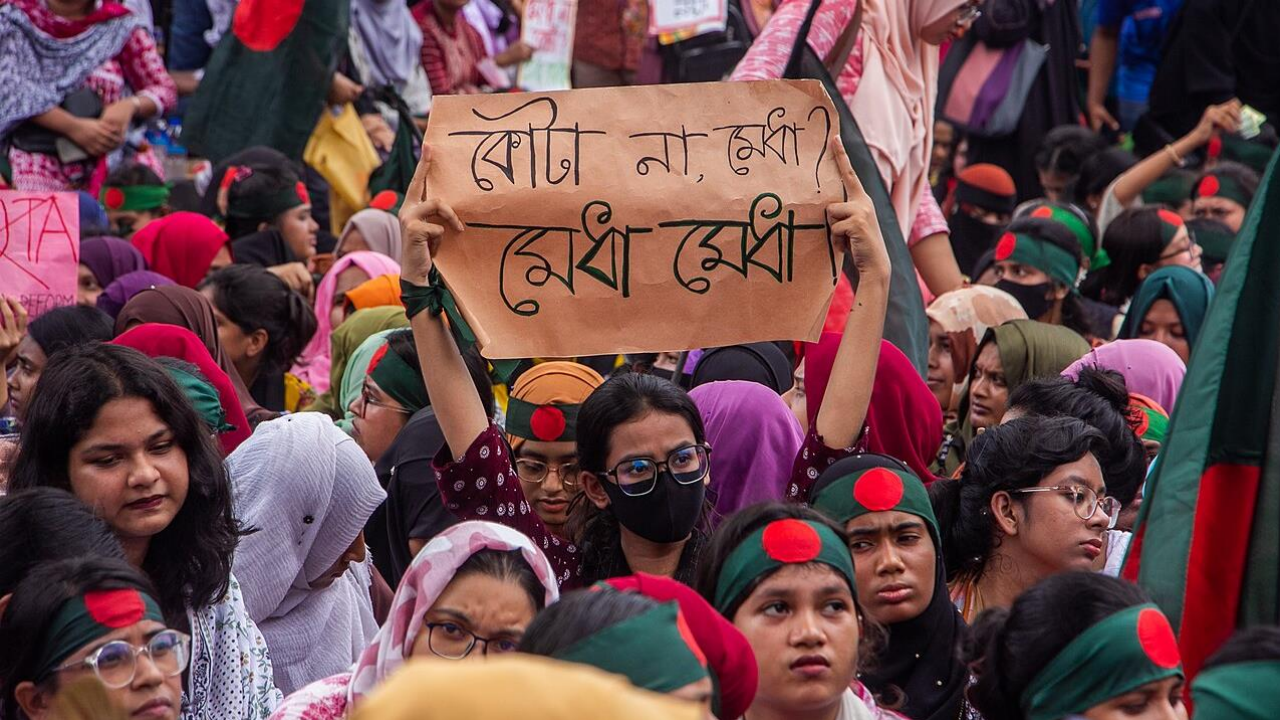


INTERNET RESILIENCE FOR COUNTRIES IN CASE OF SUBSEA ISOLATION FOR ESSENTIAL SERVICES

**JULY REVOLUTION 24
BANGLADESH 2.0**



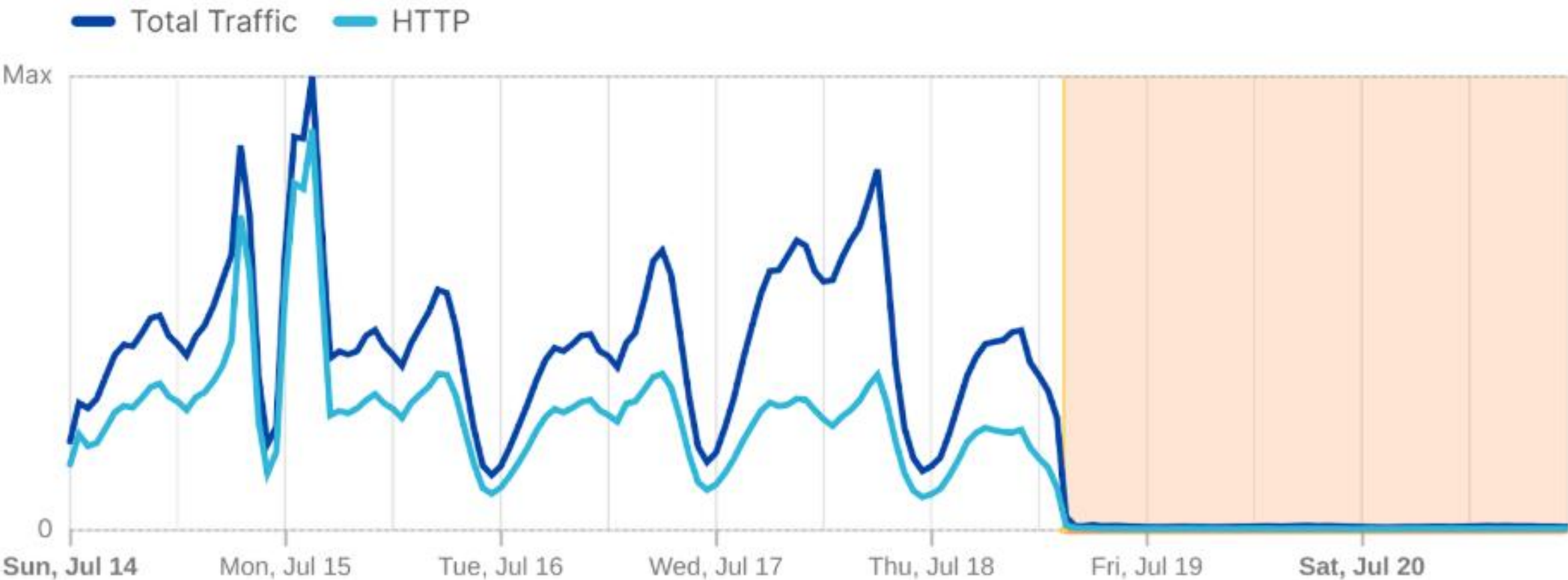


But when the
revolution is
getting the
momentum...

