



Our IT / Tech Community is one big family.

We don't think in colors, we don't think in races or genders, we don't think in borders.

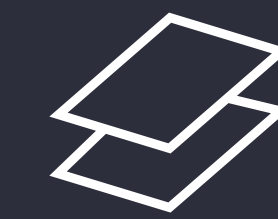


Keep Ukraine Connected

February 24, 2022

This was the day everything began.
War started in Ukraine.

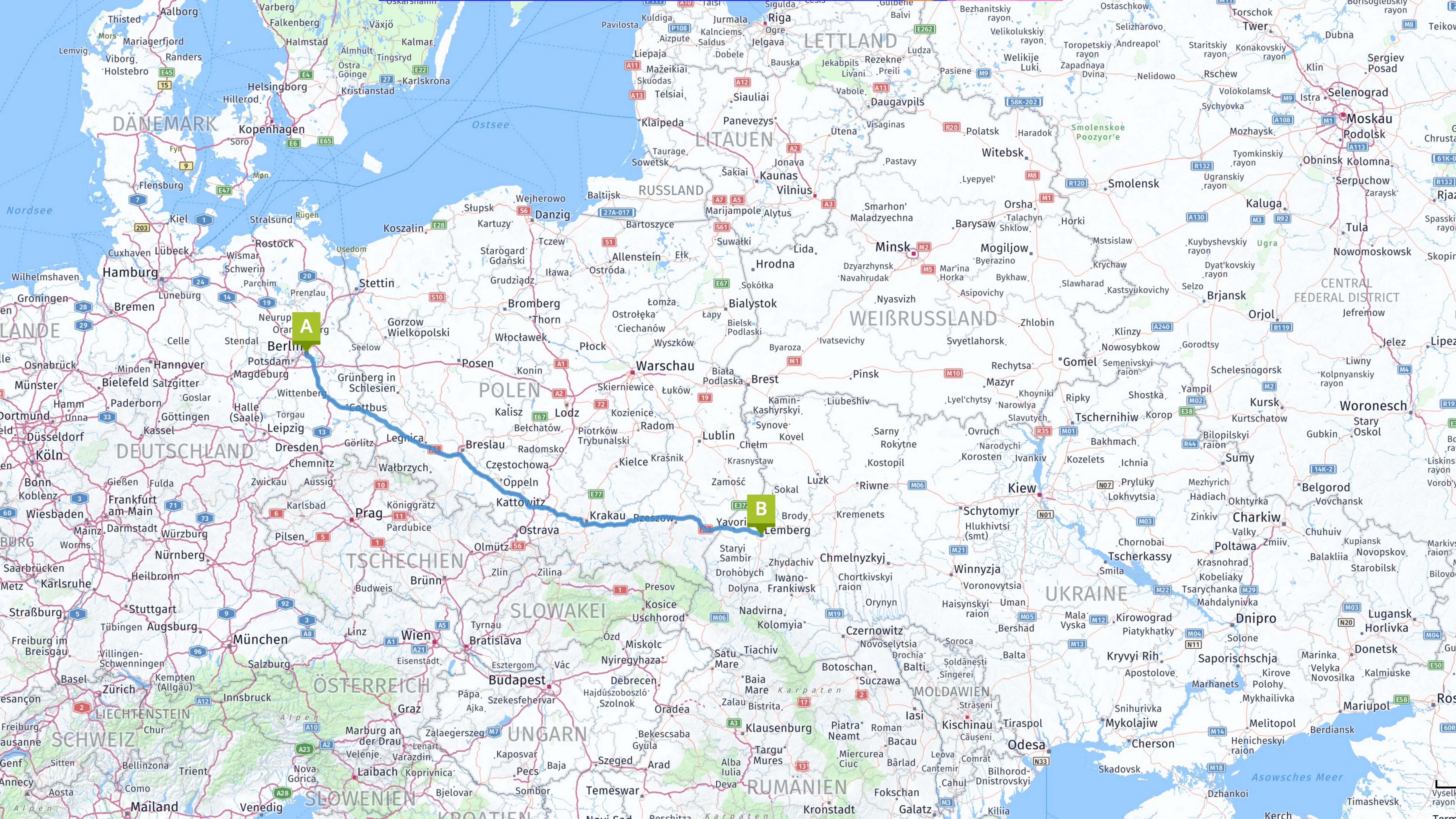
Dark days for Ukrainian people,
but also for Internet Service Providers in the region.



The beginning...

When Russia invaded Ukraine, our chair René Fichtmüller didn't want to stand idly by. He first got together with his friend Patrick, and helped organise two truck's worth of relief, which they dropped off at the Ukrainian border in the second week of March 2022.

However, of course, this was not enough.



A

B



Keep Ukraine Connected

March 07, 2022

1st Trip with humanitarian goods

Nearly 2 weeks after the War started!



WEMME

Events

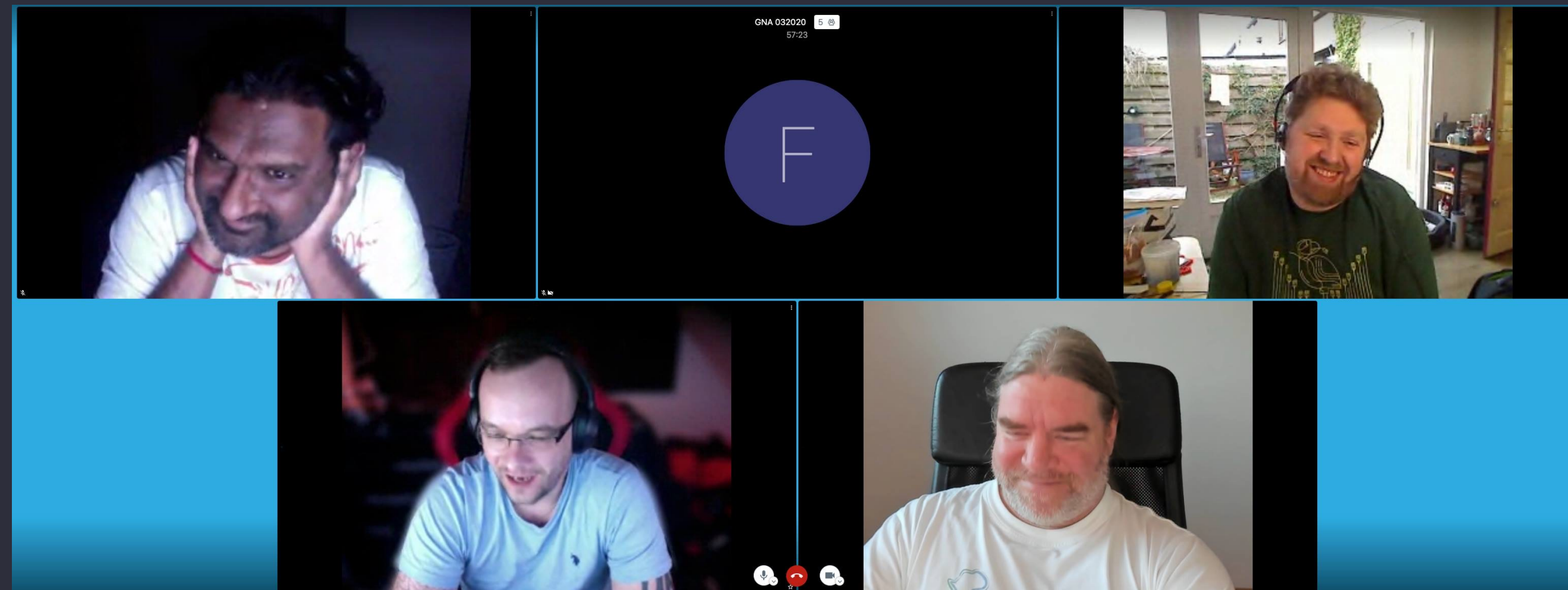
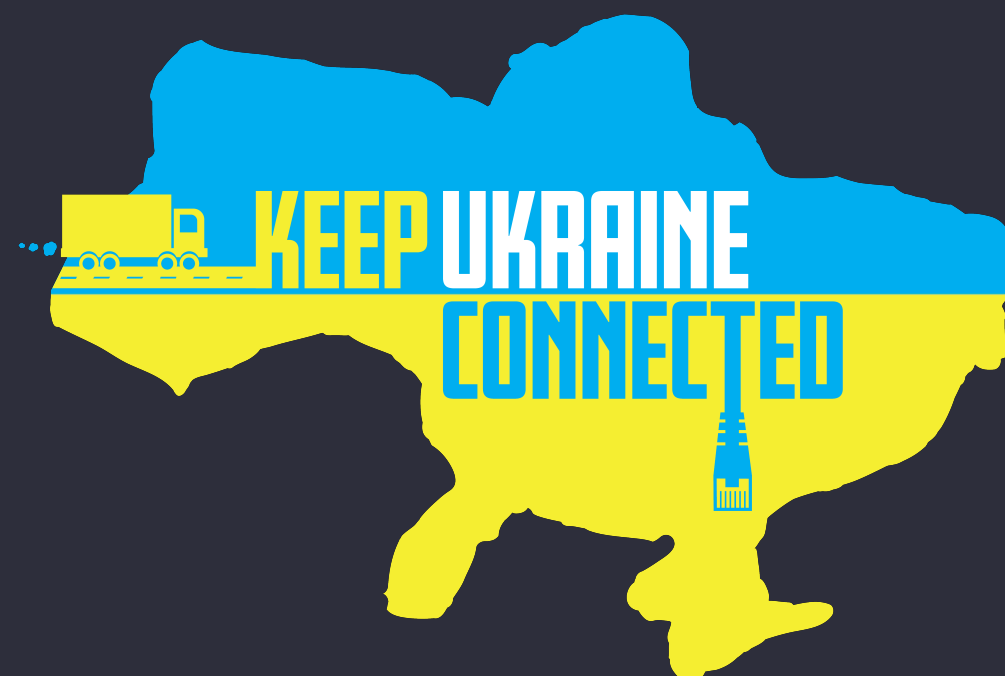
The next day...

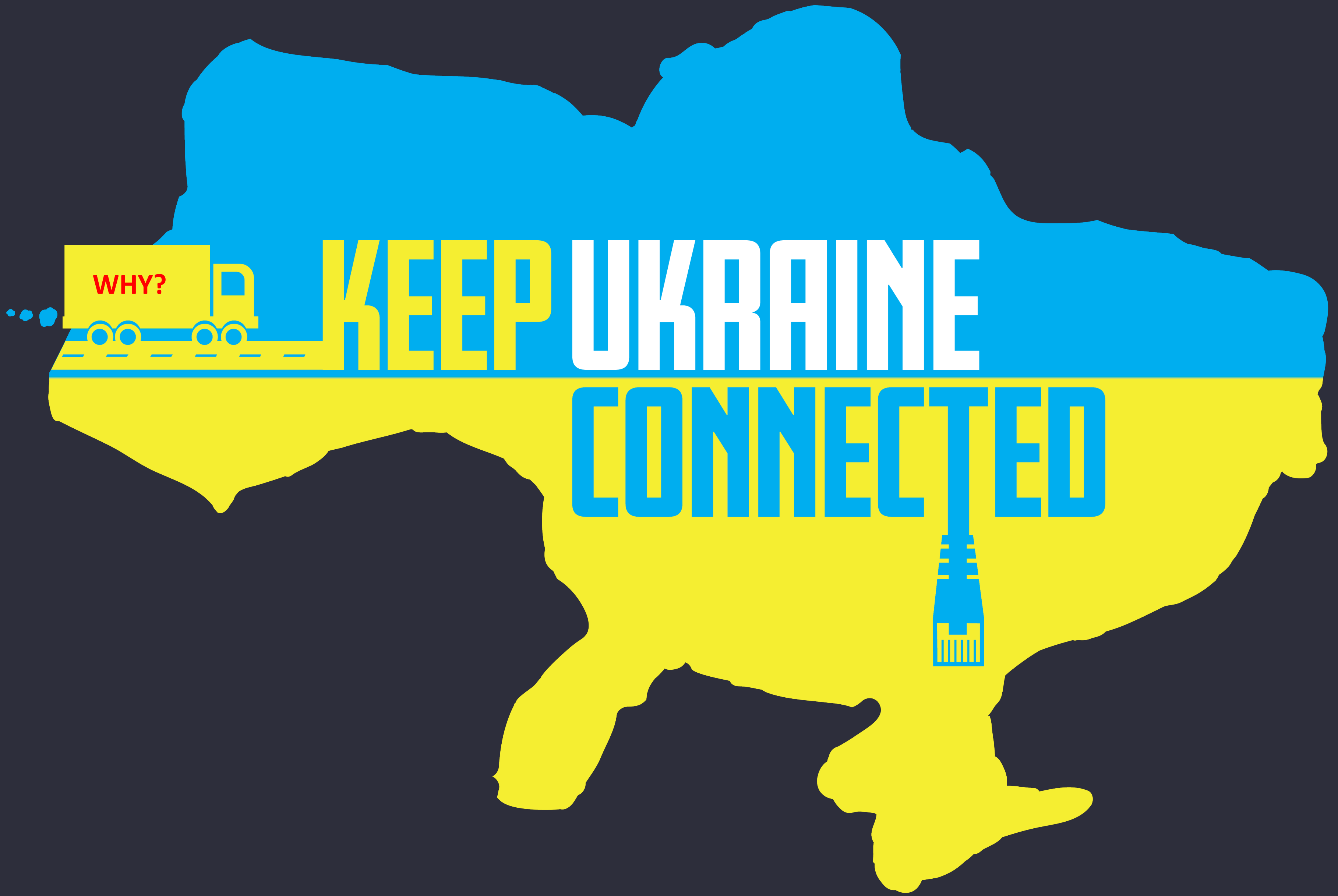
At the Global NOG Alliance Board Meeting

Rene shared his thoughts on the next steps, and we all agreed that it was time to do exactly what the Global NOG Alliance was founded to do.

