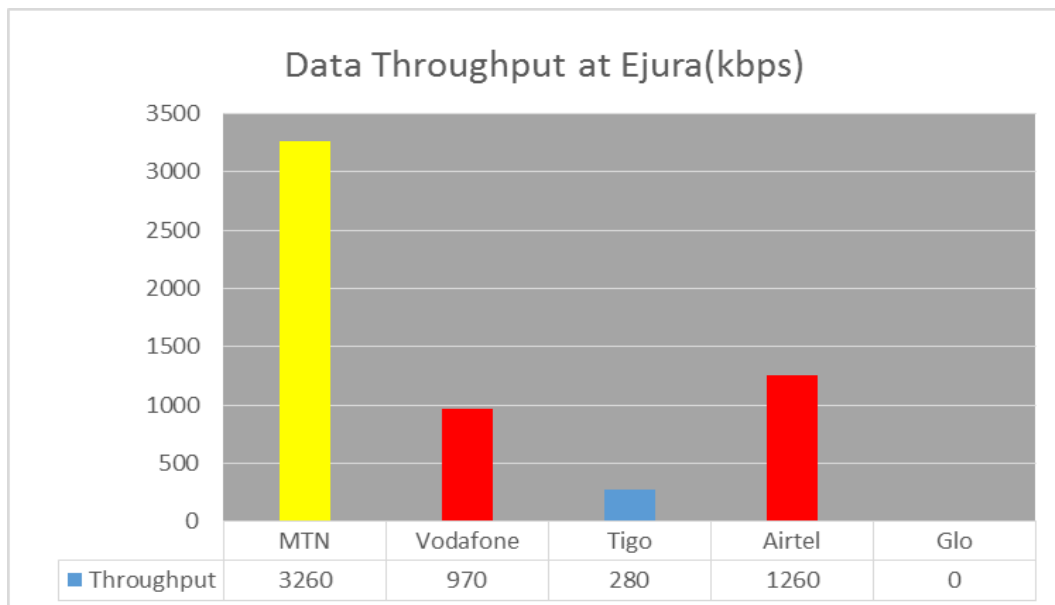
Figure 7. Data Throughput - March 2016, Ejisu



REMARKS:

- ❖ All MNOs exceeded the Threshold of 256kbps

Figure 8. Data Throughput - March 2016, Ejura

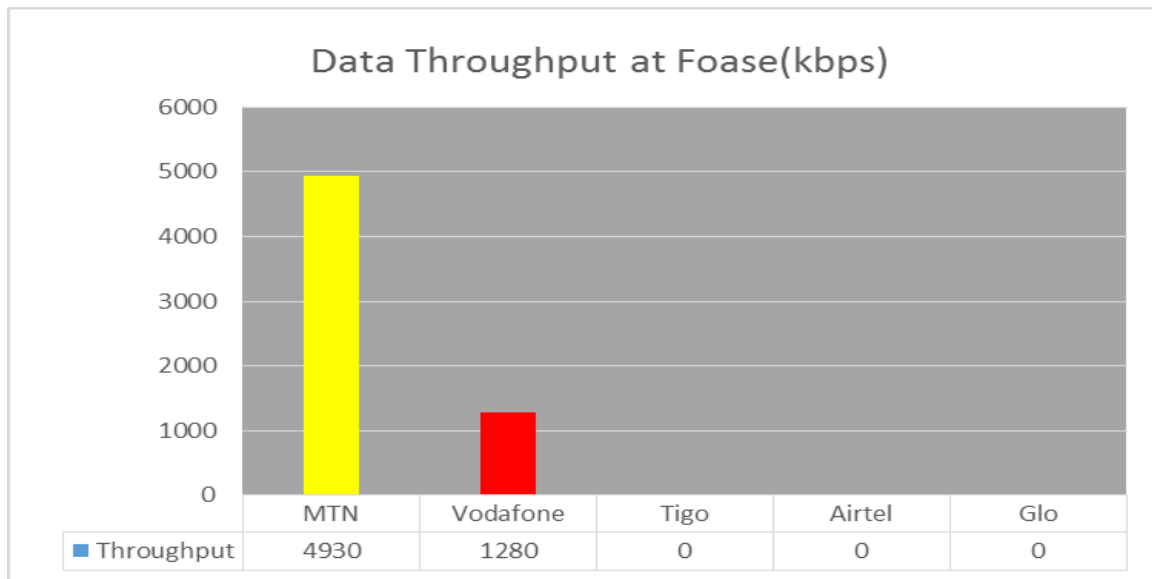


REMARKS:

- ❖ All MNOs except Glo exceeded the Threshold of 256kbps.
- ❖ Glo had no 3G Service at the time of the tests.

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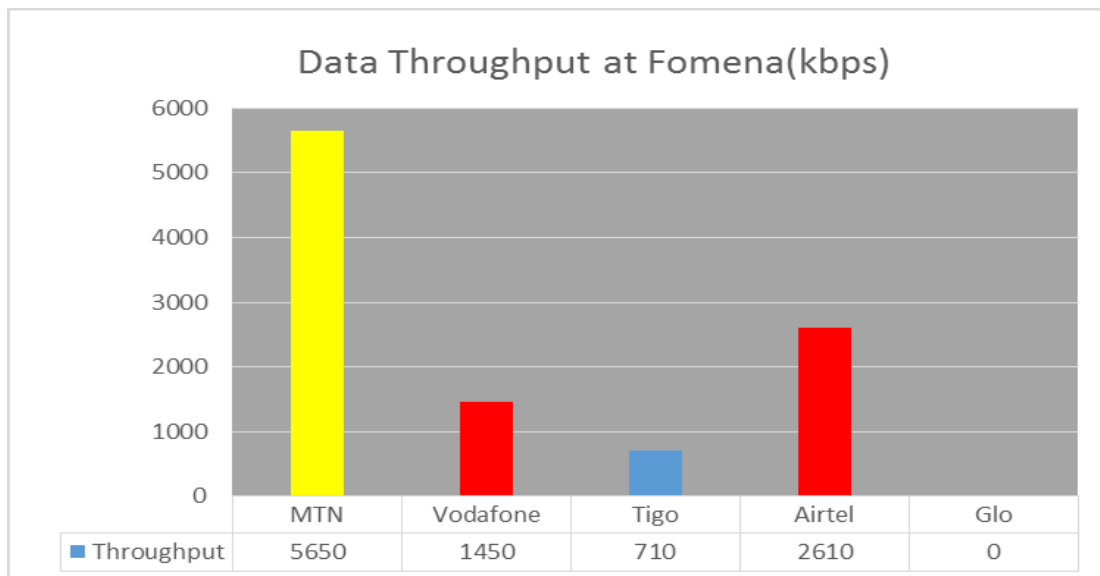
Figure 9. Data Throughput - March 2016, Foase



REMARKS:

- ❖ MTN and Vodafone exceeded the Threshold of 256kbps.
- ❖ Tigo, Airtel and Glo had no 3G Service at the time of the tests.

