

The Severed Island

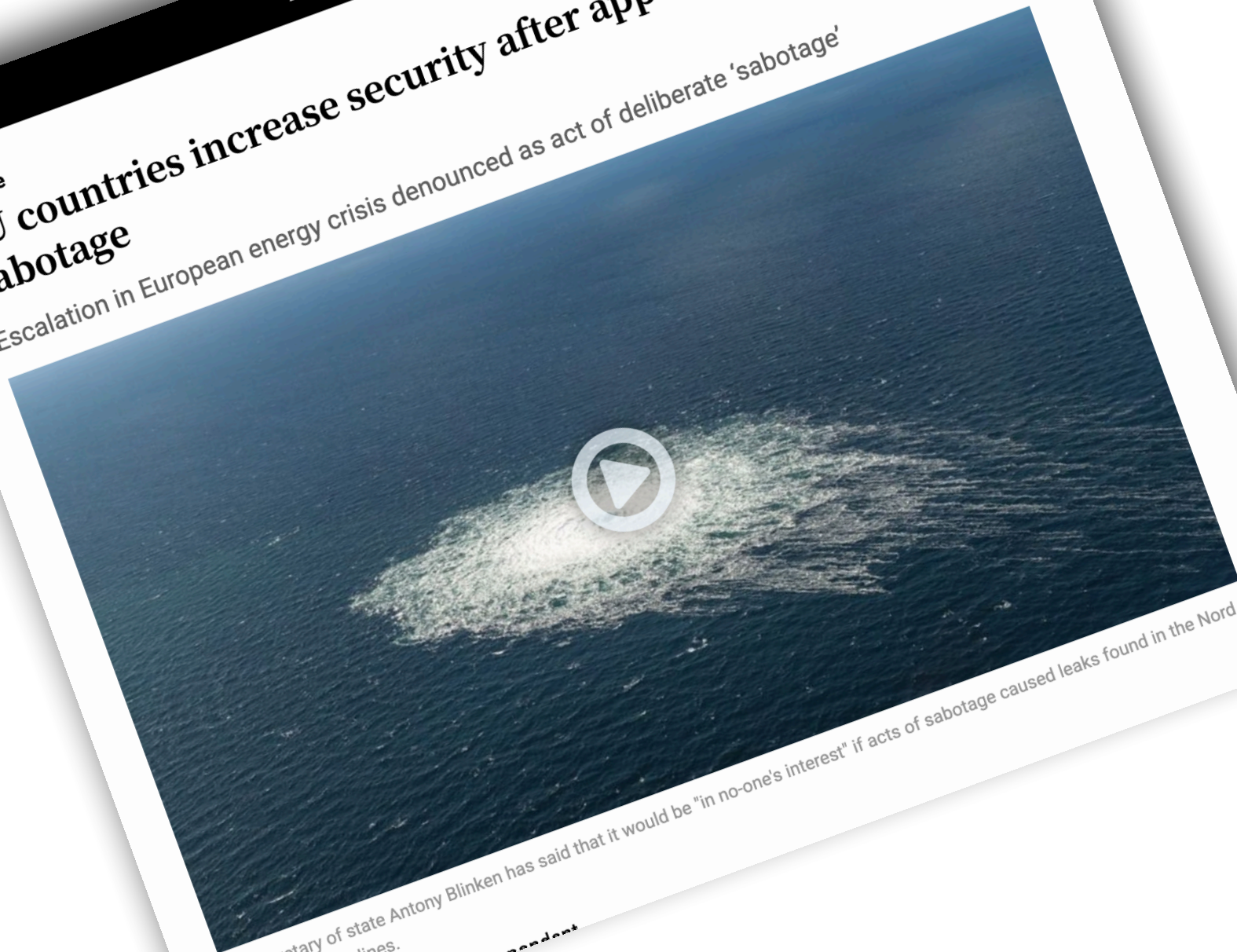
Could Ireland Survive an Undersea Blackout?