Help Network Operators.

We called this task force:





WHY?



KEEP UKRAINE

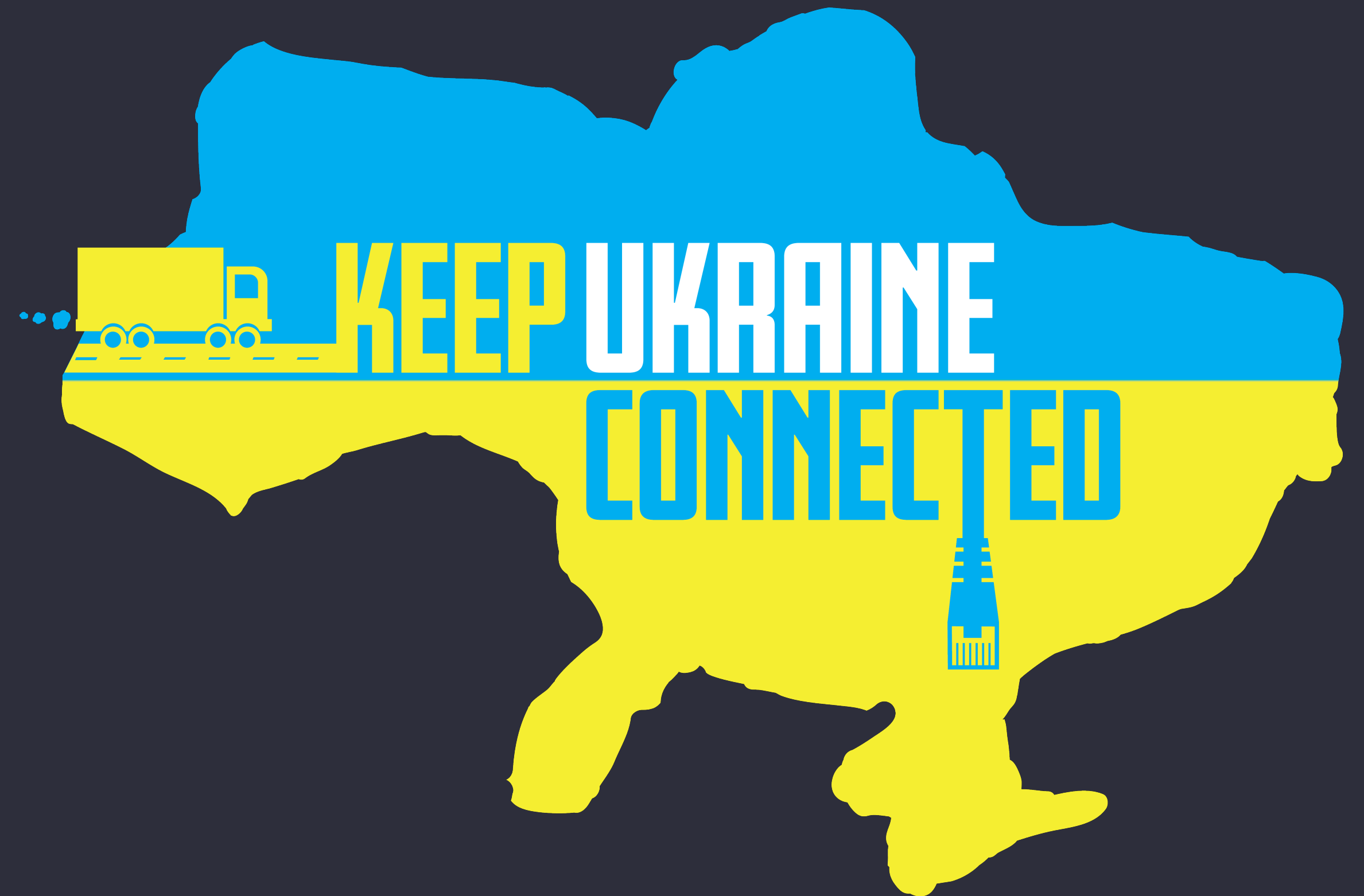
CONNECTED



Our vision & mission

We are the Link between the Disaster Region and the global community.

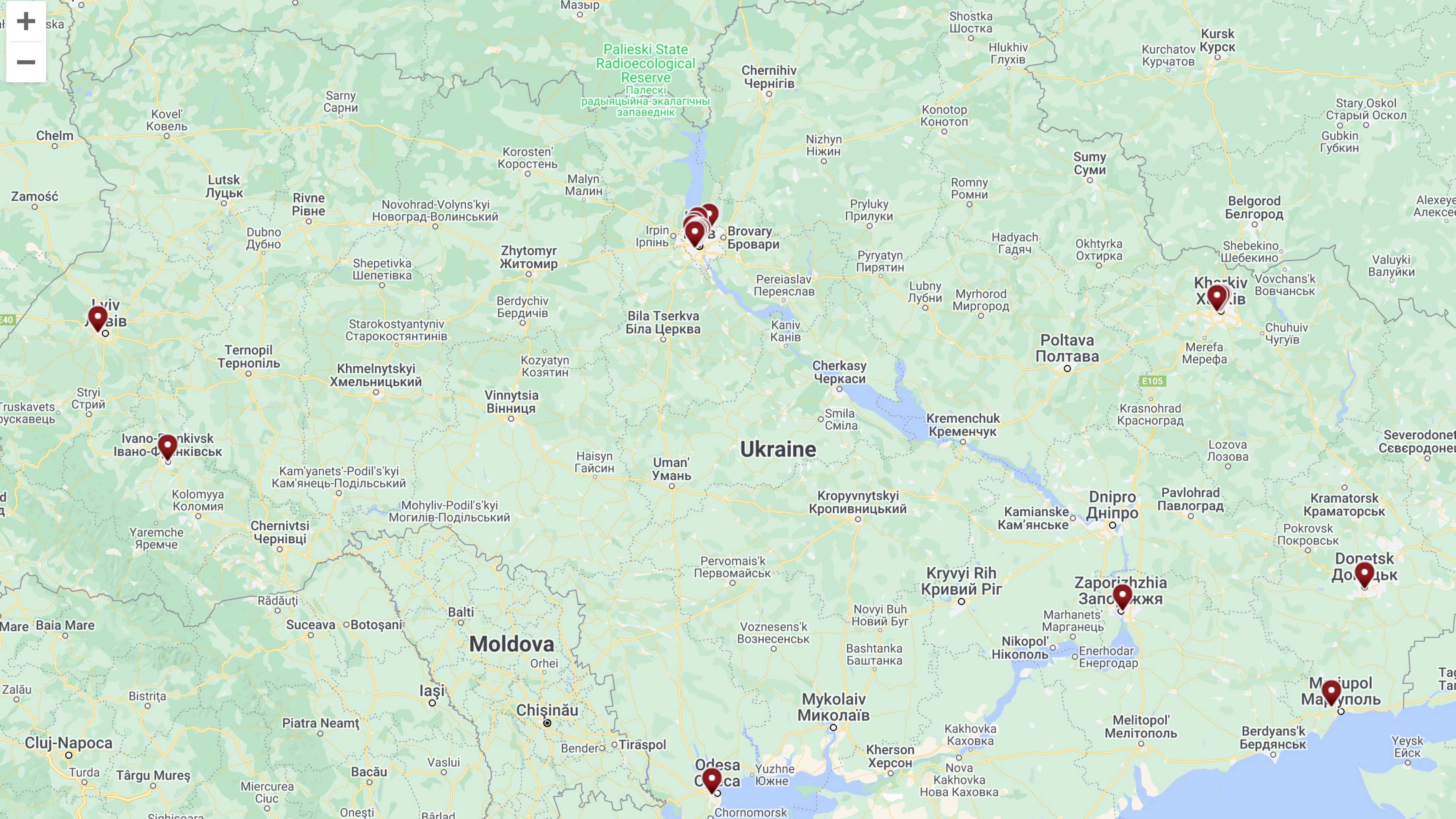
We have contacts in the community and with the manufacturers. We wanted to use these contacts to do good things.



WHY?

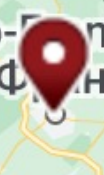


Name	Media Type	Country	City	Network...
<u>GigaNET Kyiv</u> Giganet Internet exchange network	Ethernet	UA	Kyiv	172
<u>DTEL-IX</u> Digital Telecom Internet Exchange	Ethernet	UA	Kiev	167
<u>UA-IX</u> Ukrainian Internet Exchange	Ethernet	UA	Kiev	127
<u>PITER-IX Kiev</u> PITER-IX Kiev	Ethernet	UA	Київ	63
<u>1-IX Kyiv</u> 1-IX Internet Exchange	Ethernet	UA	Kyiv	49
<u>GigaNET Odessa</u> GigaNET Odessa local exchange	Ethernet	UA	Kiev	11
<u>CLOUD-IX KIEV</u> CLOUD-IX KIEV	Multiple	UA	Kiev	10
<u>LVIV-IX</u> Lviv Internet Exchange	Ethernet	UA	Lviv	10
<u>RUDAKI-IX</u> RUDAKI INTERNET EXCHANGE	Ethernet	UA	Kyiv	9
<u>IF-IX</u> IVANO-FRANKIVSK INTERNET EXCHANGE	Ethernet	UA	Ivano-Frankivsk	8
<u>Crimea-IX</u> Crimea-IX	Ethernet	UA	Simferopol	7
<u>GigaNET Kharkov</u> GigaNET Kharkov local exchange	Ethernet	UA	Kharkov	7
<u>kremen-IX</u>	Ethernet	UA	Kremenchuk	7



Palieski State
Radioecological
Reserve
Палескі
радіяційно-екологічний
заповідник

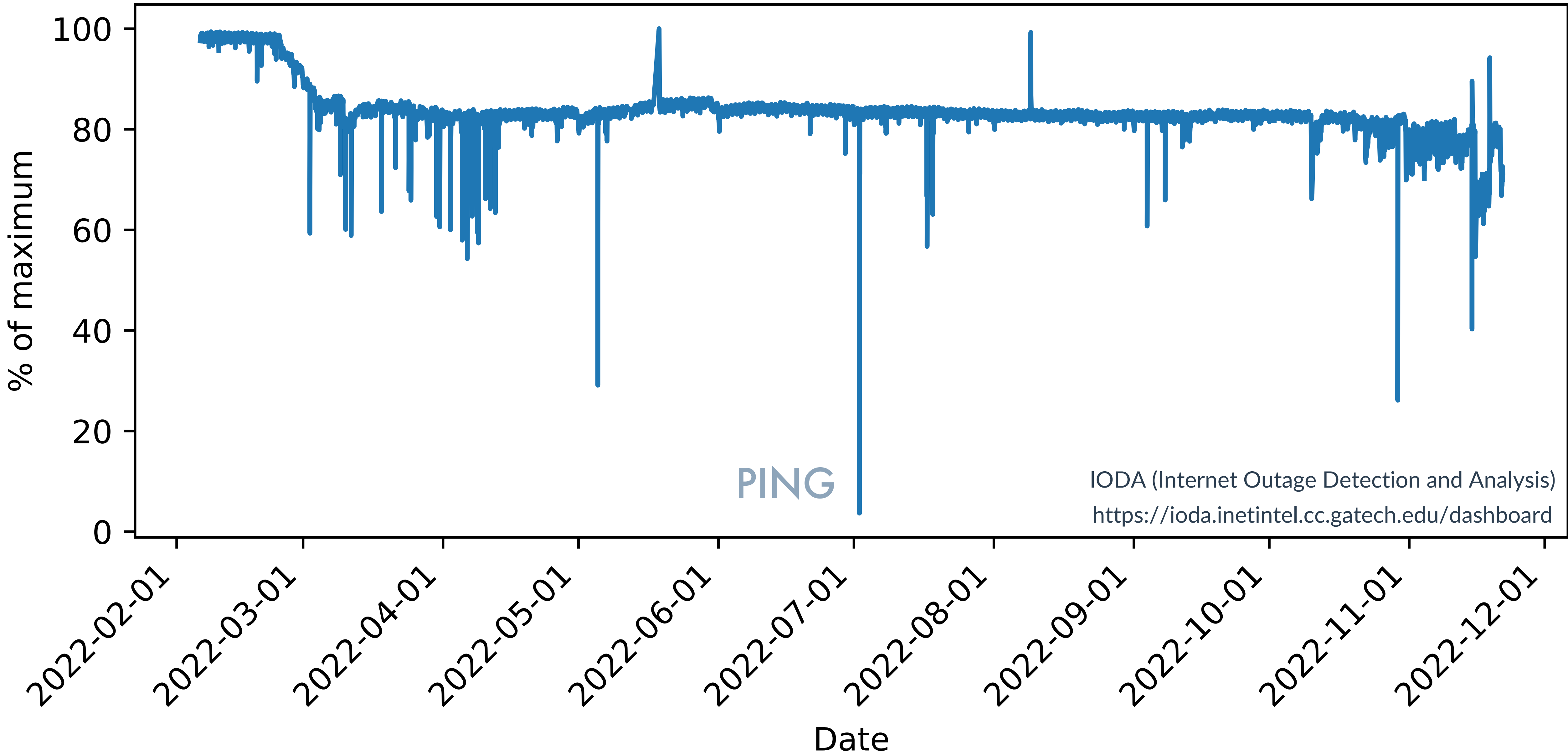
Ukraine



Name Management	CLLI NPA-NXX	City Country	State Postal Code	Networks ↓ ⁹
<u>NewTelco Kiev</u> NewTelco Ukraine	- -	Kiev UA	- 1033	146
<u>Ucomline Kiev</u> Ucomline (Digital Generation)	- -	Kiev UA	- -	62
<u>9 Leontovicha</u> NetAssist LLC	- -	Kiev UA	- 01030	26
<u>Giganet</u> GigaNET IXN	- -	Kiev UA	- 03037	23
<u>OD-IX</u> GigaNET IXN	- -	Odessa UA	- 65020	19
<u>BeMobile</u> BeMobile	- -	Kyiv UA	- 02000	17
<u>TSUA</u> TSUA	- -	Kiev UA	- 01030	15
<u>Omega Telecom Kyiv</u> Omega Telecom LLC	- -	Kyiv UA	- 03067	13
<u>Datagroup Kiev</u> Datagroup JSC	- -	Kiev UA	- 03005	12
<u>TOPNET/UA/Leontovicha9</u> TOPNET	- -	Kiev UA	- 03037	10

