Fisheries Bill enters the House of Commons

The flagship legislation, which creates the powers for the UK to operate as an independent coastal state and manage its fish stocks sustainably outside the EU, has today been introduced to the House of Commons for its First Reading.

The Bill, which passed Third Reading in the Lords on 1 July, ends current automatic rights for EU vessels to fish in British waters. If access to UK waters for foreign vessels is negotiated, the Bill will also enable the Fisheries Administrations to ensure that foreign vessels follow the same rules as UK vessels.

The legislation will ensure that fish stocks, and the marine environment, are better protected for future generations with new powers to set UK fishing opportunities and days at sea, new measures for the Devolved Administrations, as well as a single set of UK-wide fisheries objectives.

Fisheries Minister Victoria Prentis said:

> I am encouraged to see the progress of the Fisheries Bill through Parliament. This Bill offers us the opportunity to set a gold standard for sustainable fisheries and gives us the powers to protect our precious fish stocks while enabling our seafood sector to thrive.
>
> Now that we have left the EU, we have the opportunity to create a more resilient and profitable fishing industry, leaving behind the outdated Common Fisheries Policy.

In the House of Lords, Lord Gardiner made clear that the Bill gave the UK the opportunity to develop a vibrant and sustainable fishing industry and gave the UK the power to strengthen our protection of the marine environment, whilst providing a healthy and valuable food source to millions.

The government is now considering carefully the amendments made during the Bill’s passage in the House of Lords.

The Bill’s provisions on sustainable fishing will be underpinned by the requirement for the UK government and the Devolved Administrations to publish a Joint Fisheries Statement to coordinate fisheries management where appropriate, and Fisheries Management plans to achieve sustainable stocks.

The Bill will also ensure:

- EU vessels' automatic access right to fish in UK waters is removed
- Foreign boats will be required to be licensed to fish in UK waters and will have to follow the UK's rules if access to UK waters is agreed
- Fisheries will be managed sustainably
- The UK fisheries administrations will seek to ensure increased benefits from fish caught by UK boats in a way that respects the devolution settlements
- Sensitive marine species, such as dolphins, are protected and the bycatch of unwanted fish reduced
- The UK fisheries administrations will continue to collect robust scientific data on fish stocks and shares it to manage shared stocks sustainably
- UK boats can continue to access any part of UK waters, as they do now regardless, whether they are registered in England, Scotland, Wales or Northern Ireland

Follow the progress of the Fisheries Bill here.

Half a million frontline NHS workers benefit from coronavirus telecoms deal

Half-a-million NHS frontline staff in England have benefited from mobile and fixed broadband offers to stay connected at work during the coronavirus outbreak.

This follows an agreement made in April between the Government, NHS and telecommunications companies with 29 mobile and fixed broadband providers agreeing to prioritise connectivity improvement for NHS frontline staff.

Connectivity is more important than ever as many NHS frontline staff find themselves adapting to remote working.

Almost 500,000 NHS staff have claimed directly from their provider or through the NHS triaging system.

Will Loughborough, Consultant Radiologist from Royal United Hospitals Bath NHS Foundation Trust said:

> I am a Consultant Radiologist and because of COVID-19 and social distancing I'm spending more time than usual reporting from home and remote participation in MDTs.
>
> The triage process was straightforward and within three days I received a new router as part of a temporary free broadband upgrade with my provider.

> The speed of downloading images has improved greatly meaning I can report a higher volume of studies in a given session. This is particularly relevant for more complex studies such as PET-CT, which is an essential study to help guide the treatment of patients with complex cancer.

Minister for Digital Infrastructure Matt Warman said:

> We've depended on our NHS heroes throughout this crisis and I am glad we've been able to provide this package of support from our brilliant telecoms companies to keep them connected.
>
> That so many frontline staff during this difficult time are benefitting from the mobile data, calls and texts they need at no extra cost is no less than they deserve.

