BRIEFING BY THE MINISTER FOR COMMUNICATIONS AND DIGITALISATION TO PARLIAMENT ON INTERNET DISRUPTION IN GHANA AS A RESULT OF THE DAMAGE TO SUBMARINE CABLES

18th March, 2024

1. Introduction

1.1. In the early hours of 14th March, 2024, The Ministry of Communications and Digitalisation and the National Communications Authority (NCA) were notified of internet disruptions on both the Telecel and MTN networks which had caused a major loss of internet service.

1.2. Investigations revealed that there had been multiple undersea cable disruptions that had affected Mobile Data and Fixed Data services nationwide on MTN and Telecel. The AT network had not experienced any disruption.

The current internet outage is deeply concerning and has impacted several countries across west Africa including Ghana.

The country has six subsea cables with the first submarine fiber cable landed in Ghana by the SAT-3 consortium of which the Government of Ghana through Ghana Telecom was a member.

Until October 2023 Ghana had five (5) Submarine Cable Providers; SAT-3, MainOne, WACS, Glo and ACE and another cable from the Facebook/Meta led 2Africa consortium landed in November 2023.This 2Africa cable will be live in the fourth quarter this year.

For clarity, this incident may have been caused by a landslide that has wiped out most of the fiber cables between Ghana and Europe that have a landing station here. A separate event in the red sea has cut fibers going around the other direction from Africa to Europe. By chance, there are two cables that have been unaffected: Google/Equiano cable and Angola to Brazil cables. However, these cannot support the lost capacity with the same quality levels, and the same latency within a reasonable time.

2. Risk Mitigating Measures by the NCA

2.1. In 2020, during the Covid, the National Communications Authority (NCA) engaged the Mobile Network Operators (MNOs) and Internet Service Providers (ISPs) to assess their current capacities and redundancies to submarine cable providers and ensure that they have the necessary environment to provide reliable services to all subscribers.

2.2. The NCA realised that the MNOs and Broadband Wireless Access Providers were connected to only one or two submarine cable providers. In order to mitigate any risk from a national emergency point of view, the NCA issued directives to the MNOs and Surfline, in a letter dated 30th April 2020 (copy attached), that the service providers should establish and maintain physical cable connections to at least three (3) submarine cable providers operating in Ghana.

2.3. The NCA also indicated in the directive that all redundant cable connections should be capable of being lighted within twenty-four hours (24 hours) in the event of outage on their primary links.

2.4. All the MNOs complied as indicated below:

Table 1 – MNO Capacity with Sub Marine Cable Provider

MNO	**Physical Connection**	**Capacity (Gbps)**
MTN	ACE	170
	WACS	150
	Main One	150
Telecel	SAT-3	144
	WACS	20
	ACE	20 (Activated during the outage)
AT	Main One	14.5
	ACE	10
	***WACS (through WIOCC)**	**10**

2.5. Not only did AT comply, they went further to establish and maintain a physical connection to an external submarine cable provider that did not land in Ghana. They acquired this additional service from WIOCC (through the WACS) which provides connectivity from Nigeria through the Equiano Cable.

2.6. As a result, at the height of the outage AT had a better service while the other MNOs had degraded service.

2.7. Also, at the time of the outage, MTN had provisioned a separate 70 Gbps capacity over WACS cable to Nigeria. This facility was used to maintain a local cache exchange with the internet community via Glo-1 Cable in Nigeria; and was repurposed for a partial MTN internet data services when all four subsea cable providers in Ghana had complete outage on Thursday, March 14th.

3. Details of the Network Outages

3.1. Preliminary findings and further investigations of this cable fault revealed that the fault occurred due to external incidents that resulted in cuts on the submarine cable systems, in the Atlantic Ocean offshore Cote D'Ivoire, along the coast of West Africa and Portugal. The subsea cable landing service providers have remotely identified the approximate locations of the damage and have made preparations to dispatch repair vessels to the location for physical assessment and restoration.