Source:

https://www.peeringdb.com/advanced_search?country_in=UA&reftag=



PING

IODA (Internet Outage Detection and Analysis)
<https://ioda.inetintel.cc.gatech.edu/dashboard>

RIPE Atlas Probes in Ukraine



- Slow decline

Connected RIPE Atlas probes

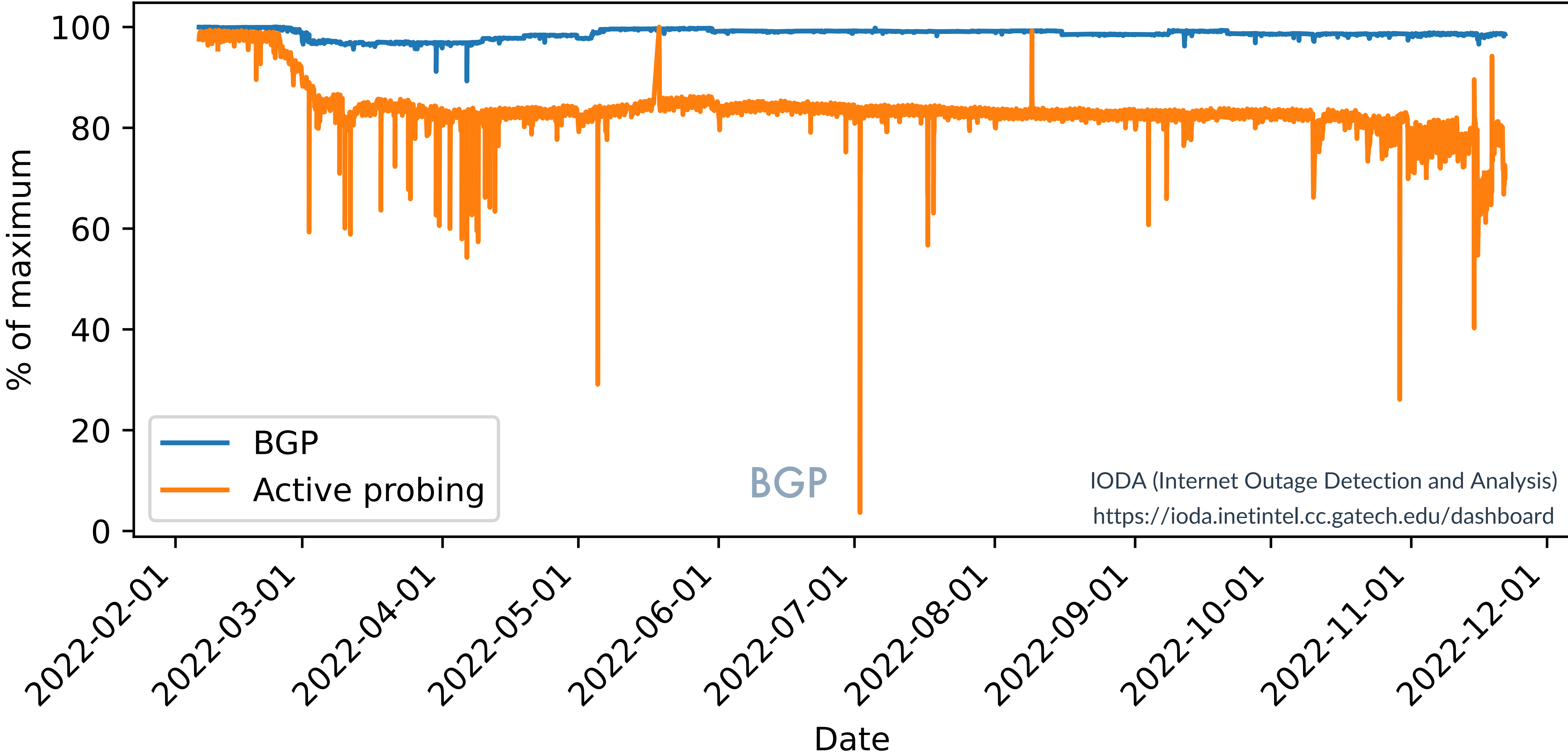


<https://observablehq.com/@ripencc/internet-outages-as-seen-by-ripe-atlas>

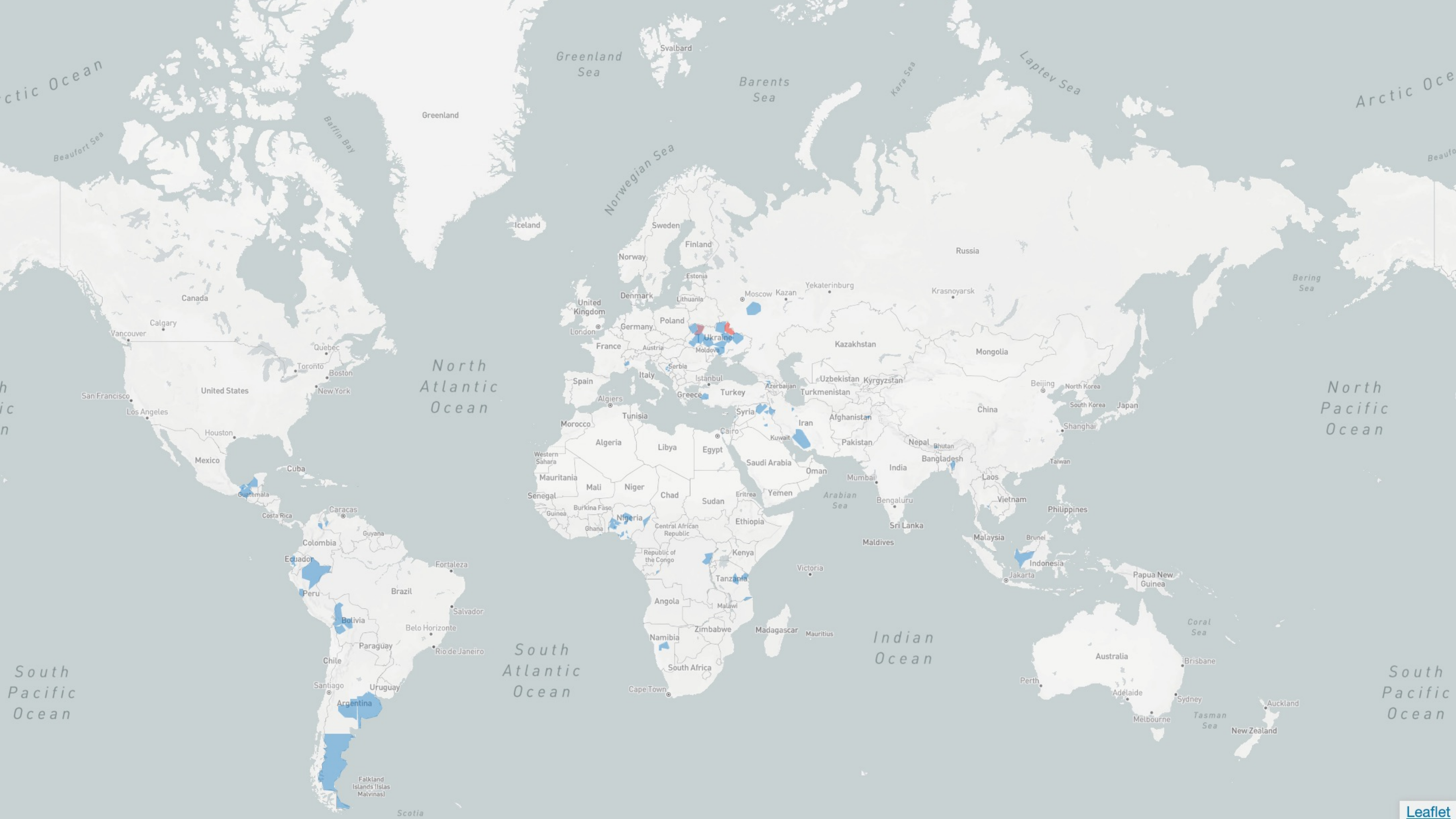
Source:

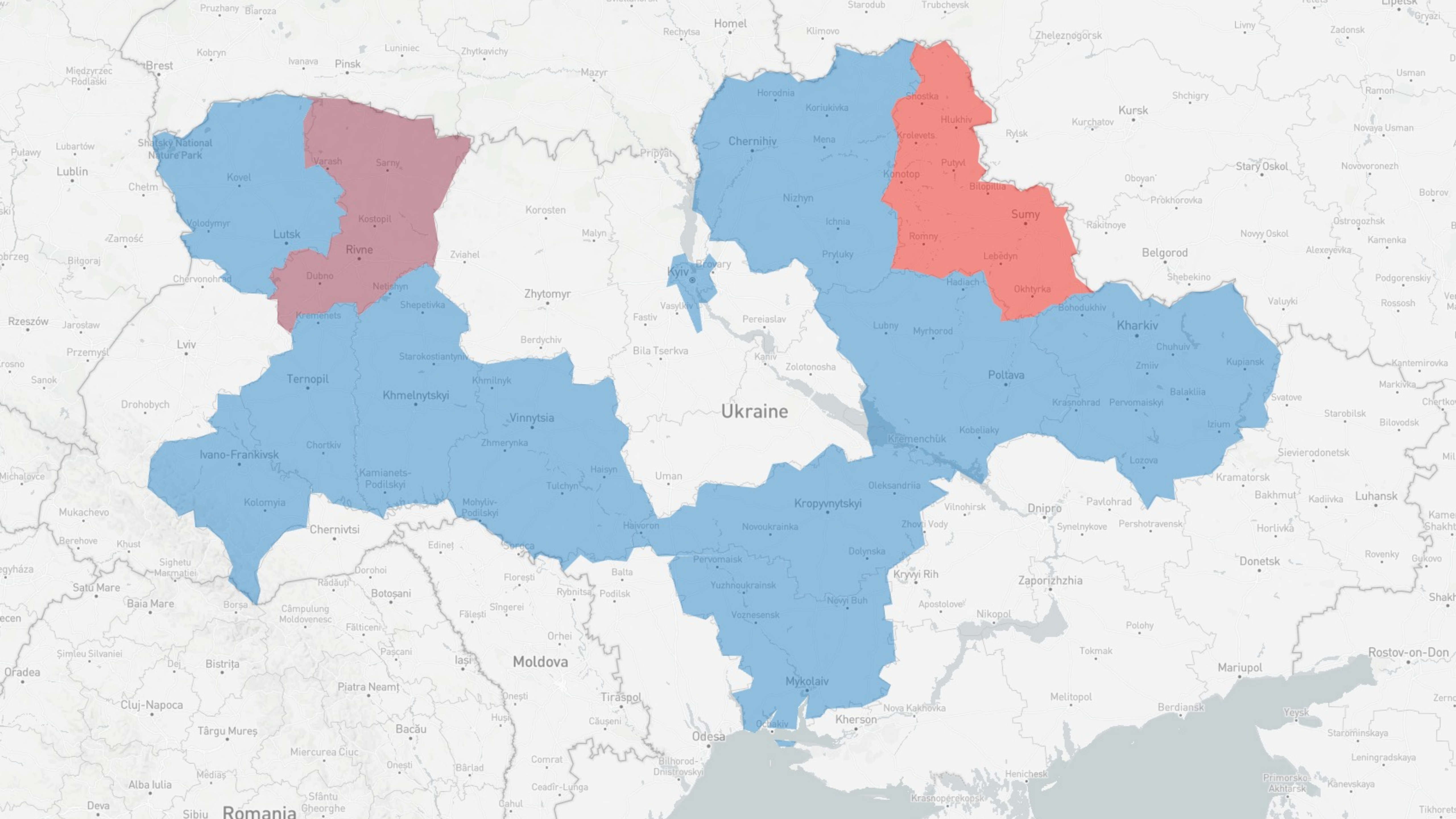
[Emile Aben emile.aben@ripe.net](mailto:emile.aben@ripe.net) - RIPE 84