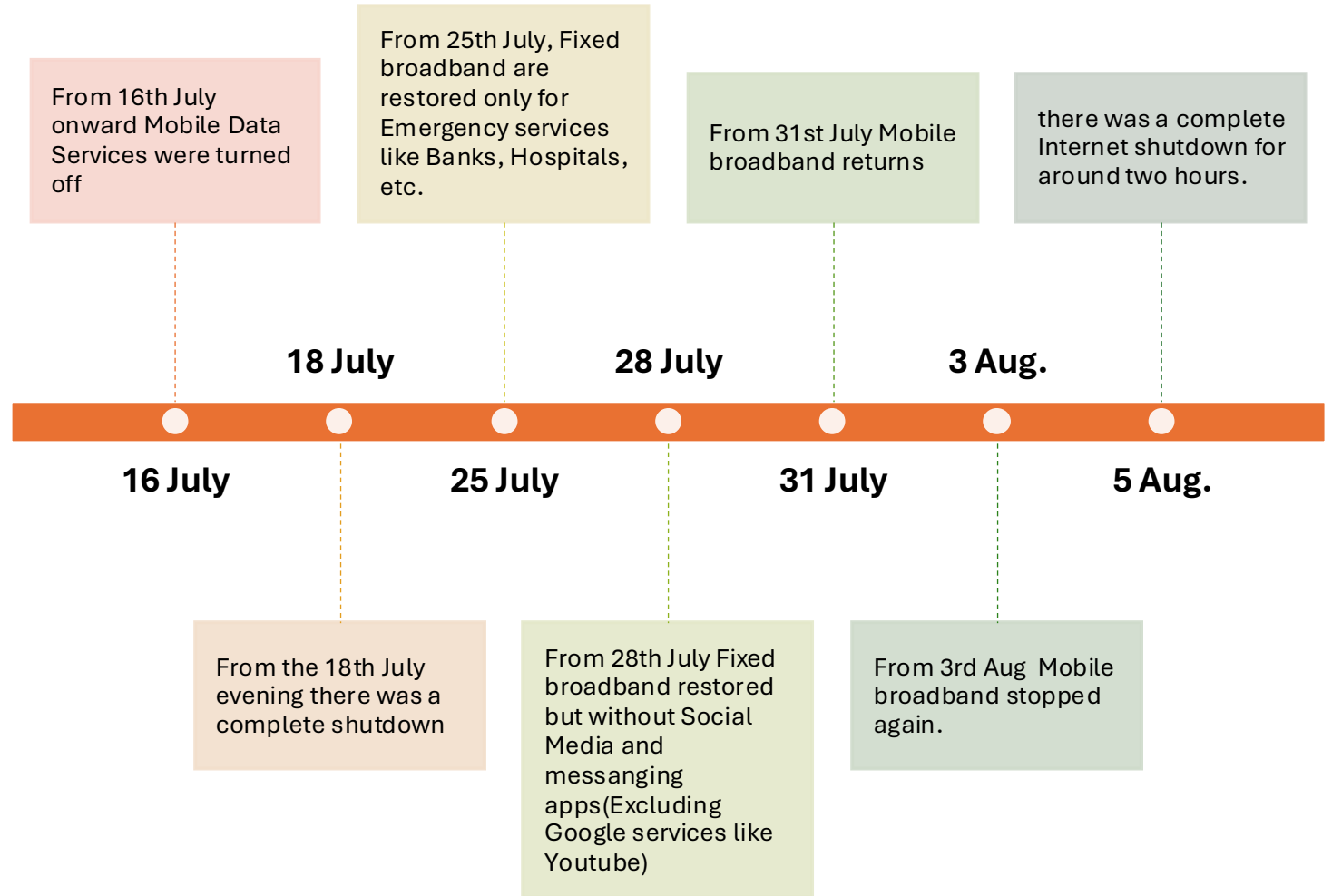


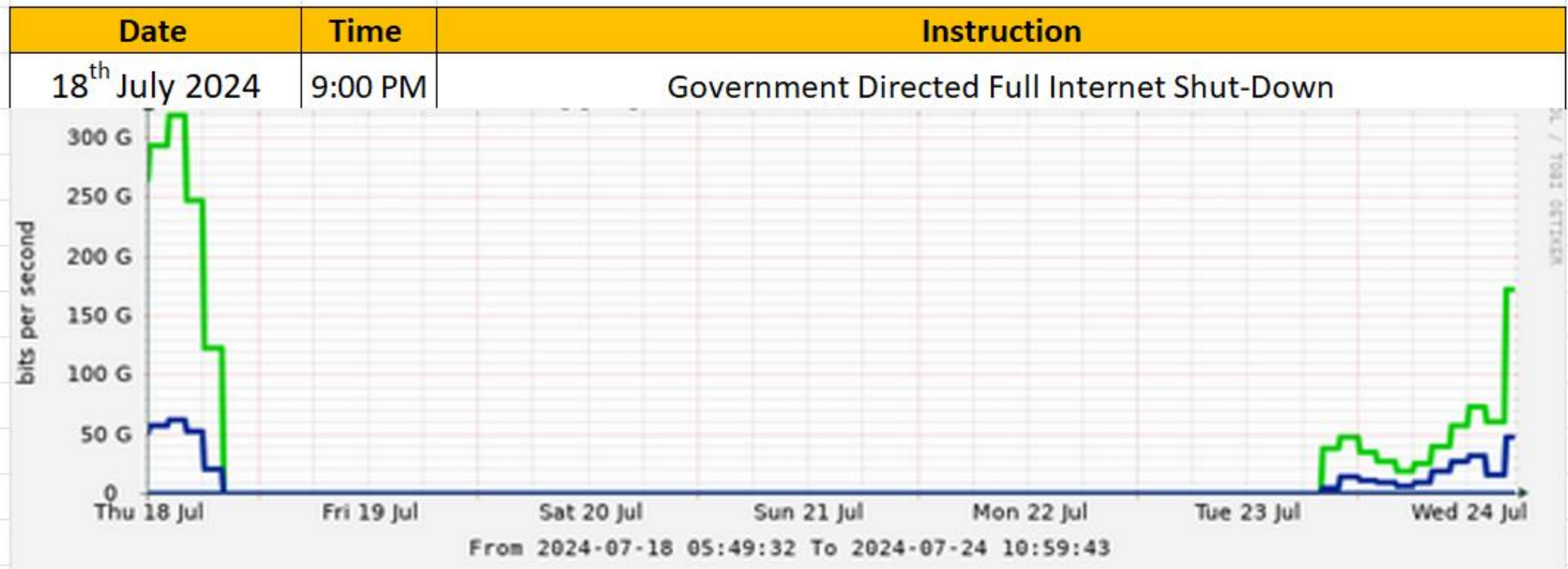
Internet traffic trends