

**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

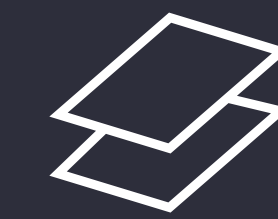
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*February 24, 2022*

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

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



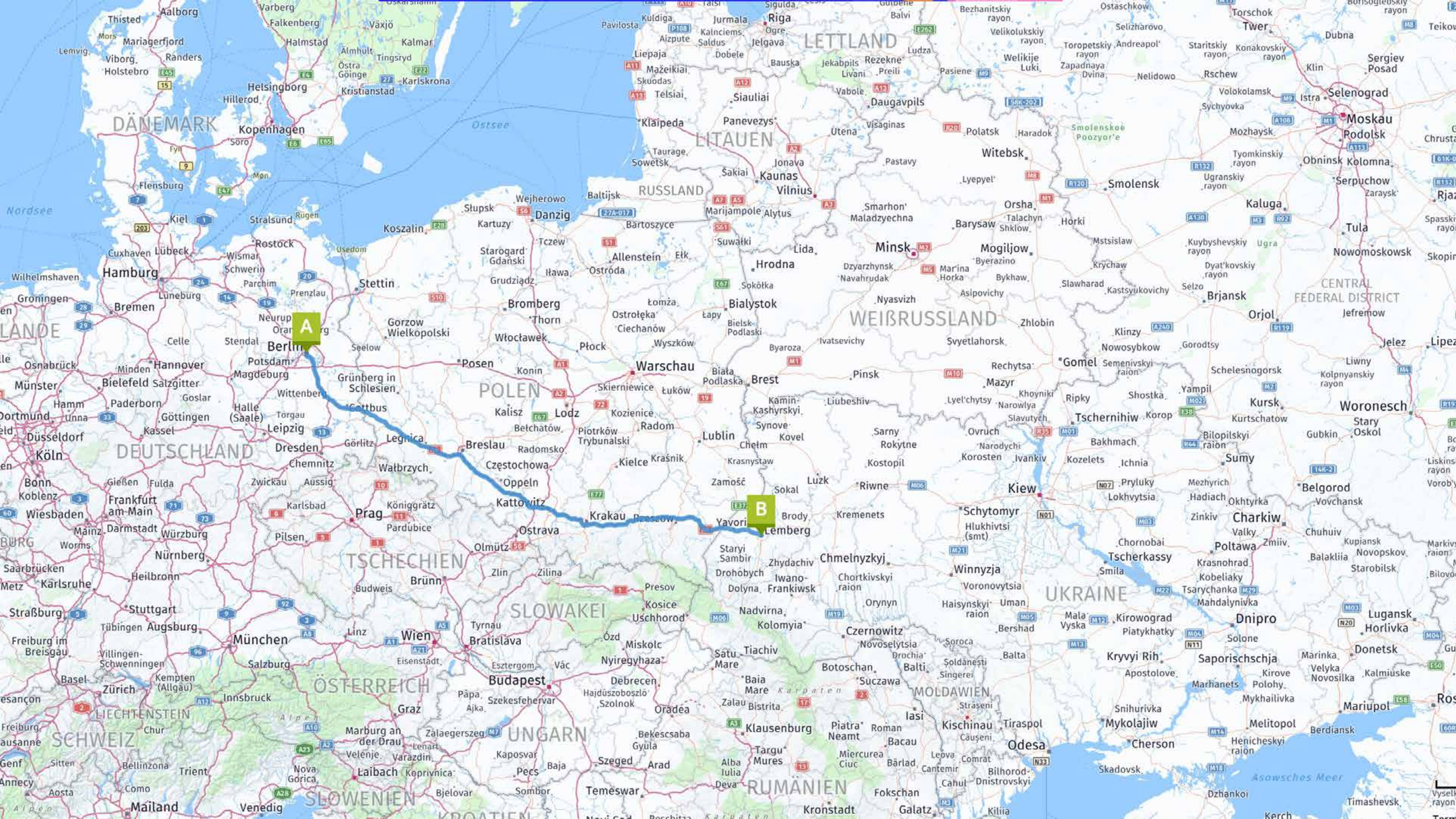


## The beginning...

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



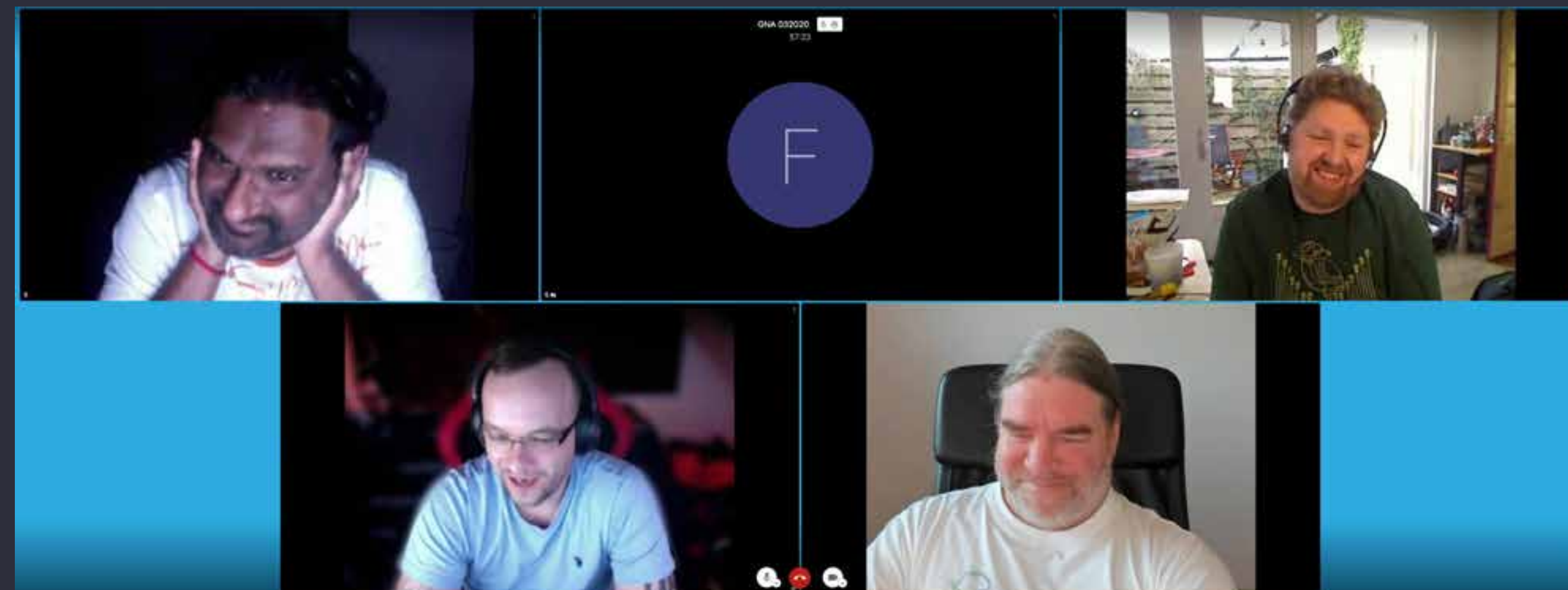
# The next day...

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



...why are we doing this?