[https://ripe84.ripe.net › uploads › presentations](https://ripe84.ripe.net/uploads/presentations)



IODA (Internet Outage Detection and Analysis)
<https://ioda.inetintel.cc.gatech.edu/dashboard>





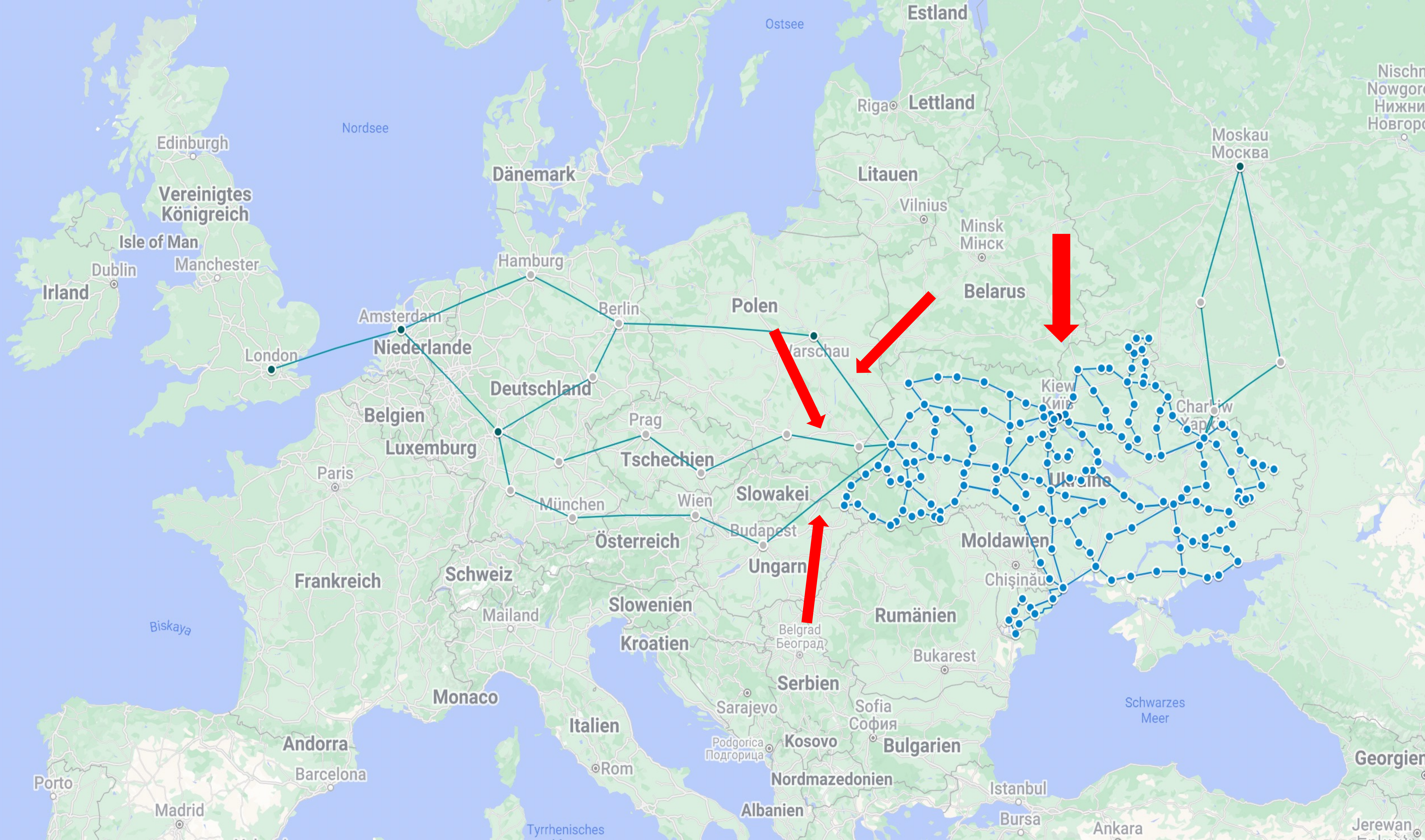
Ukraine

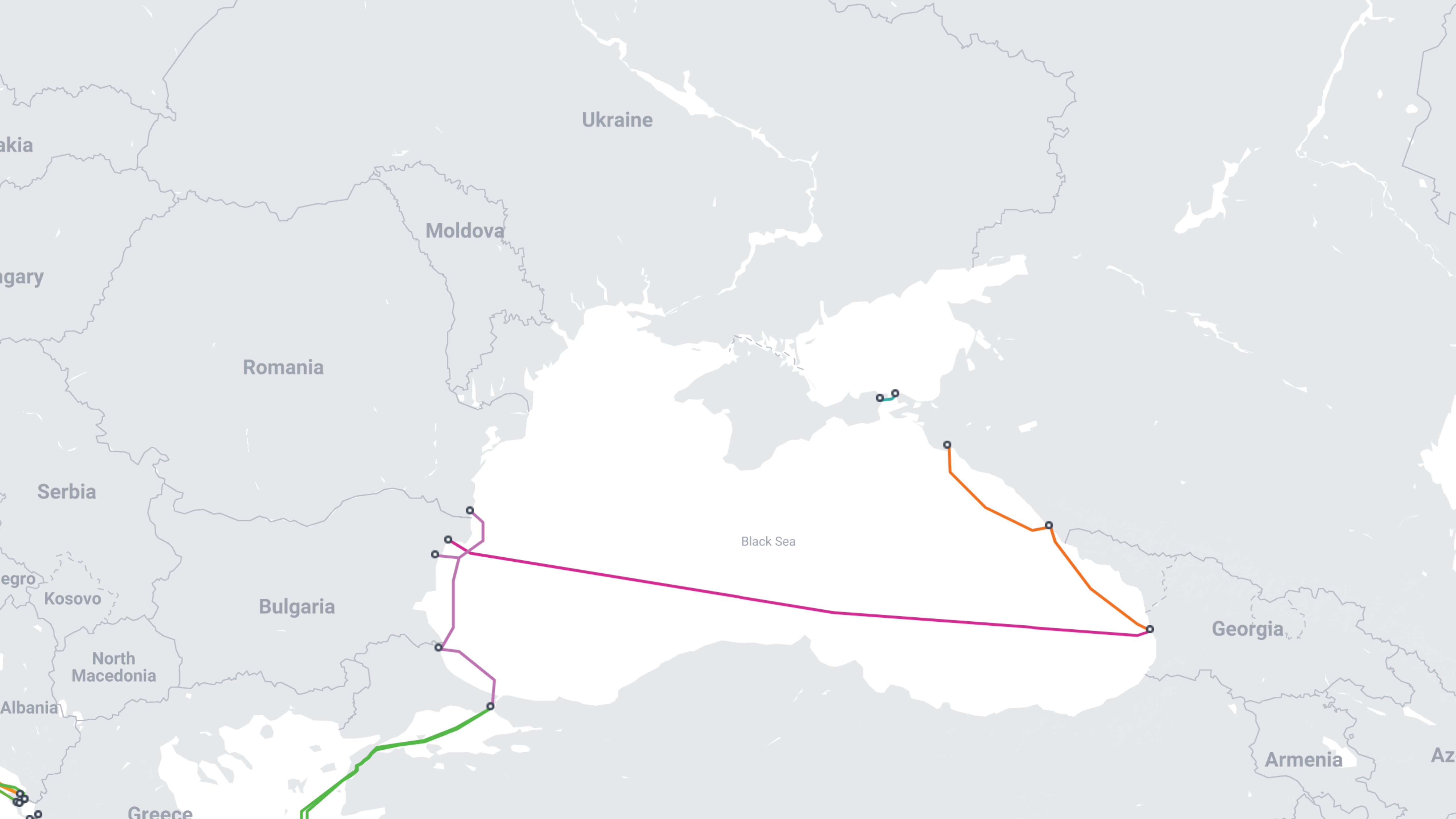
Moldova

Romania

Chernihiv
Kyiv
Lviv
Ternopil
Rivne
Zhytomyr

Sumy
Kharkiv
Kropyvnytskyi
Mykolaiv
Kherson
Zaporizhzhia
Dnipro
Krasnodar Krai





Ukraine

Moldova

Romania

Black Sea

Bulgaria

Georgia

Armenia

Az

Greece

Serbia

Kosovo

North Macedonia

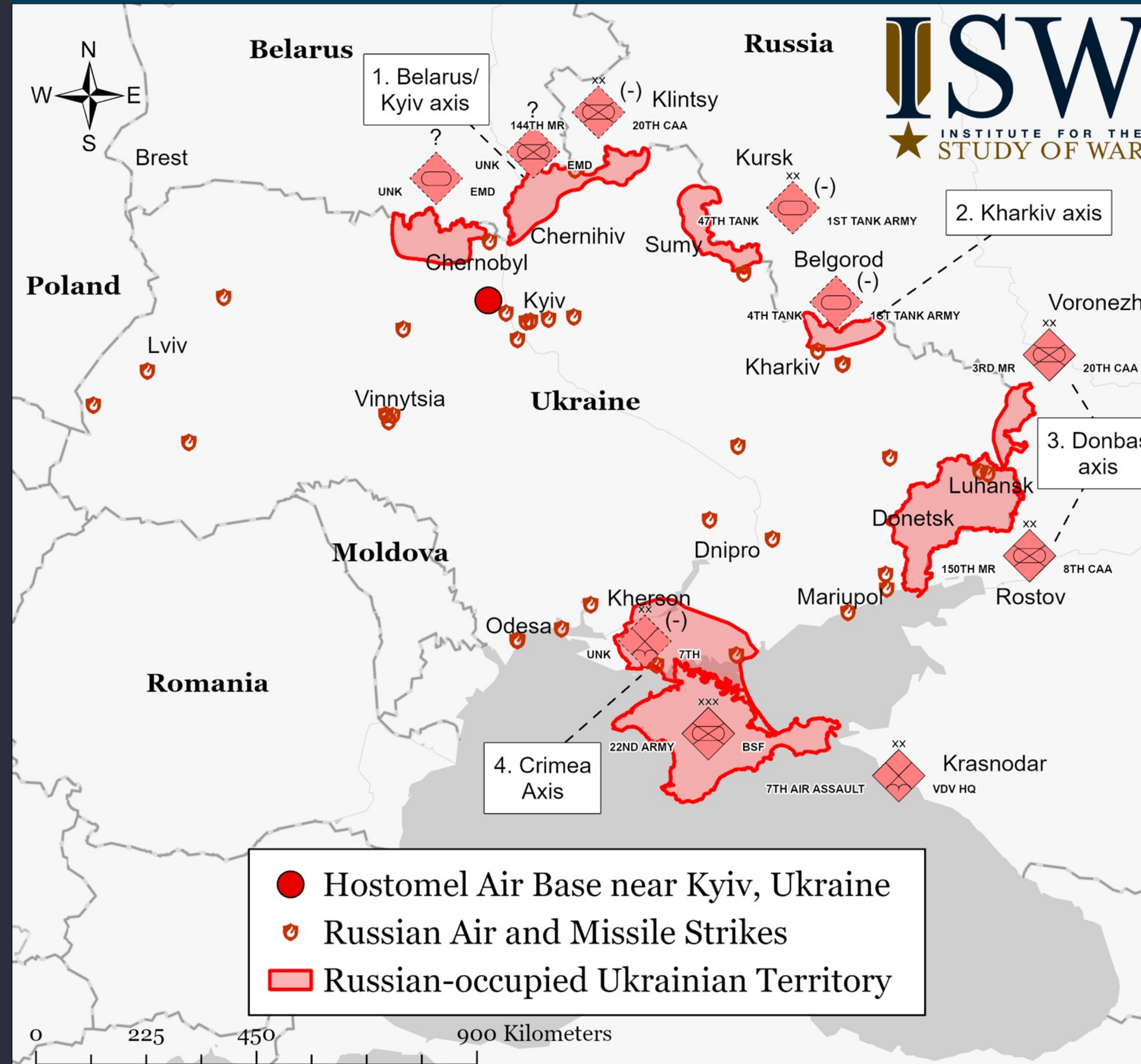
Albania

egro

akia

ngary

Assessed Control of Terrain in Ukraine and Main Russian Maneuver Axes as of February 24, 2022, 2:00 PM EST



