

# How to Prepare for the PSTN Switch-Off and Keep the Faxes Flowing



OFF

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# Introduction - the great PSTN switch-off

We are witnessing the end of an era. The foundations of communication are transforming as we all strive to embrace true digitalisation.

Public switched telephone networks (PSTN), the analogue lines that have kept us all connected since the 19th century, are being switched off. Depending on the country, it will be completed in the next five years.<sup>1</sup> While some parts of Europe (such as Estonia) have already completed their switch-off, others, like the UK, Poland and Sweden, are aiming to be finished by 2025.

Why is this happening? Because PSTN is no longer fit for purpose. As a policy paper by the UK communications regulator Ofcom notes, "PSTN has been in place for many decades and generally includes copper wires, and equipment dedicated to supporting call services."<sup>2</sup> This infrastructure is expensive to maintain, and the technology itself is not suitable for the massive demands placed on it by our digital lives. On top of that, new, faster and better equipped alternatives, such as voice over internet protocol (VoIP), are available.

The switch over from analogue to digital is not new – as the paper goes on to say, work has been going on over the last decade as "telecoms companies have built modern internet protocol (IP) based networks which can support both broadband and landline telephone services. While some providers have maintained two separate networks – the PSTN for call services and a separate IP network for broadband – others have replaced the PSTN and carried phone calls over broadband."

Both users and providers stand to benefit – for the latter, reduced costs and improved efficiencies, while the former stand to receive a better overall service with potentially a lower cost (though that depends on operators passing the savings they make on to their customers).

The switch-off of legacy infrastructure is necessary to propel the world into the digital era. From faster broadband to the introduction of 5G, the proliferation of Internet of Things technology to being able to work from anywhere, on any device, we need communications networks that are future proof, that are suited to sharing vast amounts of data rapidly, and that can do that even as ever more devices are added to the network.

# PSTN switch off – a global undertaking

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Globally, there is a consistent understanding that PSTN needs to be replaced. However, despite the migration being driven in the majority of cases by operators, rather than by regulators or their governments, the pace of migration, and the overall approach, varies from country to country.

In Europe, according to one benchmarking report, only Estonia and Germany have transitioned to all-IP, with the Netherlands expected to complete in 2021 and Spain the year after. For the likes of Sweden, France, Poland and the UK, a complete shutdown of PSTN is not expected for between three and five years.<sup>3</sup>

Country	<b>PSTN</b> transition status
Estonia	Complete
Germany	Complete
Netherlands	Expected 2021
Spain	Expected 2022
France	Expected 2023-25
Poland	Expected 2023-25
UK	Expected 2023-25
Sweden	Expected 2023-25

Source: Copper switch-off: A European benchmark, WIK-Consult, December 2020

It is perhaps unsurprising that Estonia has pioneered a shift away from PSTN – regularly held up as a posterchild for what digital governments can achieve, the Baltic state has been



named 'the most advanced digital society in the world', runs 99% of government services online, and saw nearly 50% of residents using internet voting in recent European Parliament elections.

Estonia is, in many ways, an outlier – no other country comes close to delivering the comprehensive volume, and standard, of digital services that it does. It stands to reason that it would want to ensure that its infrastructure was futureproofed and able to sustain the increasing demands its digital way of life placed on the network.

For other countries, it is not so straight forward. While many have, on the surface, a similar model of having an incumbent operator (such as Orange in France, BT in the UK and Deutsche Telekom AG in Germany), the increasingly fragmented nature of the telecoms market, with multiple operators of varying sizes, makes wholesale migration challenging. That is before one considers virtual and downstream operators, and the services they provide.

The UK's Ofcom said "In the majority of cases, a communications provider will not be aware of the specific downstream services that are being run over their network and so will not have a record, or full understanding, of all the services that may be impacted by the switch-off or how extensive the impact will be." <sup>4</sup>

However, despite this, there are some consistencies, particularly when it comes to what the main drivers for migration are. In Germany, one report highlighted that the main drivers for making the migration away from PSTN to all-IP were to create a single, standardised network with lower operating costs, to separate services from transmission and enable the faster creation of improved customer experiences, and to combat the challenges of maintaining existing equipment with a shrinking knowledge base and rising costs.<sup>5</sup>

While these were noted as specific to Germany within the report, it is hard to see how these would not be factors in other markets, or the primary reasons for incumbent operators to instigate a PSTN switch-off.