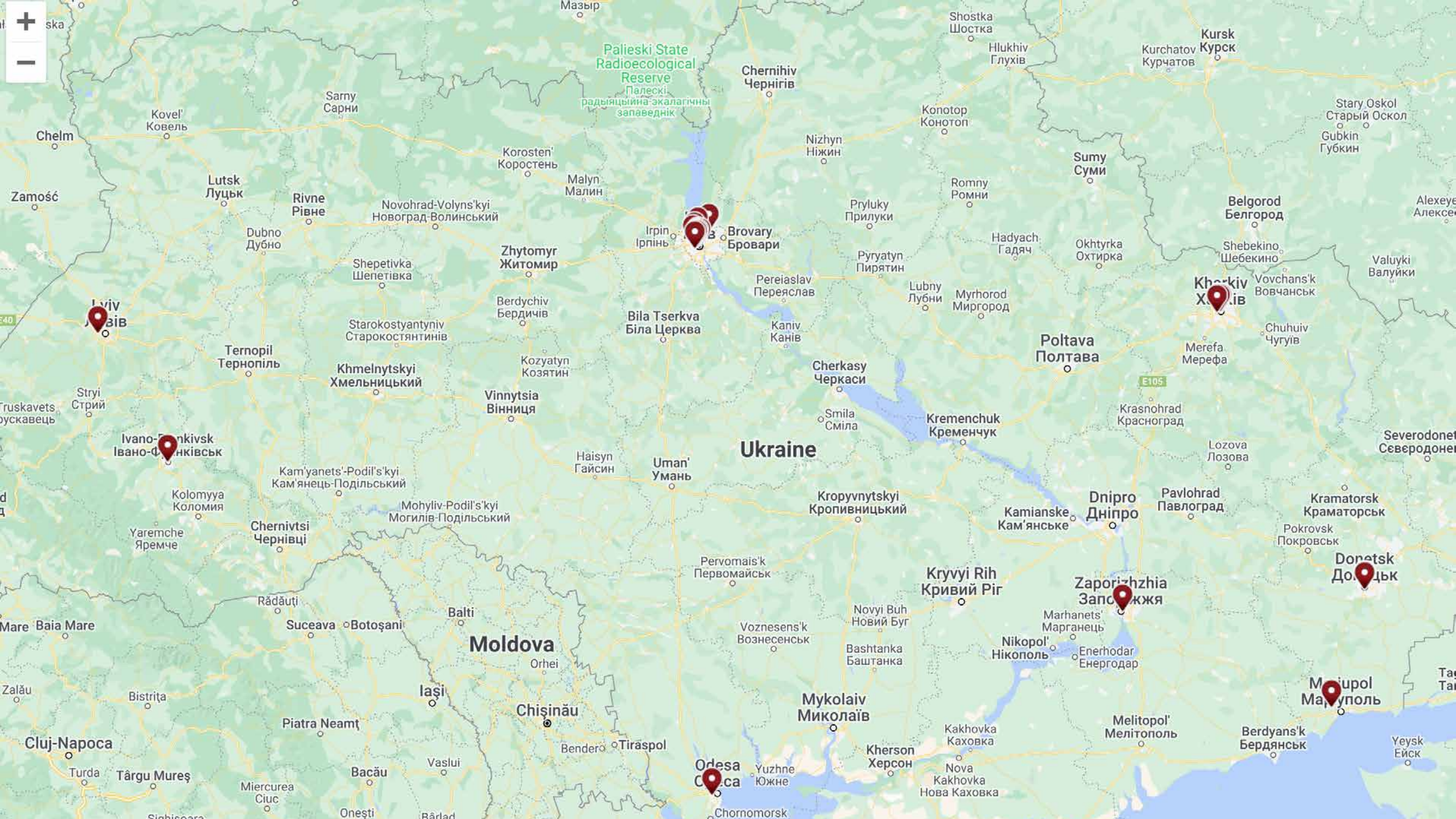
## Infrastructure perspective





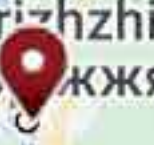
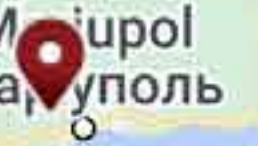
Name	Media Type	Country	City	Network...
<u>GigaNET Kyiv</u> Giganet Internet exchange network	Ethernet	UA	Kyiv	172
<u>DTEL-IX</u> Digital Telecom Internet Exchange	Ethernet	UA	Kiev	167
<u>UA-IX</u> Ukrainian Internet Exchange	Ethernet	UA	Kiev	127
<u>PITER-IX Kiev</u> PITER-IX Kiev	Ethernet	UA	Київ	63
<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 радыяцыйна-экалагічны запаведнік

Ukraine





Name Management	CLLI NPA-NXX	City Country	State Postal Code	Networks ↓ <sup>1</sup>
<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:

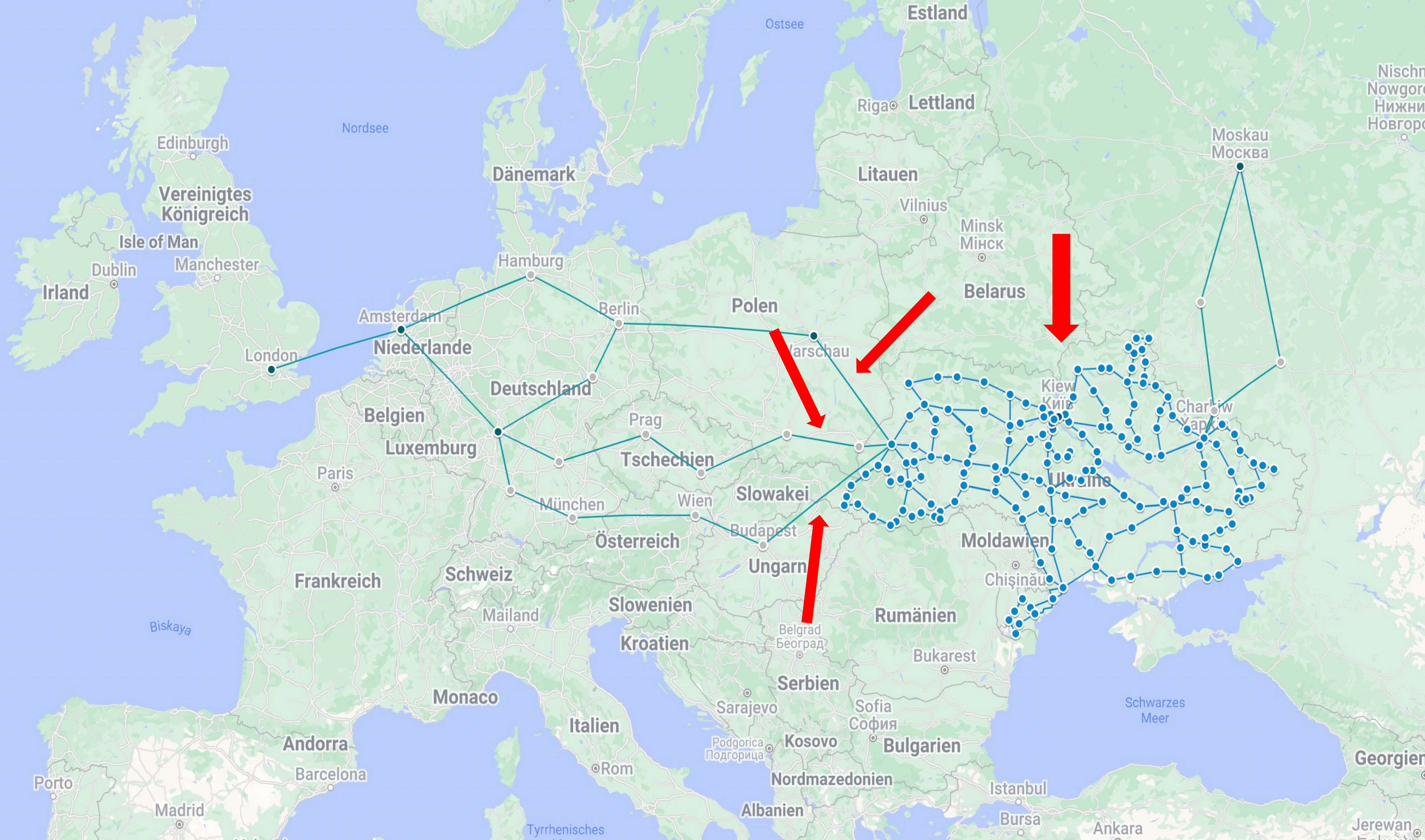
[https://www.peeringdb.com/advanced\\_search?country\\_in=UA&reftag=](https://www.peeringdb.com/advanced_search?country_in=UA&reftag=)