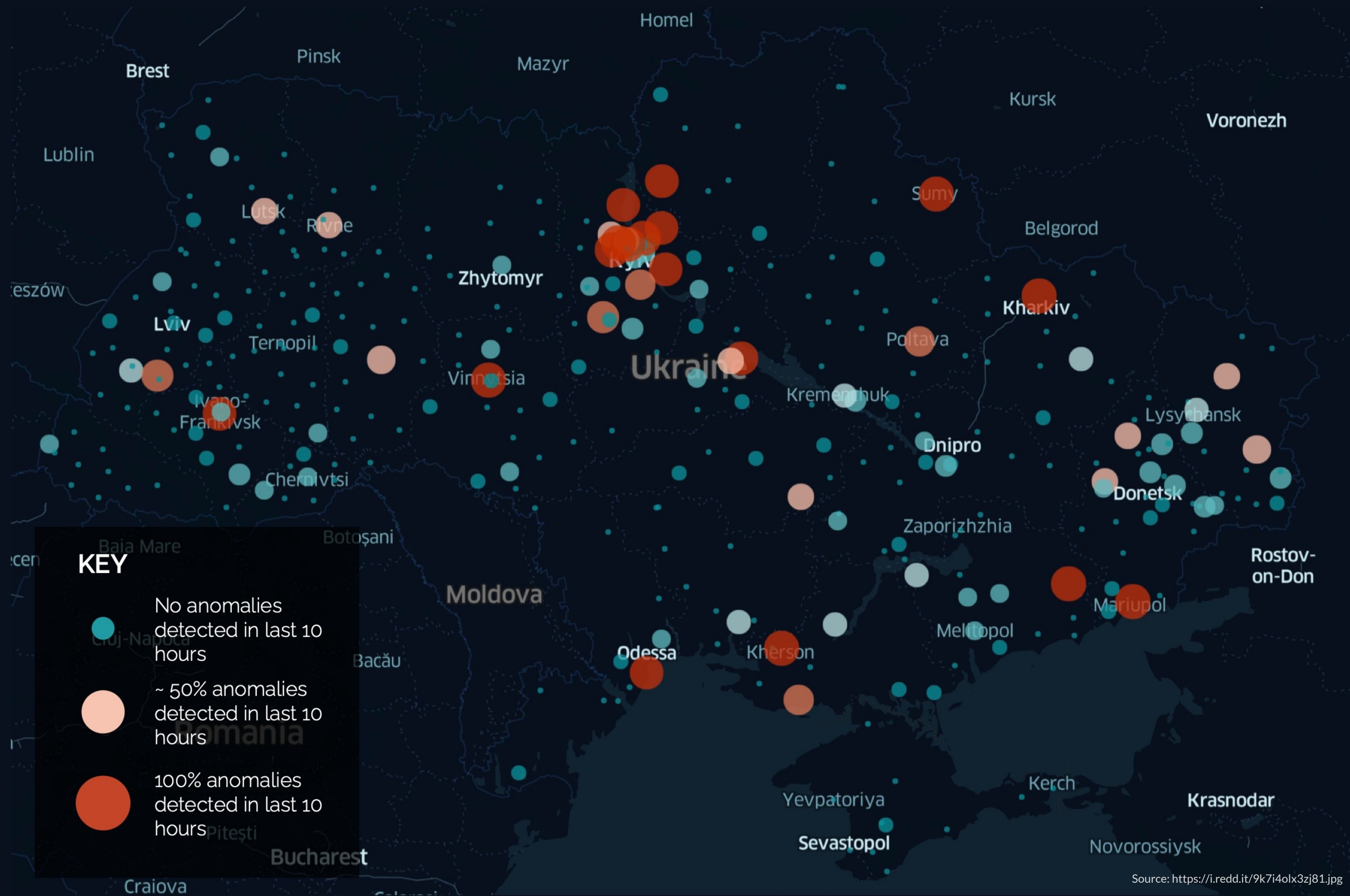
Current ICT Connectivity Anomalies

UKR // 11h 25 Feb 2022 (GMT +2h)

25-Feb-2022 01:00:00 to 25-Feb-2022 11:00:00 (GMT +2H)

Map shows number of ICT connectivity anomalies (degraded internet) in last 10 hours for the given district

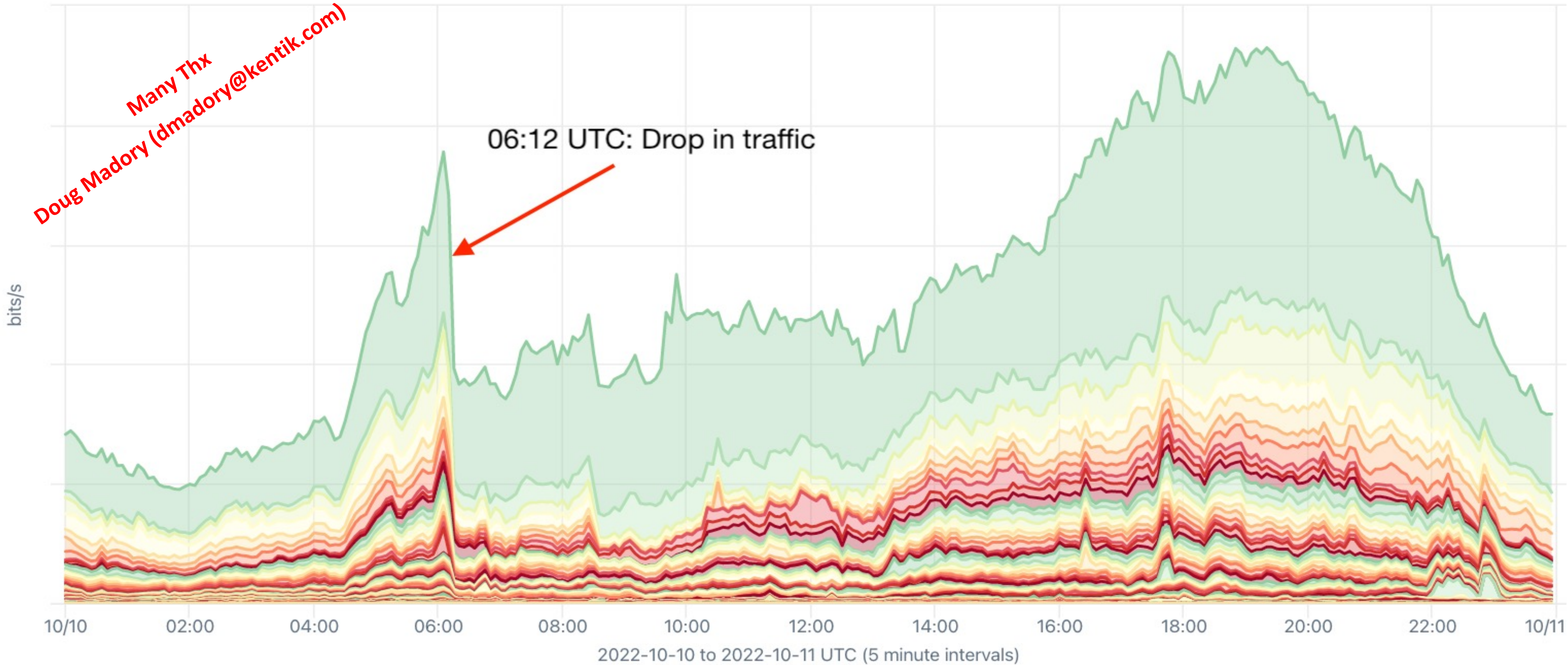
powered by
KASPR Datahaus



Top Dest AS Number by Average bits/s

Oct 10, 2022 00:00 to Oct 11, 2022 00:00 (1d)

Internet Traffic to Lviv

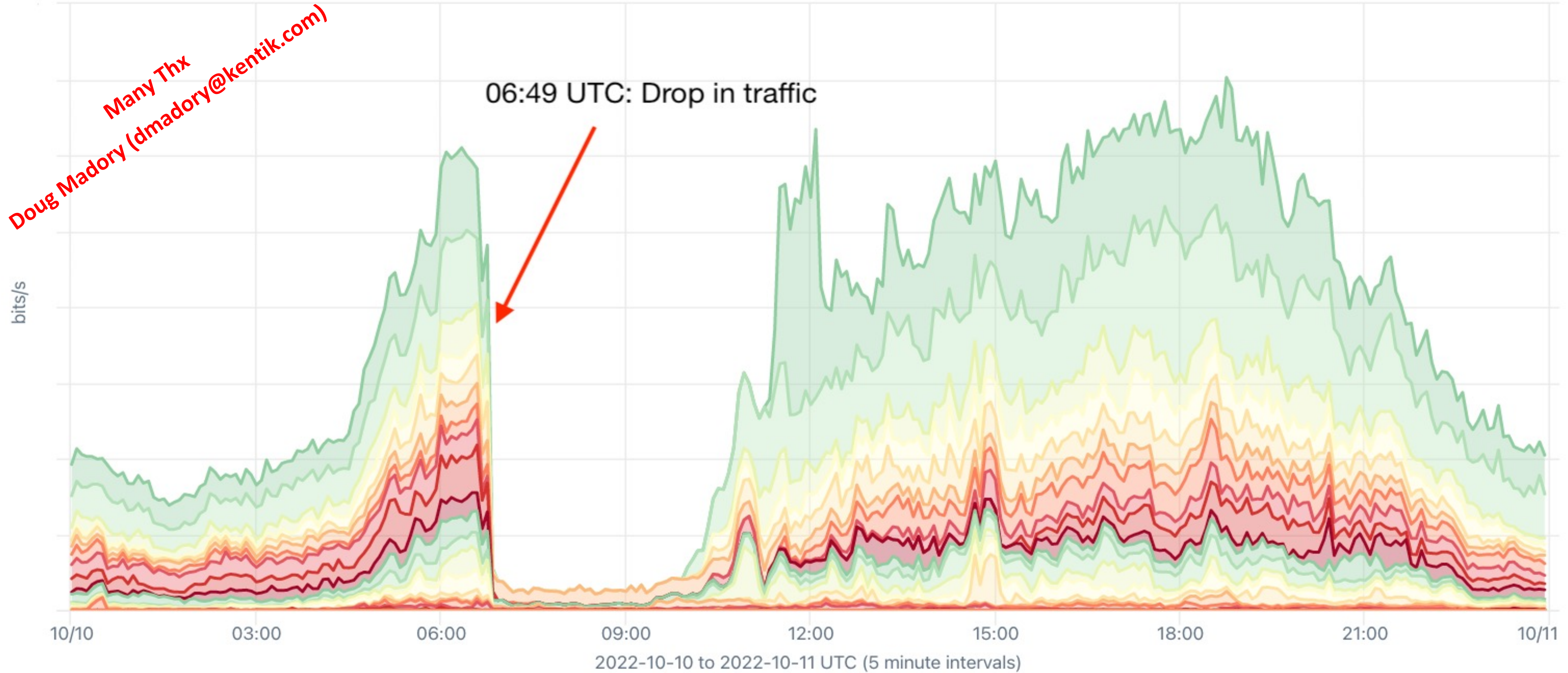


Many Thx
Doug Madory (dmadory@kentik.com)

Top Dest AS Number by Average bits/s

Oct 10, 2022 00:00 to Oct 11, 2022 00:00 (1d)

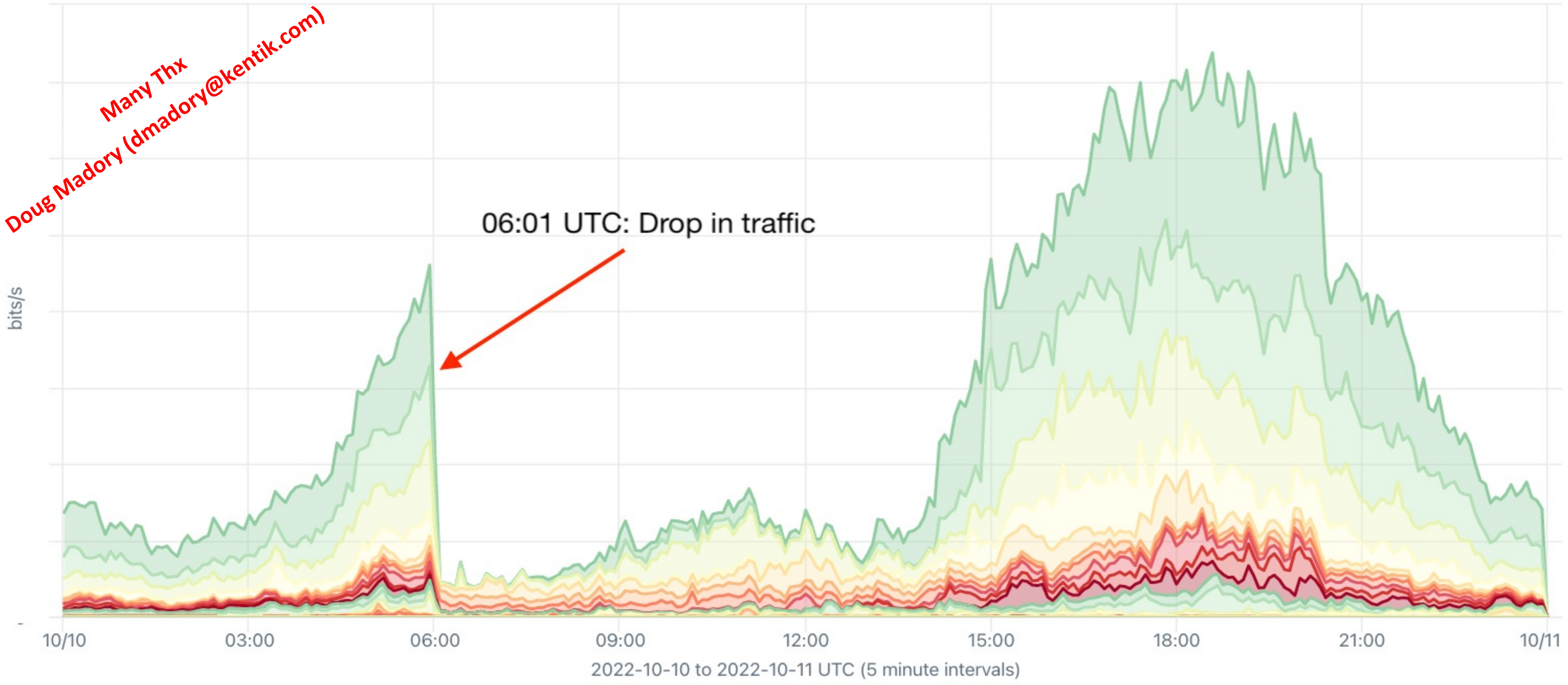
Internet Traffic to Sumy



Top Dest AS Number by Average bits/s

Oct 10, 2022 00:00 to Oct 11, 2022 00:00 (1d)