in Bangladesh

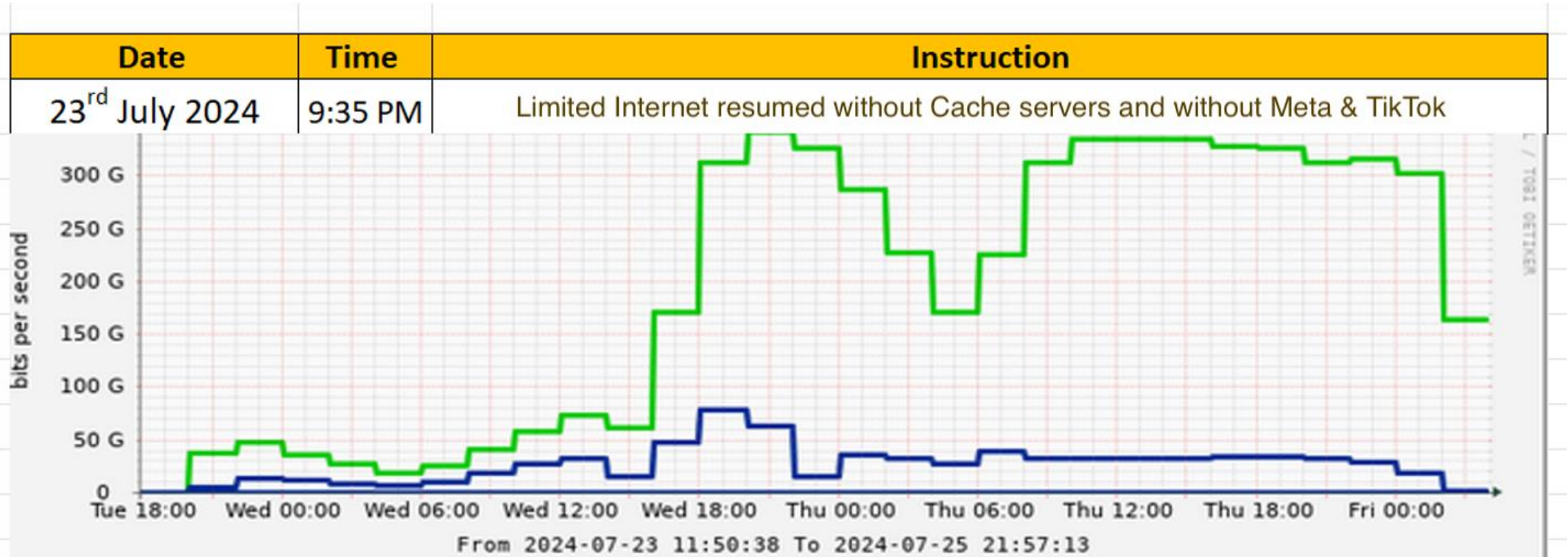
Traffic volume over the selected time period