# Map Backbone











Ukraine

Moldova

Romania

Black Sea

Bulgaria

Georgia

Armenia

Az

Serbia

Kosovo

North Macedonia

Albania

Greece

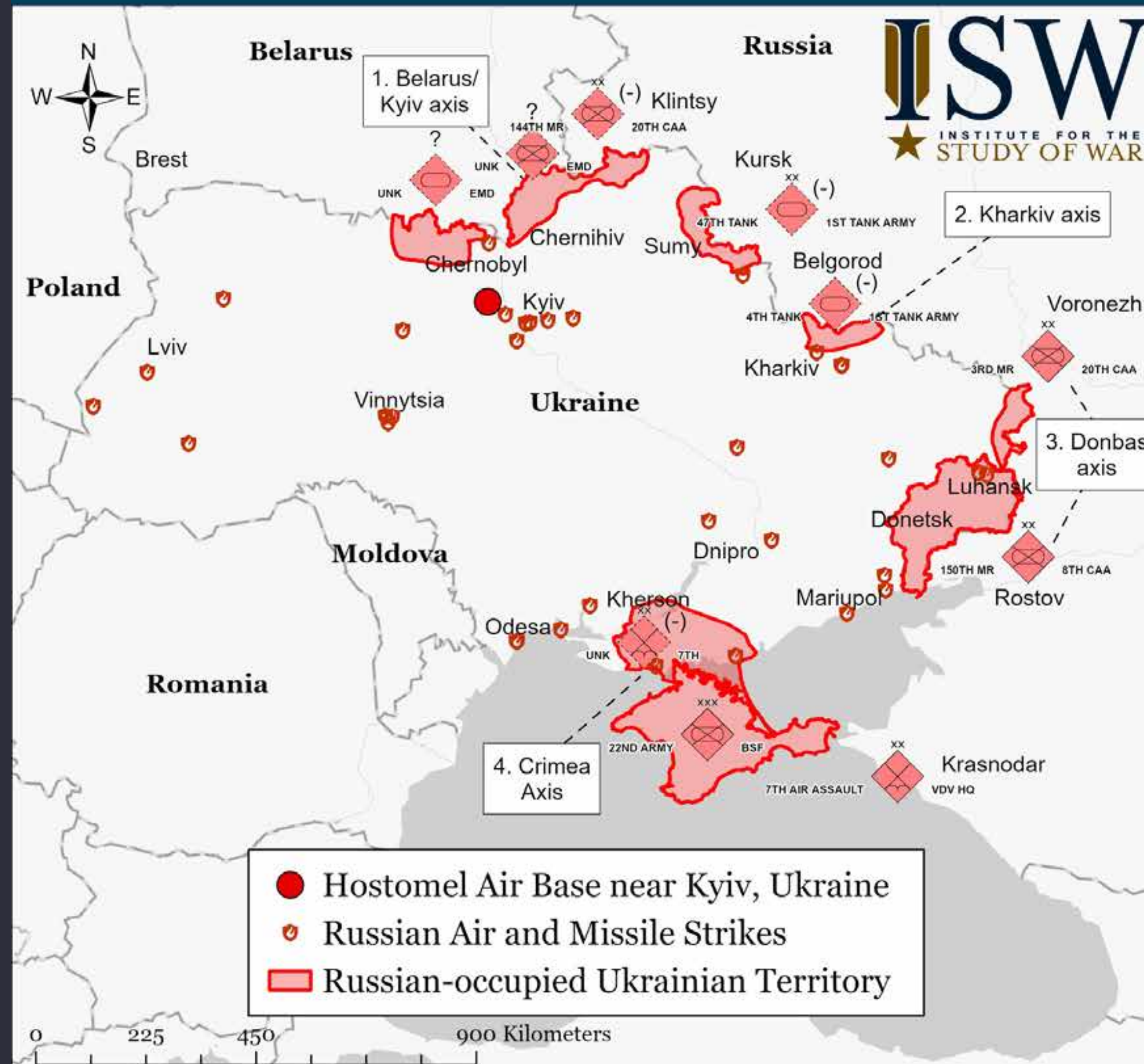
akia

ngary

egro



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





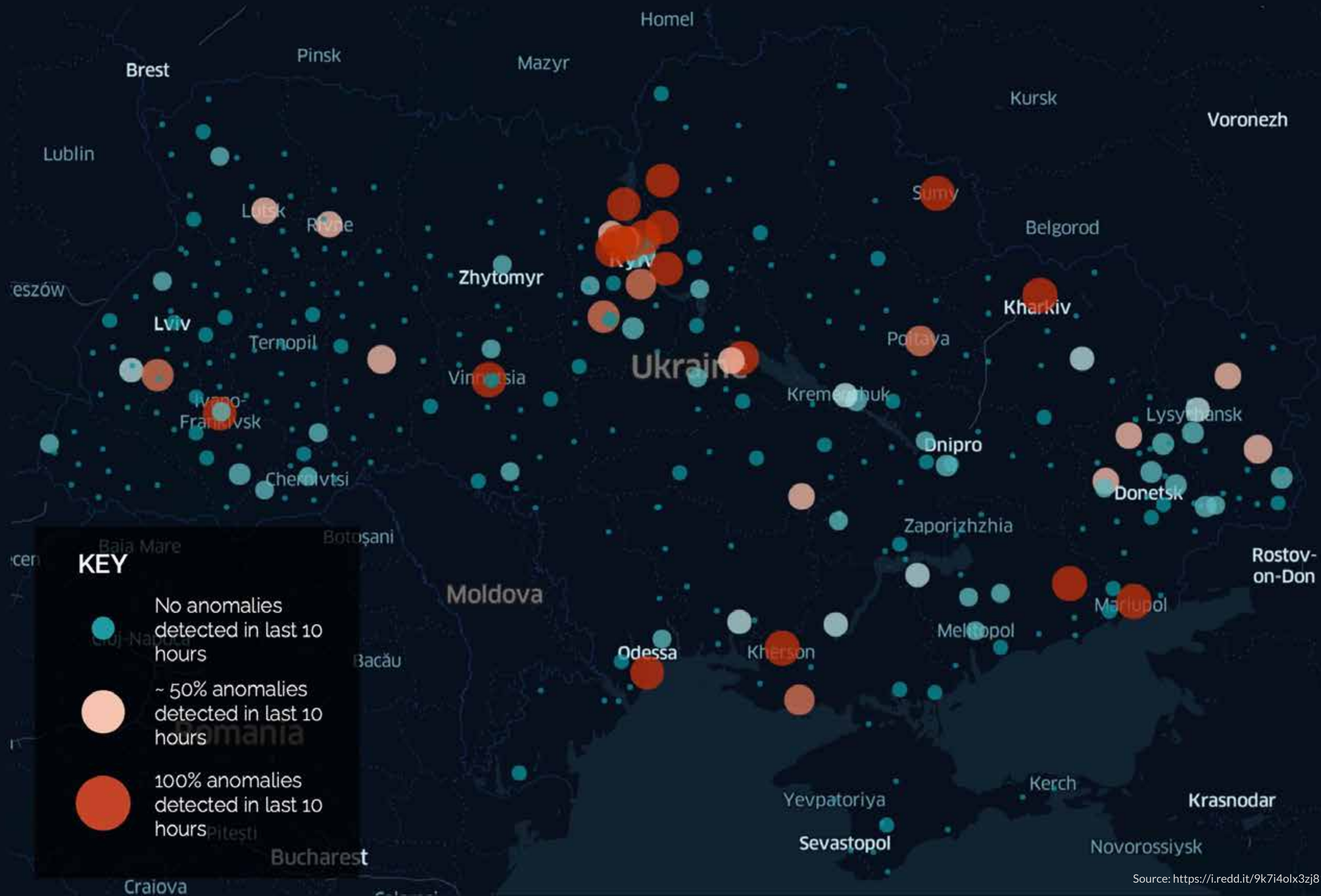
# Current ICT Connectivity Anomalies

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

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

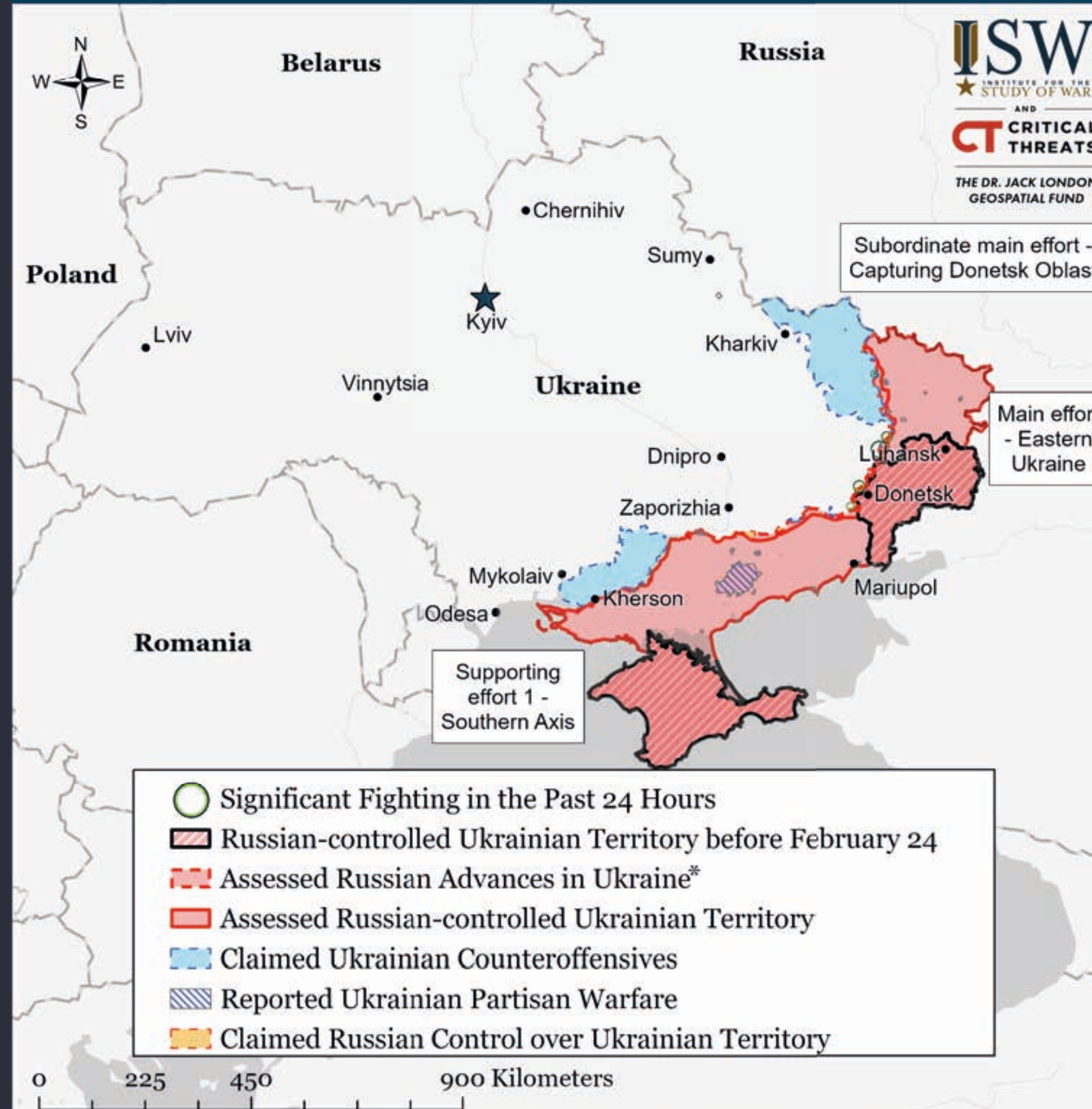
Map shows number of ICT connectivity anomalies (degraded internet) in last 10 hours for the given district

