Managing the Transition to 5G

Full Speed Ahead?

Contents:

Learning Objectives

After you have read this whitepaper, you should be able to:
- Summarise...5G's potential applications and how the technology makes them possible.
- List...the obstacles that currently stand in the way of those developments.
- Explain...how organisations can best protect themselves against the cyber risks generated by 5G.

Managing the Transition to 5G

The era of 5G has arrived – along with breathless reports about how the technology's ultrafast speeds, rapid response times and ability to connect billions of Internet-enabled devices will make futuristic advances a reality. A 5G-enabled world looks like one of accessibility and convenience: The technology promises such benefits as instantaneous video downloads, smart cities that can manipulate traffic patterns to ease congestion, and the wider use of robots to take on procedures ranging from food preparation to brain surgery. What's not to like?

But the capabilities of 5G are only as good as the network infrastructure and devices supporting them – and those elements will take time to become universal (and useful). In the UK, 5G arrived in May 2019 via two mobile networks, then gradually spread to more than 100 towns and cities in the following 18 months. The government has said it wants "the majority of the UK population to be covered by a 5G signal by 2027 so that the entire country can benefit from its social and economic advantages."[1] Around the world, some countries are a bit farther along on the path to 5G and their experiences with it are still evolving.

"We're at an important inflection point right now before 5G becomes widely available," said Mark Crane, Technology & Cyber Practice Leader for Travelers Europe. "While 5G will give us new capabilities, it will also expose us to new risks. Organisations must know what those risks are and then develop a plan to monitor and manage them."

As we head toward fully fledged 5G in the UK, what obstacles will organisations face? How should forward-thinking businesses in the UK operate when they are eager to deploy 5G technology but may not yet have the infrastructure support required for it to work effectively? What risks must be considered and managed during and after the transition?

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1 "5G supply chain diversification strategy." Department for Digital, Culture, Media & Sport, 7 December 2020.
   https://www.gov.uk/government/publications/5g-supply-chain-diversification-strategy/5g-supply-chain-diversification-strategy

Clearing hurdles along the way

As eager as the UK, in general, may be to bring about 5G-enabled advances, the nation is making the transition to 5G as it manages a host of significant challenges. COVID-19 and Brexit may be the most historic among them – and they both have the power to distract organisations, ranging from small businesses all the way up to the UK government, from other tasks that would help their networks mitigate 5G risks. But other challenges exist too. For one, there is public perception that 5G may pose health risks. At the other end of the spectrum, there may be difficulties in collaborating and competing with organisations in countries that have readily accepted 5G technology and are farther along in their deployment of it. All have the potential to create bumps on the road to UK-wide 5G adoption in the coming years.

At a time when global health has been under unprecedented strain, public health concerns have impacted community acceptance of 5G. According to Deloitte's Digital Consumer Trends survey of more than 4,100 UK consumers between the ages of 16 and 75, public trust in 5G is shaky. The survey found that 14 percent of UK consumers on average (and 18 percent of consumers aged 25-34) believe there are health risks associated with 5G's radiofrequency radiation. More than 43 percent of consumers are unsure whether or not 5G poses risks to public health. Consumers in other European markets are even more wary. [2] Research into the potential health risks of 5G is ongoing but the conclusions announced so far have indicated the risk of negative impacts is minimal but still possible, which may feed the broad variety of views about its safety. The Wall Street Journal reported that cities and towns in several US states have issued ordinances to prevent the development of new 5G cell sites in residential areas or have proposed bills mandating further study of 5G's health impacts. [3]

While some areas of the world have been deploying 5G more deliberately for these reasons and others, others have jumped into it headfirst. CNET said in July 2020 that in parts of Asia and the US, for example, 5G has been rolling out steadily to more markets, while the pace of deployment has been slower in Canada and Europe. To add another wrinkle to 5G's global rollout, the type and quality of 5G connection available varies depending on the market. For example the newly released iPhone 12 will reportedly be able to operate on ultrafast millimeter wave (mmWave) 5G networks – but only for users in the US (and a subset of them at that) for now. An iPhone 12 used in the UK and Europe will be "limited to lower-band networks, which deliver slower speeds but cover broader areas and are easier to deploy." [4]

So, will the countries on the cutting edge of 5G gain a significant competitive advantage while the rest of the world catches up? One study of the potential economic impacts of 5G between 2020 and 2034 found that while there are localised benefits for early adopters of the technology, the greatest benefits for all will come once 5G is broadly available globally:

"5G's full socio-economic impact is dependent on access to a variety of spectrum resources, including millimetre wave (mmWave) bands between 24 GHz and 86 GHz," according to a 2018 GSMA study. "The mmWave spectrum allows for the increases in bandwidth and capacity that numerous 5G applications require. It will play a key role in meeting the demand for many enhanced mobile data services as well as new wireless broadband use cases such as remote object manipulation, industrial automation, virtual and augmented reality and next-generation connectivity for vehicles. These use cases will continue to increase the impact that mobile services have on societies and economies… Although economic benefits are greater in the early adopting economies over the period studied, the rate of contribution of mmWave in later adopting economies outpaces that of early adopters in the later years of the study… Once 5G has taken off in regions such as Sub-Saharan Africa, the annual gain from mmWave 5G will grow much faster from 2026 onwards, closing the gap between the early and late adopters." [5]

It's also fair to say that any benefits enjoyed by early adopters of 5G may be proportionate to the new risks they face. Transitioning to any new technology or way of operating creates pockets of vulnerability that criminals are eager to exploit. 5G, which promises changes to all facets of life, makes for an appealing target. As the technology becomes more widespread and homes, cities, hospitals and transport networks increasingly rely on data transmitted through connected devices to function properly, 5G's risks will intensify.

