The Severed Island

Could Ireland Survive an Undersea Blackout?

Barry O'Donovan, INEX

45th Euro-IX Forum, Utrecht, October 12th, 2026

Interconnecting networks
and people since 1996

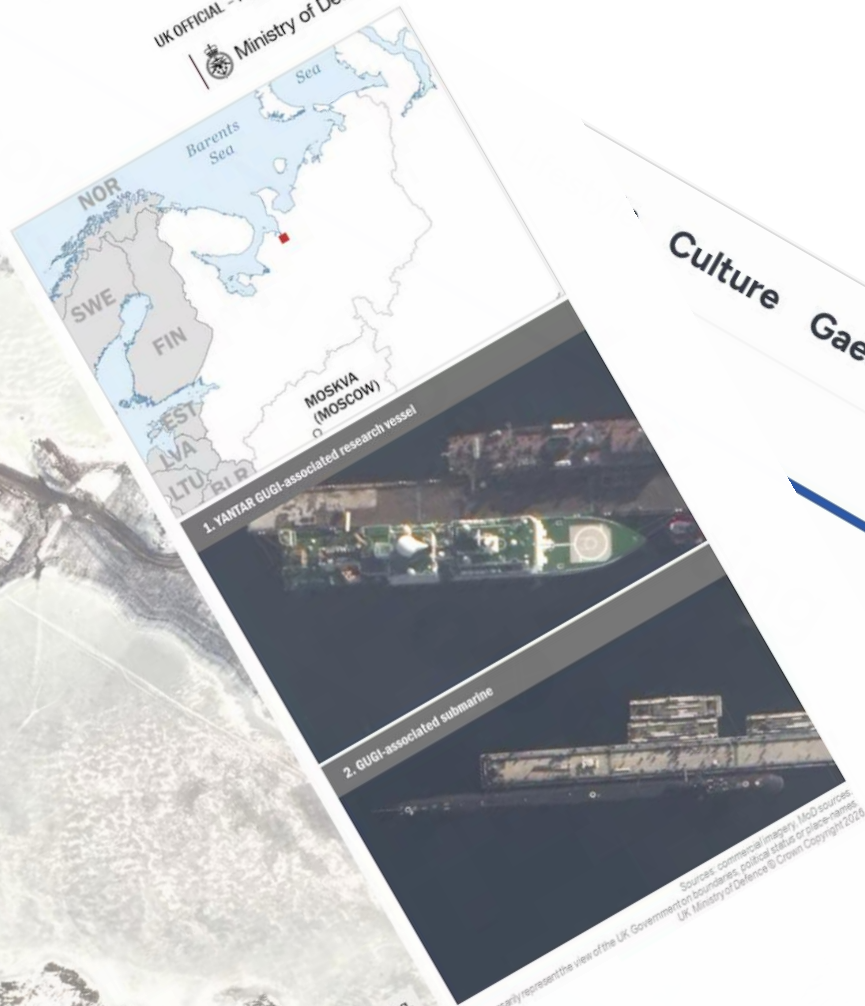