Figure 10. Data Throughput - March 2016, Fomena

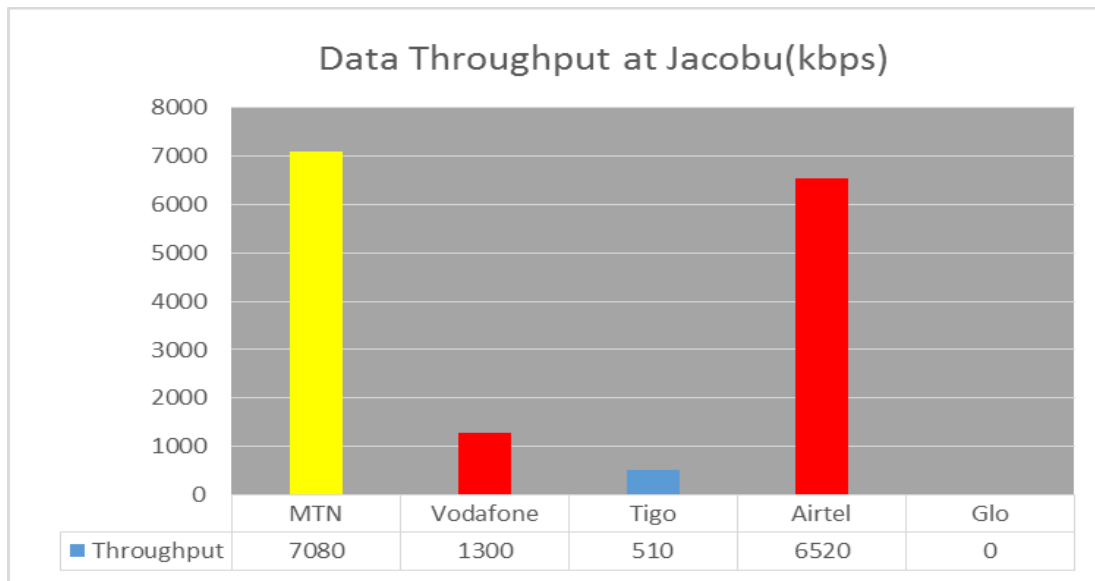


REMARKS:

- ❖ All MNOs except Glo exceeded the Threshold of 256kbps
- ❖ Glo had no 3G Service at the time of the tests

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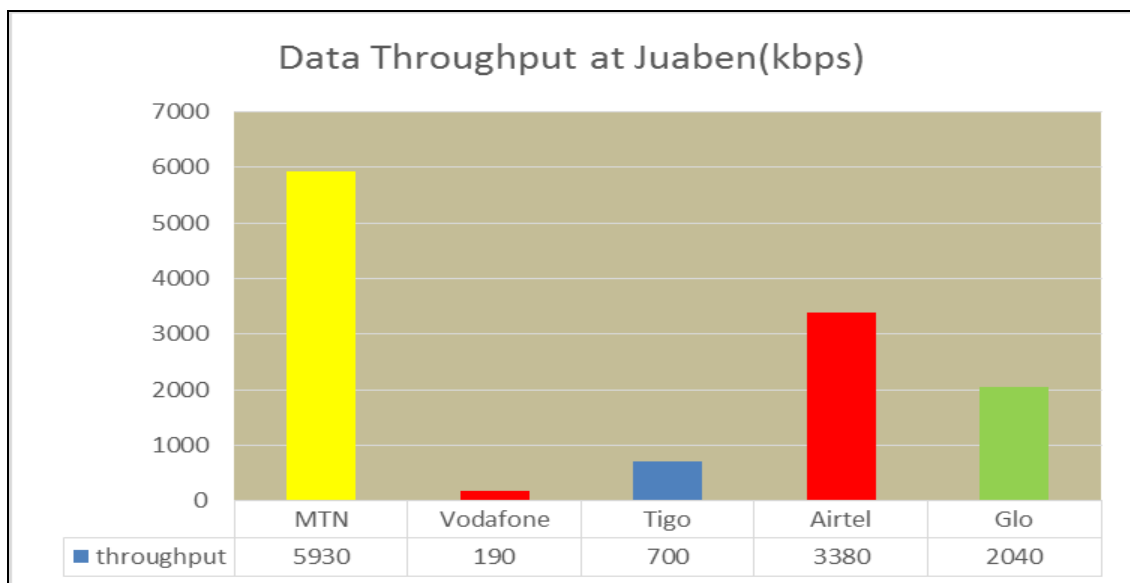
Figure 11. Data Throughput - March 2016, Jacobu



REMARKS:

- ❖ All MNOs except Glo exceeded the Threshold of 256kbps.
- ❖ Glo had no 3G Service at the time of the tests.