Partial and a full Internet Shutdown

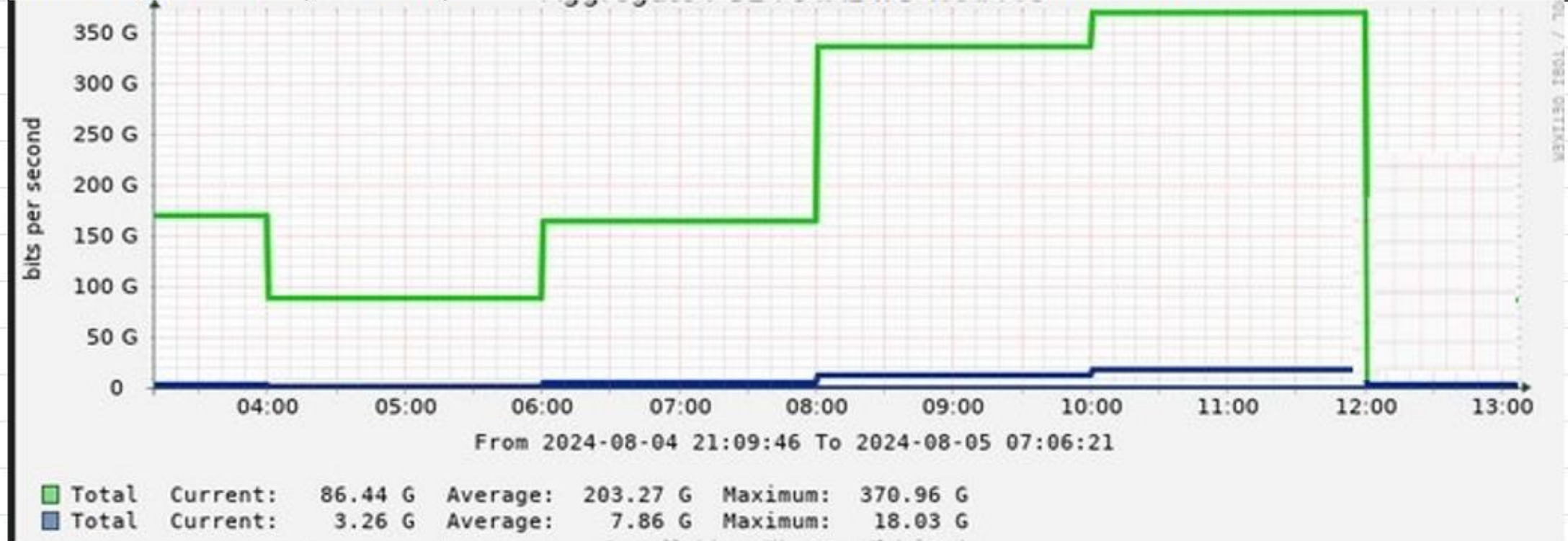




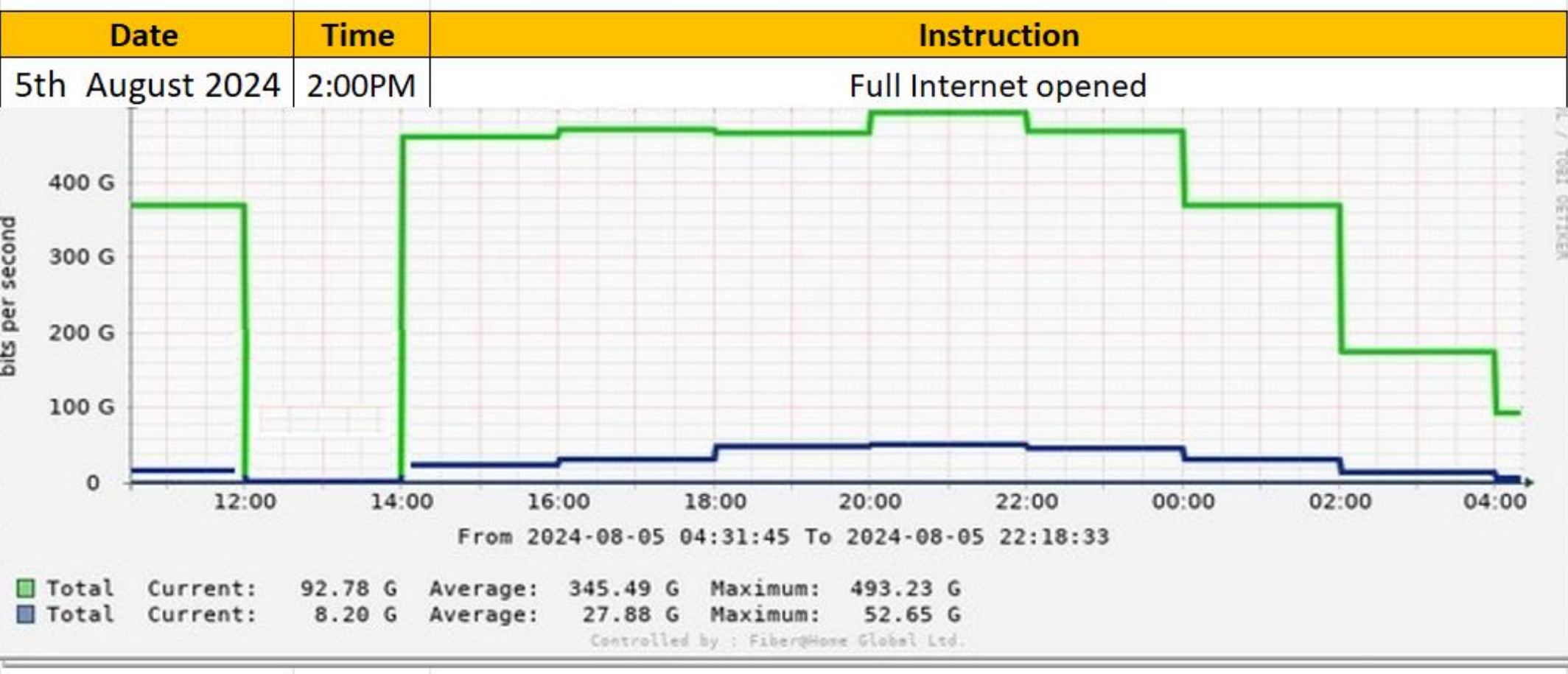


VPN traffic raised to approximately 400 gbps compared to 30GBPS in normal time.

Date	Time	Instruction
5th August 2024	10:45PM	Full Internet Shut-Down



BANGLADESH 2.0



36
July

From the earth to a lonely planet!!

-
- Life without the Internet





Basic Utilities
were unusable

- Mobile Money
 - PoS
 - Ecommerce
 - Prepaid Electricity, Gas, Water meters
 - Prepaid Mobile sim's
- 

Local Apps didn't work!!



Some Apps are hosted in cloud
abroad



Some of them used java scripts
or API hosted in cloud abroad

Some direct IP based communication were slowed down due to
reverse DNS failure

Apps and websites should have a lightweight version avoiding fancy
remote scripts or API for the disaster time. And must have a local
mirror.

Recent Internet Shutdown incidents

January 2026 (82 days)	Iran	Started with protest and intensifies during war
October 2025	Cameroon	Significant mobile data and network disruptions surrounding the presidential election.
October 2025	Tanzania	Targeted platform blocks and localized network shutdowns implemented around the national polls.
Sept – Oct 2025	Afghanistan	Countrywide digital restrictions enforced by the Taliban, heavily blocking humanitarian networks.
May 16, 2025	Libya	Complete network collapse following public protests against the unity government.
May – June 2025	Iraq	Periodic, multi-hour nationwide shutdowns deployed to prevent cheating during national student exams.
July 15 – Aug 5, 2024	Bangladesh	Severe multi-stage national blackout (broadband and mobile) utilized during mass student protests.
May 3 , 2024	Nepal	Commercial Upstream Blackout.
Ongoing	India/Myanmar	Regional and localized blocks to avoid unrest

Submarine Cable Vulnerabilities

- One of India's biggest digital vulnerabilities sits on a six-kilometre stretch of Mumbai's Arabian Sea coast.
- Around Versova, a densely populated neighbourhood on the city's northwest, at least 13 of [India's 18 intercontinental submarine cables](#) come ashore within six kilometres of one another.
- Together they carry as much as 95% of India's international bandwidth to Europe, Africa and West Asia.



Is India's internet boom running into an undersea problem?