In Germany's case, DTAG began PSTN migration in 2014, drawing on the work undertaken by its operations outside of Germany in other countries, such as Croatia and Slovakia. These experiences, albeit in smaller countries and networks, helped inform DTAG's business case and ultimate approach within Germany. While there were some bumps in the road, which are explored later in this paper, this has led to a successful PSTN switch-off. Looking beyond Europe, New Zealand's PSTN operator, Spark, has begun withdrawing PSTN services. The operator is following a passive migration process - while the technology itself needs to be switched off, many customers are choosing non-PSTN products when they renew their products. The company's customer director, Grant McBeath, underscored this when he told one publication that Spark's "customers have been moving off this technology in droves, and we now need to start completing that process for all customers. When we started the upgrade in 2017, we had over a million customers on the PSTN-it is now around 400,000, with another 10,000 customers on average leaving every month."6

Where does that leave the UK? As the table above notes, full PSTN switch-off is not due until 2025, but BT, through its Openreach subsidiary, stopped offering businesses the ability to acquire ISDN and PSTN in 2020. BT's intention is to move the vast majority of customers over to VoIP, though as Copper switch-off: A European benchmark notes, this starts from a low base, with limited VoIP except in new builds.<sup>7</sup>

Ultimately, while there are consistencies in why countries (or rather, local operators) are switching off PSTN, how they are going about it, and their rate of progression, remains varied. This reflects how different many countries are when it comes to telecoms and broadband services and practices – for instance, in France, the market penetration of infrastructure-based competitors is estimated to be around 10% lower than in the UK.<sup>8</sup>

What connects them all is the universal need to deliver the infrastructure suitable for the delivery of digital services and experiences. Whether the customer is business or consumer, end-users increasingly expect intuitive, fast and reliable interactions. Yet, in our headlong rush to get digital ready, we must not assume that just because the network we are replacing is old and not fit for purpose that the applications and services that use it are redundant, too.

The PSTN switch-off is a massive migration on a scale rarely seen. While it is being led by carriers and telecoms providers, businesses have a duty to themselves to ensure that they do not lose access to vital communications tools when the day comes for the PSTN lights to be turned off.



## Same drivers, different results – how countries are varying with the PSTN switch off

### Estonia

- One of the world's most digital societies
- Completed PSTN switch off in 2017, taking just two and a half years, and migrating the last consumer customer to an alternative IP solution in June 2017<sup>9</sup>

### Germany

- One of Europe's most populous countries
- Deutsche Telekom AG started the migration in 2014, completed in 2019
- Other operators have until 2022 to complete migration

### New Zealand

- Started migration in 2017, with an expected completion of 2022 for all operators
- Began with coincidental migration, where customers chose non-PSTN products and services ahead of switch-off, but will progress to forced migration

### France

- High VoIP penetration 74% in 2018
- Targeted completion in 2030, driven primarily by voluntary and coincidental migration

### UK

- Aims to complete migration by 2025
- Low VoiP base except among new builds, could hamper transition

# The hidden consequences of PSTN switch-off

Any migration, no matter how big or small, is fraught with complexity. Something that seemed to be fairly straight forward invariably throws up challenges. Systems that people barely knew existed are suddenly rediscovered or, worse, ignored right up until they completely undo any hopes of a successful migration.

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In short, there is always something that gets forgotten.

For those countries, and more particularly those businesses that are still going through PSTN switch-off, it is worth considering where the changeover has been less successful and seeing where those that have already completed the migration have struggled.

For instance, while Germany's PSTN switch-off has, by and large, been a success, there were a number of notable issues. According to one report, "There appear to have been some initial problems with migration in Germany...there were early problems with the IP migration process in Germany in terms of service interruptions, inadequate information supplied to customers, and use of fax machines."<sup>10</sup>

What is striking about the latter is how the report goes on to say that neither Deutsche Telekom, the operator leading the PSTN switch-off, nor the national regulator BNetzA, "has any idea of the extent to neither which [fax machines] are used nor how many have encountered problems as a result of the All-IP migration."

It is not just fax machines; in Germany, security, fire prevention, remote health and social care monitoring devices were all affected by the PSTN switch-off. This highlights what many will overlook – that there are a large number of devices still in use that require PSTN, and where the impact and consequences of the switch-off have not been considered.



It might come as a surprise to some, but the fax machine is still a vital method of communication for many:

- There are 43 million fax machines in use globally, sending over 17 billion documents every year.<sup>11</sup>
- Eighty two percent of respondents to an IDC survey indicated that fax usage increased or stayed the same from the previous year,<sup>12</sup> with manufacturing, healthcare, finance and government organisations reported the highest growth.
- The same study found that the top three reasons for using fax were:
  - 1. Customers and suppliers use it, which forces us to use it

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- 2. Fax is an important part of a workflow or business process
- Easy tracking of document transmission; traceable audit trail indicates success or failure of transmission

# Will fax be the great casualty of the PSTN switch-off?

What the example from Germany shows is that it is all too easy to make the assumption that just because a majority of people do not use a particular tool or service, no one else does either. Yet as the numbers show, the likes of fax are critical parts of many organisations' communication channels.

