ADVERT

UGANDA COMMUNICATIONS COMMISSION

QUALITY OF SERVICE FINDINGS FOR MOBILE VOICE TELEPHONY AND DATA SERVICES IN UGANDA

1. Background

Uganda Communications Commission (the Commission) is tasked by the Uganda Communications Act 2013 to, among others, promote and safeguard the interests of consumers and operators as regards the quality of communications services and equipment.

In the period from 7th August 2023 to 8th September 2023, the Commission conducted benchmark measurements of mobile voice telephony and data services in twenty-five (25) towns across Uganda to assess the Quality of Service (QoS) received by users/consumers of these services. The operators whose services were considered under this exercise were Uganda Telecommunications Corporation Limited (UTCL) t/a Utel, MTN Uganda Limited (MTN), Airtel Uganda Limited (Airtel), and Tangerine Limited t/a Lycamobile.

2. INTERPRETATION

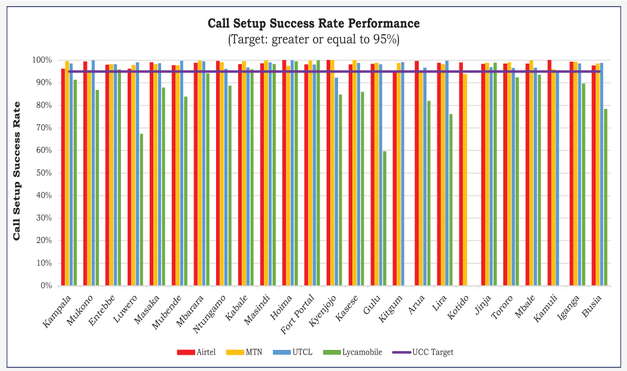
The following information is provided to facilitate the consideration of the findings.

A. Blocked call means a call attempt that fails to achieve a connection to the destination party and therefore not receiving an alerting or ring tone, busy tone, answer signal or announcement.
B. Dropped call means a call terminated by the network before it is ended by either party participating in the call.
C. Data Throughput means the amount of data that gets transferred from one point on the network to another in a given amount of time.
D. Latency means the time taken for a packet of data to travel from a user's device to destination device.
E. Packet Loss depicts the level at which the packets of data sent are dropped along the route and therefore, unable to reach their intended destination.
F. The Commission standard for QoS is as indicated below

SN	Parameter	Definition	Target
1.	Blocked Call Rate (BCR)	Maximum proportion of call attempts on the network blocked	≤2%
2.	Dropped Call Rate (DCR)	Maximum proportion of calls on the network dropped	≤2%
3.	Call Setup Success Rate (CSSR)	proportion of call attempts with an indication of call connection (alerting, busy tone or announcement) within 12 seconds from the instant the user initiates a request	≥95%

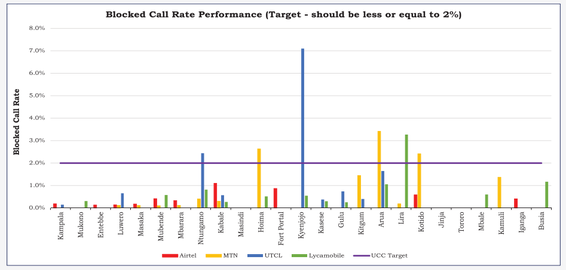
3. SUMMARY OF THE FINDINGS

Figure 1: Call Setup Success Rate (CSSR) performance per network per town surveyed



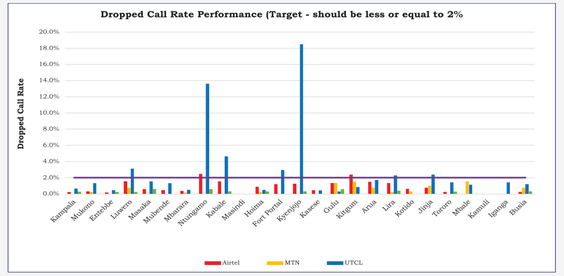
This looks at the proportion of call attempts that succeed in getting a response from the network e.g. ring tone or user busy or unavailable, within the 12 seconds of dialling. The shorter the call set up time, the better. Therefore, the higher the call setup success rate in the graph above, the better.

Figure 2: Blocked Call Rate (BCR) performance per network per town surveyed



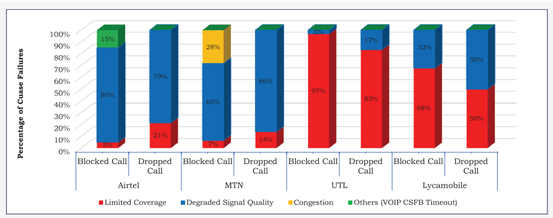
This portrays the likelihood of a call attempt achieving a connection to the called party. The lower the percentage of blocked calls, the better.

Figure 3: Dropped Call Rate (DCR) performance per network per town surveyed



This provides insight of the likelihood of a call being sustained until either the caller or called party terminates the call. The lower the percentage of dropped calls, the better.