Minister for Care Helen Whateley said:

> NHS staff have been at the frontline of our battle against this disease and I am hugely grateful for their expertise and dedication in caring for patients during this difficult and unprecedented period.
>
> This agreement has helped NHS staff stay connected with their colleagues and patients and allowed them to work flexibly from home, ensuring patients continue to get the care they need.

The ongoing commitments made by UK telecoms providers include prioritised access to mobile data access, voice calls and texts on personal mobiles for work purposes, so that NHS staff can work without fear of extra charges and limitations.

There were also broadband improvements where possible for NHS clinicians working from home, so that they can perform tasks such as consultations via video conferencing and review radiology images.

Providers involved in the commitment include BT, EE, O2, Vodafone, Three, Tesco Mobile, Virgin Media, talktalk, Sky, Openreach, Gigaclear, Cityfibre, Post Office, ID Mobile, Lycamobile, GiffGaff, Plusnet, KCOM,ASK4, Community Fibre, Zzoomm, Voneus, Smarty, Hyperoptic, G.Network, Spectrum and Wightfibre.

Other firms have committed to help the NHS stay connected during the outbreak by working with customers who find it difficult to pay their bills as a result of coronavirus, removing data allowances on fixed broadband services and offering generous new mobile and landline packages.

Marc Allera, CEO of BT's Consumer Division, said:

> Over a quarter of a million NHS staff have taken us up on our unlimited data offer since April and we hope this support has given them one less thing to worry about. Along with the discount we already provide, this is a thank you from all of us at EE to those in the NHS that are working so hard for us all. We've also removed caps on our broadband packages so customers have unlimited data, which helps all those working remotely.

Nina Bibby, Chief Marketing Officer O2 (Telefonica UK) said

> We recognise and value the incredible work of NHS frontline workers throughout this challenging period. Mobile connectivity remains more important than ever and from providing thousands of connected devices and additional mobile data and voice calls, through to handing over the keys for The O2 to be used as an NHS training facility, we're proud to support NHS staff and help them stay connected to their colleagues and loved ones.

Nick Jeffery, CEO of Vodafone UK said:

> We were delighted to be able to help NHS staff and carers during this difficult period.

Lutz Schüler, CEO of Virgin Media said:

> Our NHS staff are the true heroes of this crisis who continue to make huge sacrifices and take risks to battle coronavirus. We are proud to have played our part in helping these incredible individuals get the connectivity and services they needed to support their vital work. Keeping the country connected has been a top priority for Virgin Media since day one and we'll continue working to ensure we deliver.

Clive Selley, CEO of Openreach said:

> Everyone at Openreach is proud to be connecting our NHS heroes. The pandemic has shown that digital connectivity is more important than ever for our friends, families and healthcare professionals – so we're cracking on with our plan to build a new, ultrafast and ultra-reliable broadband network to millions more people all over the UK.

Andrew Glover, Chair of the Internet Service Providers Association, said:

> The telecoms industry has stepped up throughout this crisis and is proud to have been able to offer such support to the NHS at this time. ISPA has been working with our membership to push through these commitments and we're delighted that so many clinicians have been able to benefit from the scheme.

Allirajah Subaskaran, Founder and Chairman of Lycamobile said:

> We're incredibly proud to have been a part of this important Government initiative. It's heartening to know that nearly half a million NHS frontline staff have been able to access mobile and broadband services without having to worry about bills or hidden charges. They have made tremendous sacrifices to ensure the safety of millions of citizens around the country and this is just one small way in which we can say thank you to them for all of their efforts. Our commitment to providing free services to NHS heroes will remain in place until the crisis comes to a close.

Dale Raneberg, CEO, KCOM said:

> KCOM is very happy to be able to help support this valuable initiative. NHS staff have worked tirelessly to protect people in the UK throughout the COVID-19 outbreak and where our fibre technology can make it easier and safer for clinicians to consult with patients and to manage their work remotely then it's important and right that we play our part.