Figure 12. Data Throughput - March 2016, Juaben

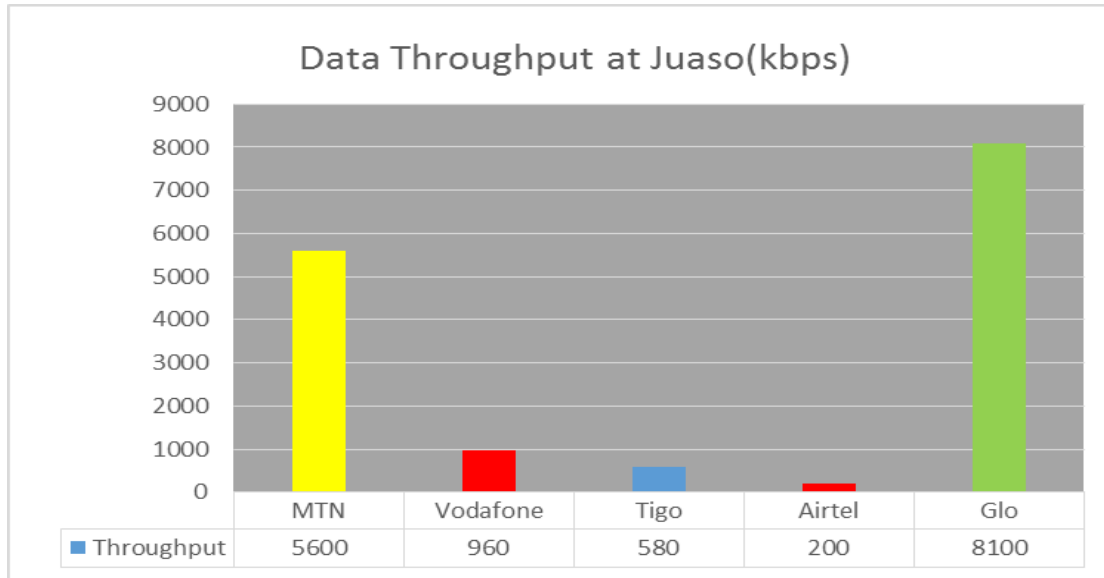


REMARKS:

- ❖ All MNOs except Vodafone exceeded the Threshold of 256kbps

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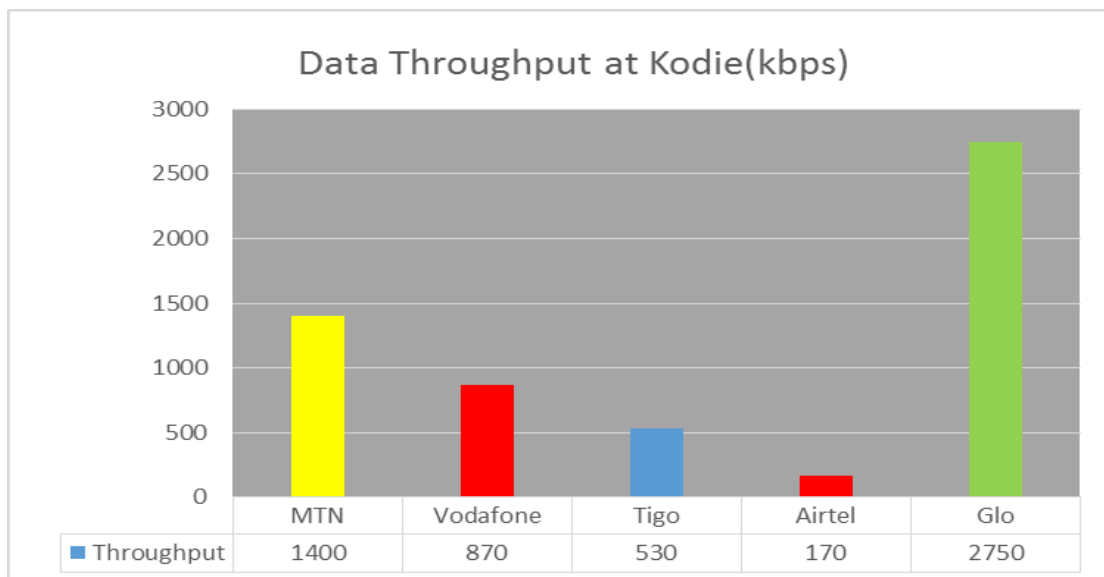
Figure 13. Data Throughput - March 2016, Juaso



REMARKS:

- ❖ All Operators except Airtel exceeded their Throughput threshold.
- ❖ Airtel failed to meet the Throughput threshold.

Figure 14. Data Throughput - March 2016, Kodie

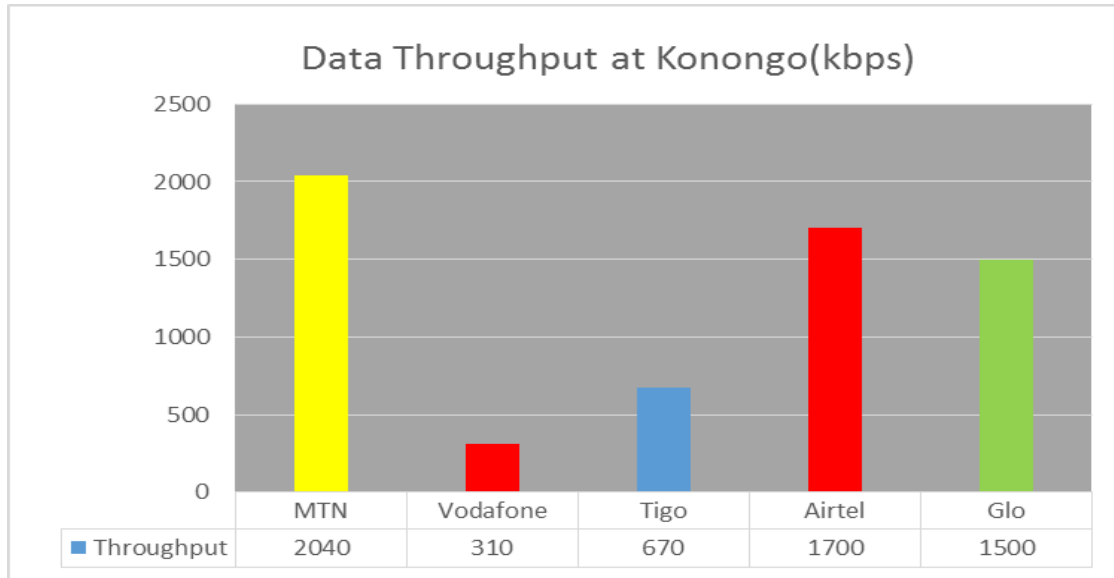


REMARKS:

- ❖ All Operators exceeded the Throughput threshold.