THE IRISH TIMES

Europe

Nato allies say they foiled Russian subsea cable sabotage plot

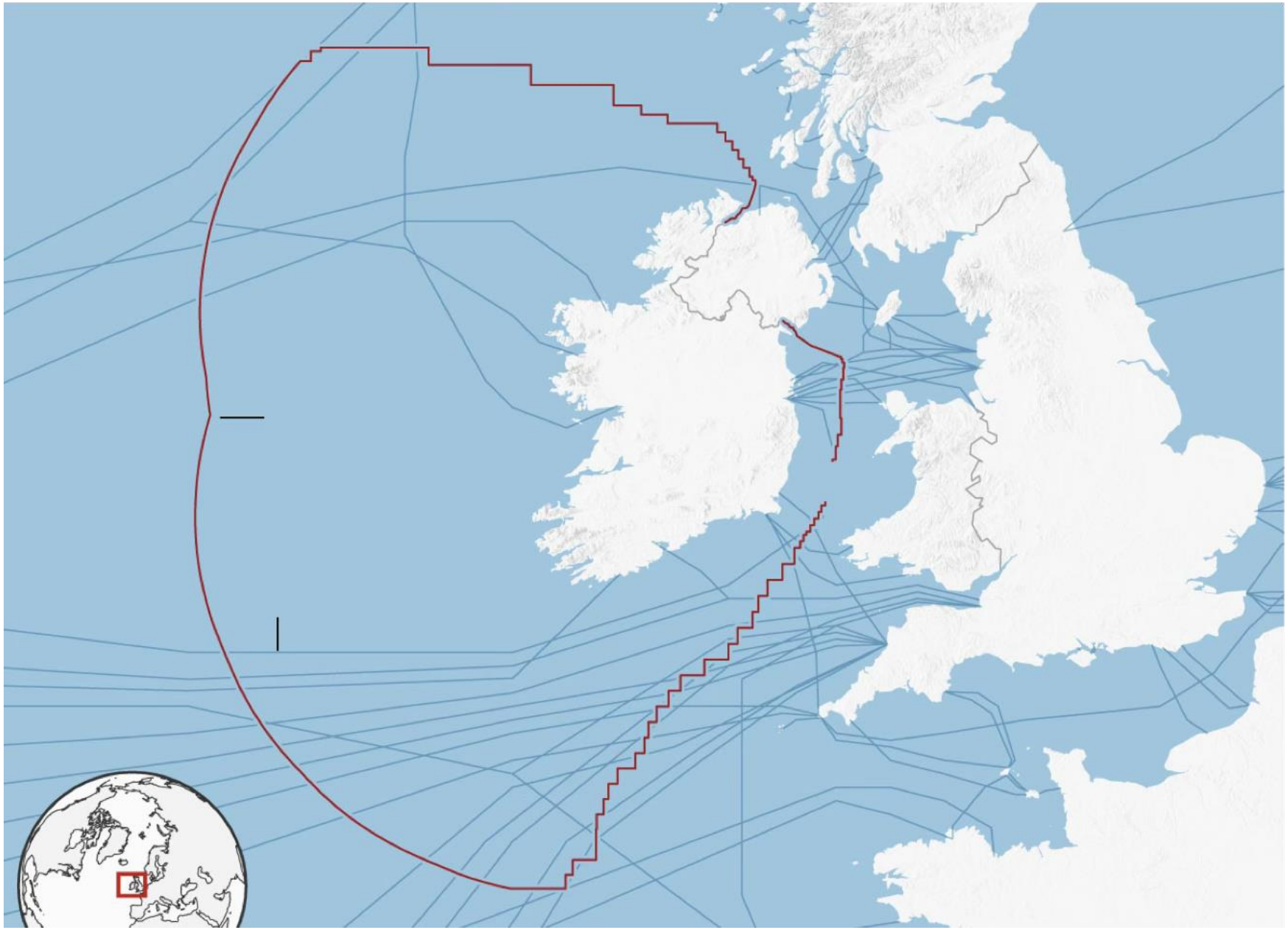
Western officials describe new 'secret weapon' for disabled undersea cables