3.2. As detailed above, this did not affect AT as they had executed connectivity with a sub marine cable provider that does not land in Ghana.

3.3. This major disruption has had a major impact on almost all industries, affecting economic, commercial, academic and social activities among others.

4. Likely Cause of the Outages

4.1. Most submarine cable faults occur as a result of human activities such as fishing and anchoring in shallow waters near shore, natural hazards such as earthquakes, landslides, and then equipment failure. Given the distance from land, and the cable

depth reported to be about 5 kms at the point of fault, any kind of human activity – ship anchors, fishing, drilling etc has been immediately ruled out by the experts.

4.2. It is also important to note that only two (2) sub marine cables in the sub-region, Equiano and Glo were not affected. Coincidentally, these 2 do not have landing cable stations in Abidjan, Cote D'Ivoire while the four (4) that were affected have cable landing stations in Abidjan.

5. Interim Measures

5.1. The Mobile Network Operators (MNOs) and subsea cable landing service providers continue to work with their international partners in the sub-region to progressively add more capacity for data services as it becomes available. Currently ACE has a fibre connectivity between Ghana and Nigeria and the sub marine cable providers are leveraging on this to get some capacity from Nigeria.

5.2. As at Sunday, 17th March, the NCA provided updates on the incremental additional capacity and a monitoring of the situation confirms that the consumer experience is improving. It is our expectation that this will continue while efforts are underway for full restoration of services. Connectivity is much better than it was yesterday and will improve further, reaching full capacity when the cables are repaired.

5.3. The NCA in treating the national crisis has been issuing regular communications to the general public and will continue to do so until full restoration of service is achieved.

5.4. No other country which was fully impacted like Ghana, has restored its full capacity.

6. Restoration Measures

6.1. The submarine cable providers have maintenance agreements with international submarine cable repair companies like Atlantic Cable Maintenance and Repair Agreement (ACMA) to provide repair services for the submarine cables.

6.2. The initial remote investigations by all affected sub marine cable providers have given them the approximate locations where the cables have been damaged. To commence the repairs, the affected sub marine cable operators need permits from the authorities in Cote d'Ivoire and/or Senegal, their vessels will be assigned to retrieve the necessary spares required for the repair work before sailing to the fault location to conduct the physical repair work.

6.3. The affected section of the submarine cable will have to be pulled up from the seabed onto the ship where it will be spliced by skilled technicians to complete the repair, it will be tested for any defects and then lowered back to the seabed.

6.4. This process might take 1-2 weeks for repairs while about 2-3 weeks of transit time may be required for the vessel to pick up the spares and travel from Europe to West Africa once the vessel is mobilised. That is why the NCA estimates a minimum period of 5 weeks for the repair work.

7. Use of Satellite as an Alternative

7.1. With regards to the use of Satellite service as an alternative to the sub marine cable, it is important to note that:

7.1.1. The bandwidth of a Satellite back-up for MNOs cannot replace the capacity that has been lost due to the outage.

7.1.2. Satellite back up for Consumers is more feasible, however, the cost is relatively high.

Immediate Initiatives

1. The government will license satellite gateway earth stations, landing rights, and satellite earth station networks. Oneweb has already been licenced , Starlink is in the process of being licenced and other operators are being encouraged to land in Ghana. We must also invest in operationalising RAScom, the Regional African Satellite Company instead of each country hound it alone to provide satellite internet services.
2. All MNOs must arrange and implement alternative routes to restore full service by 30th March 2024.
3. Organisations and enterprises are encouraged to host their content, databases , applications, and services in at least two tier 3/4 data centres in different locations. Public organisations must utilise the national Data Centre as either their primary or back up data host.

8. Satellite Licensing Framework

8.1. The NCA did not have a framework for licensing Satellite internet and the Authority has in the last year, conducted benchmarking and learning from other jurisdictions where this has been implemented. Currently, the NCA has developed a Satellite Licensing Framework in Ghana which has been approved by its Board and processes are in place for final policy approval.