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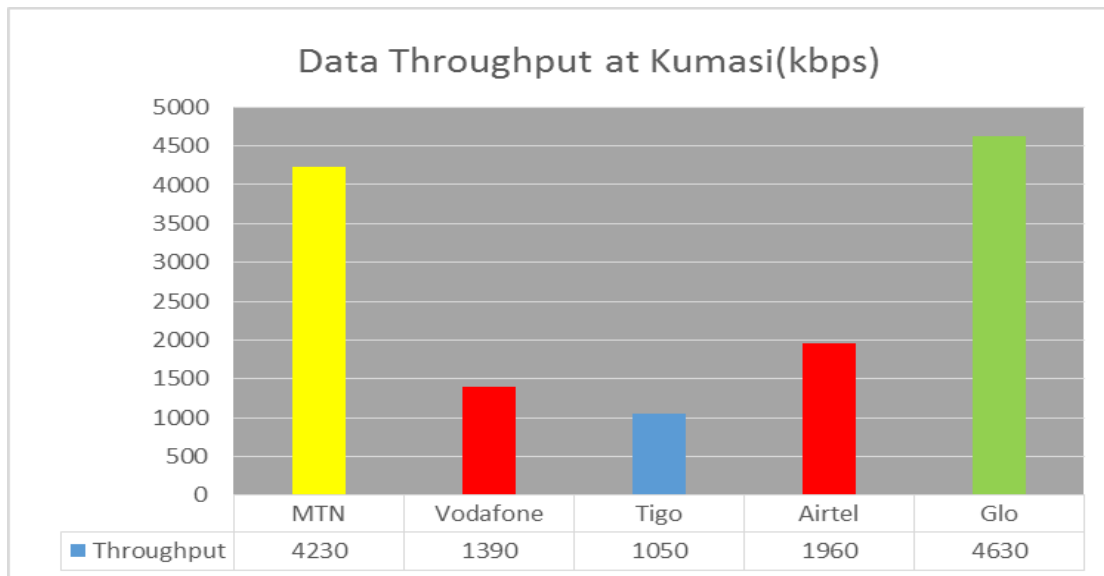
Figure 15. Data Throughput - March 2016, Konongo



REMARKS:

- ❖ All Operators exceeded the Throughput threshold in the tested location.

Figure 16. Data Throughput - March 2016, Kumasi

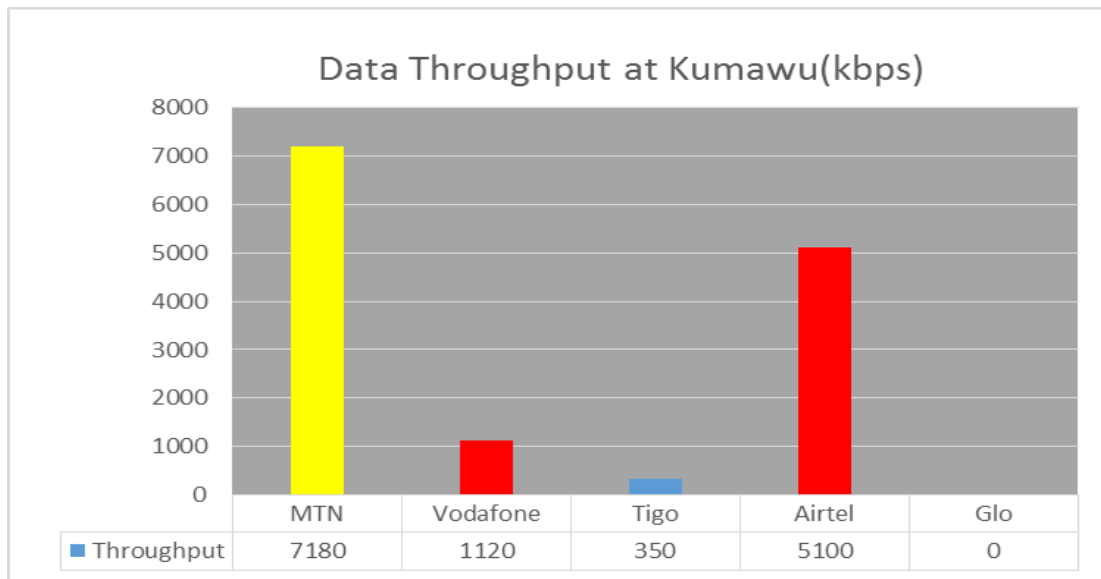


REMARKS:

- ❖ All Operators exceeded the Throughput threshold.

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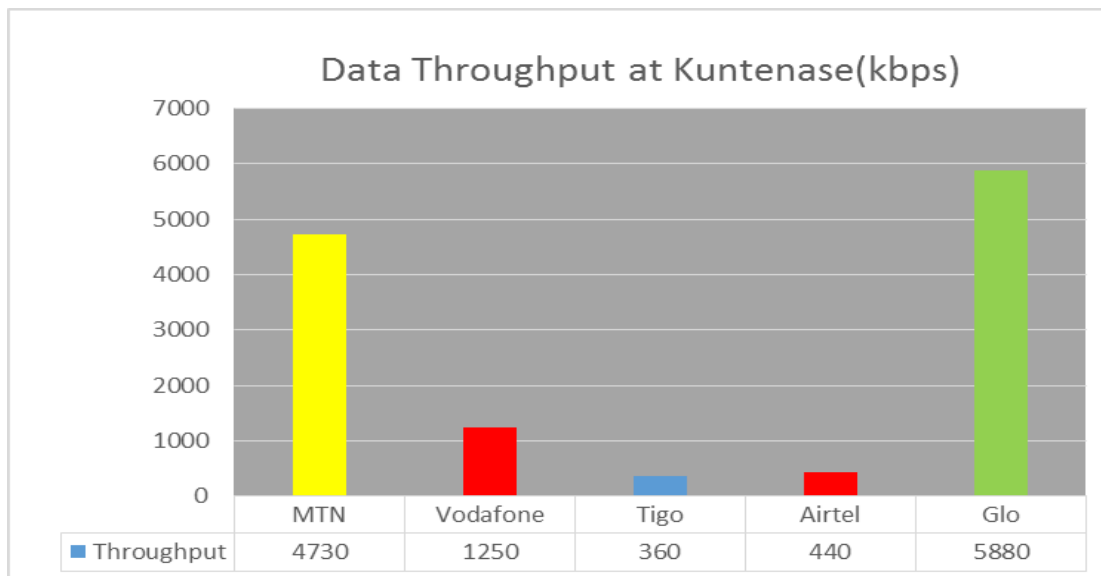
Figure 17. Data Throughput - March 2016, Kumawu



REMARKS:

- ❖ All Operators except Glo exceeded the Throughput threshold.
- ❖ Glo had no 3G Service at the time of the tests.