However, when it comes to corporate oversight, quite often something like fax is hidden from view. As it has relied upon the phone line for so long, many people, including business decision-makers, will assume that it simply migrates to VoIP when PSTN is switched off. Rarely do people consider that rather than being one and the same, telephones and fax machines are actually different types of technology using the same infrastructure.

But surely they can just switch to email? If that was the case, the fax machine would have completely died out around 20 years ago, yet there are still many functions and industries that rely upon it as a way of sharing documentation. In an article on The Conversation, Professor Jonathan Coopersmith summarised the persistence of fax in a world of email when he said, "Fax's longevity also benefits greatly from reluctance – both legal and social – to accept email as secure and an emailed electronic signature as valid."<sup>13</sup>

Plus, fax machines are not simply a method of sending documents; the IDC survey found that multi-function printers

accounted for nearly a quarter of fax volume, with fax providing the critical link between user and output. Quite often, these sophisticated printers are connected via a PCSI fax card that connects the printer to the fax server.

While the great changes in how and where we work are still defining themselves, it is unlikely that we will see a wholesale end to the office (and by extension, the need for major officer hardware, such as MFPs).

The MFP issue is just one example of how interconnected fax can be within an organisation; even one that prides itself on being digital native. The problem is, that as telecoms becomes IT with the transition from PSTN to services such as VoIP, IT managers are going to be in for a shock when they realise the implications for fax.

# Fax is now an IT tool

The great digitalisation of business brings many benefits and, as we have seen, the pandemic has helped accelerate digital transformation across many companies. An eFax study found that 60% of IT decision makers are accelerating the speed of their transformation projects as a direct result of COVID-19 disruption.<sup>14</sup>

Yet one of the often-overlooked implications is how it takes what were once distinct departments, and brings them all into IT. While the delivery may now be more aligned with what IT managers are familiar with, the intricacies of the likes of telecom services and networks are actually very different. It is the same with fax. As mentioned above, many people assume that fax and telephone are one and the same, but actually there are a number of points of differentiation that IT departments need to be aware of as they face the PSTN switch-off:

**1. It is not free** – Time and time again, fax is seen as free, but it is still very much part of the telephone bill, it just has not previously been split out. As they wrestle to keep fax going, IT needs to be aware that it is not a new cost, but an old one repackaged. Whatever solution they chose, they need to factor that in.

**2. New infrastructure requirements** – As PSTN switches off, many fax machines are going to become redundant. IT is then faced with finding a digitally-suitable update – if they go down the hardware route, this could be a major undertaking. That is why the PSTN switch-off offers an opportunity to reduce hardware maintenance costs while still facilitating the use of fax.



**3. Different security challenges** – As the world becomes more security conscious, businesses are waking up to the fact that the human factor is quite often the cause of many breaches, whether intentional or not. Many people make the mistake of thinking that legacy fax is a secure method of communication, with the result that fax machines send confidential data all the time. While the actual method of delivery may have been secure, most fax hardware is in the centre of an open plan office, and how many recipients wait for faxes to come through? Important information can be left out in the open for some time. Plus, the assumption that fax is secure can lead to issues when the technology is integrated with wider systems, with many organisations overlooking how attackers could use unsecured fax machines to access corporate networks. If businesses are going to continue with fax in the post-PSTN world, they need to be clear on how they are securing it.

**4. The migration challenge** – As highlighted previously, quite often there is no central oversight of the use of fax within a company. That is why IT needs to audit the entire organisation for the use of fax before it goes ahead with a PSTN switch-off. They will need to be prepared for a lack of understanding and knowledge – at one enterprise, a company-wide request for fax machines to be logged with IT led to many being left in the IT centre over the weekend, with no indication of where they had come from or how much they had been used.

These insights highlight another issue businesses face – in their drive for digital, companies may well lose knowledge that, in the short to medium term, is vital for a smooth transition. New generations of IT managers may well be suited to creating hybrid environments to support both the cloud native and legacy applications that businesses need in order to deliver intuitive customer experiences. Where they fall short could be their lack of specific functional knowledge to support the migration of non-IT legacy infrastructure, such as the critical understanding of complex communication networks.

What they need to be aware of is that there is still a place for old approaches when there is not an adequate replacement.

Fax is one of those.

But to see fax as a necessary legacy evil is to miss a major integration opportunity. The rise of digital cloud fax offers businesses a best-of-both-worlds solution – a fax-based method of communication that is integrated into the latest digital technologies, including email. Indeed, the IDC survey found that being able to integrate faxing with email, so it's more accessible and easier to use, was the top driver for increased fax use, while cloud fax was expected to see the most growth out of the fax technologies in use (cloud fax, fax servers, MFP devices with fax, standalone fax machines).<sup>15</sup>

Rather than rely on a phone line, digital cloud fax uses any device connected to the internet (whether PC, tablet or mobile) to send and receive faxes. It transmits emails with faxes as attachments either to physical fax machines or other digital fax services (such as mobile apps). Documentation is encrypted before it is sent, and remains protected through processing and transfer, making it more secure than standard email. By allowing faxes to be read directly on devices (and digitally archived), overheads such as hardware maintenance and printing costs can be reduced, while having a dedicated fax number is also no longer required.