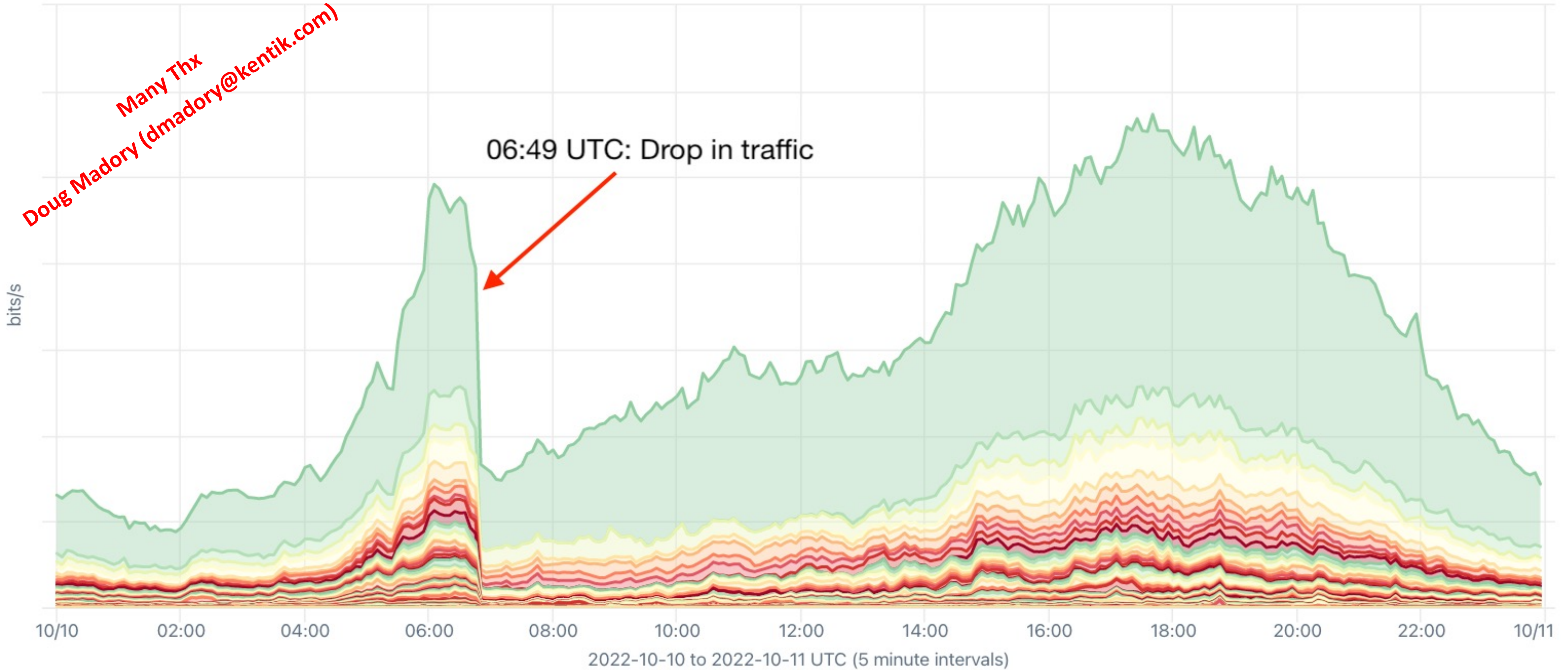
Internet Traffic to Zhytomyr



Top Dest AS Number by Average bits/s

Oct 10, 2022 00:00 to Oct 11, 2022 00:00 (1d)

Internet Traffic to Kharkiv



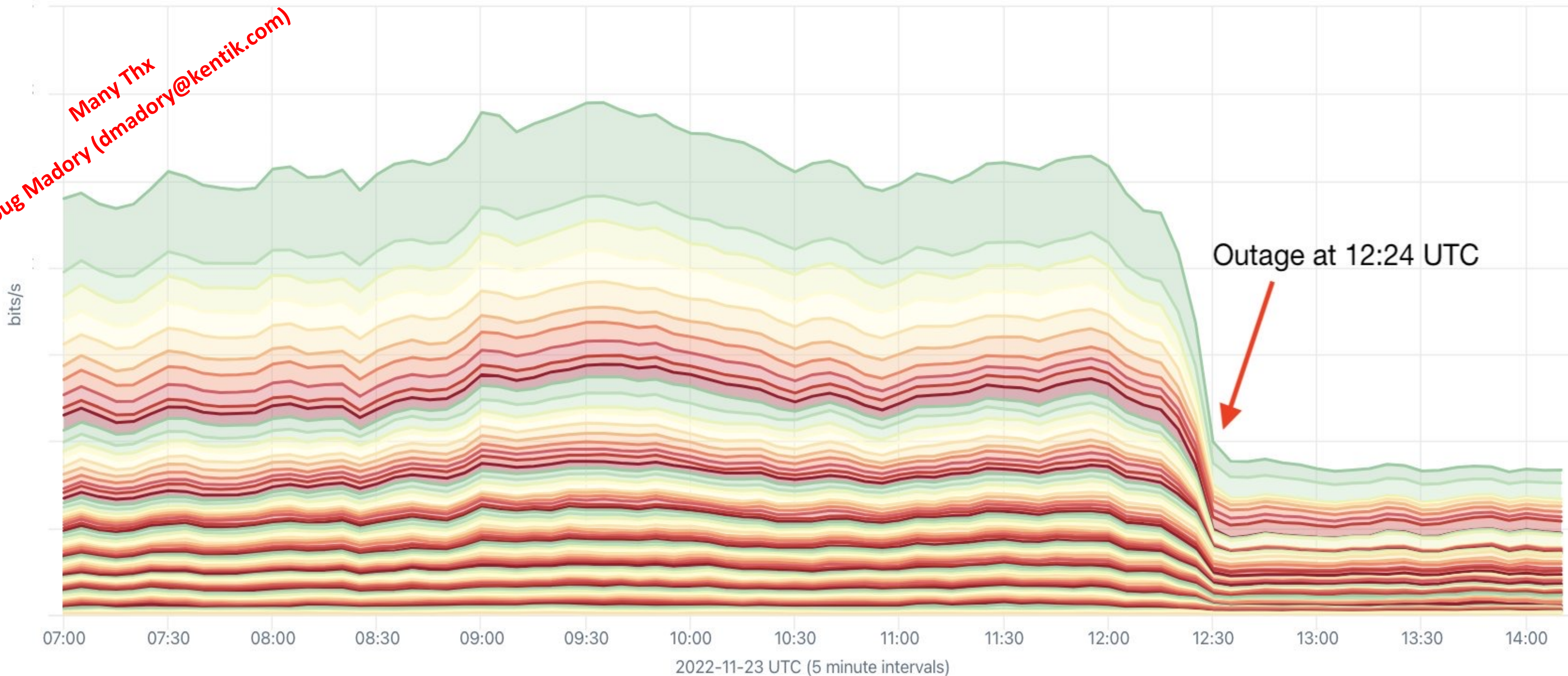
Many Thx
Doug Madory (dmadory@kentik.com)

Top Dest AS Number by Average bits/s

Nov 23, 2022 07:00 to Nov 23, 2022 14:12 (7h and 12m)

Internet Traffic to Ukraine

*Many Thx
Doug Madory (dmadory@kentik.com)*

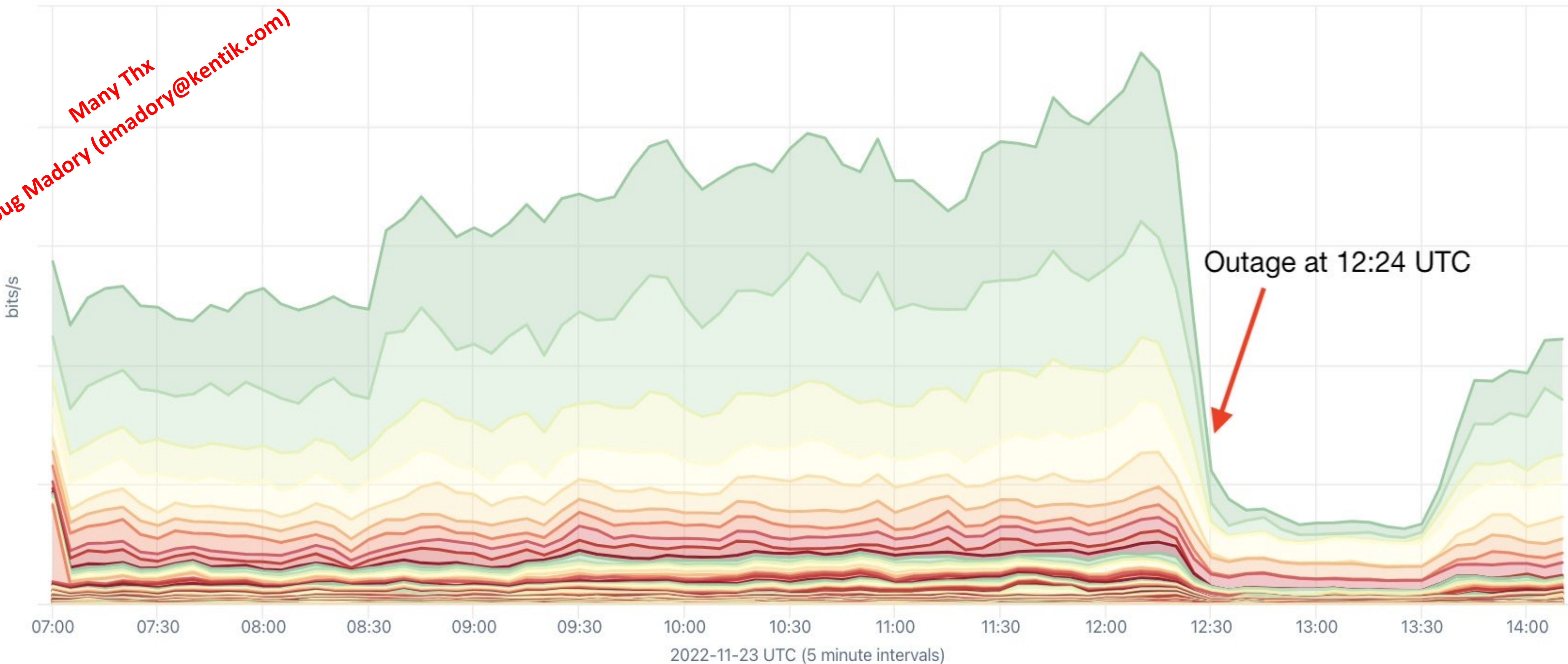


Top Dest AS Number by Average bits/s

Nov 23, 2022 07:00 to Nov 23, 2022 14:12 (7h and 12m)

Internet Traffic to Moldova

*Many Thx
Doug Madory (dmadory@kentik.com)*



After Russia's continued attack on Ukraine's electrical grid.

Internet Connectivity for Ukraine [?](#)

IODA (Internet Outage Detection and Analysis)

<https://ioda.inetintel.cc.gatech.edu/dashboard>



Assessed Control of Terrain in Ukraine and Main Russian Maneuver Axes as of December 7, 2022, 3:00 PM ET



Map by George Barros, Kateryna Stepanenko, Noel Mikkelsen, Daniel Mealie, and Will Kielm
© 2022 Institute for the Study of War and AEI's Critical Threats Project

* Assessed Russian advances are areas where ISW assesses Russian forces have operated in or launched attacks against but do not control.