Figure 18. Data Throughput - March 2016, Kuntense

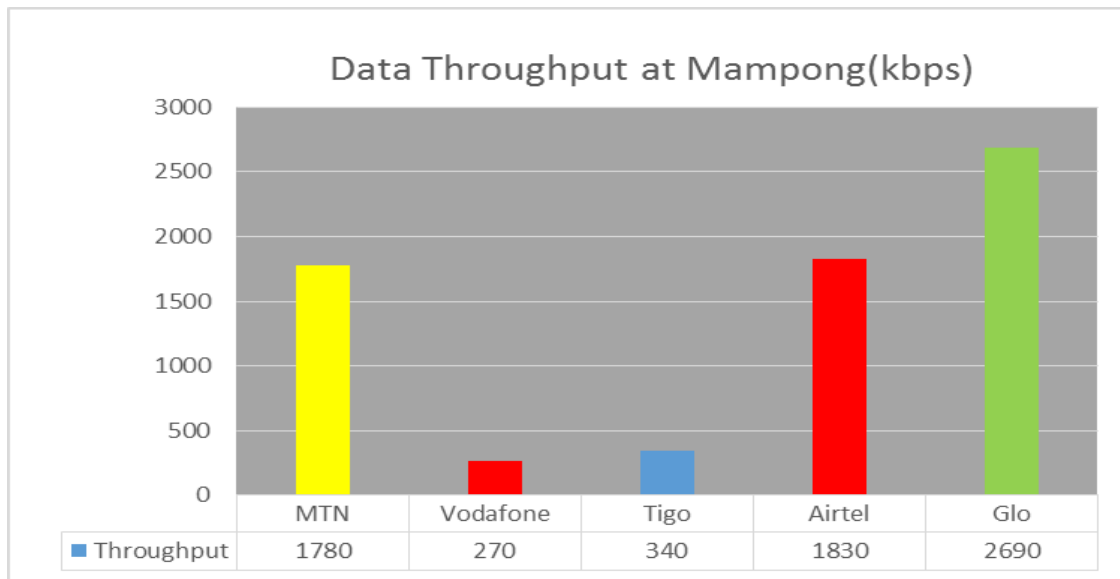


REMARKS:

- ❖ All Operators exceeded the Throughput threshold

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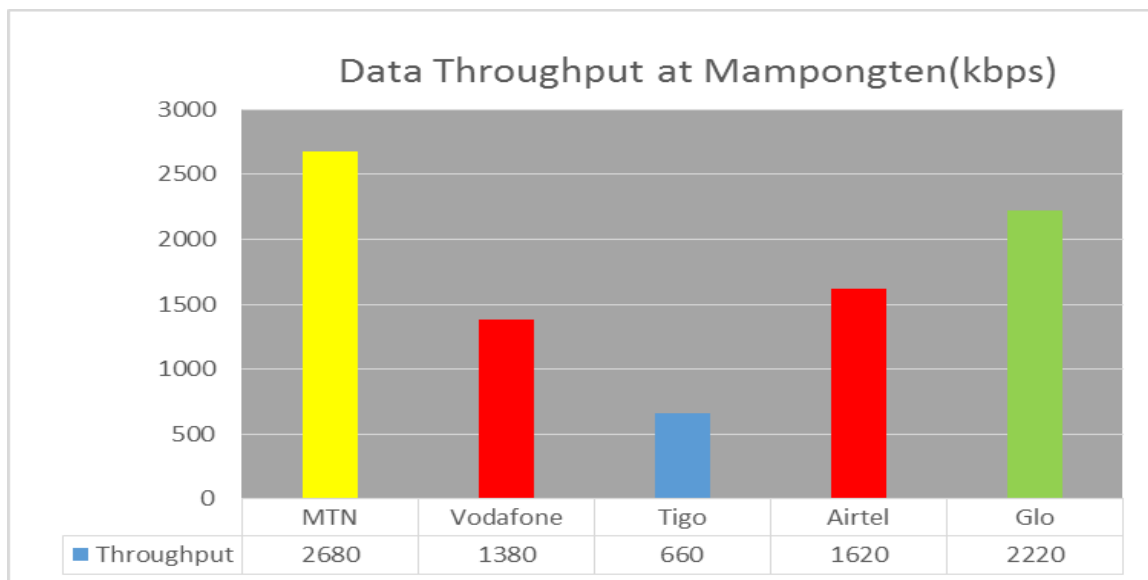
Figure 19. Data Throughput - March 2016, Mampong



REMARKS:

- ❖ All Operators exceeded the Throughput threshold.