2 "Missed connection: 43% of UK consumers unsure whether or not 5G technology poses a health risk." Deloitte, 23 September 2020. https://www2.deloitte.com/uk/en/pages/press-releases/articles/missed-connection-forty-three-percent-of-uk-consumers-unsure-whether-or-not-5G-technology-poses-a-health-risk.html#
3 Mims, Christopher. "Cities are saying no to 5G, citing health, aesthetics – and FCC bullying." The Wall Street Journal, 24 August 2019. https://www.wsj.com/articles/cities-are-saying-no-to-5g-citing-health-aestheticsand-fcc-bullying-11566619391
4 Asante, Keith. "Apple's new iPhones are now finally ready for 5G. Can Europe say the same?" The London Economic, 9 November 2020. https://www.thelondoneconomic.com/tech-auto/technology/apples-new-iphones-are-now-finally-ready-for-5g-can-europe-say-the-same/09/11/

5 "Study on socio-economic benefits of 5G services provided in mmWave bands." GSMA, December 2018. https://www.gsma.com/spectrum/wp-content/uploads/2019/10/mmWave-5G-benefits.pdf

Entering a new era of cyber risk

Cyber security concerns – a growing challenge for organisations before the advent of 5G – will only escalate when the latest generation of mobile internet delivers faster speeds and connects an expanding number of devices.

The UK's decision to remove from its infrastructure any telecommunications equipment provided by companies considered "high-risk vendors" reflects that concern. [6] The protections that were adequate for 4G will be insufficient to manage the transition to 5G. Organisations will have to identify and deploy talent in new ways, as well as adopt additional technologies that can serve as a support structure for the faster network. Wendy Frank, Deloitte Risk & Financial Advisory Cyber 5G leader, sees the need for changes at several levels:

"For organisations leveraging 5G, cyber risk will mount quickly if challenges -- like a lack of sophisticated encryption, decentralised operations or security monitoring functioning to the detriment of performance speeds – are not resolved." she said. " Securing the vastly expanded threat landscape resulting from 5G adoption will demand two equally important efforts: getting the right talent in place or upskilled, and leveraging artificial intelligence and machine learning to automate areas like security policy configuration, compliance monitoring and threat and vulnerability detection." [7]

While it looks like the world is racing to adopt 5G benefits and the economic lift that those changes may bring, it's more prudent for organisations to step back and give 5G time to develop, while concurrently taking steps to fortify the risk-readiness of their own operations. (See sidebar: *Ready, Steady, 5G* for guidelines.)

"As 5G becomes more widespread, insurers and brokers will need to partner with clients to assess how risks are evolving and determine how best to manage them," said Mark Lawrence, Technology Underwriting Development Manager for Travelers Europe. "While the technology is changing quickly and promises exciting benefits, insurers can only underwrite risk in accordance with the data currently available. The more we know about emerging risks, the better we can tailor cover to new exposures."

Ready, steady, 5G

To tap into the benefits 5G makes possible, organisations must first understand and contain the exposures that will accompany it. Is your organisation considering these vulnerabilities as part of its risk management plan?

- **Decentralised network structure.** Networks used to have a hub-and-spoke, hardware-based structure that provided natural cybersecurity checkpoints for organisations, but we have since moved to a more decentralised, software-focussed model. As a result, activity is pushed out into a web of digital routers that are more difficult to inspect and manage.

- **Vulnerable gatekeepers.** Networks are currently managed by software that is vulnerable to attack. Someone who gains control of the software managing the networks can also gain control of the networks.

- **Virtualisation of complex functions.** 5G is making it possible for software to perform and virtualise more higher-level network functions that used to be handled by physical appliances. These functions are based on standard internet protocols and have been valuable tools for cyber criminals.

- **Attacks from new and growing angles.** 5G's expanded bandwidth creates more potential paths for an attack. Antennas in urban centres become physical targets. Further, the multiple streams of information sharing bandwidth through these sites carry their own varying cyber risks. Protections must be able to flex with those exposures.

- **A growing army of connected mini-computers.** The billions of common smart devices connected through the Internet of Things present billions of opportunities for cyber-attacks. [8]

Your organisation is only as strong as its cyber security standards. Are there gaps in your defence? Ensure you update software patches regularly, require protections such as multifactor authentication and firewalls, manage and monitor network access, employ talent with cybersecurity expertise, and train employees on an ongoing basis about their responsibility to connect to networks securely and report suspicious activity promptly.

6 Collins, Katie. "UK bans installation of new Huawei gear in 5G networks starting in September." CNET, 30 November 2020.
   https://www.cnet.com/news/huawei-kit-no-longer-allowed-to-be-added-to-uk-5g-network-from-september/
7 "With 5G adoption comes new cybersecurity risks to mitigate." Deloitte, 7 December 2020.
   https://www.prnewswire.com/news-releases/with-5g-adoption-come-new-cybersecurity-risks-to-mitigate-301187268.html

8 Wheeler, Tom, and Simpson, David. "Why 5G requires new approaches to cybersecurity." The Brookings Institution, 3 September 2019. https://www.brookings.edu/research/why-5g-requires-new-approaches-to-cybersecurity/

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