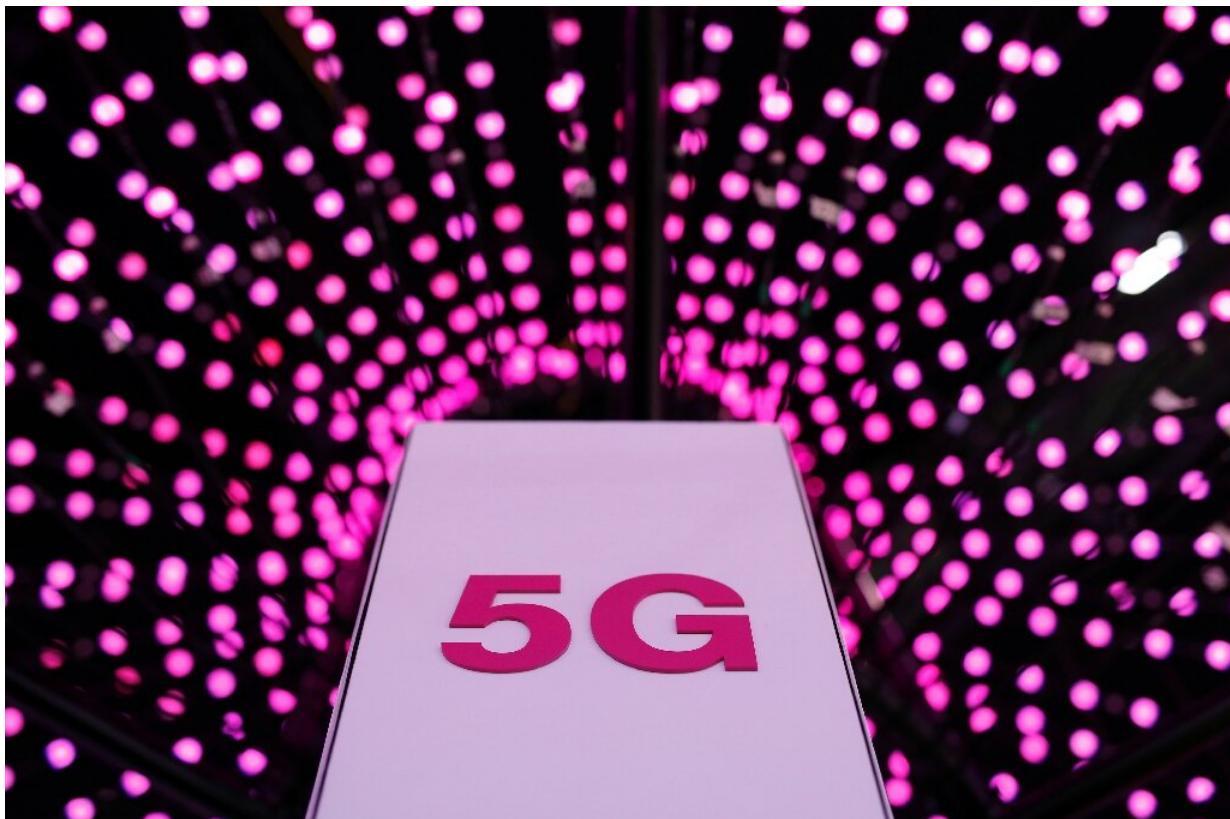


# 5G: Five things to know

May 16 2019, by Erwan Lucas

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Fifth-generation or 5G mobile networks promise ultra-fast downloads, but will there be a rapid rollout and uptake of the technology?

It is heralded as an essential step to a brave new world of technology, but in the here and now, super-fast 5G networking is already pitting China against the West.

Here are five things to know about the fifth-generation successor to today's 4G technology, which is a decade old and struggling to keep pace with global broadband demand.

— What is 5G? —

5G promises radically quicker transfers of data, instigating major changes to an array of products and services from self-driving cars to "telemedicine".

On the entertainment front, users will be able to download a high-definition movie in a few minutes compared to an hour or two now.

The market for streaming video games, a rapidly growing area, will get a huge lift, as will the "[internet of things](#)"—domestic appliances, lighting and other at-home technologies connected and operated remotely.

It's not just about speed of downloads and uploads. 5G promises much lower "latency" than 4G. That is the time lag between a command being sent by a user and a device acting on it.

In the real world, that brings into play the possibility of factory robots being operated remotely or surgeons operating on patients from far away using augmented reality glasses.



An antenna for the ultra-fast 5G mobile network

The most visible gain from lower latency could be with the widespread advent of self-driving cars. But these will need 5G networks to cover large areas, which is some way off.

— When's it coming? —

5G is already here in South Korea and for fixed internet lines in some US cities. It is also available in parts of Estonia, Finland and Switzerland.

The global breakthrough—widespread ultra-fast mobile networks on a par with 4G today—is still in the works.

Japan and China are targeting 2020 for nationwide rollouts. The rest of Asia and Europe will follow over the decade.

But mobile communications industry body GSMA, which represents 800 operators worldwide, estimates 5G will account for just 15 percent of total global mobile connections in 2025.

And when will most of us see 5G smartphones? China's Huawei was set to launch a 5G phone later Thursday in London.

But broad adoption by consumers depends on 5G networks spreading far enough, and for the handhelds' chips and other architecture to be capable of handling the added workload.



A Samsung Galaxy S10 5G smartphone displayed at a telecom shop in Seoul last month

— 5G, give us a wave —

Governments first need to harmonise standards for the award of so-called millimetre-wave (mmWave) spectrum, which will carry the vast data flows promised by 5G.

That high-frequency mmWave spectrum starts at about 30 gigahertz. In contrast, 4G networks operate at lower than 6 GHz.

That means not only ultra-fast broadband but also much greater bandwidth for many more users and devices to be connected to the network at the same time.

— Who's building it? —

To bring the promised speeds to the masses, 5G requires a whole new infrastructure of masts, base stations and receivers.

Among the networking companies in the race are Huawei, Sweden's Ericsson and Nokia of Finland. South Korean giant Samsung and China's ZTE are other infrastructure players.

Huawei says it offers better technology at a lower cost. The Chinese leader, however, is hitting hurdles in the global race.



In addition to making network equipment, Huawei has become a major supplier of phones

— What's the fuss? —

The US government says Huawei—founded by former Chinese army engineer Ren Zhengfei—is a security risk and has urged allies including Britain to shun its equipment over fears it could serve as a Trojan horse for Chinese intelligence services.

The US government has banned all federal agencies from acquiring Huawei equipment. Others including Australia, Japan and India have followed suit.

Against the backdrop of a US-China trade war, on Tuesday President Donald Trump went further by effectively barring Huawei from the US market.

China then formally arrested two Canadians already being held on suspicion of stealing state secrets in a case seen as retaliation over Canada's arrest of a Huawei executive on a US extradition request.

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