8.2. This Framework will provide the policies and rules relating to the application for frequency authorisations for satellite services in Ghana. It outlines the various categories of satellite services, the licensing requirements and its associated fees. A draft framework was subjected to industry consultation.

8.3. The objective of the framework is to provide:

8.3.1. Increased regulatory oversight for the services

8.3.2. More connectivity solutions/options for customers

8.4. The fee charged by Starlink for hardware and services shows that they will cater for the high value subscribers. It is not cheap.

We are currently having discussions about affordable backhaul Satellite solutions with all satellite service providers, under the auspices of the ITU, and hopefully, this incident will focus minds abc enable us get a quick agreement.

9. The Way Forward

9.1. Future Regulatory Interventions

9.1.1. All MNOs and ISPs will be required to establish connectivity with other sub marine cable providers that are not present in Ghana. All internet service providers should be obliged to connect to additional undersea cables, satellite options, and terrestrial links through neighbouring countries. Mixed infrastructure with adequate capacity is required to provide redundancy to Ghana's internet connectivity.

IMPORTANCE OF GIX IN LOCALISATION OF INTERNET CACHES

The localisation of internet caches is integral to enhancing the speed, efficiency, and reliability of content delivery on the internet. It improves user experience, offers cost savings, and helps maintain a robust and scalable infrastructure for delivering digital content.

Ghana requires one more Internet Exchange on the coast and another inland to provide redundancy and improve internet delivery for a better experience in the country. We currently have two which are active and one which is not. All will be put in service and additional capacity secured.

Some key points highlighting the importance of localising internet caches:

1. Improved Load Times:

   By having caches located closer to end-users geographically, the latency in accessing content is significantly reduced. Users can access cached content more quickly, leading to a better browsing experience and higher user satisfaction.

2. Reduced Network Congestion:

   Localising caches helps in offloading traffic from the main servers, reducing the strain on the network infrastructure. This can prevent network congestion and bottlenecks, ensuring smoother data delivery.

3. Cost Savings:

9.2. Full Adoption of the Ghana Internet Exchange

9.3. The Ghana Internet Exchange (GIX) is the facility which keeps Ghanaian Internet traffic in Ghana. GIX allows local Internet Service Providers and Network Operators to easily exchange traffic within Ghana, while improving connectivity and services for their customers.

9.4. Despite the benefits of the GIX, most internet traffic originating from Ghana are exchanged internationally using expensive transit circuits; we should therefore

encourage the creation of local contents and international content such as Facebook, Instagram, YouTube and Netflix should be hosted locally. Google has servers in Ghana and Nigeria so cached content like YouTube was not affected by the disruption.

9.5. We will issue a directive for all entities that provide critical content such as banking products, Gh.Gov, ECG and similar platforms, educational materials, etc. to be hosted in Ghana.

9.6. This policy should create an enabling environment to make the service affordable and reliable for hosting content locally.

9.7. Government should support the creation of regional exchanges in Ghana to augment the GIX. We should also invest in talents and developers to develop more local content that will be of interest to our people.

9.8. The NCA, will issue directives to all authorised and licensed entities to connect to the exchange and will facilitate the licensing process for authorising more entities to build exchanges in the country.

9.9. The NCA may consider making it a requirement to register and interconnect to the local exchange as part of the application for a licence.

9.10. Government through the NCA, National Information Technology Agency, NITA, and the Ghana Domain Name Registry, GDNR, should play a key role in IXP management in that:

the facility is a public infrastructure.

citizens and government data are involved.

cybersecurity and data protection issues play a role.

It is critical to ensure local traffic is exchanged locally.