Graeme Oxby, Chief Executive Community Fibre said:

> Community Fibre thanks all NHS staff who have made such a massive contribution to saving lives. Our own key workers have been keeping London connected and we are delighted that NHS staff have been able to take advantage of the special discounts available to them. We look forward to welcoming more in the coming months.

How GDS improved GOV.UK's frontend performance with HTTP/2

Summary

Objectives

The aim was to improve the performance of GOV.UK for users, regardless of the type of device they use or their connection by enabling HTTP/2. During testing, the team identified a number of issues they needed to fix before they could fully enable HTTP/2.

The organisation

Government Digital Service (GDS) leads the digital transformation of the UK government. It runs GOV.UK, which is the government's online brand, letting citizens interact with government for personal and professional needs.

The project

HTTP/2 (H2) is the latest version of the HTTP protocol. The HTTP Working Group, part of the Internet Engineering Task Force, published H2 in May 2015. H2 is based on the work Google carried out with the SPDY protocol to improve the performance of websites and other internet applications.

The primary goals for HTTP/2 are to:

- minimise protocol overhead via the compression of headers
- reduce network latency with the use of request and response multiplexing
- add support for request prioritisation

Minimise protocol overhead

H2 comes with a technology called HPACK header compression, which compresses any repeated headers. Headers contain metadata and are included in every request and response sent between the browser and the server. The size of all these headers can slow down the loading while a user is browsing a site.

HPACK can result in header compression of over 70% on each request sent to the server during a session.

Reduce network latency

With HTTP/1.1 (H1), the server could only send a single file over each Transmission Control Protocol (TCP) connection at one time. H2 includes a technology called multiplex streams, which send multiple files over the same established TCP connection at the same time.

This results in both parties using fewer resources, and more efficient usage of a user's bandwidth.

Request prioritisation

Under H1, the browser would request the highest priority assets first. These

are Cascading Style Sheets (CSS) and fonts, and the webpage cannot render until the browser receives them.

With H2, the browser looks for resources to download, and once it's found them, the browser sends a request to the server for all assets at the same time. The server decides the order in which the assets are sent. This is where request prioritisation is important, as it can have a dramatic effect on the page rendering performance for the user.

This prioritisation is complex and easy to get wrong, and many content delivery network (CDN) providers have broken prioritisation implementations. GOV.UK uses a CDN provider which prioritises correctly.

The challenges GDS faced

Enabling H2 on GOV.UK was as simple as asking the CDN provider to switch it on. But before the frontend team at GDS was in a position to do that, it had to test H2 to make sure it would provide the performance improvements the team was looking for.

In October 2018, the team enabled H2 for a trial period of 6 weeks. In that time the team monitored performance across a range of devices. The team decided to only leave it on if they were sure enabling it would actually improve performance for its users.

Unfortunately, synthetic testing found that in many cases H2 actually made performance worse for GOV.UK users. Synthetic testing is a method of testing that simulates the journey a user would take on a service and monitors the performance.

The team compared metrics like:

- first visual change – video analysis to look when page rendering was first visible
- fully loaded – the point at which network activity goes quiet, indicating the page has completely loaded
- SpeedIndex – how quickly the contents of a page are visibly populated (lower is better)
- last visual change – a visual measurement to see when the page last changed

In most cases, the overall timings actually increased, which is not what the team was expecting.

In some instances the difference was minor, maybe a few milliseconds slower for each metric. But in other cases, for example on a slow connection on an older mobile device, there was a big difference in performance.

The GDS frontend team found that H2 actually added seconds to the page load time, which was an unacceptable drop in performance. The team has to make sure GOV.UK works well for every person who needs to use it, regardless of what connection they've got or what device they're using.

The team spent a number of weeks trying to identify why this time increase happened, investigating resource hints such as:

The team felt the issue was related to the assets domain used to serve its static assets. However the team had other work priorities, so they decided to disable H2 until they had time to investigate further.