Barry O'Donovan, INEX
Dublin, September 17th, 2026

Europe

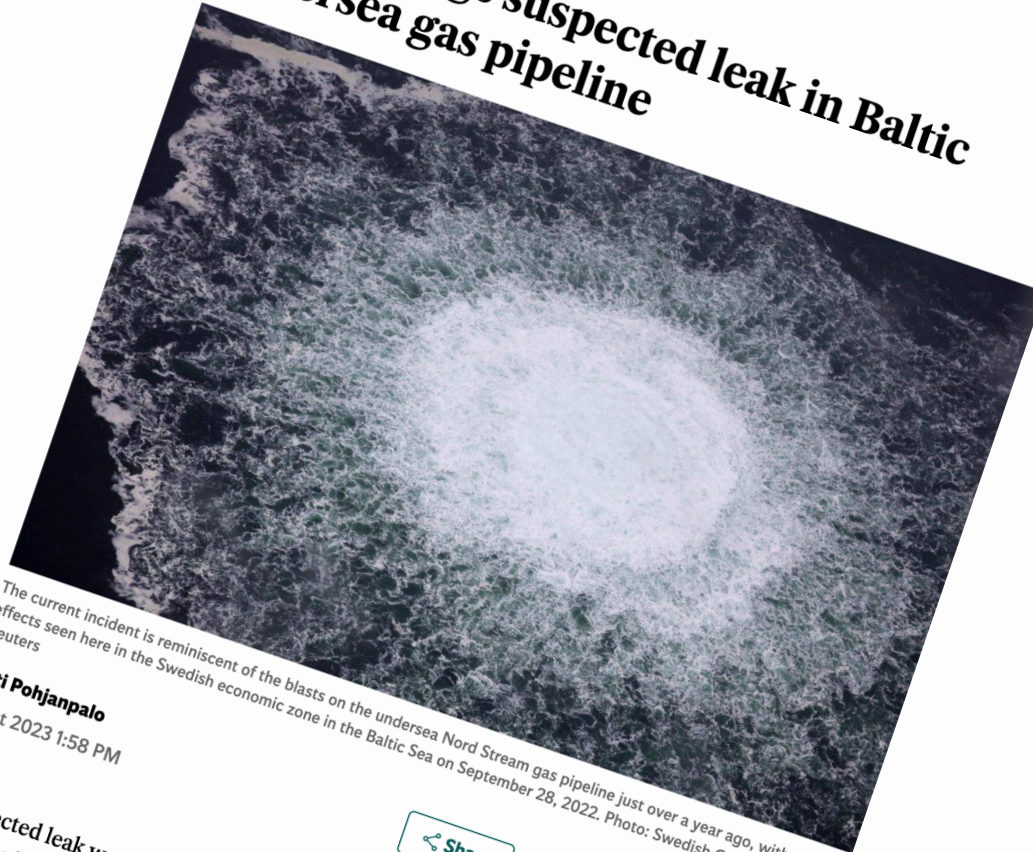
EU countries increase security after apparent pipeline sabotage

Escalation in European energy crisis denounced as act of deliberate 'sabotage'



Secretary of state Antony Blinken has said that it would be "in no-one's interest" if acts of sabotage caused leaks found in the Nord
lines.
pendent

Finland flags suspected leak in Baltic undersea gas pipeline



The current incident is reminiscent of the blasts on the undersea Nord Stream gas pipeline just over a year ago, with the effects seen here in the Swedish economic zone in the Baltic Sea on September 28, 2022. Photo: Swedish Coast Guard/Reuters

Kati Pohjanpalo

8 Oct 2023 1:58 PM

A suspected leak was detected overnight in an undersea pipeline connecting the Finnish and Estonian grids, which its operators closed while investigating the incident.

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Europe

EU countries
sabotage

Escalation

Leaks found in the Nord

PRO DEFENCE

Undersea cables, the threat driving the defence and security debate in neutral Ireland

Damage to the vital infrastructure also risks huge disruption in mainland Europe

Charles Cohen  Euractiv



(Photo

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Russian spy ship escorted away from area with critical cables in Irish Sea