3 days ago

Share

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 Add as preferred on Google

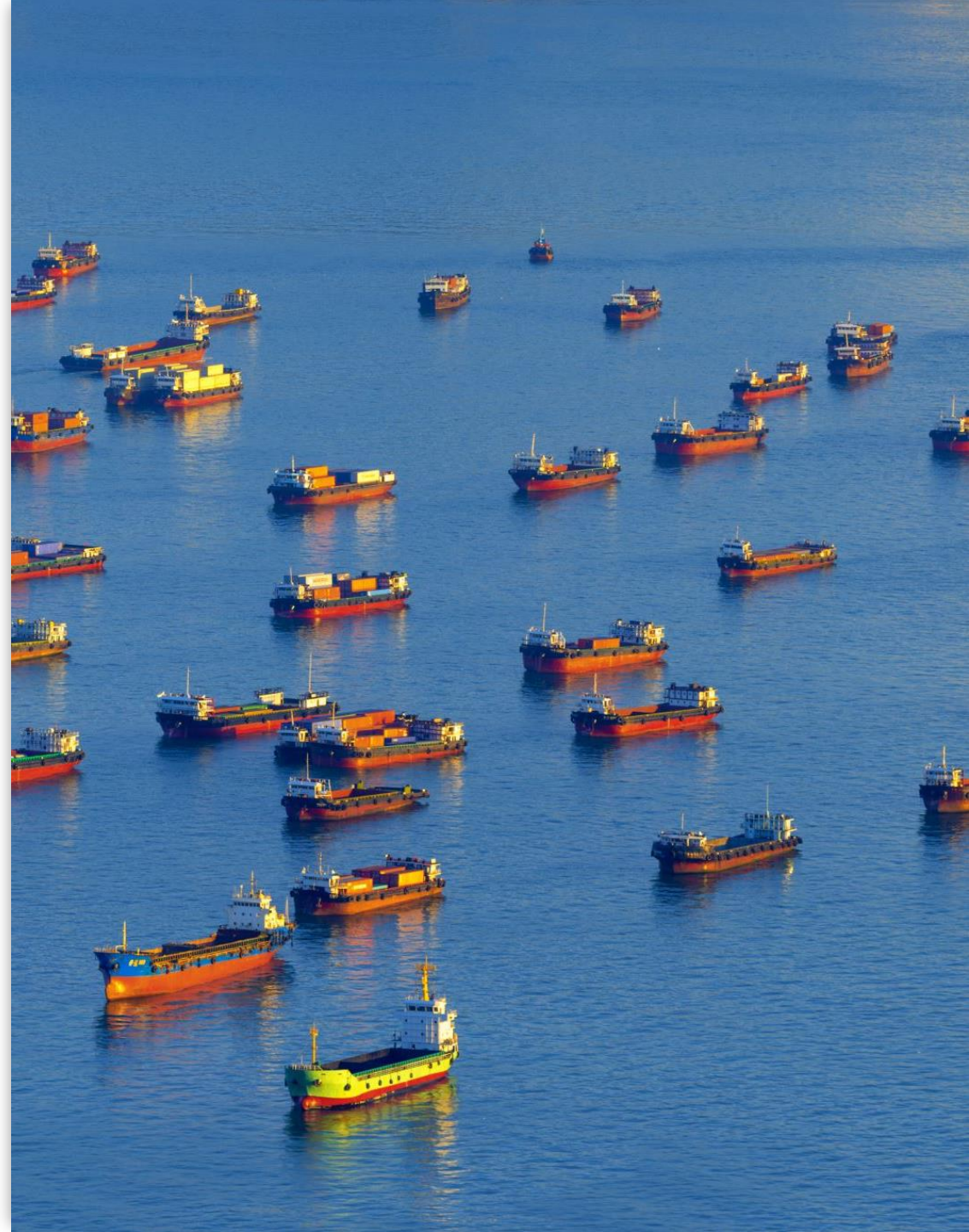
Soutik Biswas

India correspondent

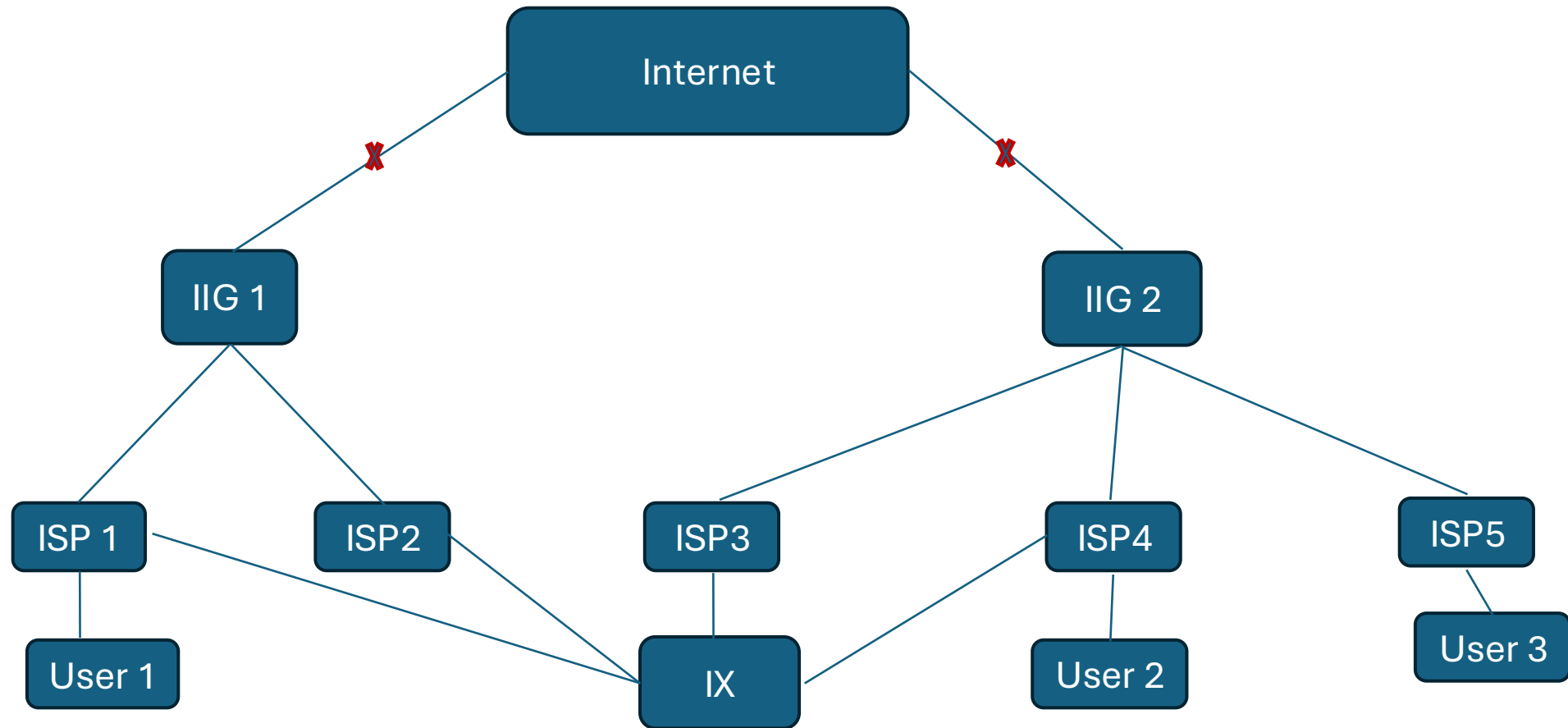


Primary Causes of Submarine Cable Faults

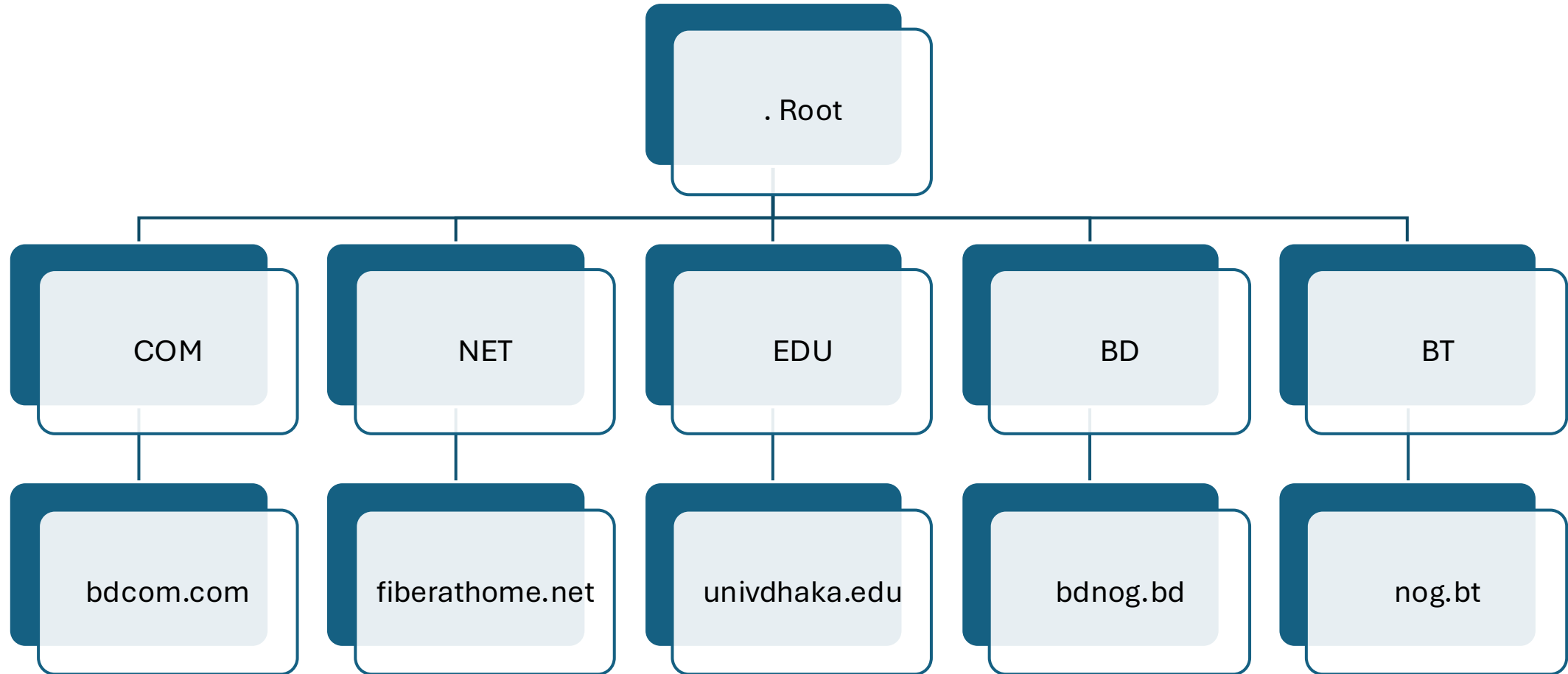
- **Human Activity (The Leading Cause):** Over 70% of faults occur in shallow waters, primarily due to bottom-trawling fishing nets and ship anchors snagging or dragging across cables.
- **Natural Hazards:** Earthquakes, underwater landslides, and extreme weather events can snap cables or bury them under tons of debris, particularly in deep waters.
- **Equipment Failure & Wear:** Continuous abrasion against rocky seabeds, manufacturing defects, or water ingress can cause gradual degradation and eventual failure.
- **Rare & Exceptional Causes:** Intentional sabotage by bad actors or damage caused by marine life (such as shark bites) are statistically rare but notable threats.