Figure 4: Proportion of causes of blocked and dropped calls

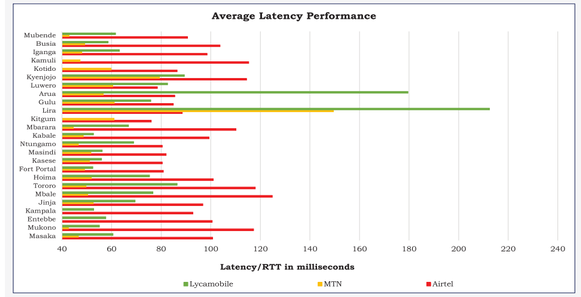


Causes of inadequate or degraded voice performance

The following were the contributors to the performance degradation observed:

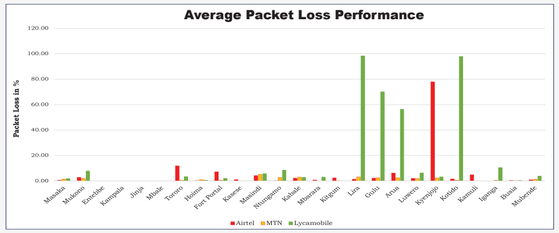
i) Degraded signal quality: this is interference to the radio signal from within the network or another nearby radio source e.g. from illegal network boosters/amplifiers.
ii) Limited coverage: Areas where there is no or inadequate signal strength for a phone to connect to the mobile network.
iii) Congestion: where the number of users trying to use the network at the same time is higher than the capacity available on the network in that location at that particular time.

Figure 5: Average Latency performance per network per town surveyed



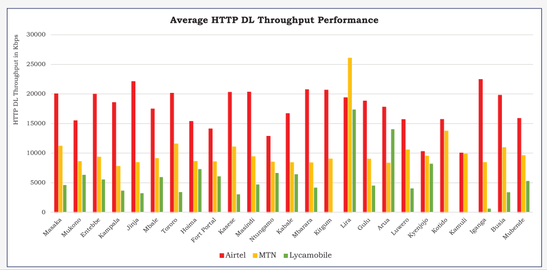
This is an indication of the level of delay in transferring data across the network. The lower the value of latency, therefore, the better. This is especially critical to online services/applications needing close to real time experience. Key cause of latency is distance between request and server responding to the request and thus how the data is routed as well as the infrastructure along the path.

Figure 6: Average packet loss performance per network per town surveyed



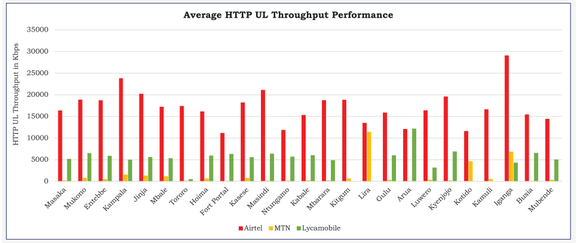
Packet loss impacts user experience in terms of network disruption or slow service. The typical causes of packet loss are network congestion, network interference, weak signal and inadequate infrastructure. Low packet loss is thus desirable especially for applications that rely on real time data processing like video conferencing.

Figure 7: Average HTTP Download Throughput performance per network per town surveyed



This provides an indication of speeds at which information would be downloaded from the internet. The higher the value, the better. Throughput is affected by the bandwidth (size of pipe), network congestion, latency and packet loss.

Figure 8: Average HTTP Upload Throughput performance per network per town surveyed



This provides an indication of speeds at which one can send information. The higher the value, the better.

4. CONCLUSION

Typically, it is globally recognised that the quality of service received by consumers may vary with time in the same location and at different locations due to coverage, type of infrastructure, usage traffic and natural factors.

However, from the findings, it is observed that coverage including a number of blackspots (geographical areas with weak signal or no communication coverage) remains a major cause of quality of service shortfalls. Black spots are due to:

a) physical obstructions e.g. buildings, trees and geographical terrain – valleys and sides of hills,
b) placement of tower/mast and the resultant distance relative to user location impacting signal strength,

c) dense concrete and metallic building material impacting signal penetration and in turn indoor coverage.

The public is asked to desist from installing signal boosters as these cause interference to the networks. The public is also invited to note that while higher-frequency radiation like x-rays and gamma rays are ionising in nature because they have energy levels that can disrupt matter at a molecular level and can cause damage to human cells directly, radiation from telecom masts is in the non-ionising radiation range like visible light, common electrical appliances, radio, and television. After in-depth review of the various scientific literature, the World Health Organisation (WHO) concluded that 'despite extensive research, to date, there is no evidence to conclude that exposure to low level electromagnetic fields is harmful to human health.'

To address the quality of service offered, all operators were given a licence obligation to rollout their respective networks to 90% of the geographical coverage of Uganda within 5 years of being licensed. Additionally, in July 2023, the Commission did award additional spectrum to enhance network performance and quality of service.

The Commission remains committed to empowering consumers to exercise choice of provider and to ensuring the availability of quality, modern communication services to foster the realisation of the transformation of Uganda into a modern and prosperous country.

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