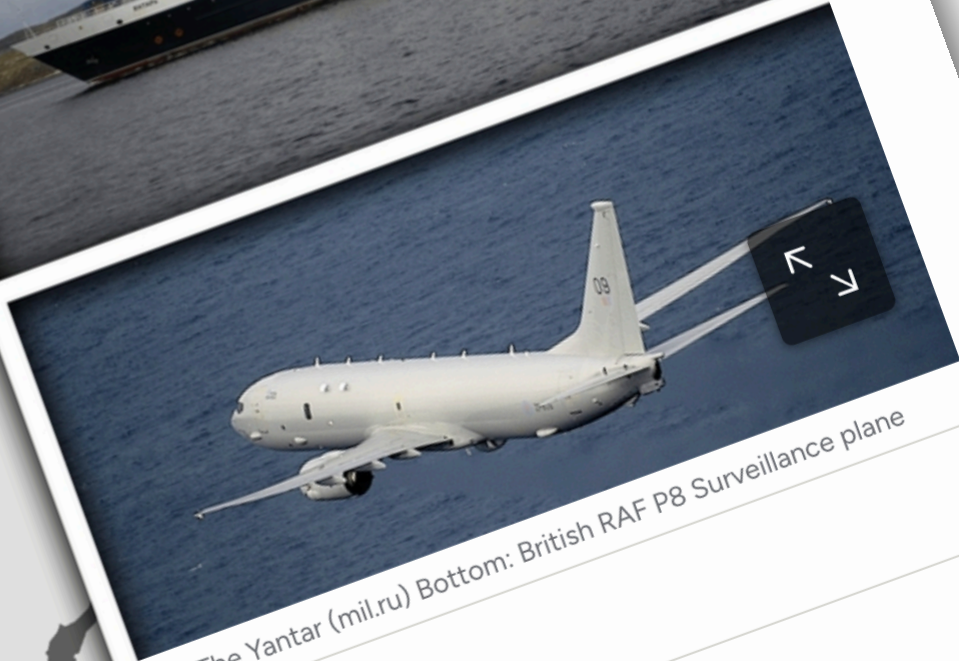
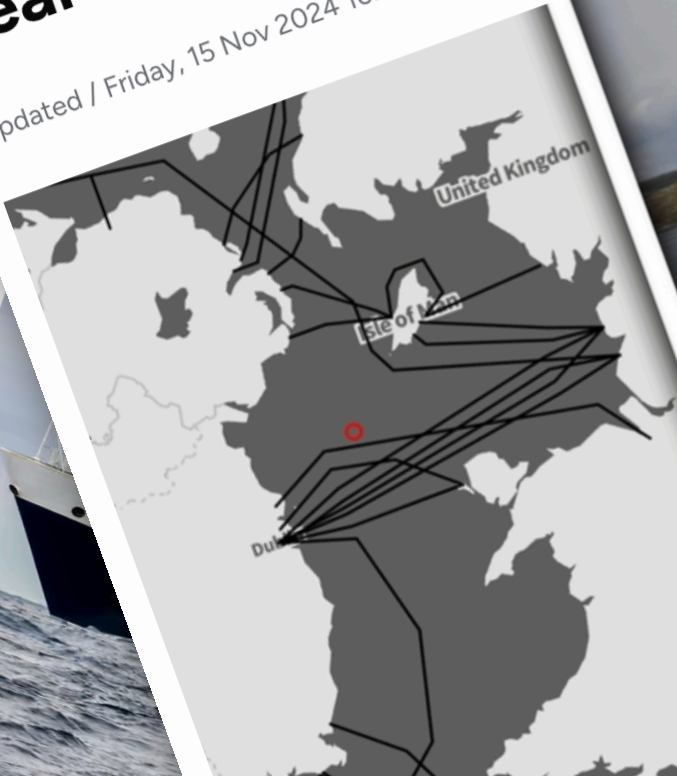
Yantar intelligence ship was seen operating drones in an area containing subsea energy and internet infrastructure



(Photo

Russian spy ship confirmed to be operating near cables off Dublin

Updated / Friday, 15 Nov 2024 16:48



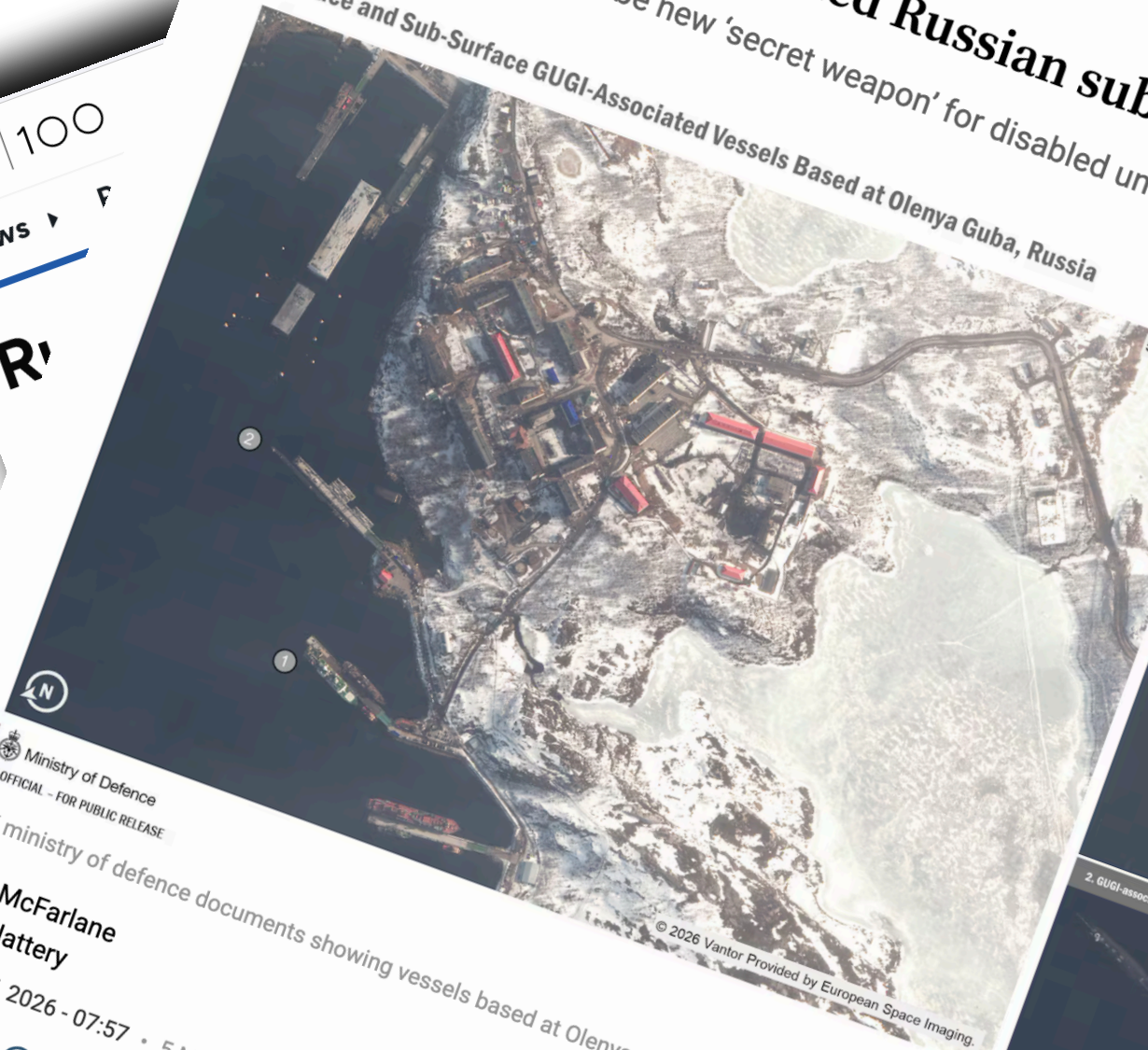
The Yantar (mil.ru) Bottom: British RAF P8 Surveillance plane