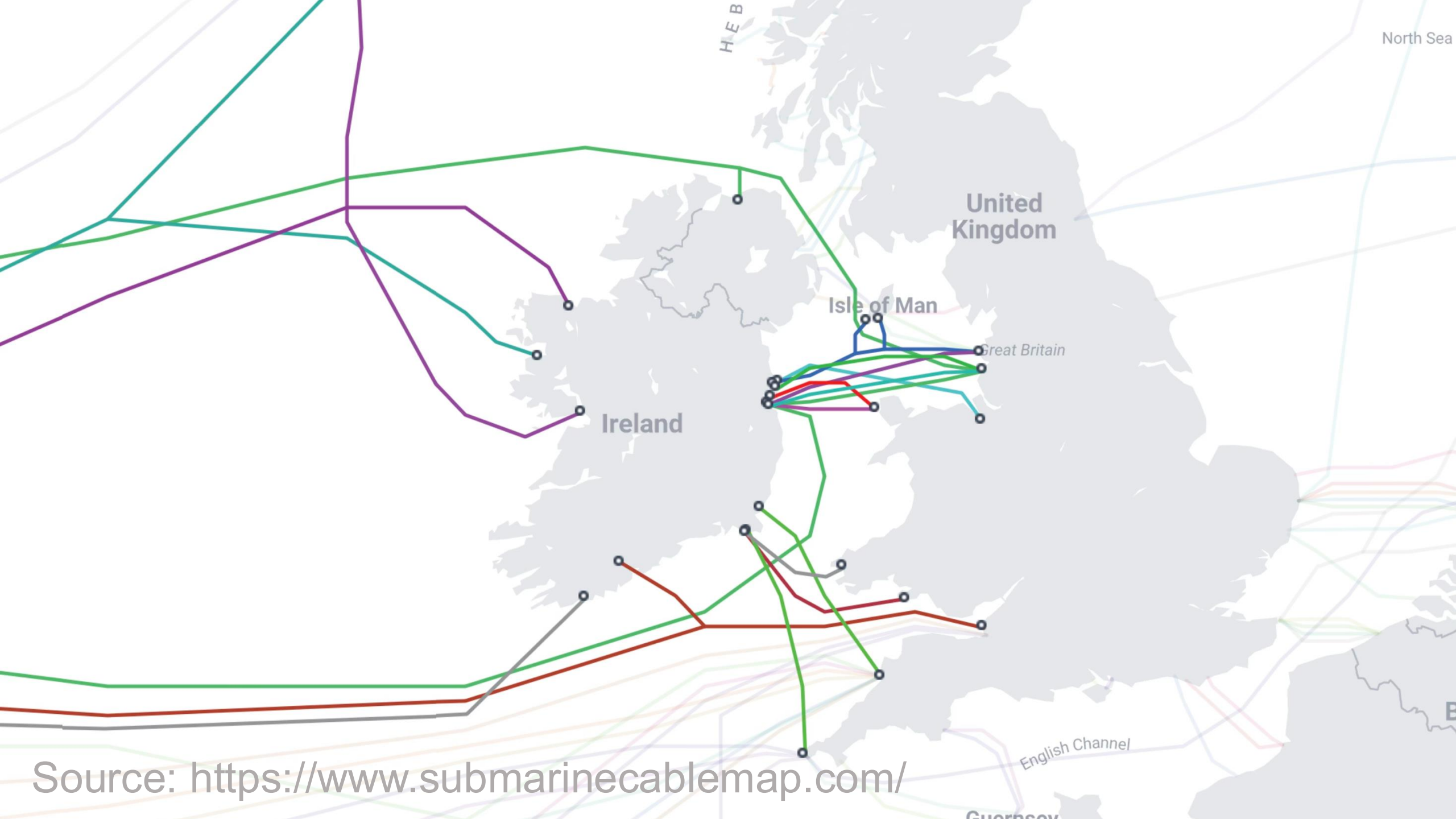


Culture Gaeilge

By Mark Coughlan



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



Source: https://www.submarinecablemap.com/

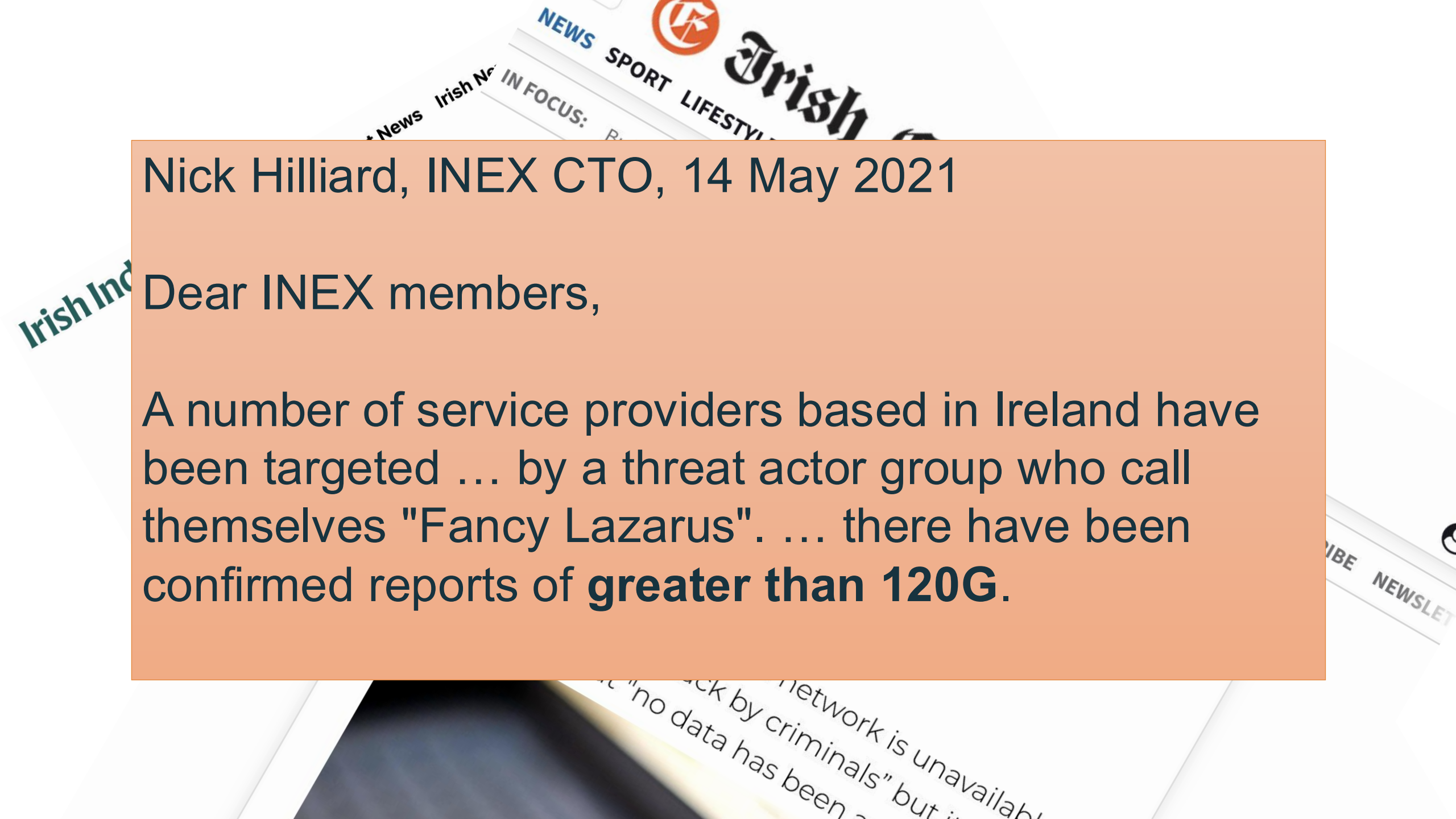
Experiment: ‘Severed Island’

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?



Nick Hilliard, INEX CTO, 14 May 2021

Dear INEX members,

A number of service providers based in Ireland have been targeted … by a threat actor group who call themselves "Fancy Lazarus". … there have been confirmed reports of **greater than 120G**.