powered by  
**KASPR Datahaus**





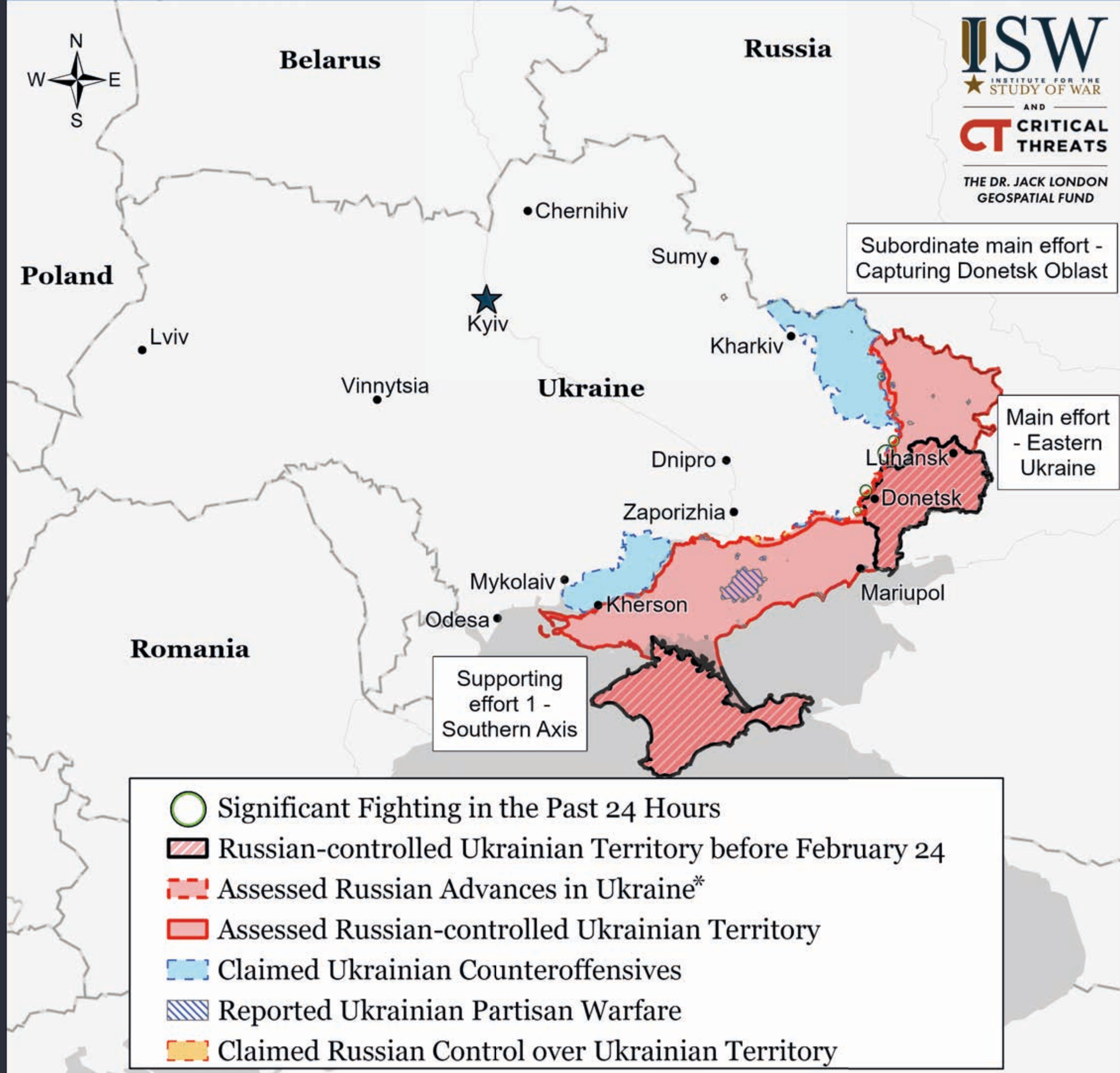
# Assessed Control of Terrain in Ukraine and Main Russian Maneuver Axes as of November 19, 2022, 3:00 PM ET



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.





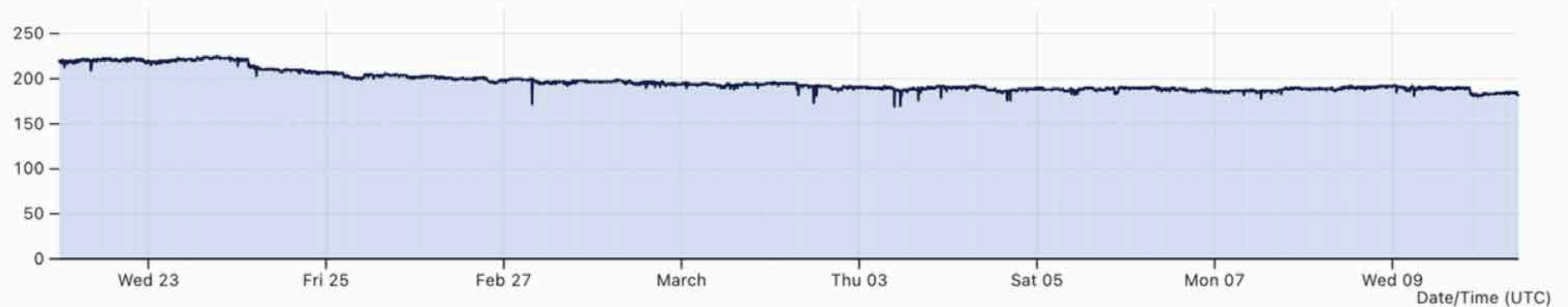


# RIPE Atlas Probes in Ukraine



- 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)



# Brief info about Ukraine



Area – 603,7 thousand km<sup>2</sup> (BT 38.394)