Nato allies say they foiled Russian subsea cable sabotage plot

Western officials describe new 'secret weapon' for disabled undersea cables

Surface and Sub-Surface GUGI-Associated Vessels Based at Olenya Guba, Russia



5 April 2026



1. YANTAR GUGI-associated research vessel

2. GUGI-associated submarine

Ministry of Defence
UK OFFICIAL - FOR PUBLIC RELEASE

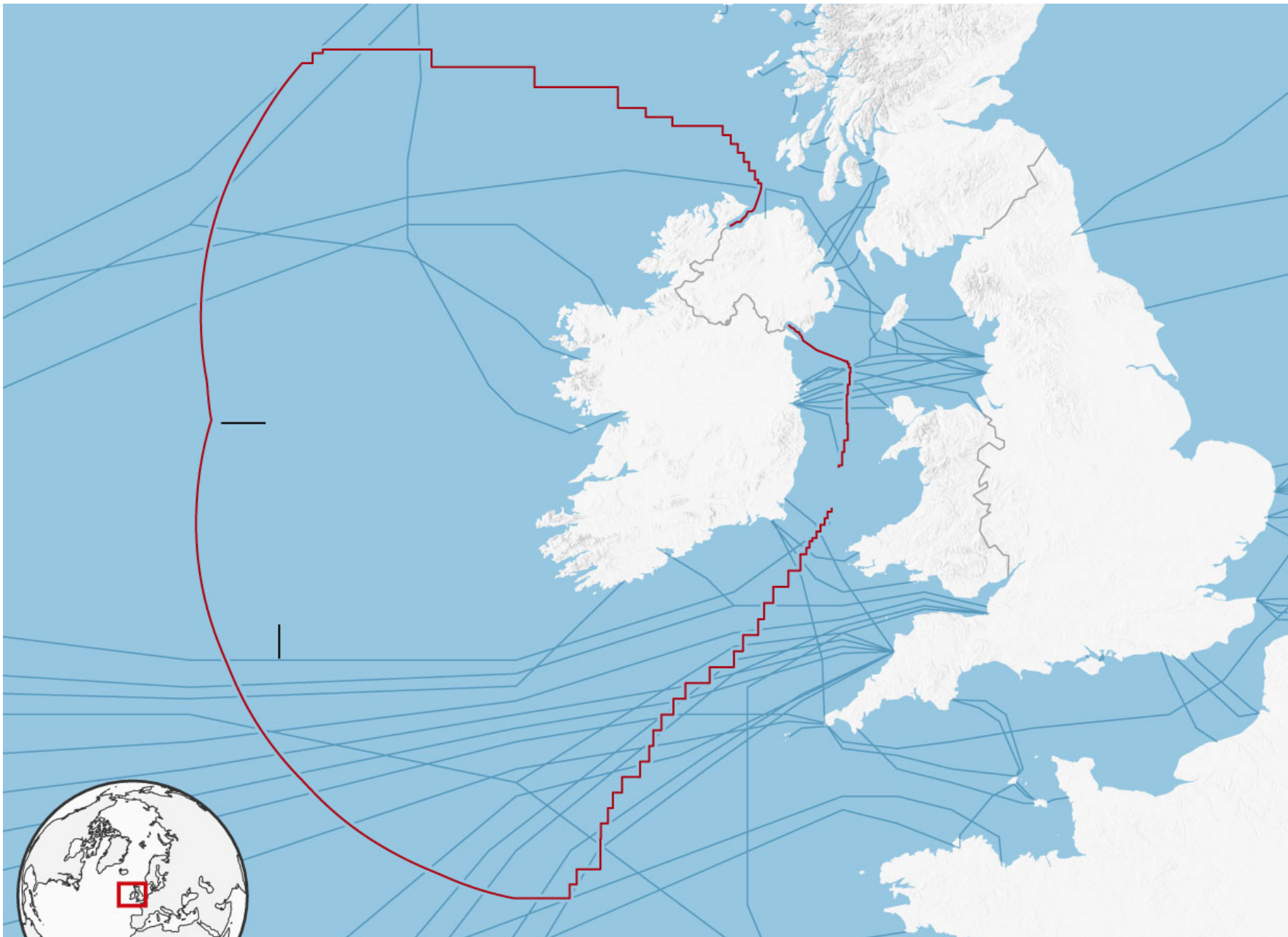
A UK ministry of defence documents showing vessels based at Olenya Guba in Russia. Photos

