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|  | | Fifth Generation of Mobile Network | | | | |  | |
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Introduction:

* <https://www.qualcomm.com/5g/what-is-5g>

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##### Introduction

5G is the 5th generation mobile network. It is a new global wireless standard after 1G, 2G, 3G, and 4G networks. 5G enables a new kind of network that is designed to connect virtually everyone and everything together including machines, objects, and devices.

No one company or person owns 5G, but there are several companies within the mobile ecosystem that are contributing to bringing 5G to life. The industry organization that defines the global specifications for 3G UMTS (including HSPA), 4G LTE, and 5G technologies.

5G is based on [OFDM](https://en.wikipedia.org/wiki/Orthogonal_frequency-division_multiplexing) (Orthogonal frequency-division multiplexing), a method of modulating a digital signal across several different channels to reduce interference.

##### 5G use cases and system concept; frequency band

1. Introduction

Mobile access has been enhanced through higher bandwidth utilization efficiency resulting in higher and higher data rate. The maximum data rate of 3G is 20Mbps up to 100Mbps and is enhanced to 100Mbps–1Gbps in 4G. In 3G and 4G, the main focus was to enhance access data rate. Now 5G is being developed. The 5G is not only further enhancement of mobile access data rate. Its target is to cover diversified requirements as infrastructure for multimedia and IoT as well as voice communications.

1. Global Trends and Issues in ICT
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##### 5G network challenges

**First generation - 1G**  
1980s: 1G delivered analog voice.

**Second generation - 2G**  
Early 1990s: 2G introduced digital voice (e.g. [CDMA](https://www.qualcomm.com/content/qcomm-martech/us/en/home/our-company/research/stories/world-changing-technology)- Code Division Multiple Access).

**Third generation - 3G**  
Early 2000s: 3G brought mobile data (e.g. CDMA2000).

**Fourth generation - 4G LTE**  
2010s: 4G LTE ushered in the era of mobile broadband.

1G, 2G, 3G, and 4G all led to 5G, which is designed to provide more connectivity than was ever available before.

5G is a unified, more capable air interface. It has been designed with an extended capacity to enable next-generation user experiences, empower new deployment models and deliver new services. With high speeds, superior reliability and negligible latency, 5G will expand the mobile ecosystem into new realms. 5G will impact every industry, making safer transportation, remote healthcare, precision agriculture, digitized logistics — and more — a reality.

There are several reasons that 5G will be better than 4G:  
• 5G is significantly faster than 4G  
• 5G has more capacity than 4G  
• 5G has significantly lower latency than 4G  
• 5G is a unified platform that is more capable than 4G  
• 5G uses spectrum better than 4G

**5G is a unified platform that is more capable than 4G.**  
While 4G LTE focused on delivering much faster mobile broadband services than 3G, 5G is designed to be a unified, more capable platform that not only elevates mobile broadband experiences, but also supports new services such as mission-critical communications and the massive IoT. 5G can also natively support all spectrum types (licensed, shared, unlicensed) and bands (low, mid, high), a wide range of deployment models (from traditional macro-cells to hotspots), and new ways to interconnect (such as device-to-device and multi-hop mesh).  
   
**5G uses spectrum better than 4G.**  
5G is also designed to get the most out of every bit of spectrum across a wide array of available spectrum regulatory paradigms and bands—from low bands below 1 GHz, to mid bands from 1 GHz to 6 GHz, to high bands known as millimeter wave (mmWave).  
   
**5G is faster than 4G.**  
5G can be significantly faster than 4G, delivering up to 20 Gigabits-per-second (Gbps) peak data rates and 100+ Megabits-per-second (Mbps) average data rates.  
   
**5G has more capacity than 4G.**  
5G is designed to support a 100x increase in traffic capacity and network efficiency.1  
   
**5G has lower latency than 4G.**  
5G has significantly lower latency to deliver more instantaneous, real-time access: a 10x decrease in end-to-end latency down to 1ms.1