Population – over 40 mln people



Mobile subscribers – 53 mln



Quantity of ISP providers – over 3000

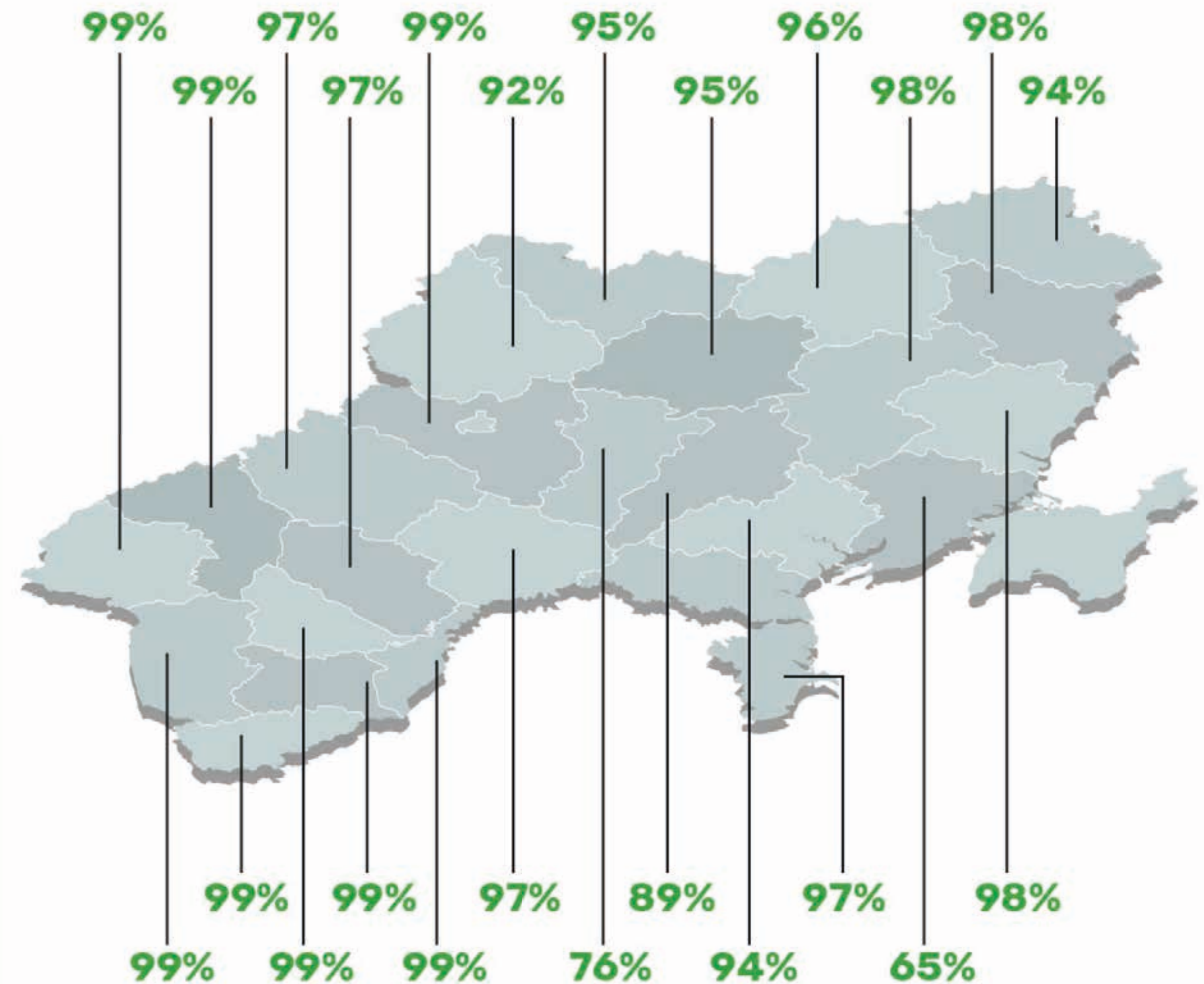


The cheapest internet in Europe and one of the cheapest in the world



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



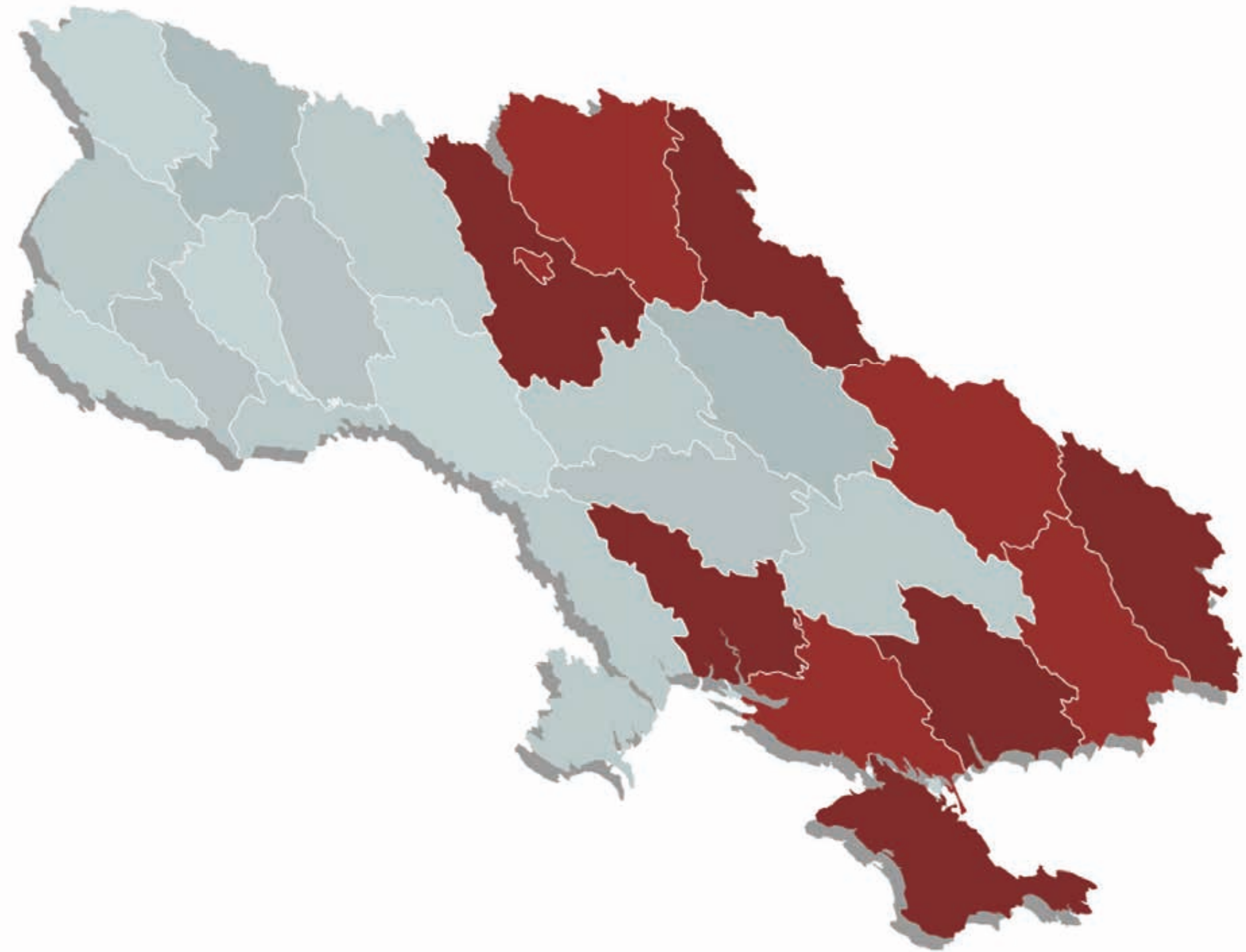
Devaluation of national currency for 50%



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



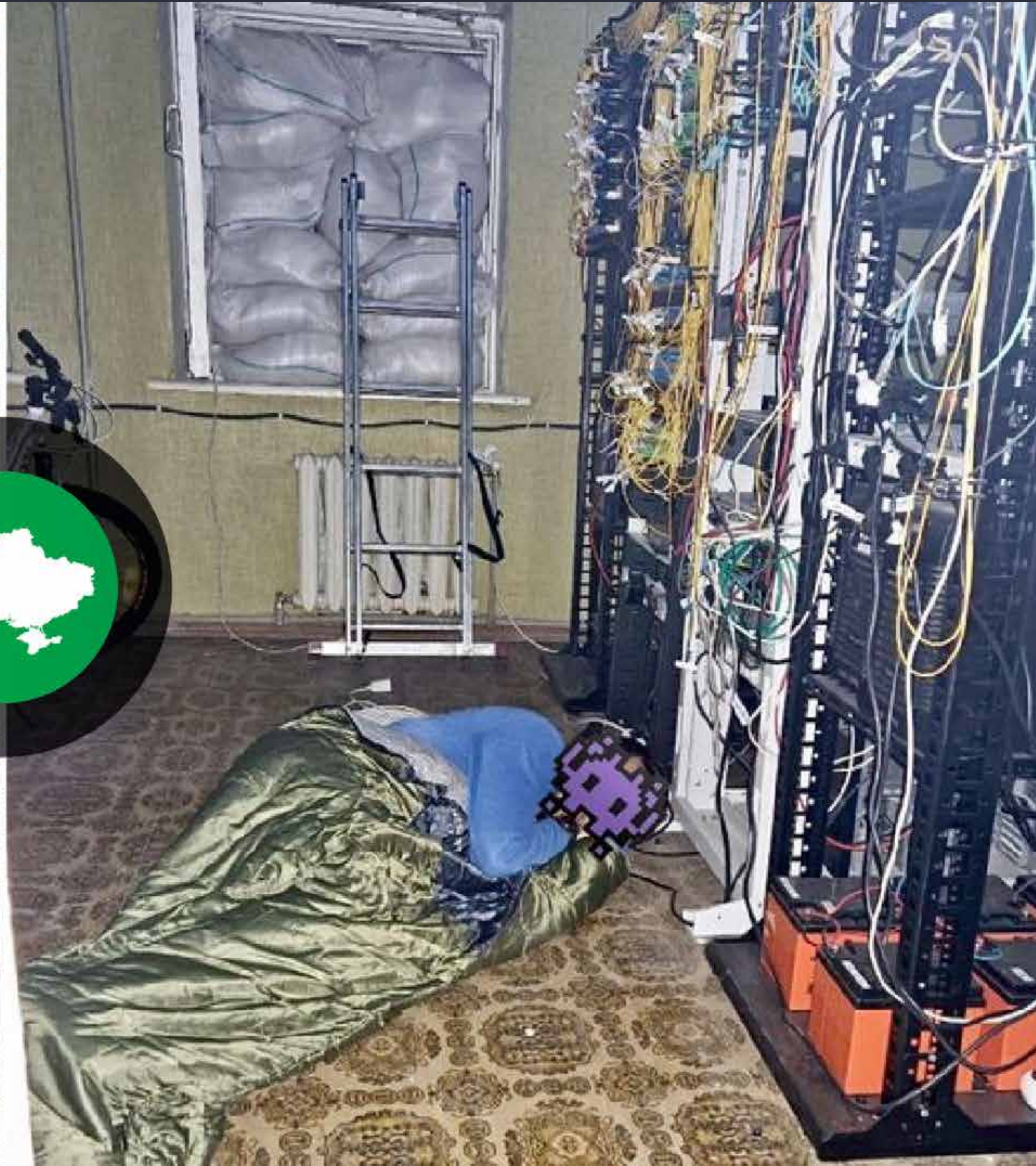
Infrastructure, authorities sites  
and biggest internet websites and  
malls DDoS attacks



















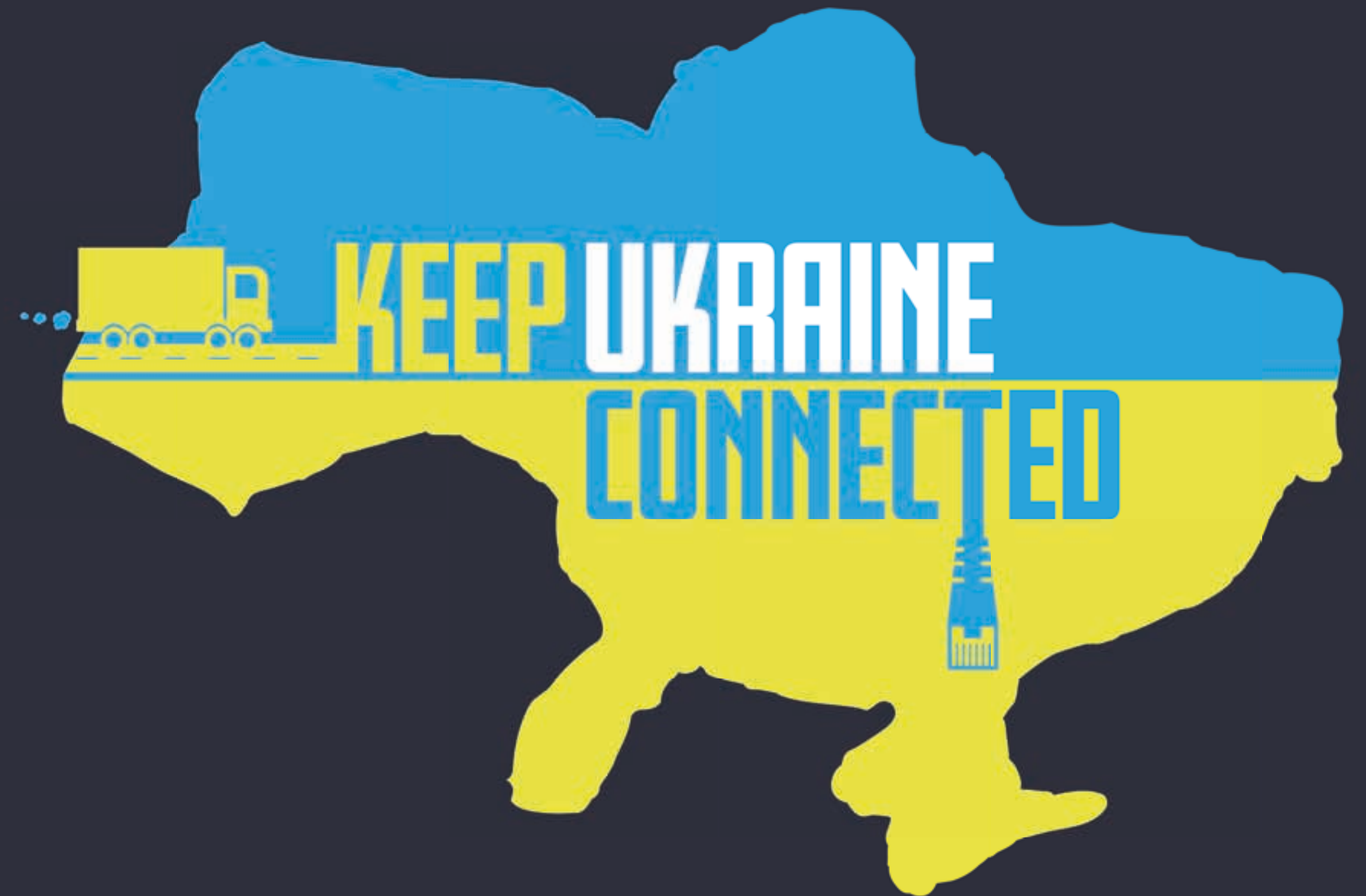


## **Our vision & mission**

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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.