Sarah McFarlane
Gram Slattery

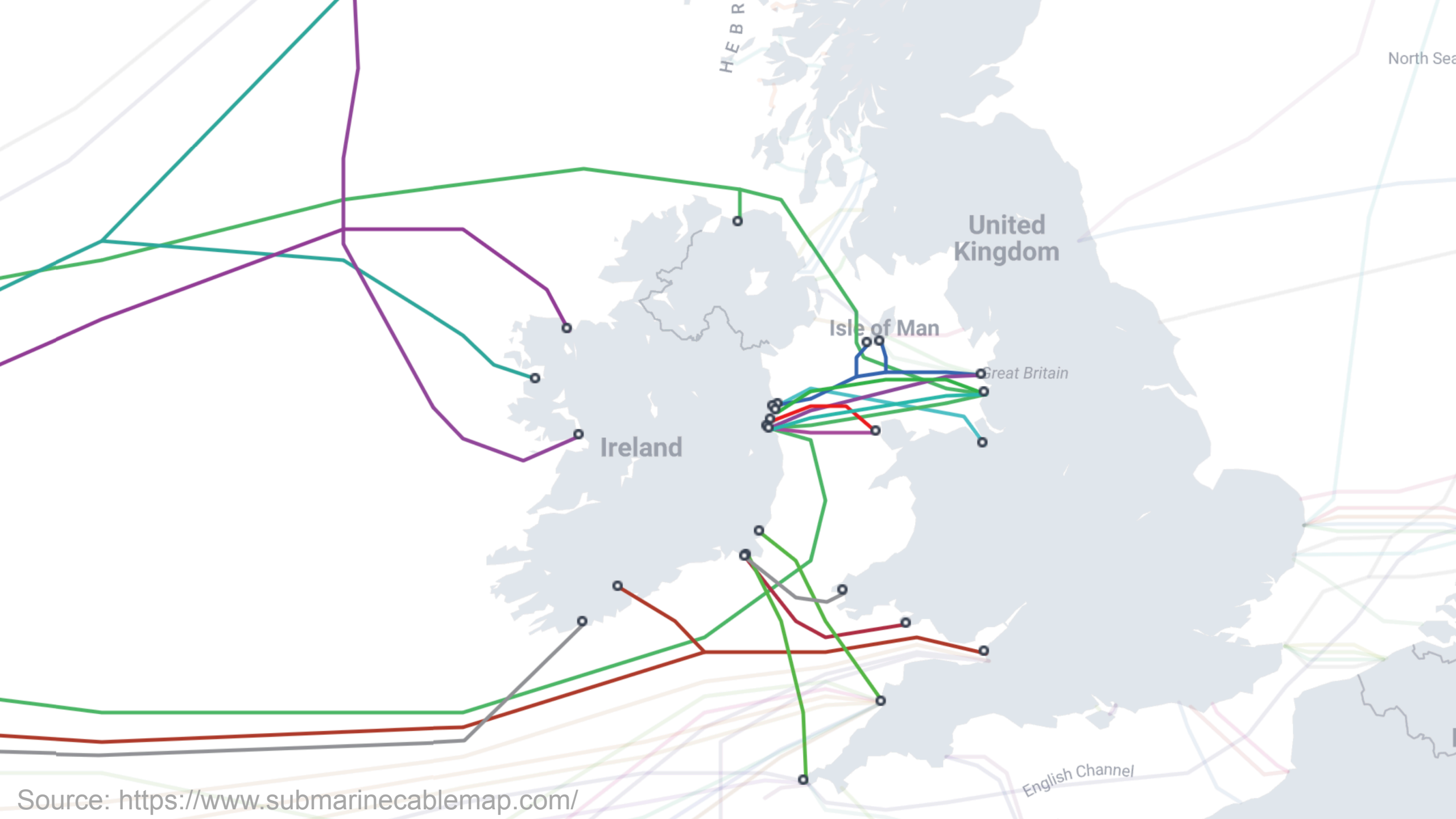
Fri Sept 11 2026 - 07:57 • 5 MIN READ



Deep in Ar...