The way it was cut off



It's the DNS that didn't work, though all are connected locally!



Popular DNS Resolvers in BD



8.8.8.8



8.8.4.4



1.1.1.1



9.9.9.9



In Case of Total Isolation

- . root-servers.net. 3600000 IN SOA a.root-servers.net. 14400 7200 1209600 3600000
- COM/NET gtld-servers.net. 1800 IN SOA av4.nstld.com. 1783556307 3600 900 1209600 86400
- ORG/INFO org.afiliat-nst.info. 86400 IN SOA . noc.afiliat-nst.info. 10800 3600 2592000 86400
- CLOUD trs-dns.com. 300 IN SOA ns02.trs-dns.com. 3600 300 604800 300
- EDU edu-servers.net. 86400 IN SOA av4.nstld.com. 3600 900 1209600 86400

If ISPs use their own recursive resolvers and there are in-country root server mirrors, locally hosted Internet should be accessible for around 14 days!

Local Internet was down mostly due to the DNS failure

- .BD
- .বাংলা
- Root Servers
- ccTLD Mirrors
- TLD Mirrors

Most of these servers have local presence in Bangladesh. But all of them were inaccessible!

These servers
must have
maximum
possible
redundancy
including
satellite links!!

For ISP's, use your own recursive resolvers,
Don't depend on public DNS Services

The evolutionary roadmap extends from the seabed to the stars.

Phase 3:
Total Multi-Dimensional Redundancy

Vertical integration with LEO satellites and microwave systems as off-grid backups for Root Zone synchronization.

Phase 2:
Achieving Logical Autonomy

Large-scale deployment of Signed Geofed and regional DNS Mesh protocols to maintain internal resolution.

Phase 1:
Hardening the Physical Layer

Integration of DNS infrastructure with deep-underground CMM conduits and self-healing Fabric Mesh.

Dr. Kenny huang : Paradigm Shifts in DNS Security and Resilience.

For prolong outage > 14 Days!

The Root Server Mirrors
and other TLD Server
Mirrors will start to stop
working!

ISP's can still manage to
access the local ccTLD
(e.g. .BD) by creating a
local root zone for .BD in
local resolver

- Copy the BD zone
- DNSSEC SIGN ZONE
- Add a local trust anchor!

Popular Domains in BD

.COM

.NET

.BD

.বাংলা



Have an in country ccTLD domain names to survive in difficult times.

Operational Continuity Strategy for Total Isolation

DNSSEC and TLS certificates will fail if system clocks drift during prolonged isolation.

- **Hardening Time Synchronization (NTP)**
 - **Deploy Stratum 1 NTP:** Install a local server with a GPS-based hardware clock (e.g., using `gpsd` and `chrony`)
 - **DHCP Distribution:** Update DHCP server configurations across the network to **advertise the local NTP server's IP** as the primary time source for all clients.

If primary masters are unreachable during the isolation event, secondary DNS servers zones will eventually expire and stop resolving.

- **Action:** Administrators of secondary local DNS servers must manually override or extend the **zone's Expire parameter** to prevent them from timing out and going dark during prolonged isolation

Operational Continuity Strategy for Total Isolation

- Fast-Fail Foreign Lookups:
 - Configure the server to return **NXDOMAIN** immediately for any IP prefix not belonging to Bangladesh. This allows requests to fail instantly instead of timing out.
- Bypassing "No Internet" OS Alerts
 - **Domain Spoofing:** In your recursive DNS, create static entries for connectivity check domains (e.g., **connectivitycheck.gstatic.com**, **captive.apple.com**, **msftconnecttest.com**)
 - **Local Landing Page:** Point these domains to a local web server configured to return a 204 No Content status or a simple "Success" string

To keep alive utilities

- Configure a separate APN for IoT and related mobile network services, ensuring it is never deactivated under any condition..
- All devices should have an independent backup channel. 5G, LORA, Ethernet....



Internet
Shutdown



Thank you!!

- Sumon Ahmed Sabir
- INNOG 9/APNIC 62