Figure 20. Data Throughput - March 2016, Mampongten

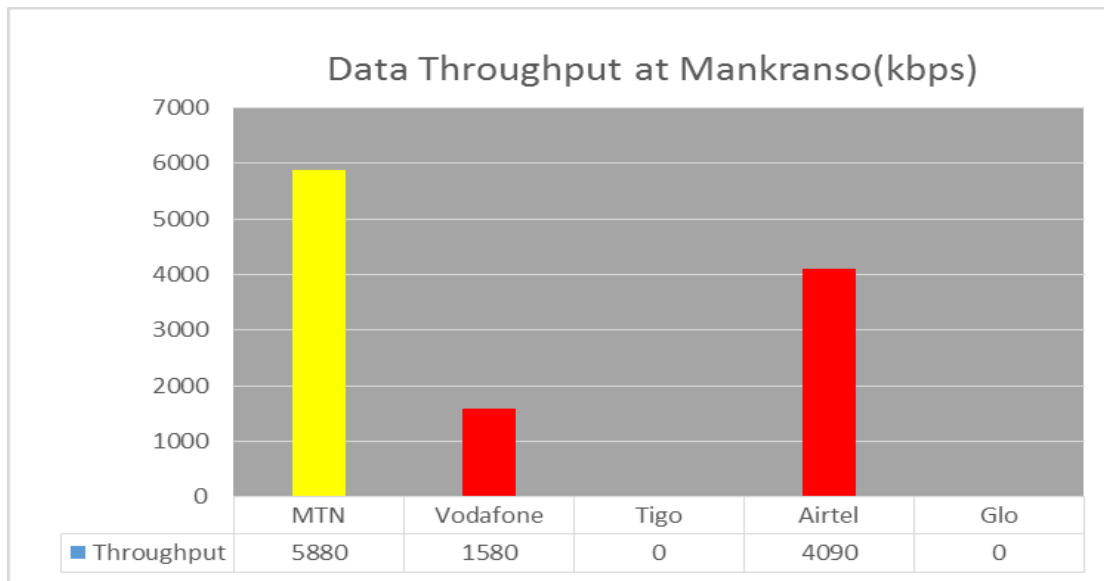


REMARKS:

- ❖ All Operators exceeded the Throughput threshold.

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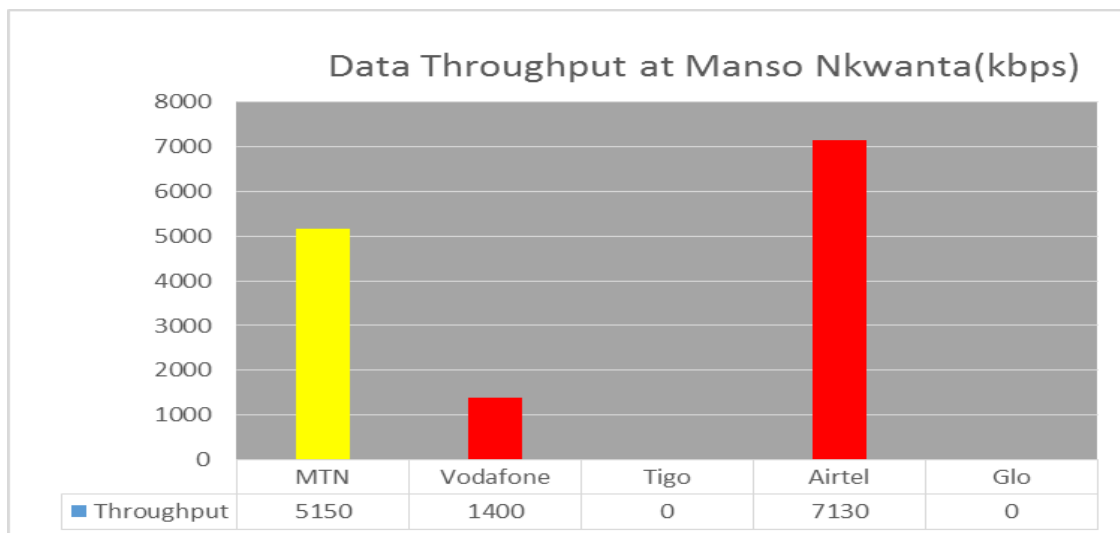
Figure 21. Data Throughput - March 2016, Mankranso



REMARKS:

- ❖ MTN, Vodafone and Airtel exceeded the Throughput threshold.
- ❖ Tigo and Glo had no 3G Service at the time of the tests..

Figure 22. Data Throughput - March 2016, Manso Nkwanta

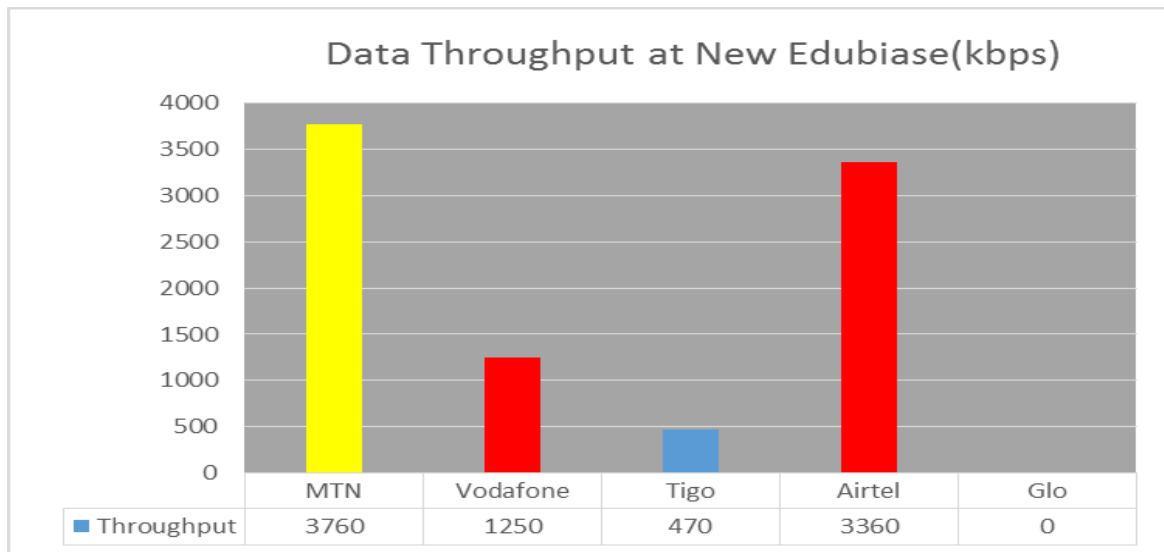


REMARKS:

- ❖ MTN, Vodafone and Airtel exceeded the Throughput threshold.
- ❖ Tigo and Glo had no 3G Service at the time of the tests.