Re-examining results

While researching another H2 technology called connection coalescing, the team decided to revisit some of the old tests they had conducted when trialing H2, to see if there was any evidence of connection coalescing happening.

The team had previously looked at connection coalescing in case it was causing the slowdown. The team could not confirm it at the time, but the new investigation showed H2 connection coalescing was happening. For example, the team found the browser downloading an image from the assets domain before the domain connection was negotiated, which should not be possible.

The team discovered that connection coalescing was happening between the origin and the assets domain. They found the image downloading on the pre-established TCP connection. So while the browser downloaded HTML and images through the same connection, CSS and JavaScript needed to download through a second connection.

This was because the frontend team had a browser security feature called Subresource Integrity (SRI) enabled for its CSS and JavaScript assets. A requirement of SRI is that you must include the crossorigin attribute.

This attribute is a Cross-Origin Resource Sharing (CORS) security feature that controls exposure of error information to scripts from another domain. Changing the setting to anonymous tells the browser that it must use a TCP connection that does not share user credentials, like cookies, client-side SSL certificates, or HTTP authentication.

This is a real problem for the browser as it cannot establish an anonymous connection quick enough for it not to block page rendering (even when the team tried using the Preconnect resource hint). In turn this new connection negotiation blocks all page rendering, as without the CSS, the browser cannot render anything to the page.

Proposing changes

To fix this issue the team proposed changes through the Request for Comments (RFC) process used for making changes on GOV.UK.

Their initial proposal in RFC-114 was a relatively simple update to change the crossorigin attribute's value from anonymous to use-credentials.

The theory behind this change was that by letting the browser know it could use a credentialed connection for these assets, it could then use the already

established connection to the origin and take advantage of H2 connection coalescing. This would remove the render-blocking wait for the CSS.

Unfortunately, this change was not possible because the team currently serves its assets with the Access-Control-Allow-Origin: * header. The Fetch specification forbids the use of a use-credentials value where Access-Control-Allow-Origin is set to *. This change causes a CORS error in the browser console, and the browser does not fetch the resources.

The team then wrote RFC-115. This RFC proposed to refactor the Access-Control-Allow-Origin header so it was only served with GOV.UK's font assets, and removed SRI completely when requesting the CSS and JavaScript code.

This meant the team could remove the crossorigin attribute, allowing these assets to use the same connection that was established to the origin domain via H2 connection coalescing.

Making changes

After some feedback and adjustments to the RFC, it was finalised and merged as an accepted proposal.

Removing SRI from the CSS and JS assets was an easy change to make, and it was the last blocker to enabling H2 on GOV.UK. This change was made via 9 pull requests to separate GOV.UK applications, and once merged and released the team could test the change on its integration server to verify it had worked.

The tests showed CSS, JavaScript and images were transferred over the same TCP connection, and only fonts were downloaded over an anonymous connection. This meant the browser was downloading CSS and JavaScript through a credentialed connection.

Making HTTP/2 live

The last step of the process involved enabling H2 on both the origin and assets domains. Once done, the difference in the connection views from H1 to H2 was striking. GOV.UK went from 13 TCP connections under H1 with SRI enabled down to 2 TCP connections under H2.

The team tracked the results in a spreadsheet, and found that most device and connection combinations showed performance improvements.

The team still has some work left to do, mainly involving removing the 'assets' domain for its static assets (CSS, JavaScript, fonts, images), and serving them from the origin. Doing so removes the need for all browsers to coalesce these connections. As some browsers either do not support or have broken implementations of H2 connection coalescing, this change will allow all browsers to fully benefit from the H2 optimisations.

User impact

The team used synthetic web performance testing to monitor the change moving from H1 to H2 has had on GOV.UK users. The team tested 3 of the most common device and connection combinations used to access GOV.UK. They looked at the data from an aggregate of results from 18 pages from different areas of GOV.UK.