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...
<b>AUTHENTICATION AND AUTHORIZATION</b>
<b>Groups</b> <span>+ Add</span>
<b>CONTACTS</b>
<b>Contacts</b> <span>+ Add</span>
<b>Organisations</b> <span>+ Add</span>
<b>SUPPLY &amp; DEMAND</b>
<b>Changes</b>
<b>Offers</b> <span>+ Add</span>
<b>Requests</b> <span>+ Add</span>

<input type="checkbox"/> <b>Network Automation &amp; Config Management Software</b>	Multiple Unimus Unlimited Licenses
<input type="checkbox"/> <b>Network equipment</b>	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"/> <b>Power Generator</b>	1x Pramac P2000
<input type="checkbox"/> <b>Power Generators</b>	10x IMOTO 5000 Watt
<input type="checkbox"/> <b>Power Generators</b>	10x Misc Power Generator 5KW
<input type="checkbox"/> <b>Rack</b>	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

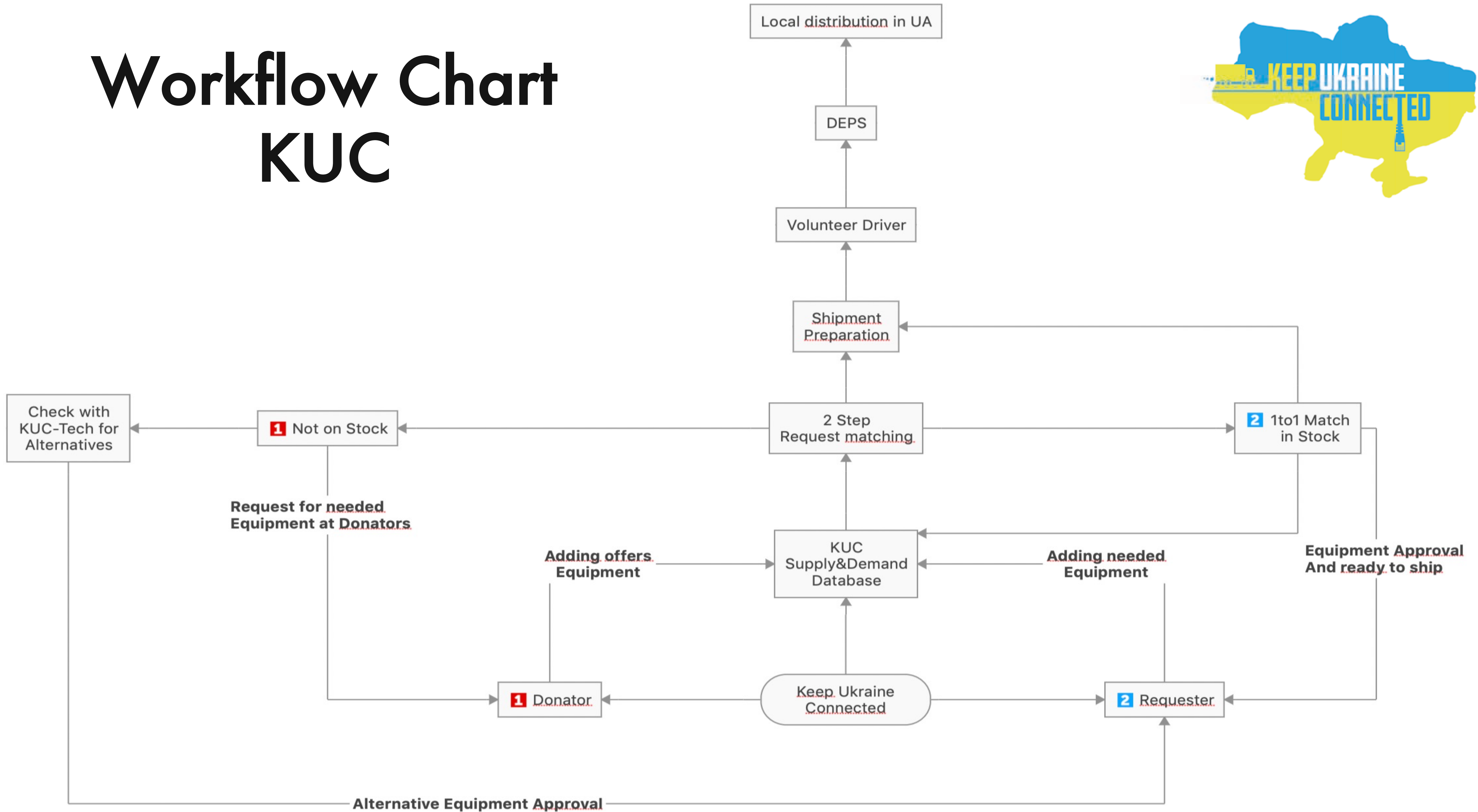
Search

Action:   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



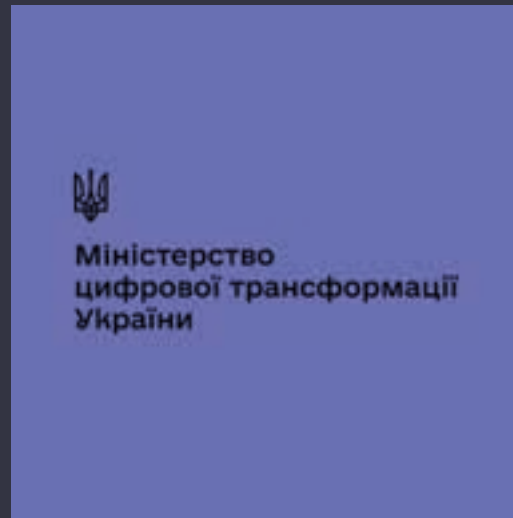
## CLIENT RELATIONS AND CARE TEAMS



# Our Friends & Partners in Ukraine

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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