It also means that a company's fax needs can migrate onto its existing IT infrastructure and network – the same cloud servers that support email can be used to deploy digital cloud fax. In doing so, IT departments can avoid costly new investments into new hardware and can focus on auditing fax users and then provisioning the appropriate digital cloud fax solutions as an alternative.

# Bridging between old and new

It can be easy to assume that, with all the talk of digitalisation, digital transformation, of the migration from legacy PSTN to a new fibre-led, future-proofed network, that the majority of the world is already fully connected, with old technology like faxes long gone.

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Yet these so-called old-fashioned communication devices still play a vital role in many organisations' communications.

As the PSTN switch-off gathers pace, businesses of all sizes need to be fully aware of how they are using these technologies, what the infrastructure requirements are, and what alternatives are available.

The likes of digital cloud fax offer viable solutions that bridge the old and the new – allowing enterprises to keep communicating in a way that fits their needs, without requiring major investments in new infrastructure, and aligning to the always-on, mobile and increasingly digital ways of working the world is embracing.

If the PSTN switch-off is going to affect your fax needs, or you are not even sure whether your business still uses fax, speak to eFax to see how digital cloud fax could support your transition into the post-PSTN communication landscape.

- <sup>2</sup> https://www.ofcom.org.uk/\_\_data/assets/pdf\_file/0032/137966/future-fixed-telephone-services.pdf
- <sup>3</sup> https://www.ftthcouncil.eu/documents/2020%201202%20Copper\_switch-off\_analysis\_.pdf
- <sup>4</sup> <u>https://www.ofcom.org.uk/\_\_data/assets/pdf\_file/0032/137966/future-fixed-telephone-services.pdf</u>
- <sup>5</sup> http://www.broadbanduk.org/wp-content/uploads/2018/12/Plum-BSG-Preparing-the-UK-for-all-IP.pdf
- <sup>6</sup> <u>https://www.computerworld.com/article/3566913/new-zealand-begins-the-long-goodbye-to-its-copper-network.</u> <u>html#:~:text=Around%201000%20customers%20in%20these,voice%20services%20as%20alternative%20options.</u>
- <sup>7</sup> https://www.ftthcouncil.eu/documents/2020%201202%20Copper\_switch-off\_analysis\_.pdf
- <sup>8</sup> http://www.broadbanduk.org/wp-content/uploads/2018/12/Plum-BSG-Preparing-the-UK-for-all-IP.pdf
- <sup>9</sup> <u>https://www.teliacompany.com/en/news/news-articles/2017/pstn-network-closed-in-estonia/</u>
- <sup>10</sup> http://www.broadbanduk.org/wp-content/uploads/2018/12/Plum-BSG-Preparing-the-UK-for-all-IP.pdf
- <sup>11</sup> <u>https://www.efax.co.uk/blog/is-fax-still-used#:~:text=17%20Billion%20Fax%20Documents%20Are,with%20millions%20more%20purchased%20annually.&text=lt%20means%20that%20over%2017,prevalent%20fax%20use%20still%20is.</u>
- <sup>12</sup> <u>https://www.opentext.com/file\_source/OpenText/en\_US/PDF/opentext-idc-survey-fax-market-pulse%20-en.pdf</u>
- <sup>13</sup> <u>https://theconversation.com/why-do-people-still-use-fax-machines-109064</u>
- <sup>14</sup> <u>https://uktechnews.co.uk/2020/08/23/efax-research-reveals-it-decision-makers-accelerating-digital-transformation-due-to-disruption-caused-by-covid-19/</u>
- <sup>15</sup> <u>https://www.opentext.com/file\_source/OpenText/en\_US/PDF/opentext-idc-survey-fax-market-pulse%20-en.pdf</u>

<sup>&</sup>lt;sup>1</sup> https://www.ftthcouncil.eu/documents/2020%201202%20Copper\_switch-off\_analysis\_.pdf

# About eFax

eFax launched its digital cloud fax service with the goal of using the convenience of email and the speed of the internet to make it easier for people to send and receive faxes. eFax lets users and our 11 million customers receive, review, edit, sign, send and store faxes by email or through a web interface. Our appeal and success are built around three key features: the widest selection of phone numbers; an easy way to send and receive faxes and voicemail by email; and a fast, reliable and secure communications network.

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