The team monitored web performance metrics to test the impact the change had on users, including:

Low specification mobile device on a slow connection

The team used SpeedCurve to simulate what connecting to GOV.UK would be like for a user with a slow mobile device on a 2G connection. The tests showed the following improvements after enabling H2:

- page load time dropped by 5.5 seconds
- visually complete dropped by 10 seconds
- time to Interactive dropped by 2.5 seconds
- first contentful paint dropped by 4 seconds

So for users on legacy devices with a slow connection, H2 has improved the total page load time and improved perceived performance by 4 seconds, meaning a user can start reading and interacting with pages much sooner.

Medium specification mobile device on a medium connection

The team also tested a medium specification mobile device on a 3G connection. The tests showed the following improvements after enabling H2:

- page load time dropped by 1100 milliseconds
- visually complete dropped by 500 milliseconds
- time to interactive dropped by 600 milliseconds
- first contentful paint dropped by 900 milliseconds

Although not such a dramatic improvement as seen on low specification devices, it's still quite a considerable improvement. This is especially important considering Google research found that 53% of mobile website visitors will leave a webpage if it does not load within 3 seconds. This change allows the first content to be rendered to the page just under this cut-off point.

High specification desktop device on a fast wired connection

The team also tested what connecting to GOV.UK would be like with a cable connection (5Mbps down and 1Mbps up) on a desktop computer using the Chrome browser. The tests showed the following improvements after enabling H2:

- page load time dropped by 100 milliseconds
- visually complete dropped by 200 milliseconds
- time to interactive dropped by 100 milliseconds

- first contentful paint dropped by 130 milliseconds

An improvement of 100 milliseconds does not sound like a huge amount, but when you consider the pages are loading in less than a second, that's a 10% improvement.

What's next for web performance on GOV.UK

The frontend team at GDS has more changes in the pipeline for web performance on GOV.UK.

The team is gradually rolling out updates to move the frontend from its legacy codebase to the GOV.UK Design System. This offers a new optimised web font, as well as more optimised CSS and JavaScript. This should reduce the amount of data sent over the network and speed up load times.

Boost for commercial analogue radio stations

News story

Listeners of popular radio stations such as Classic FM and TalkSport will be able to access their favourite analogue shows for another ten years thanks to new government plans.

Media Minister John Whittingdale has today set out how commercial radio will be licensed over the next decade so that listeners can continue to enjoy their stations of choice despite rapid changes in technology and radio listening.

Nearly 60 per cent of all radio listening is now via digital devices, but analogue stations remain an important platform for millions of listeners who still tune into FM and AM radio services every day.

Several FM and AM commercial radio licences are due to expire from early 2022.

Provided the stations also broadcast on digital radio, the government has decided to allow Ofcom to renew these analogue licences for a further ten-year period.

Minister for Media and Data John Whittingdale said:

> As we move into an increasingly digital world we're making sure the licensing landscape for radio is fair and up-to-date and allows audiences to enjoy a wide range of high-quality stations.
>
> Today's step ensures there is no disruption for loyal listeners of treasured FM and AM radio services such as Classic FM, Absolute Radio and TalkSport over the next decade.
>
> We will soon be turning our attention to providing similar long-term certainty to support the future growth of digital radio.

The government's decision follows extensive consultation with industry and clarifies the long-term licensing arrangements for FM and AM radio services in the light of the shift to digital listening.

It will help support further investment and innovation in DAB but also provides certainty to commercial radio as it seeks to manage the financial impact of coronavirus.

The legislation to amend the Broadcasting Act 1990 to enable Ofcom to renew these licences will be laid in parliament shortly.

Following the decision on analogue licenses, the Government will now consider the position of DAB multiplex licences. Multiplexes consist of a number of digital radio stations transmitted on a single frequency, which is a more efficient method of transmission than analogue radio's individual frequencies.