Belarus

Russia

Poland

Lviv

Kyiv

Vinnytsia

Chernihiv

Sumy

Kharkiv

Ukraine

Dnipro

Zaporizhia

Mykolaiv

Odesa

Kherson

Mariupol

Luhansk

Donetsk

Romania

Subordinate main effort -
Capturing Donetsk Oblast

Main effort
- Eastern
Ukraine

Supporting
effort 1 -
Southern Axis

- Significant Fighting in the Past 24 Hours
- Russian-controlled Ukrainian Territory before February 24
- Assessed Russian Advances in Ukraine*
- Assessed Russian-controlled Ukrainian Territory
- Claimed Ukrainian Counteroffensives
- Reported Ukrainian Partisan Warfare
- Claimed Russian Control over Ukrainian Territory

Brief info about Ukraine



Area – 603,7 thousand km² (BT 38.394)



Population – over 40 mln people



Mobile subscribers – 53 mln



Quantity of ISP providers – over 3000

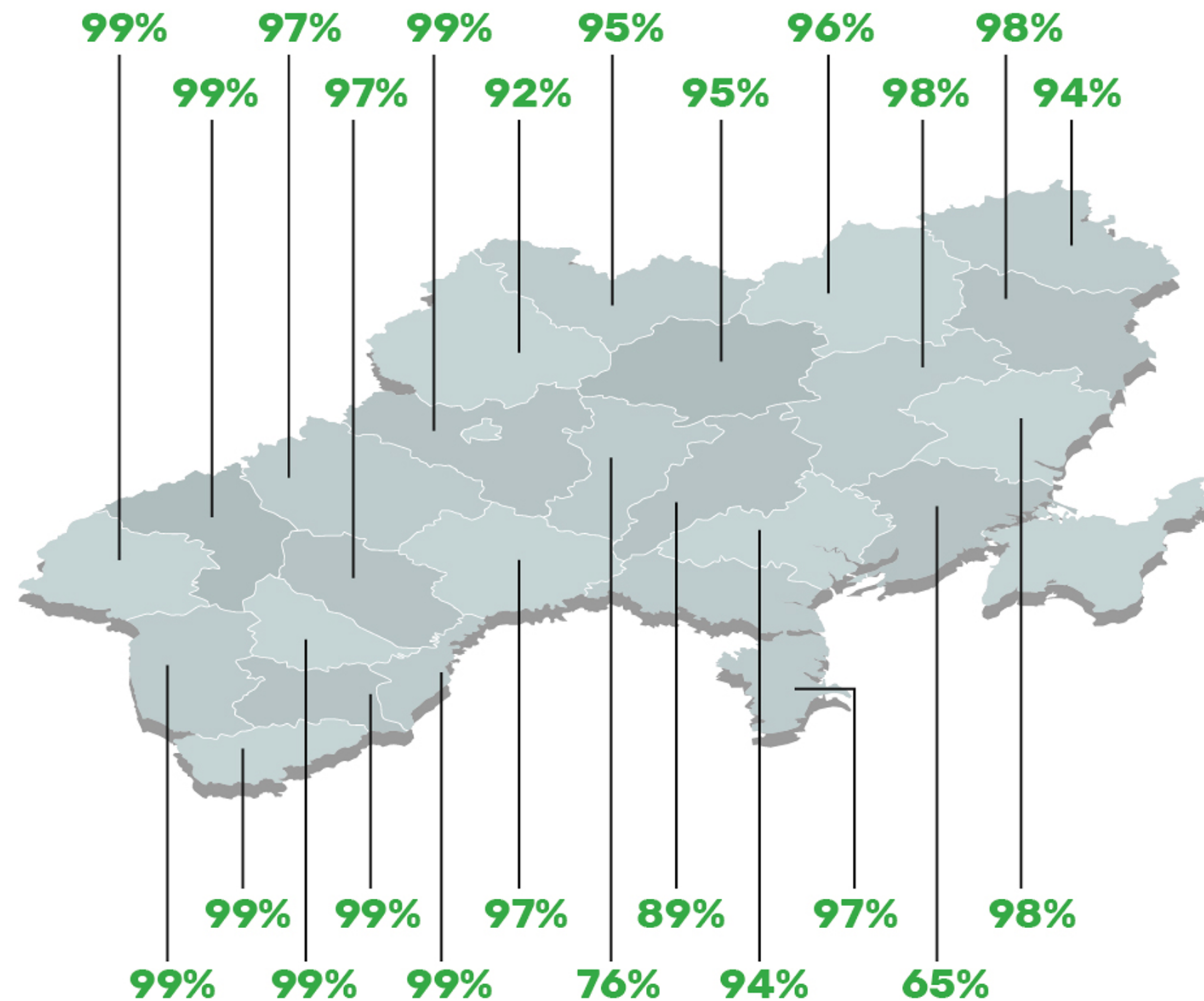


The cheapest internet in Europe and one of the cheapest in the world



High-speed fiber internet coverage – over 90%

High speed internet coverage in Ukraine



The challenges ISPs faced



Supply Chain Disruption



Refinery attack and petrol crisis



Energy crisis in the frontline cities



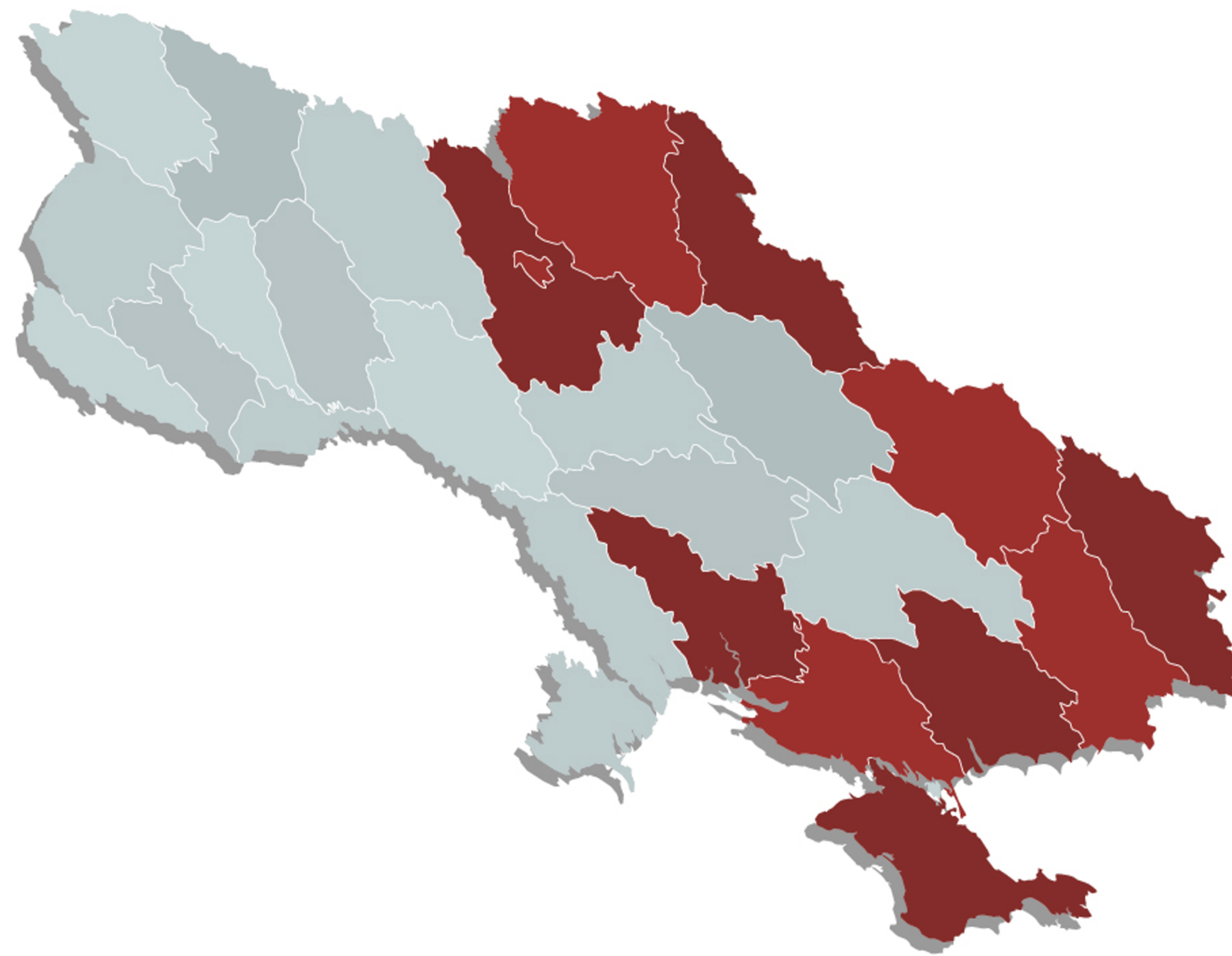
Devaluation of national currency for 50%



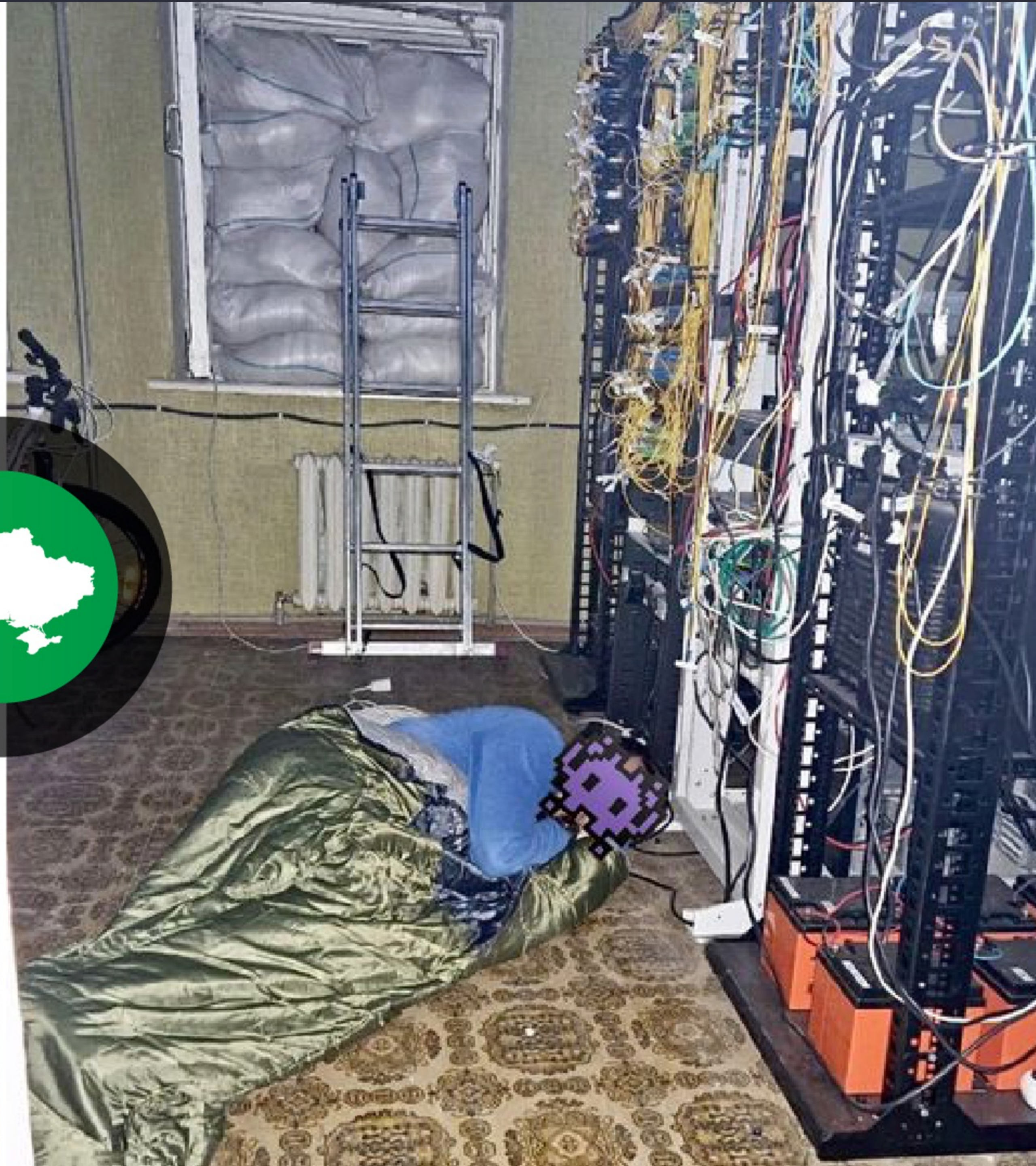
Attacks on communication sites and nodes,
total stealing and damage of the equipment



Infrastructure, authorities sites
and biggest internet websites and
malls DDoS attacks











From a simple idea,
to supply chain managers...

The GNA Supply & Demand Database works very well. Anyone who wants to donate equipment can get a login from us, and can specify what they want to donate.

Using this database, we can manage which donations we've received. This makes it easier for us to keep track of everything, and means we can show people from Ukraine who need equipment what we have in the system.