Guardian graphic. Source: TeleGeography Submarine Cable Map, [marineregions.org](https://www.marineregions.org)
<https://www.theguardian.com/world/2026/aug/03/is-irelands-unprotected-ocean-the-weak-link-in-european-defence>



Experiment: 'Severed Island'

If the subsea cables are cut, what critical infrastructure survives?

Could Ireland Survive an Undersea Blackout?

- Largely a desktop experiment at this stage
 - Worst-case scenario?
- Answers another question quite well:
 - Can Ireland's ISPs provide essential services under a prolonged DDoS attack?
 - Or a partial subsea break leading to congestion?

Irish internet service providers hit by cyber attacks

Some smaller Irish internet service providers are undergoing 'denial of service' (DDoS) attacks with demands for Bitcoin payments.



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Some Irish internet service providers are experiencing 'denial of service' cyber attacks
18 May 2021 6:15 PM

providers are undergoing a series of 'denial of service' (DDoS) cyber attacks. There are indications that the activity is related to the ongoing HSE cyber attacks. Some services were unavailable due to

Irish Independent

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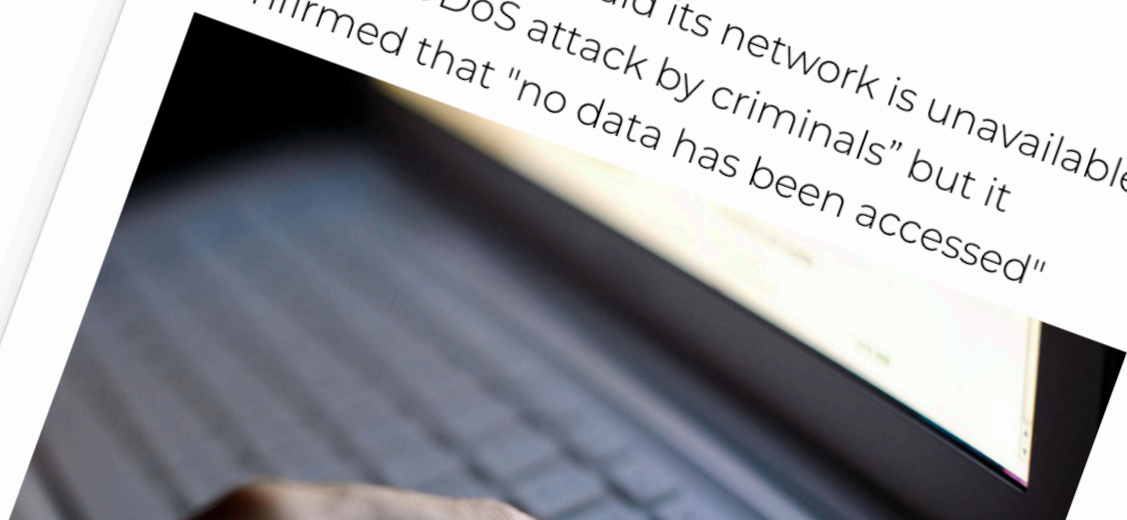
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Cork-based broadband provider hit by cyberattack

Nova Broadband said its network is unavailable due "to a DDoS attack by criminals" but it confirmed that "no data has been accessed"



cyber
g HSE

unavailable due to

Dear INEX members,

A number of service providers based in Ireland have been targeted over the last couple of days by a threat actor group who call themselves "Fancy Lazarus". The demand is that unless a quantity of bitcoin is paid, the network will be hit by a DDOS. The DDOS then starts within a couple of minutes.

The attack itself is a volumetric reflection attack, mostly DNS and UDP fragments. The attack volumes vary in intensity but there have been confirmed reports of greater than 120G. Typically a range of IP addresses are targeted, including infrastructure IP addresses. I.e. this is deliberately aimed at causing service outages. The attacks have so far started early in the morning (04:00 - 05:00 Irish time) and have stopped mid-afternoon.

From the point of view of technical mitigation, there are several options available, including upstream blackholing, selective traffic rerouting and in the worst case, temporarily IXP de-peering. All of the major transit providers have an option for community based real-time blackholing using BGP, and we would encourage all INEX members to ensure that this functionality is configured as appropriate for their network.

The attack destination IP addresses can be determined using netflow or sflow. So far, all attacks have been directed at IPv4 addresses.