Government will consult on changes to extend national and local digital radio multiplex licences by the end of 2020, in order to help futureproof the radio industry's wider licensing structure.

ENDS

Notes to editors:

- The Government has today published the response to a public consultation on extending analogue commercial radio broadcasting licences which ran from December 2019 to February 2020 and sought views on whether these licences should be renewed, and if so how long for. Read the consultation response.
- Analogue (FM or AM) commercial radio licences are issued by Ofcom under

powers granted to them by section 86 of the Broadcasting Act 1990. Such a licence permits a commercial radio station to broadcast to a specific licensed geographic area (known as the measured coverage area) in accordance with a specified format (e.g. mainly speech-related requirements, such as news) for a set period of time.

- Since the mid 1990s, the analogue licences of stations that also provide a service in digital form (in practice, either via digital audio broadcasting (DAB) or its successor technology, DAB+) have benefited from an entitlement to claim a series of renewals, in accordance with amendments made to the Broadcasting Act 1990 by the Broadcasting Act 1996, the Communications Act 2003, the Digital Economy Act 2010 and the Legislative Reform (Further Renewal of Radio Licences) Order 2015.
- A number of licences, including national analogue licences for Classic FM and TalkSport, have used up their renewals and were due to expire from early 2022. Ofcom now has the power to renew these licences for a further period. The changes only affect analogue commercial radio services. Digital radio and community radio are subject to different licensing arrangements.
- DAB radio services are broadcast as multiplexes. A radio multiplex consists of a number of DAB radio stations bundled together to be transmitted digitally on a single frequency in a given geographic area. This makes it a more efficient way of transmitting sound signals compared to analogue radio, where stations are broadcast on individual frequencies.
- The first national multiplex licence for commercial radio expires in 2023 and the shift in listening to digital (more than 58% of all radio listening is now digital) means it is time for the Government to consider the licensing arrangements for DAB multiplexes.
- The Broadcasting (Radio Multiplex Services) Act 2017 gives the DCMS Secretary of State a power to modify (through secondary legislation) the various procedures to create Small Scale Radio services. Ofcom has recently launched details of their plans to start licensing small scale radio later this year.

Published 2 July 2020

Up to £75,000 available for UK space technology projects

News story

Government grants worth up to £75,000 are available to the UK space sector to develop new commercial technologies and bring them closer to market.

The funding from the UK Space Agency is available for businesses, non-profits and academics.

The UK has a thriving space sector which generates an income of £14.8 billion each year. The UK Space Agency is working closely with industry and academia to ensure it recovers strongly from the coronavirus pandemic. This funding call, as part of the National Space Technology Programme (NSTP), is looking for innovative 6-month projects that could develop instruments for commercial applications or test disruptive ideas.

Since launching in 2011, the NSTP has supported 272 projects. Previous successful applicants include Belstead, which improved drag sail methods in the removal of space debris, and a collaboration between the University of Bristol and Rutherford Appleton Laboratory to track and analyse volcanic ash clouds, which can be detrimental to jet engines.

Charles McCausland, Head of Major Projects and Technology Development, UK Space Agency, said:

> The National Space Technology Programme has a strong track record of developing new ideas and driving growth in the UK space sector, with support available for organisations of any size.
>
> In 2019, we successfully funded 58 projects. As we ramp up support for national space capabilities and develop the new UK space strategy, the programme will continue to play a major role in forging new collaborations and backing early-stage technologies with future potential.

The NSTP funds four types of grants. This call for Pathfinder projects aims to increase the Technology Readiness Level (TRL) of space technologies, encourage collaboration between industry and academia, and encourage new entrants to the space sector.

The UK Space Agency is leading work across government to develop a comprehensive UK space strategy. A new National Space Innovation Programme will further strengthen national space capabilities and international space co-operation, while creating high-skilled jobs across the country.

Published 2 July 2020