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 dependencies

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



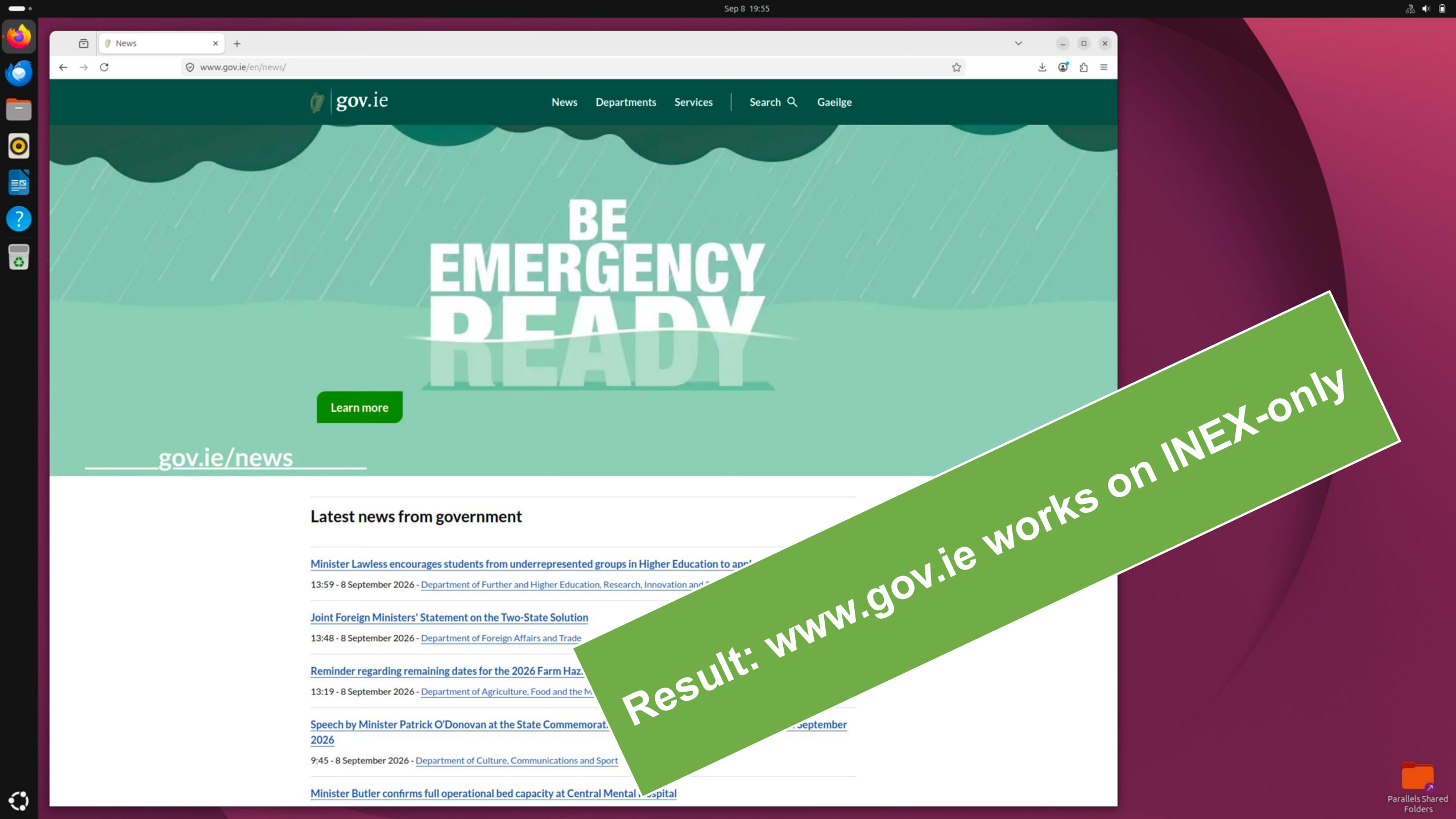
Establish HTTP/S connection and fetch HTML content

5) GET REQUIRED ASSETS



JS, CSS, images.

Other site,CDN required?