INEX Operations has observed what looks like DDOS traffic coming in from several INEX member ports. Unfortunately, upstream blackholing is not viable in this situation, and we would recommend that if anyone is seeing large quantities of ingress traffic from INEX, to please contact us on our normal support channels:

<https://www.inex.ie/support/>

Specifically, if you're seeing problems in the early morning, please call on +353-1-5313339, as the normal operations mailbox is not attended before 08:00 BST.

We recommend not disabling your INEX port(s) during an attack like this, as the majority of traffic is fine and there may be steps that can be taken to reduce the ingress traffic to manageable volumes.

As threats and attacks of this nature are criminal acts, we also encourage anyone affected to contact the Gardai:

<https://www.garda.ie/en/about-us/organised-serious-crime>

Nick Hilliard

--

Chief Technical Officer

Internet Neutral Exchange Association CLG

Cyber extortion attack.

“Volumetric reflection ... greater than 120G”

INEX

INEX

- Peering point for the island of Ireland; member-owned; cost-recovery basis; founded in 1996.
- ~120 members (~99% of eyeballs?)
- Traffic peaks of 1.4 Tbps
- Dual infrastructure, 7+ PoPs, own DF
- Opened INEX Cork in 2016
- Home of IXP Manager

Connected Edge Capacity

Member Ports by Infrastructure

Infrastructure	1 Gbits	10 Gbits	100 Gbits	Total	Connected Capacity
INEX LAN1	23	79	61	163	6.91 Tbits
INEX LAN2	14	55	24	93	2.96 Tbits
INEX Cork	5	7	0	12	75.00 Gbits
Totals	42	141	85	268	9.952 Tbits

The most densely connected network in Ireland

Test Platform

What works if we can only exchange traffic over INEX?

Test Platform to Simulate a Severed Island

- Vagrant based modern Linux host, ipv4 only
- Bird to remove the default route and set INEX-only routes
 - Pulled from the route collector
 - Also added routes from sample bilateral sessions with Google and Cloudflare
- Excluded some ASNs: 1273, 6461, 6830, 6939, 8220, 9002
 - Mostly out-of-country routes / don't peer
- Local PowerDNS recursor
- Firefox used to test sites under these routes only
 - Web developer tools identified third-party dependancies

Anatomy of a web request - www.gov.ie

1) ROOT DNS QUERY



*Query root
name server -
who resolves
TLD .ie?*

2) TLD DNS QUERY



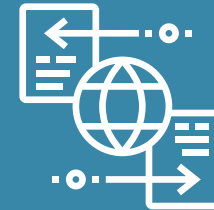
*Query .ie TLD
name server -
who resolves
gov.ie?*

3) GOV.IE DNS QUERY



*Query gov.ie
authoritative
DNS servers
for IP for
www.gov.ie*

4) ACCESS WEB SERVER



*Establish
HTTP/S
connection
and fetch
HTML content*

5) GET REQUIRED ASSETS



*JS, CSS,
images.*

*Other
site, CDN
required?*



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Latest news from government

Minister Lawless encourages students from underrepresented groups in Higher Education
13:59 - 8 September 2026 - Department of Further and Higher Education, Research and Innovation

Joint Foreign Ministers' Statement on the Two-State Solution
13:48 - 8 September 2026 - Department of Foreign Affairs and Trade

Reminder regarding remaining dates for the 2026 Farm Hazardous Waste Collection
13:19 - 8 September 2026 - Department of Agriculture, Food and the Marine

Speech by Minister Patrick O'Donovan at the State Commemoration of the 100th Anniversary of the 1916 Easter Rising at the Phoenix Cinema Fire 5th September 2026
9:45 - 8 September 2026 - Department of Culture, Communications and Sport

Minister Butler confirms full operational bed capacity at Central Mental Hospital

Result: www.gov.ie works on INEX-only



The image shows a web browser's developer tools network tab. A large red diagonal banner is overlaid with the text "account.mygovid.ie fails - challenges.cloudflare.com". The background shows a list of network requests, including "document", "script", "img", "authorize:17 (xhr)", "authorize:38 (script)", "brow-his-braitor-Scene-Ping-the-Pall-s...", "img", "stylesheet", and "xml". The "authorize:38 (script)" request is highlighted in red, indicating a failure. The status bar at the bottom shows "116 ms".



Parallels Shared Folders

Results

Current State of Critical Sites - Media

	TLD	NS	Web Server	Site
RTE	✓	✓	✓	✓
RTE Player	✓	✓	✓	✗
Irish Times	✓	✓	✓	✓
Irish Independent	✓	✓	✓	✓
Newstalk Radio	✓	✓	✓	✗
Netflix	✓	✓	✓	✗

It's always DNS?

One name. One resolver. Cold cache.