28

80 000 \$



Switches and  
routers

>1100

600 000 \$



Wireless  
equipment

>400

100 000 \$



Other

> 50 000 \$

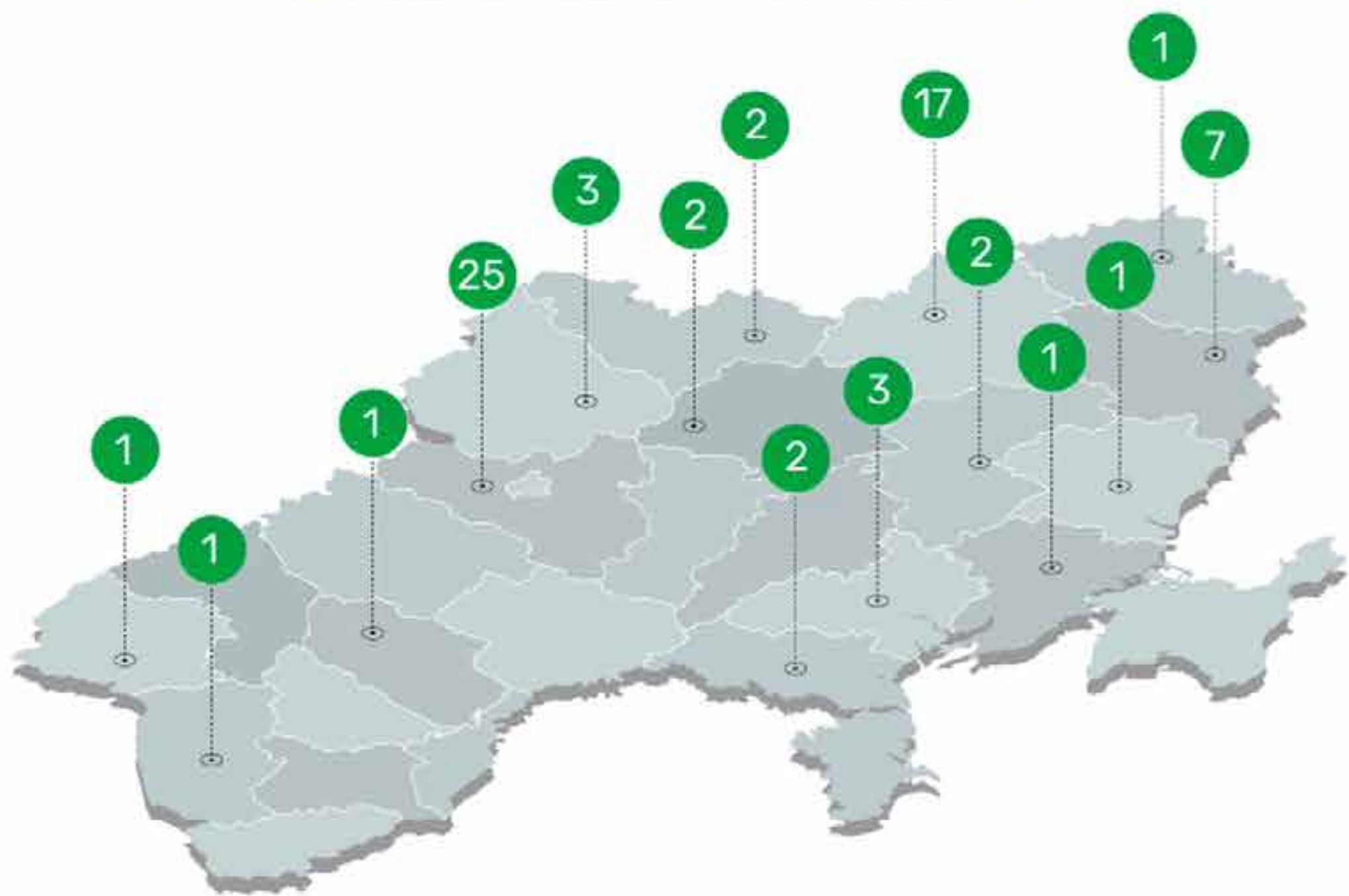
**TOTAL: 1 000 000 \$**

← Sep 2022





>60 companies

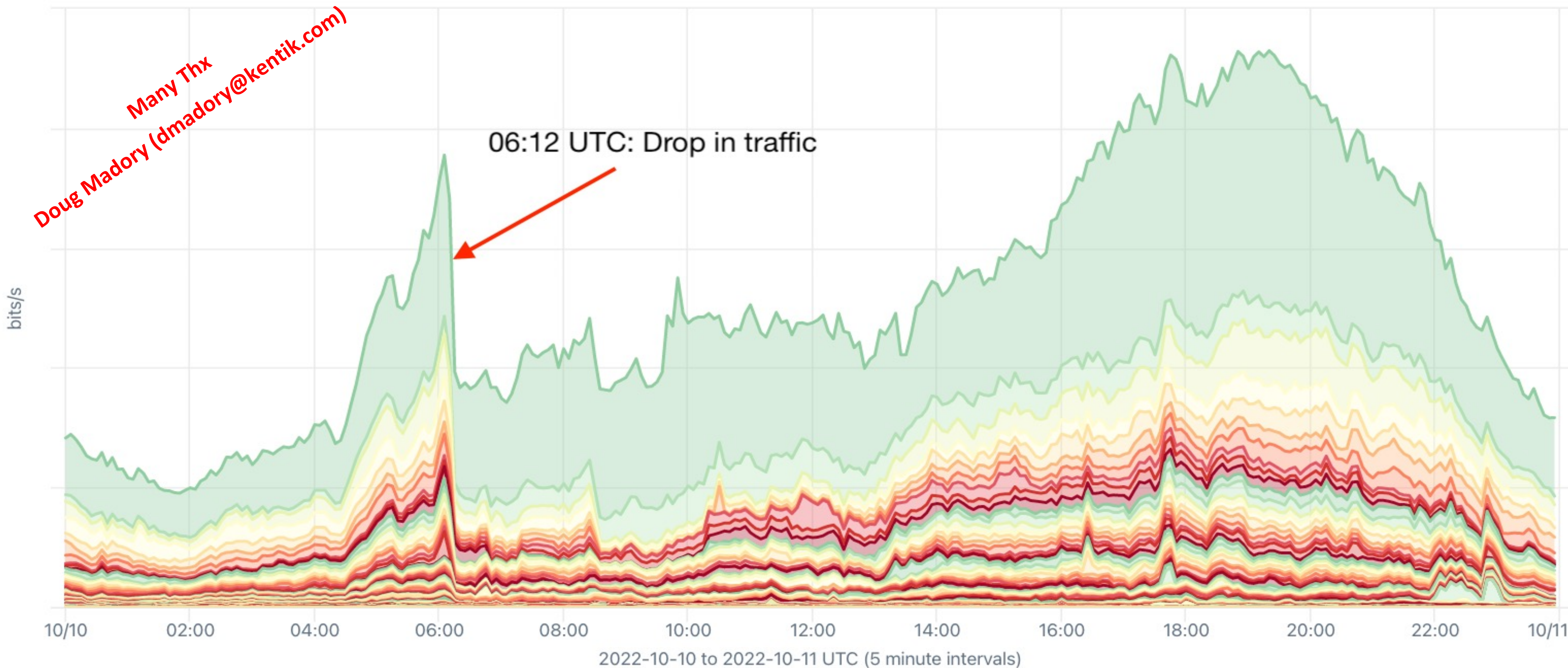




# Top Dest AS Number by Average bits/s

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

# Internet Traffic to Lviv



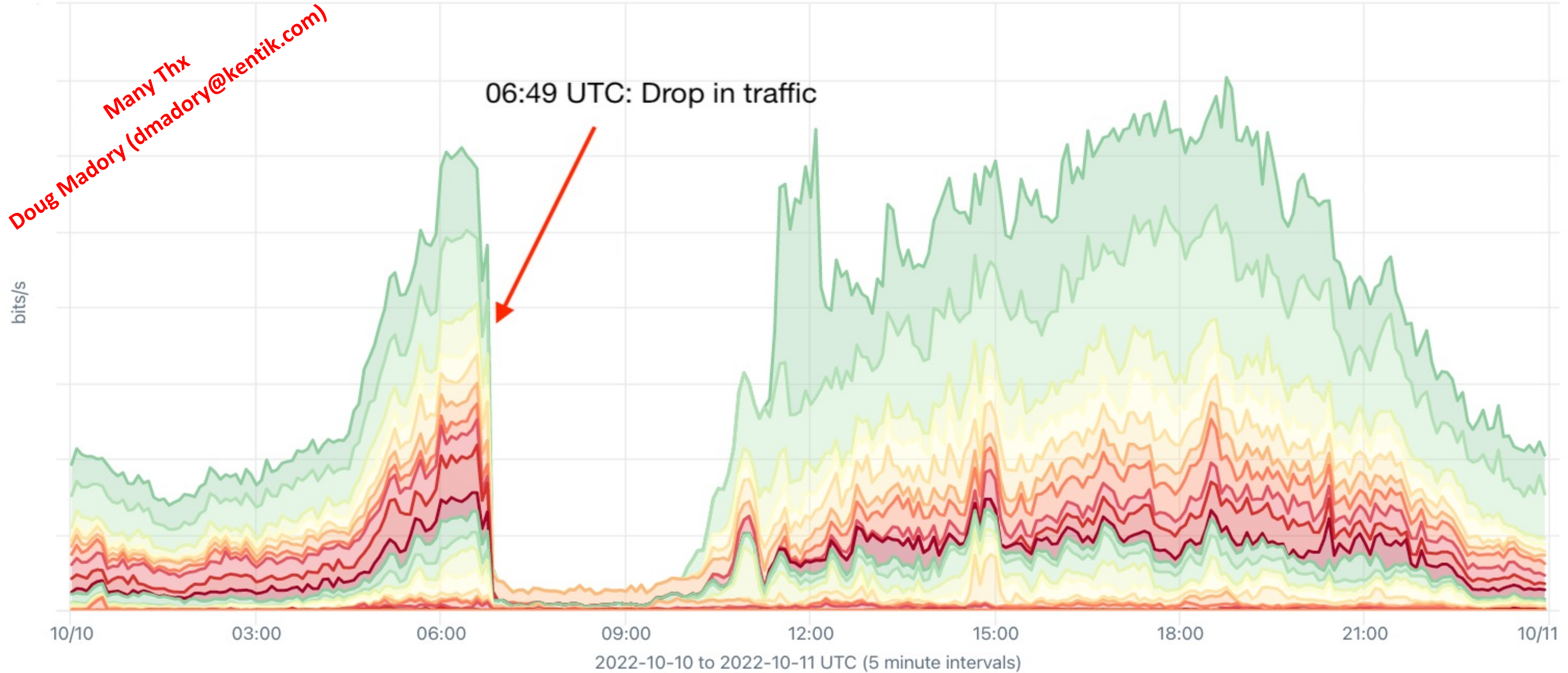
Many Thx  
Doug Madory (dmadory@kentik.com)