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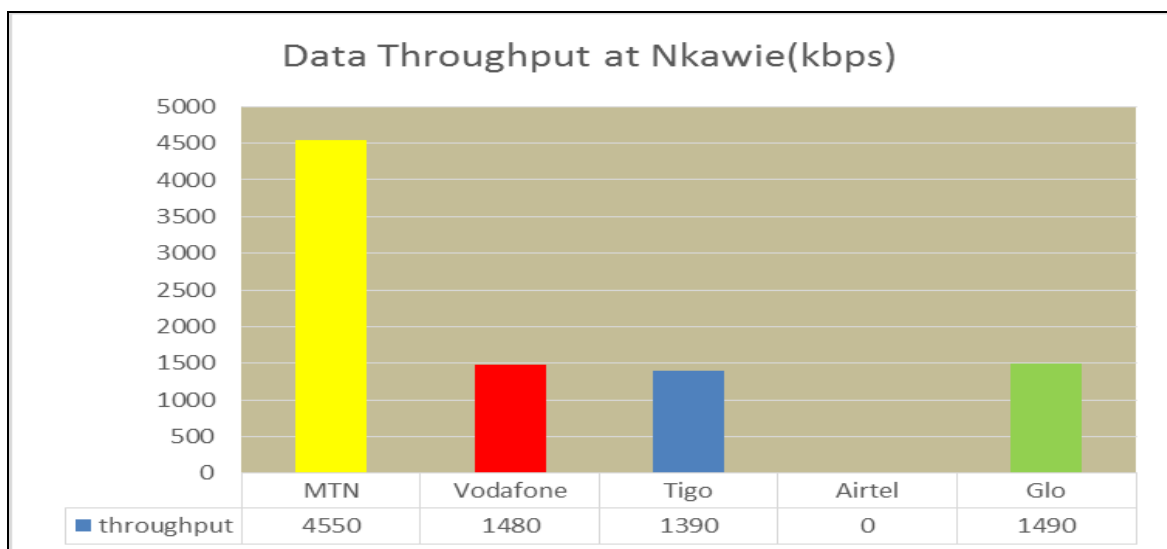
Figure 23. Data Throughput - March 2016, New Edubiase



REMARKS:

- ❖ All Operators except Glo exceeded the Throughput threshold.
- ❖ Glo had no 3G Service at the time of the tests.

Figure 24. Data Throughput - March 2016, Nkawie

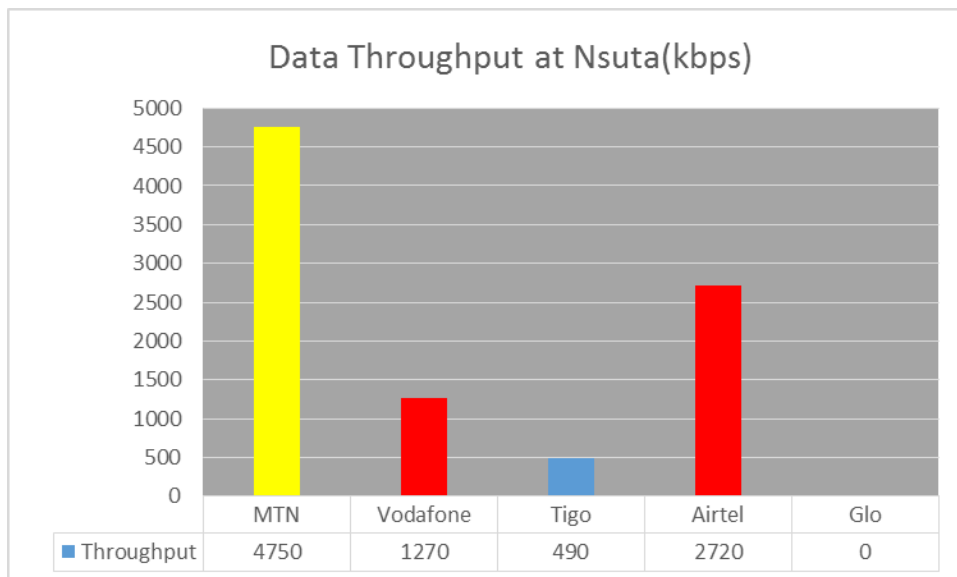


REMARKS:

- ❖ All Operators except Airtel exceeded the Throughput threshold.
- ❖ Airtel had no 3G Service at the time of the tests.

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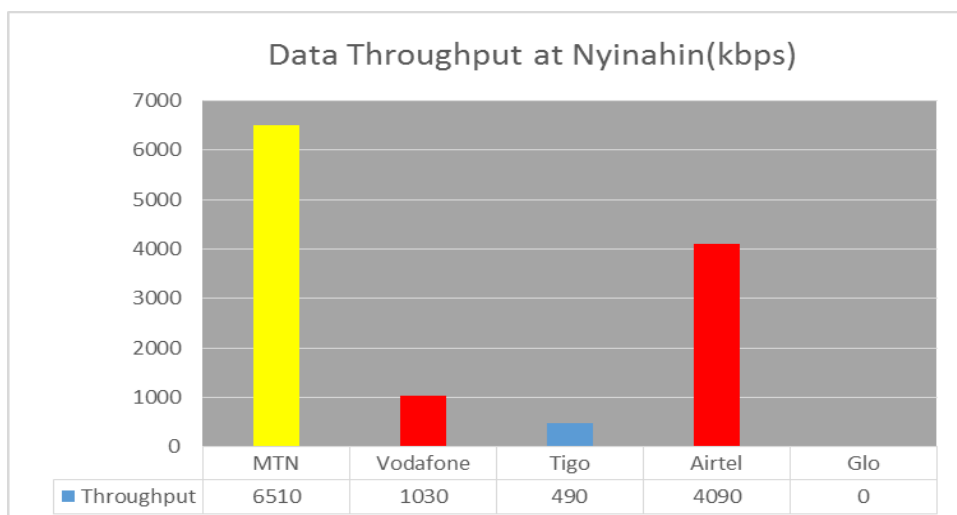
Figure 25. Data Throughput - March 2016, Nsuta



REMARKS:

- ❖ All Operators exceeded the Throughput threshold.
- ❖ Glo had no 3G Service at the time of the tests.