247

teams.microsoft.com

cold cache · single resolver · one name

1 / 32

Current State of Critical Sites - Finance

	TLD	NS	Web Server	Site
AIB	✓	✗		
Bol	✓	✓	✓	✓
Bol 365 Online	✓	✓	✗	
PTSB	✓	✓	✓	✓
PTSB Open24	✓	✓	✓	✓
Revolut Website	✓	✓	✓	✓

Could Ireland Survive an Undersea Blackout?

- Key constraints for our experiments:
 - Where is the data stored?
 - What third-party and internal dependencies exist?
 - We're really only considering the Republic of Ireland here.

Current State of Critical Sites - Utilities

	TLD	NS	Web Server	Site
ESB PowerCheck	✓	✓	✓	✓
Energia	✓	✓	✓	⚠
Gas Networks Ireland	✓	✓	✓	✓
Uisce Éireann	✓	✓	✓	✓

Current State of Critical Sites - Transport

	TLD	NS	Web Server	Site
DAA (DUB & CRK)	✓	✓	✓	✓
Aer Lingus	✓	✓	✓	⚠️/😴
Ryanair	✓	✓	✓	⚠️
Irish Rail	✓	✓	✓	⚠️
Bus Éireann	✓	✓	✓	⚠️/😴
Irish Ferries	✓	✓	✓	⚠️

Current State of Critical Sites - Digital Infrastructure

	TLD	NS	Web Server	Site
Google (Search & Maps)	✓	✓	✓	✓
Google Workspace	✓	✓	✓	✓
M365	✓	✓	⚠	✓
Facebook/Insta	✓	✓	✓	✓
Github	✓	✓	⚠	✗
OS Package Repositories	✓	✓	✗	✗
INEX & IXP Manager	✓	✓	✓	✓

Current State of Critical Sites - Health

	TLD	NS	Web Server	Site
HSE	✓	✓	✓	✓
Dept. Of Health	✓	✓	✓	✓
Laya	✓	✓	✓	✓
VHI	✓	✓	✓	✓

The background of the slide is a dark, high-contrast image of a world map. The map is overlaid with a complex network of thin, glowing orange lines that represent global connections or data flow. The lines are most dense in the central and eastern parts of the map, creating a starburst effect in several locations. The overall color palette is dark blue and black, with the glowing orange lines providing a strong visual contrast.

What else should we consider and test?

What else do we need to consider?

- CDN Fragmentation
 - Reliance on third parties for DNS and web security; embedded video players; CSS and JS frameworks; etc.
- Cloud control plane vs data plane
 - Your Microsoft/Azure data may be on-island, but Entra ID?
- RPKI / Route Validation - will these local ROA caches expire?
- Time synchronisation
 - We have no Irish time service.
 - TLS requires accurate clocks. Mobile networks?

What else do we need to consider?

- Telephony/VoIP was not tested. Access to 112/999?
- Third-party payment gateways: Global Payments, Stripe, PayPal
- Apple Ecosystem (updates, iCloud)
 - Push notifications are often a key component of 2FA
- Power & water SCADA (reliance on satellite, global MVNO SIMs, non-domestic C&C); vendor-managed control planes.
- Access control systems - can we get into the buildings hosting our infrastructure?
- Healthlink, Healthmail and ePrescribing
- Do various AWS services still depend heavily on us-east-1?

▶ Cyber Disruption 2021



TECHNOLOGY



The technology systems of the health service in Ireland were the target of a criminal cyber attack.

On 14 May 2021, the Health Service Executive (HSE) became aware of a ransomware attack that compromised its IT systems nationwide.

MORE LIKE THIS ITEM





How can INEX help?

IXPs in National Resilience Roles

- FENIX - by NIX.CZ (the Czech IXP)
 - Created in response to massive, coordinated DDoS attacks that took down major news media, banks, and mobile operators.
 - Operates as a "trusted island" within the IXP, allowing FENIX members to isolate their networks from the global internet.
- Sweden treats its IXP nodes as military-grade critical assets, housing them in hardened rock shelters/underground bunkers.
- Finland (FICIX) - part of the Telecommunications Pool of the National Emergency Supply Agency, which runs joint contingency exercises for severe international cable severing and hostile border electronic warfare.

Who needs to be involved

- The platform - INEX
- T-RRG, ComReg & NCSC (National Cyber Security Centre): To mandate or encourage participation.
- Competent Authorities under CER, NIS2 and DORA
- Cloud Providers (AWS, Microsoft, Google, Akamai, Cloudflare): To guarantee that local "island" routing can handle authentication (Control Plane) without leaving the physical borders of the state.
- Networks with "poor" peering. Also satellite ISPs.
- The entities themselves - always considering third-party dependencies and data locations.

Thank you

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INEX

INTERCONNECTING NETWORKS
AND PEOPLE FOR OVER 25 YEARS