Sep 8 19:55
News
www.gov.ie/en/news/
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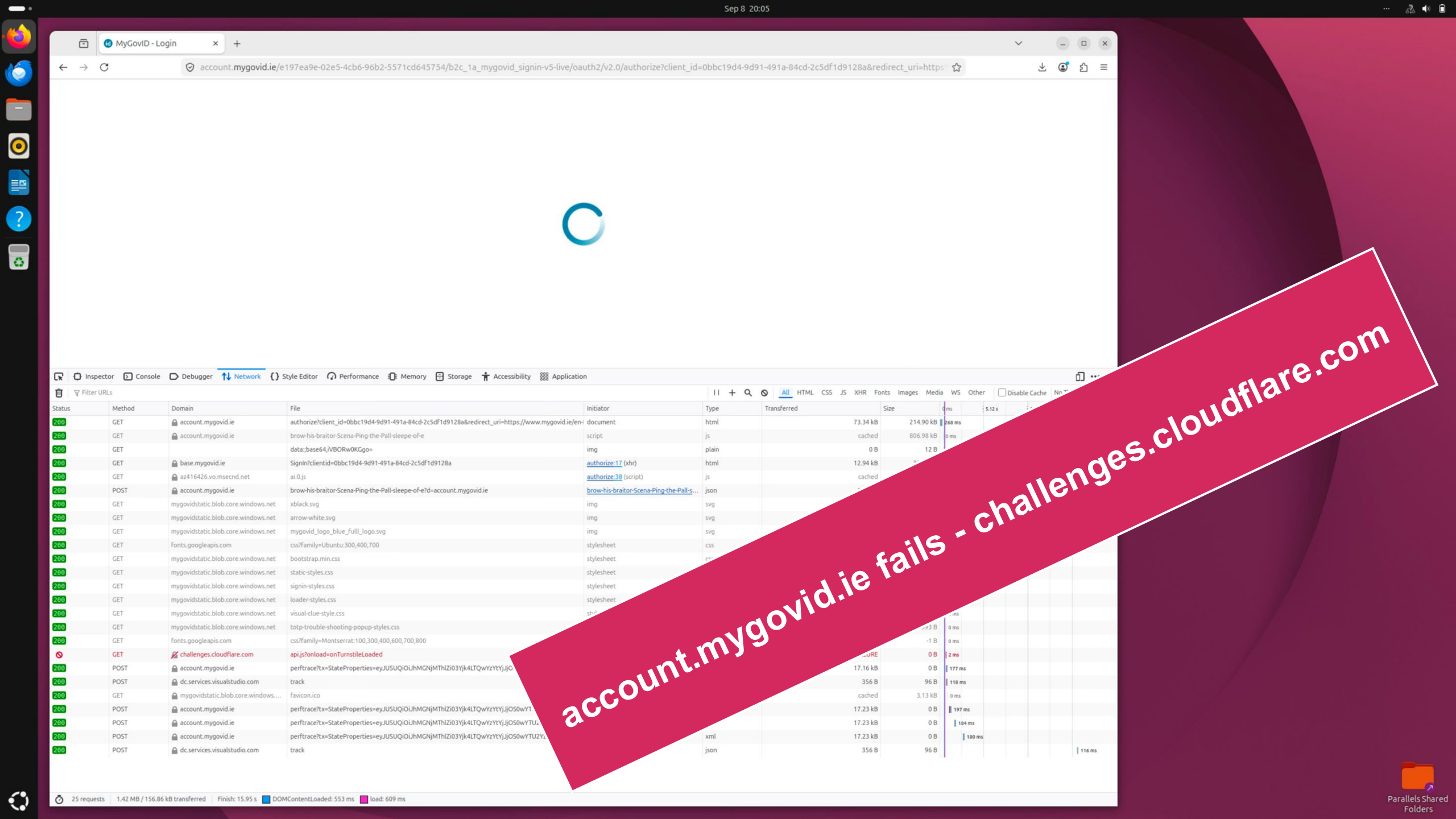
News
Departments
Services
Search
Gaeilge
BE EMERGENCY READY
Learn more
gov.ie/news
Latest news from government
Minister Lawless encourages students from underrepresented groups in Higher Education to apply
13:59 - 8 September 2026 - Department of Further and Higher Education, Research, Innovation and
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 Haz
13:19 - 8 September 2026 - Department of Agriculture, Food and the M
Speech by Minister Patrick O'Donovan at the State Commemorat
September 2026
9:45 - 8 September 2026 - Department of Culture, Communications and Sport
Minister Butler confirms full operational bed capacity at Central Mental
spital
Result: www.gov.ie works on INEX-only
Parallels Shared Folders