Supply & Demand Tool

v1.0

Start typing to filter...
AUTHENTICATION AND AUTHORIZATION
Groups + Add
CONTACTS
Contacts + Add
Organisations + Add
SUPPLY & DEMAND
Changes
Offers + Add
Requests + Add

<input type="checkbox"/> Network Automation & Config Management Software	Multiple Unimus Unlimited Licenses
<input type="checkbox"/> Network equipment	1x Advocent Mergepoint Unity 2016 1x Brocade Brocade FastIron Edge 648P 1x Brocade Brocade FastIron Edge 648P-POE 3x Brocade Brocade FastIron Edge GS 624P 2x Brocade FCX-4XG 1x Brocade FWS 624G 1x DeLL Powerconnect 5324 8x Foundry FastIron Edge 2402 2x Foundry FastIron Edge 4802-POE 1x Foundry FastIron Edge GS 624P 3x Foundry FastIron Edge X424 2x Foundry FastIron Edge X448 1x Foundry FastIron GS 648-POE 1x Foundry FastIron GS 648P 1x Juniper EX 3200 series 1x Juniper J4350 1x Juniper M5 Backbone Router 1x MRV Optiswitch 906 1x Open Gear IM 4208-2-DAC-X2
<input type="checkbox"/> Power Generator	1x Pramac P2000
<input type="checkbox"/> Power Generators	10x IMOTO 5000 Watt
<input type="checkbox"/> Power Generators	10x Misc Power Generator 5KW
<input type="checkbox"/> Rack	1x Unknown 27U rack

Supply & Demand Tool

(Requester View)

v2.0

Select offered item to change



Search

Action:



Go

0 of 100 selected

<input type="checkbox"/>	TYPE	BRAND	1 ▲	MODEL	2 ▲	NOTES	# OFFERED	CLAIMED	REJECTED	RECEIVED
<input type="checkbox"/>	Hardware			27U rack			1	0	✘	✘
<input type="checkbox"/>	Hardware			2900 mAh rechargeable Batteries			8	8	✘	✔
<input type="checkbox"/>	Hardware			8+2+2SFP All Gigabit POE Switch		PoE Switch with 2 SFP	1	1	✘	✔
<input type="checkbox"/>	Hardware			Mini Smart Switch			1	1	✘	✔
<input type="checkbox"/>	Hardware			PS2 keyboard			22	0	✘	✘
<input type="checkbox"/>	Hardware			UPS		Various UPS, without batteries	10	0	✘	✘
<input type="checkbox"/>	Hardware			USB/PS2 Optical mouse			10	0	✘	✘
<input type="checkbox"/>	Hardware			XENPAK 10G DWDM Single Mode Fiber		variety of DWDM channels, can be used without DWDM MUX. You need to add attenuation for short distance links	31	0	✘	✘
<input type="checkbox"/>	Hardware			XENPAK 10G Multi Mode			5	0	✘	✘

Availability

Already claimed

Supply & Demand Tool

(Donor View)

v2.0

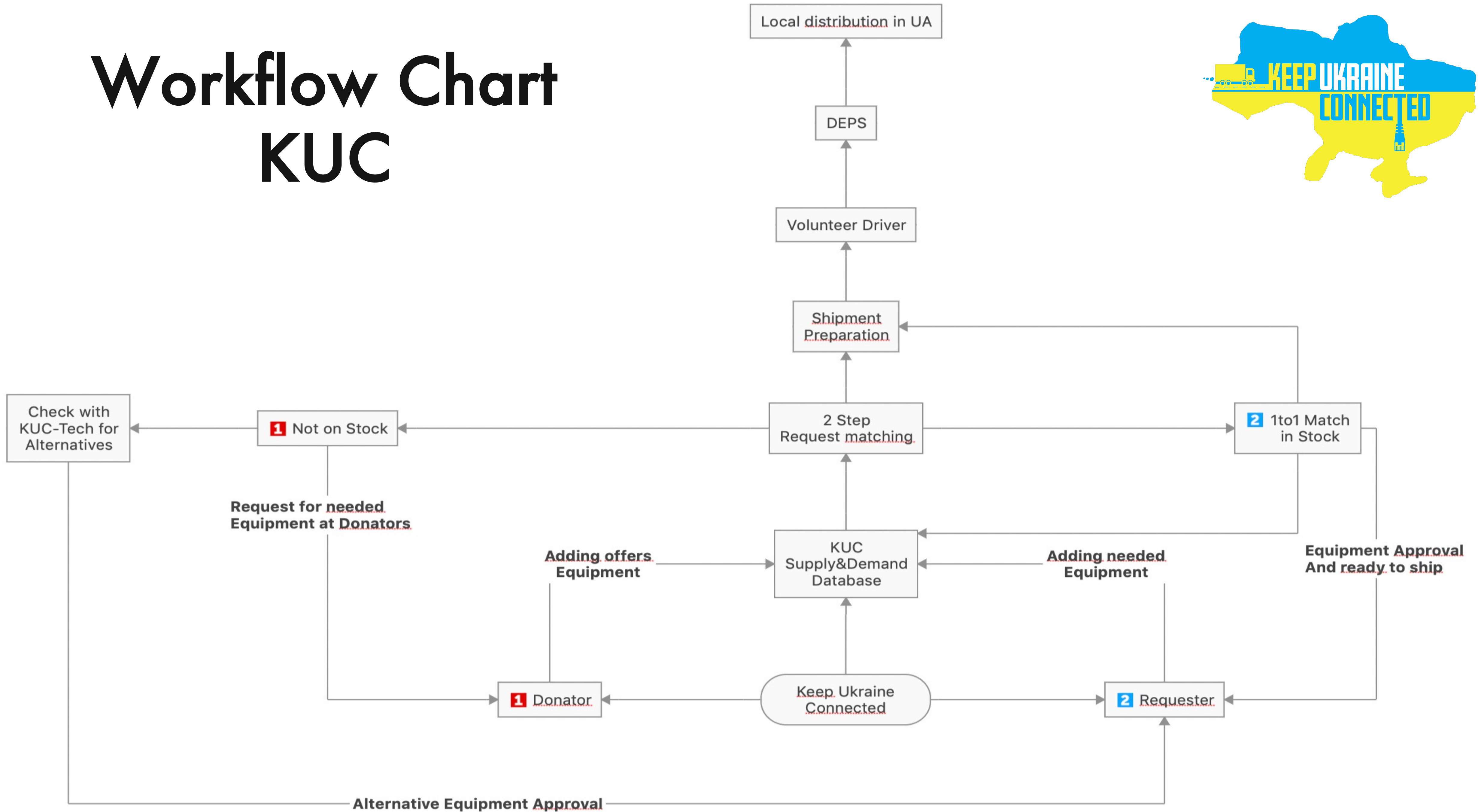
Select requested item to change

Search

Action: Go 0 of 100 selected

<input type="checkbox"/>	TYPE	BRAND	1 ▲	MODEL	2 ▲	# REQUIRED	UP TO	ASSIGNED	DELIVERED	CREATED AT	IT
<input type="checkbox"/>	Hardware			100G-CFP2-LR4		8	10	✘	✘	April 2, 2022, 6:46 p.m.	UA
<input type="checkbox"/>	Hardware			24 port switch with SFP uplinks		11	-	✘	✘	April 18, 2022, 9:01 a.m.	Ho
<input type="checkbox"/>	Hardware			Anchor clamp H3 (D)		1252	-	✘	✘	April 18, 2022, 9:08 a.m.	Ho
<input type="checkbox"/>	Hardware			Anchor clamp H3 (D)		4092	-	✘	✘	April 18, 2022, 9:05 a.m.	Ho
<input type="checkbox"/>	Hardware			any model		1	3	✘	✘	April 13, 2022, 2:22 p.m.	UA
<input type="checkbox"/>	Other			Catch-all		1	-	✔	✔	April 21, 2022, 11:52 a.m.	DE Di sh
<input type="checkbox"/>	Hardware			Coupler PLC-1x8-split-0-SC/UPC-0.9mm		360	-	✘	✘	April 18, 2022, 9:05 a.m.	Ho
<input type="checkbox"/>	Hardware			Coupler SC-1x2-1310/1490/1550-50/50-0-		32	-	✘	✘	April 18, 2022, 9:05 a.m.	Ho

Workflow Chart KUC



PROCESSES IN UKRAINE



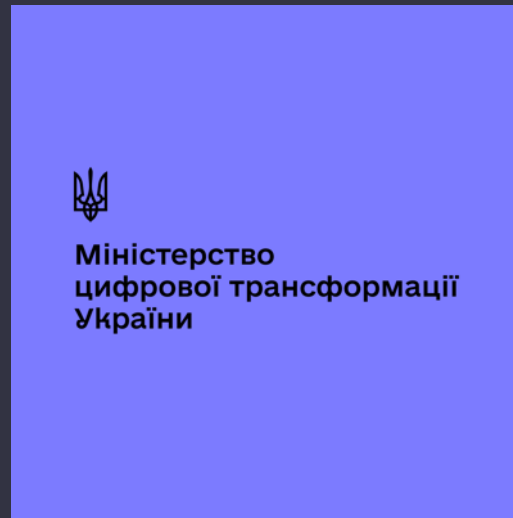
WAREHOUSE AND PROCUREMENT TEAMS



CLIENT RELATIONS AND CARE TEAMS

Our Friends & Partners in Ukraine

We are currently working with the organisations listed below. They are helping us with paperwork, permits, and local distribution of the donated equipment.



Ministry of Digital
Transformation



DEPS
(local distribution)



Ukrainian Internet
Association



NOG
ALLIANCE AID



SFP transceivers

>1000

100 000 \$



Fiber splicers

~~41~~

~~80 000 \$~~

230 000 \$



Switches and
routers

>1100

600 000 \$



Wireless
equipment

>400

100 000 \$



Other

> 50 000 \$

TOTAL: 1 000 000 \$

1 200 000 \$

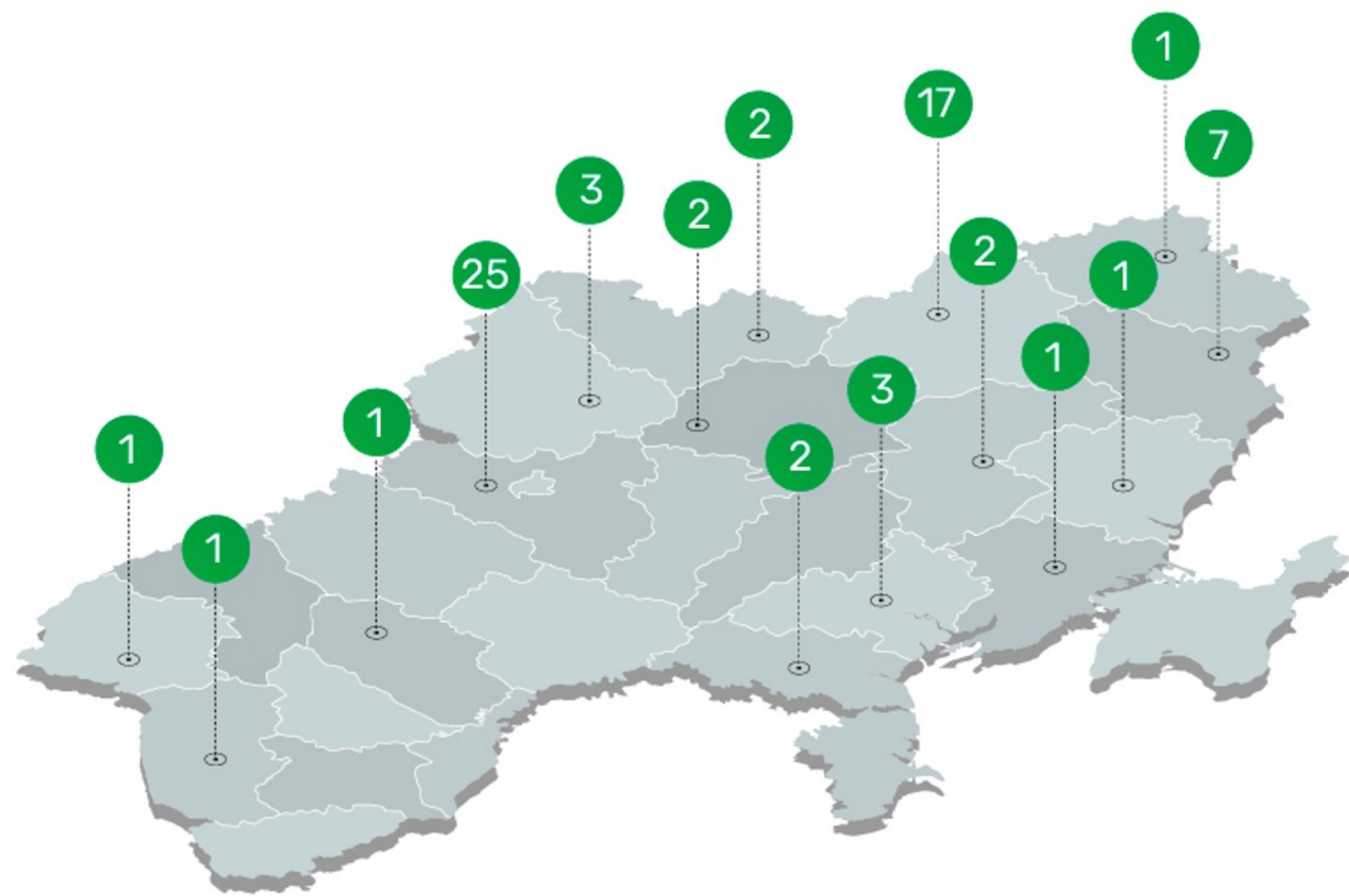
← Sep 2022

← Nov 2022

Dec 2022
1.800.000 \$ - 2.300.000 \$
Warehouse/ Storage



>60 companies



Who is behind the Task Force “Keep Ukraine Connected”



Corinne



Nathalie



Sander



Rene



Jan



Erik



Daniel



Marcin



Ester



Michael



Ihor

The partners we need to thank



René Fichtmüller



Sander Steffann



Jan Žorž



Nathalie
Kunneke-Trenaman



Daniel Houben



Marcin Kuczera



Gennadiy Lebedev



Dmitriy Kniaziev



Natalia Klitna



Міністерство
цифрової трансформації
України

My personal motivation for the future?

With extra special thanks to:



FLEXOPTIX

For giving their employees the time to invest in this task force.

Thank you!

Links and Sources

Mail us:

ukraine@nogalliance.org

Supply&Demand DB:

<https://keepukraineconnected.org/admin/login>

DEPS

<https://deps.ua/ua/>

Kentik Monitoring

<https://www.kentik.com/>

Ukrainian Internet Association

<https://inau.ua/en/ukrainian-internet-association-ua>

Ministry of Digital transformation in Ukraine

<https://thedigital.gov.ua/>

RIPE Atlas

<https://atlas.ripe.net/>

DEPS

<https://deps.ua/ua/>

Global NOG Alliance Aid- Coordinator

https://github.com/nogalliance/aid_coordinator