Figure 26. Data Throughput - March 2016, Nyinahin

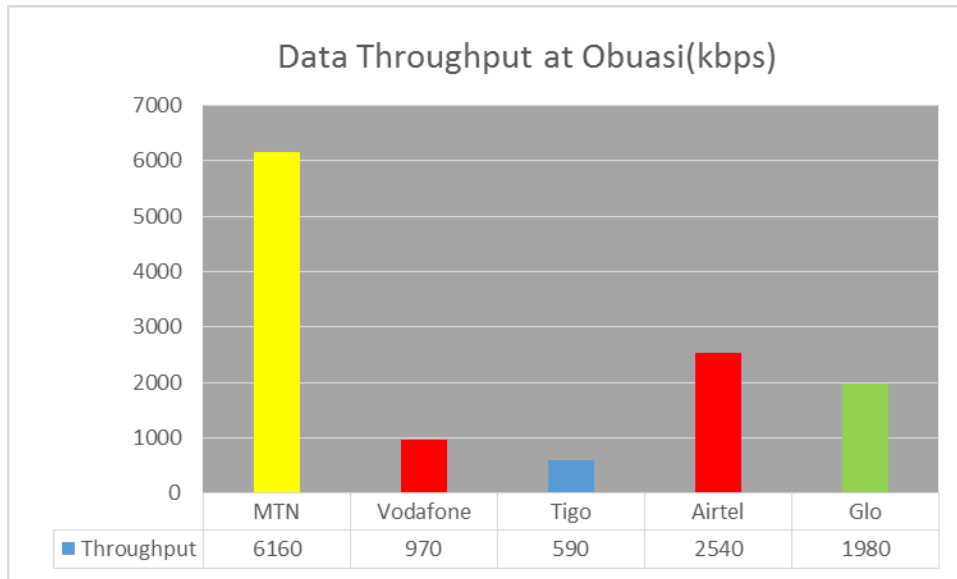


REMARKS:

- ❖ All Operators except Glo exceeded the Throughput threshold.
- ❖ Glo had no 3G Service at the time of the tests

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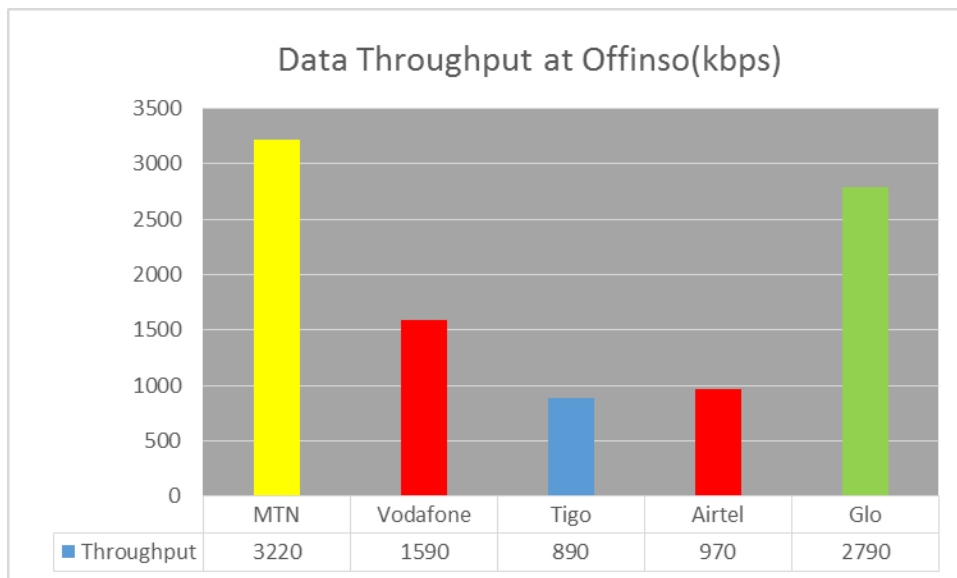
Figure 27. Data Throughput - March 2016, Obuasi



REMARKS:

- ❖ All Operators exceeded the Throughput threshold.

Figure 28. Data Throughput - March 2016, Offinso

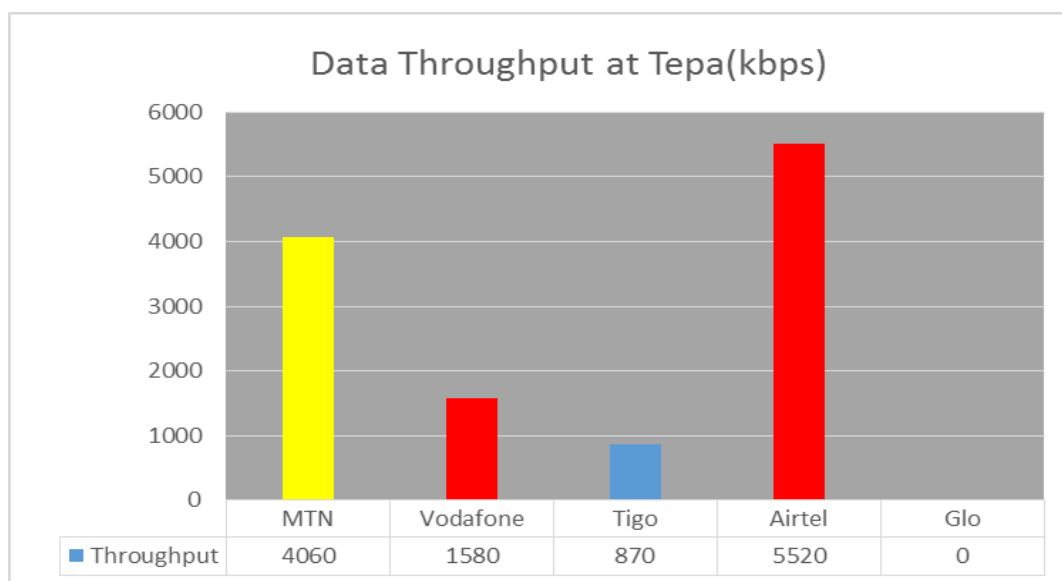


REMARKS:

- ❖ All Operators exceeded the Throughput threshold.

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Figure 29. Data Throughput - March 2016, Tapa



REMARKS:

- ❖ All Operators except Glo exceeded the throughput threshold.
- ❖ Glo had no 3G Service at the time of the tests.