Sep 8 20:05
MyGovID - Login
account.mygovid.ie/e197ea9e-02e5-4cb6-96b2-5571cd645754/b2c_1a_mygovid_signin-v5-live/oauth2/v2.0/authorize?client_id=0bbc19d4-9d91-491a-84cd-2c5df1d9128a&redirect_uri=https
Inspector
Console
Debugger
Network
Style Editor
Performance
Memory
Storage
Accessibility
Application
Filter URLs
All
HTML
CSS
JS
XHR
Fonts
Images
Media
WS
Other
Disable Cache
Status
Method
Domain
File
Initiator
Type
Transferred
Size
200 GET account.mygovid.ie authorize?client_id=0bbc19d4-9d91-491a-84cd-2c5df1d9128a&redirect_uri=https://www.mygovid.ie/en- document html 73.34 kB 214.90 kB
200 GET account.mygovid.ie brow-his-braitor-Scena-Ping-the-Pall-sleepe-of-e script js cached 806.98 kB
200 GET data:; base64,iVBORw0KGgo= img plain 0 B 12 B
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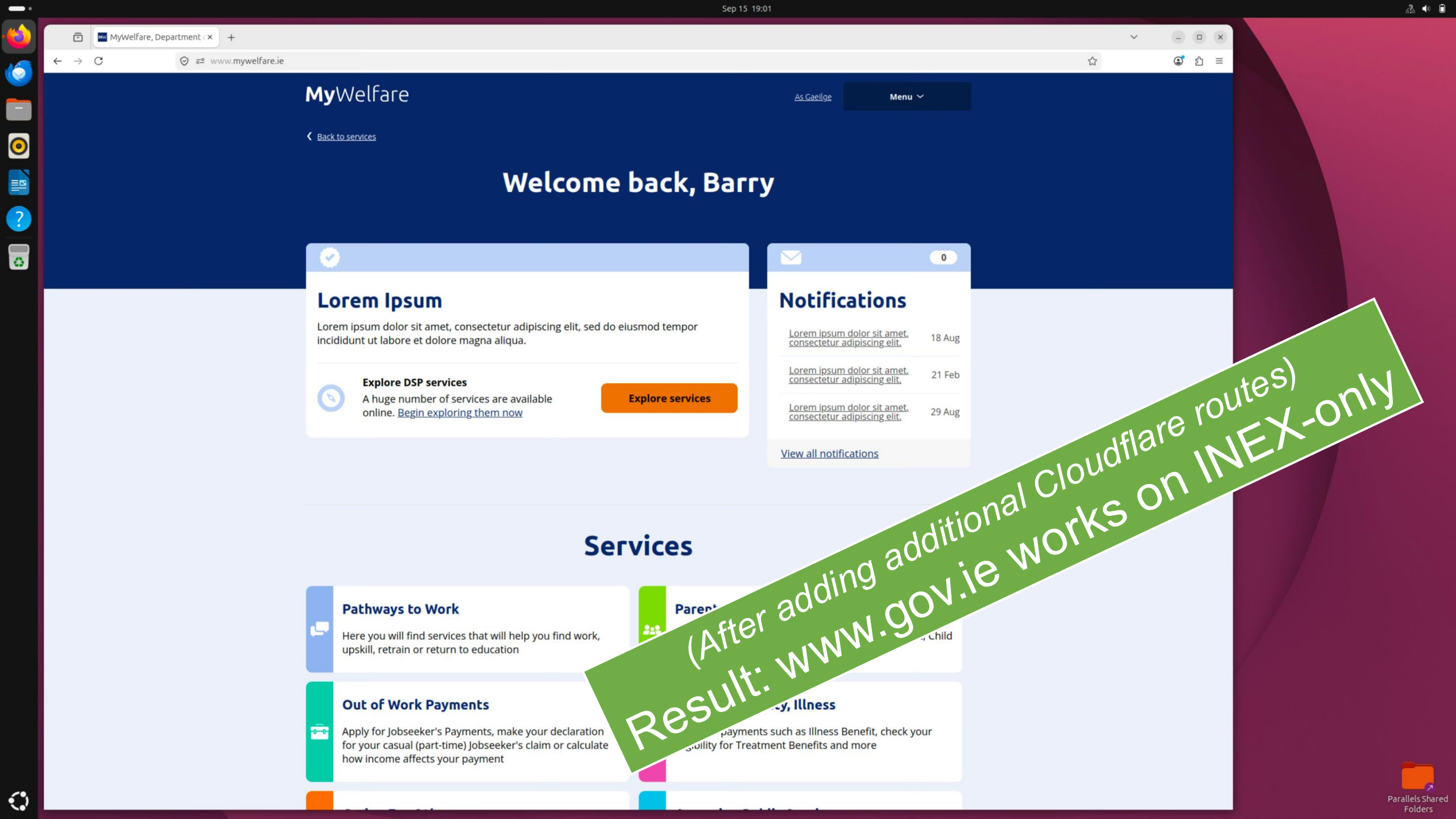
200 GET fonts.googleapis.com css?family=Montserrat:100,300,400,600,700,800
GET challenges.cloudflare.com api.js?onload=onTurnstileLoaded 0 B 2 ms
200 POST account.mygovid.ie perftrace?tx=StateProperties=eyJUSUQiOiJhMGNjMThlZi03Yjk4LTQwYzYtYj 17.16 kB 0 B 177 ms
200 POST dc.services.visualstudio.com track 356 B 96 B 118 ms
200 GET favicon.ico cached 3.13 kB
200 POST account.mygovid.ie perftrace?tx=StateProperties=eyJUSUQiOiJhMGNjMThlZi03Yjk4LTQwYzYtYj 17.23 kB 0 B 197 ms
200 POST account.mygovid.ie perftrace?tx=StateProperties=eyJUSUQiOiJhMGNjMThlZi03Yjk4LTQwYzYtYj 17.23 kB 0 B 104 ms
200 POST account.mygovid.ie perftrace?tx=StateProperties=eyJUSUQiOiJhMGNjMThlZi03Yjk4LTQwYzYtYj 17.23 kB 0 B 180 ms
200 POST dc.services.visualstudio.com track json 356 B 96 B 116 ms
25 requests
1.42 MB / 156.86 kB transferred
Finish: 15.95 s
DOMContentLoaded: 553 ms
load: 609 ms
account.mygovid.ie fails - challenges.cloudflare.com
