

# Nine questions on how 5G deployment will impact the IoT

# CONNECTIVITY

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## What does 5G deployment represent?

5G stands for Fifth Generation wireless technology.

- The first generation, 1G, made it possible to exchange voice,
- 2G added text to voice,
- 3G added the internet to voice and text,
- 4G allowed to transfer large amounts of data at higher speed, and
- 5G will be even faster and underpinned by more stable connections. Thus, 5G deployment will allow an exponential increase in the number of connected objects.

## How fast is 5G compared to 4G?

Throughput increases from 1 Gbit/s with 4G, to 20 Gbit/s with 5G. This makes existing uses smoother and enables new uses, such as high-quality video calls. 5G will reduce latency – i.e., the time it takes for data to travel from transmission to reception – by a factor of 10 to 20, and make available innovative applications like remote surgery operations.

## How to protect the privacy of IoT device users on 5G networks?

Each subscriber is authenticated by the network via a unique identifier called an International Mobile Subscriber Identity (IMSI). This is the key to accessing the network. With previous wireless technologies, this identifier was sent over-the-air, and could be intercepted and used to track the location of the subscriber for instance. With 5G deployment, the IMSI used to connect IoT devices to the network will be encrypted to protect end-user privacy thanks to (e)SIM technology.

## How to protect industrial IoT devices?

IoT devices are quickly becoming key components in critical infrastructure. They transmit sensitive data, thus creating a more complex set of security challenges. IoT devices – ranging from **smart meters** and sensors to robots, **asset trackers**, smart lights and **smart pacemakers** – are not secure by design and the industrial IoT ecosystem is extremely fragmented. To overcome this, the GSMA recommends a market-endorsed solution known as **IoT SAFE**, which relies on standardized SIM technology to ensure mutual authentication between the device and the factory IT infrastructure, and safeguard all data communications from being intercepted or altered.

## How are device updates evolving with 5G?

In the past, mobile operators used SMS to send updates to a SIM card via an OTA platform (for “over-the-air”). However, given all the various new types of IoT devices, new updating methods are necessary. With 5G, **IoT OTA platforms** rely on data connectivity to send updates. This can be done using the HTTP channel or other less energy-intensive communication protocols. OTA platforms can also detect when IoT devices reconnect to the 5G network to send updates.

## What does URLLC mean?

URLLC stands for Ultra-Reliable Low Latency Communications, in latency-critical applications that need to transmit information in real time, such as autonomous vehicles or remotely controlled surgical robots. 5G meets the requirements of URLLC thanks to 99.999% reliability and extremely low latency (1 ms).

## Why is 5G useful for low power IoT devices?

Low power cellular networks are used for IoT devices that require enhanced coverage, low throughput and minimal power (e.g. sensors to measure water consumption). 5G will handle these use cases through Long Term Evolution for Machines (LTE-M) and Narrow Band Internet of things (NB-IoT) – two Low Power Wide Area Networks (LPWAN) that already exist but will be natively included in 5G. Thanks to 5G deployment, the battery life of IoT devices will be extended from 10 years with 4G, to 15 years.

## What is network slicing?

Network slicing is a new concept introduced by 5G deployment, which will allow a 5G network to be virtually ‘cut up’ into several slices. The resulting subnetworks then deliver different performances depending on usage, without wasting resources. With network slicing, it is possible to ‘customize’ network parameters for different IoT applications, to allot resources more effectively and prioritize essential operations.

## Why should companies set up a private 5G network?

By using a dedicated infrastructure or network slice, **5G private cellular networks** can replace physical cables and Wi-Fi to transmit more data to more devices with a higher rate of responsiveness. This will enable private companies and critical service providers to control end-to-end security and configure network settings in line with their individual needs.