9.11. Within Africa, countries can facilitate discussions to push for inter-country exchanges that will ensure mutual benefit to all. This can be achieved through the African Union, Smart Africa Alliance, ECOWAS and the other regional blocs in Eastern, Southern and Northern Africa. Currently Microsoft has a Data Centre in Nigeria which has brought its global network closer to Ghana. An inter-country exchange between Ghana and Nigeria will bring a lot of benefit to local users subscribing to MS Azure Cloud services and Microsoft 365. The largest data centre in Africa is being built at the Trade Fair Centre in Accra by the African Data Centre's Limited to facilitate the hosting and storage of data in Ghana by local and international companies, global giants too.

9.12. These inter-country exchanges will encourage international content delivery networks to bring their servers to the continent which will help deliver faster and seamless connectivity

10. Conclusion

We have also ensured that the national data center and internet gateway has redundancy &and is functioning properly. All the public agencies hosted there are operational. In addition, under my leadership, we have completed the connectivity to 951 agencies nationwide and all 261 districts which have been connected to the same internet gateway with redundancy provided through Satellite links which are also operational. This GOVNET is providing connectivity to critical infrastructure such as hospitals, post offices, police stations, courts etc.
The Rural Telephony project will also connect some four million citizens to voice and data services when completed this year.

As a nation we need to be proud of the efforts we have made in last few years to build the critical national infrastructure, reduce the digital divide & provide universal access to connectivity. The telecom sector which has been under invested in for several years has seen new investment with the Telecel acquisition of Vodafone and recently announced joint venture between AT and Hannam Investment partners.

We have worked with the operators and cable companies to identify alternate routes, and implement those routes as quickly as possible. These routes are being allocated as we speak, and every day will see better and better capacity onboarded for all operators until the main cable breaks are repaired.

In addition, I have shepherded the multi-year process of getting the Facebook/2Africa 45,000 km cable to Ghana; and while the fiber recently landed here in November last year, it will be operational by the end of this year to increase the country's redundancy and capacity. As the newest cable, its capacity is 180 Terabits per second, multiple times that of the older fibers.

We will endeavour to seek and implement forward looking measures that will safeguard the use of and our adoption of digital solutions.

During this hard time of limited access to the internet we hope we can count on the patience and resilience of our people as we work assiduously to weather the storm. This too shall pass.

IT IS POSSIBLE!!!

Attached

Copy of 2020 Directive to MNOs and ISPs

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NATIONAL COMMUNICATIONS AUTHORITY (NCA), GHANA

REF: NCA/OPT-DIST/VOL 6/36 30th April, 2020

See Distribution:

Dear Sir/Madam,

DIRECTIVES ON NCA'S RISK ASSESSMENT OF OPERATORS' CURRENT CAPACITIES AND REDUNDANCIES TO SUBMARINE CABLE PROVIDERS

The National Communications Authority refers to its scheduled meetings with Mobile Network Operators (MNOs) and Broadband Wireless Operator, Surfline Communications Limited (Surfline), from 1st to 3rd April, 2020 on the above-mentioned subject.

Further to the said engagements, the Authority conducted an independent risk assessment of your undersea cable service subscriptions. In accordance with relevant provisions in your Licences the Authority hereby **directs** as follows:

1. From a national emergency point of view, all MNOs and Surfline should **establish and maintain physical cable connections to at least three (3) submarine** cable companies.

2. Further to (1) above, all redundant cable connections should be capable of being lighted **within twenty-four hours (24 hours)** in the event of outage on your primary links.

3. All MNOs and Surfline should ensure **commensurate expansion of capacities** at the radio and IP connectivity links to the submarine cable companies.

4. All MNOs and Surfline, effective April 2020, must submit to monreports@nca.org.gh monthly reports on your **capacities, utilizations and redundancies/ protections** to your respective submarine cable providers.

5. Further to (4) above, all MNOs and Surfline should communicate to the Authority its planned expansion works anytime capacity utilization **exceeds eighty-five percent (85%)**.

We count on your cooperation in this regard.

Yours faithfully,

JOE ANOKYE
DIRECTOR GENERAL

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Distribution

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   Accra

4. The Chief Executive Officer
   Surfline Communications Limited
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