Parallels Shared Folders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MyWelfare, Department
www.mywelfare.ie
MyWelfare
As Gaeilge
Menu
Back to services
Welcome back, Barry
Lorem Ipsum
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Explore DSP services
A huge number of services are available online. Begin exploring them now
Explore services
0
Notifications
Lorem ipsum dolor sit amet, consectetur adipiscing elit.
18 Aug
Lorem ipsum dolor sit amet, consectetur adipiscing elit.
21 Feb
Lorem ipsum dolor sit amet, consectetur adipiscing elit.
29 Aug
View all notifications
Services
Pathways to Work
Here you will find services that will help you find work, upskill, retrain or return to education
Out of Work Payments
Apply for Jobseeker's Payments, make your declaration for your casual (part-time) Jobseeker's claim or calculate how income affects your payment
(After adding additional Cloudflare routes)
Result: www.gov.ie works on INEX-only
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?



Source: RIPE 92, DNS, Transitive Trust and How Many is Many, Ondřej Surý
https://ripe92.ripe.net/programme/meeting-plan/sessions/98/ATVK7Z/

Current State of Critical Sites - Finance

	TLD	NS	Web Server	Site
AIB	✅	❌		
BoI	✅	✅	✅	✅
BoI 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/Instagram	✅	✅	✅	✅
GitHub	✅	✅	⚠	❌
OS Package Repos	✅	✅	❌	❌
INEX / IXP Manager	✅	✅	✅	✅

Current State of Critical Sites - Health

	TLD	NS	Web Server	Site
HSE	✅	✅	✅	✅
Dept. of Health	✅	✅	✅	✅
Laya	✅	✅	✅	✅
VHI	✅	✅	✅	✅

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 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, …
- 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?

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.

Could Europe Survive?


inex
Thank You.
inex
Interconnecting networks
and people since 1996