### Top Dest AS Number by Average bits/s

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

### Internet Traffic to Sumy

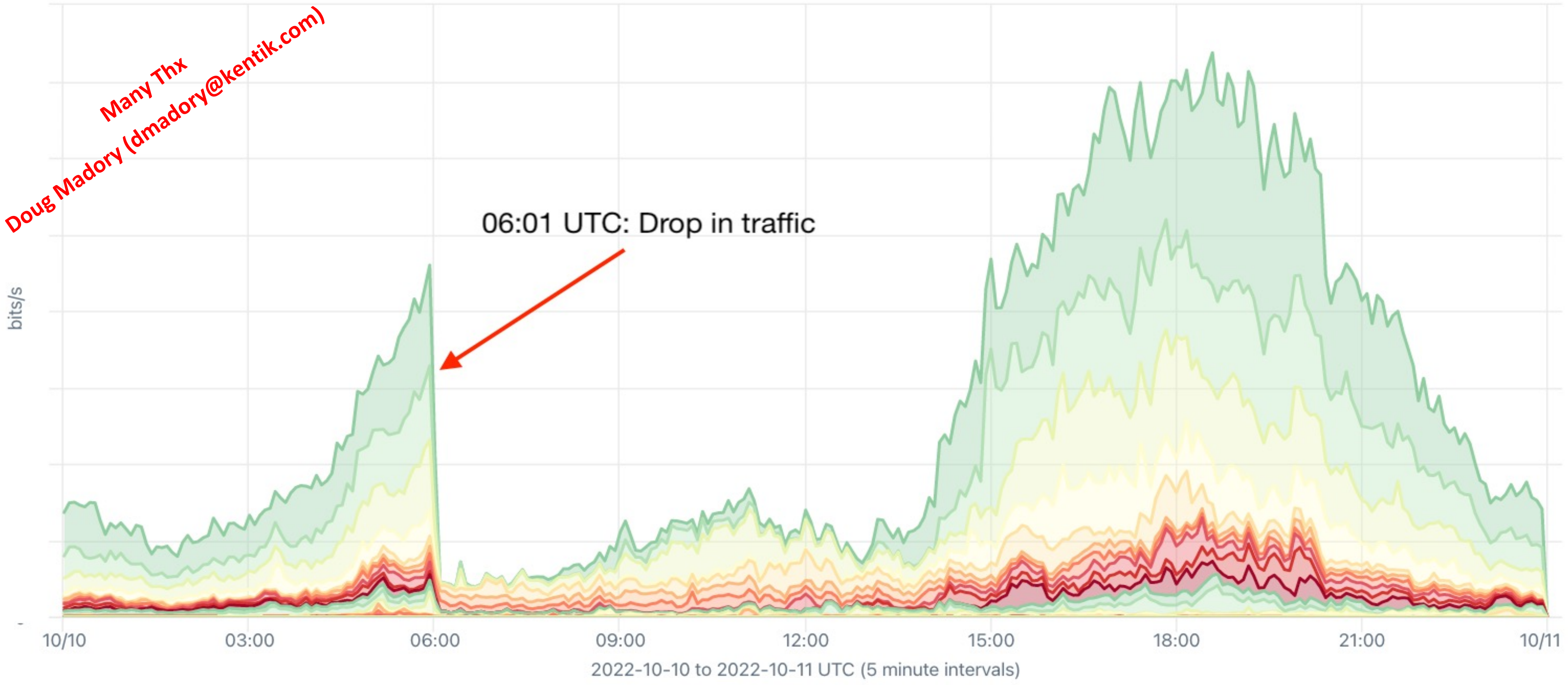




### Top Dest AS Number by Average bits/s

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

### Internet Traffic to Zhytomyr

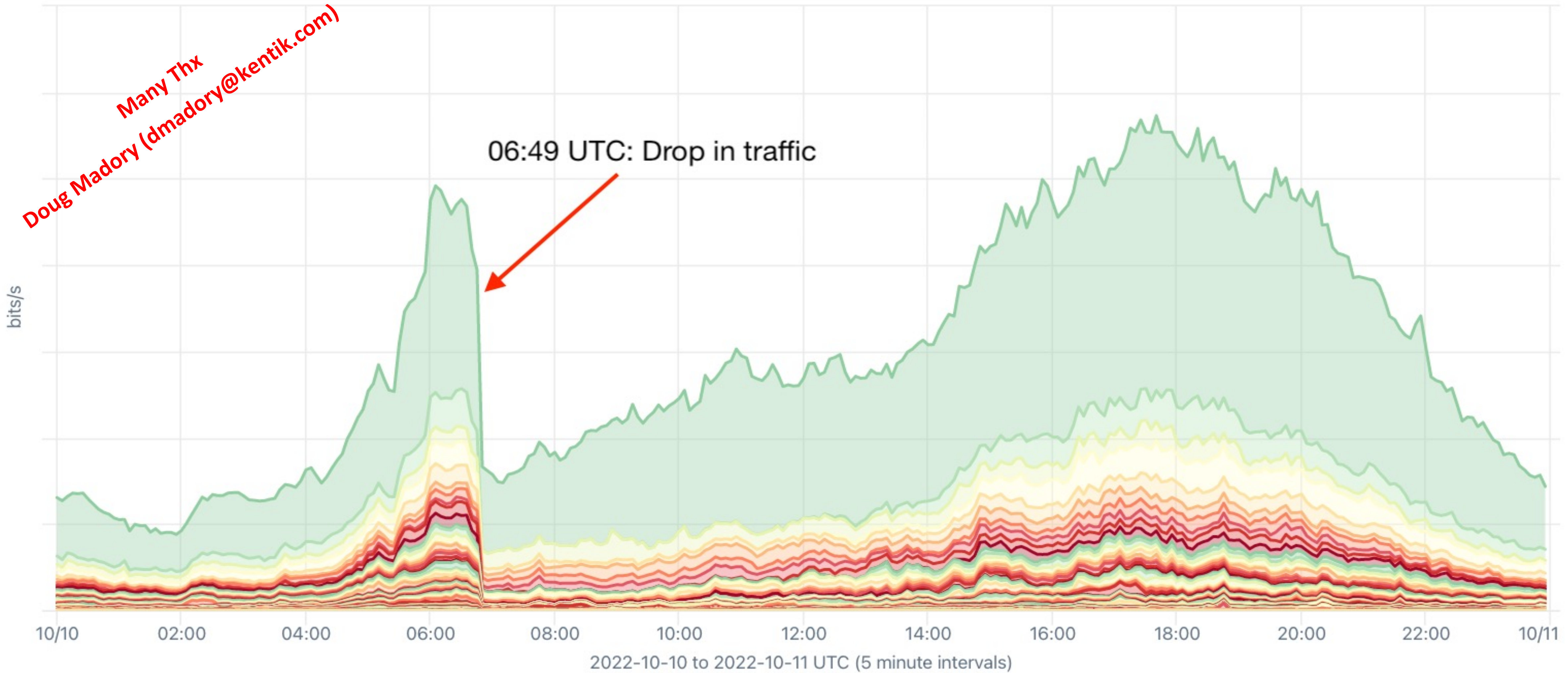




### Top Dest AS Number by Average bits/s

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

### Internet Traffic to Kharkiv



Many Thx  
Doug Madory (dmadory@kentik.com)



Who is behind the Task Force “Keep Ukraine Connected”



# Who is behind the Task Force “Keep Ukraine Connected”



*Corinne Pritchard*



*Nathalie Trenaman*



*Sander Steffann*



*Rene Fichtmueller*



*Jan Žorž*



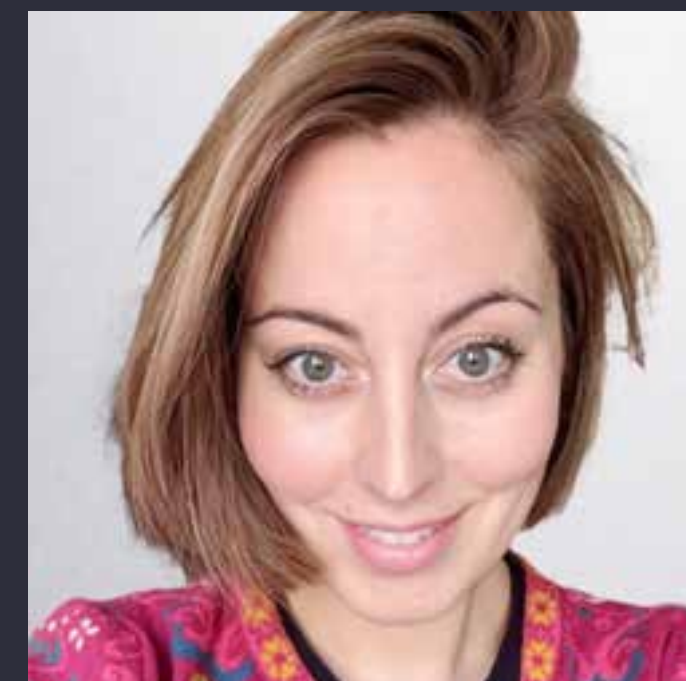
*Erik Bais*



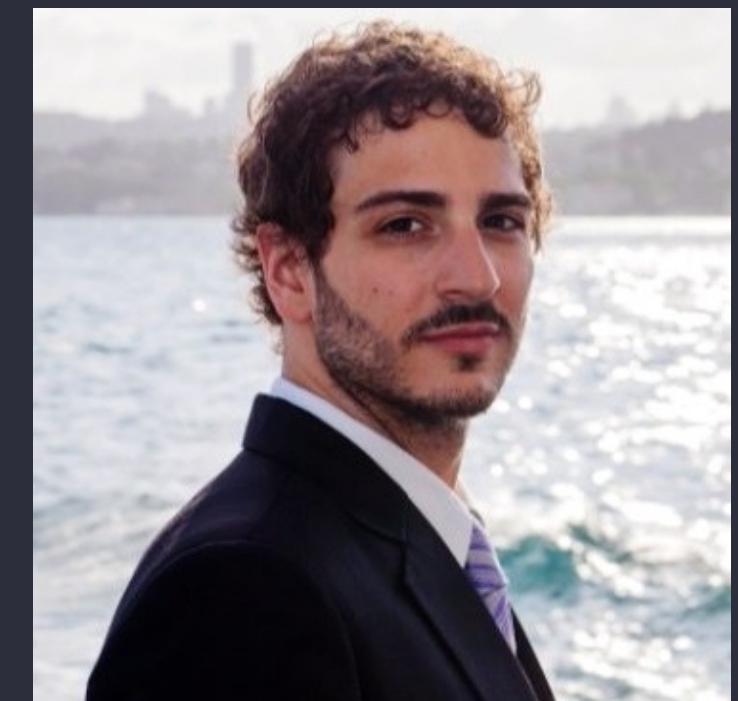
*Daniel Houben*



*Marcin Kuczera*



*Ester Paál*



*Michael Oghia*



# 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](mailto: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](https://github.com/nogalliance/aid_coordinator)