

1G, 2G, 3G, 4G, 5G

G?

- G → Generation
- Generation of wireless phone technology

1G

- Frequency: 150MHz / 900MHz
- Bandwidth: Analog telecommunication (30KHz)
- Characteristic: First wireless communication
- Technology: Analog cellular
- Capacity (data rate): 2kbps
- From 1980 to 1990
- Bad voice quality
- Poor battery, cellphones
- Big cellphones
- Better than nothing, at least its wireless and mobile



2G

- Frequency: 1.8GHz (900MHz), digital telecommunication
- Bandwidth: 900MHz (25MHz)
- Characteristic: Digital
- Technology: Digital cellular, GSM
- Capacity (data rate): 64kbps
- Why better than 1G?



- From 1991 to 2000
- Allows txt msg service
- Signal must be strong or else weak digital signal
- 2.5G
 - 2G cellular technology with GPRS
 - E-Mails
 - Web browsing
 - Camera phones



3G

- Frequency: 1.6 – 2.0 GHz
- Bandwidth: 100MHz
- Characteristic: Digital broadband, increased speed
- Technology: CDMA, UMTS, EDGE
- Capacity (data rate): 144kbps – 2Mbps
- Why better than 2G?
- From 2000 to 2010
- Called smartphones
- Video calls
- Fast communication
- Mobil TV
- 3G phones rather expensive



4G

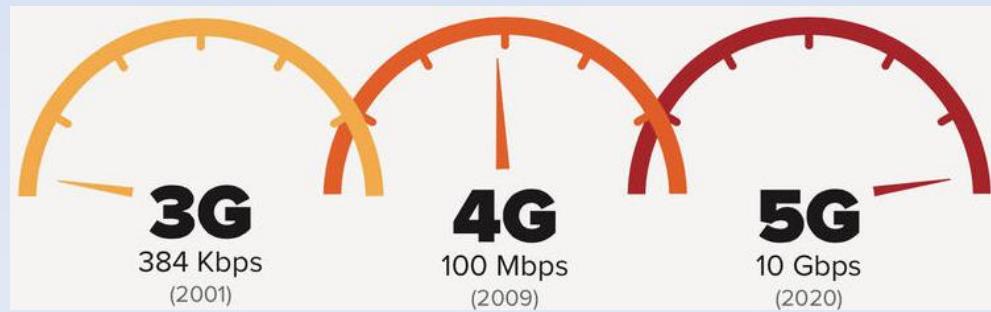
- Frequency: 2 – 8 GHz
- Bandwidth: 100MHz
- Characteristic: High speed, all IP
- Technology: LTE, WiFi
- Capacity (data rate): 100Mbps – 1Gbps
- Why better than 3G?



- From 2010 to today (2020?)
- MAGIC
 - Mobile multimedia
 - Anytime, anywhere
 - Global mobile support
 - Integrated wireless solutions
 - Customized personal service
- Good QoS + high security
- Bigger battery usage

5G

- <https://5g.co.uk/guides/5g-frequencies-in-the-uk-what-you-need-to-know/>
- Capacity (data rate): 1Gbps – ULIMITED?
- Why better than 4G?
 - From X (2020?) to Y (2030?)
 - High speed and capacity
 - Faster datatrasmission than 4G
 - Supports
 - Interactive multimedia
 - Voice streaming
 - Buckle up.. Internett
 - More efficient



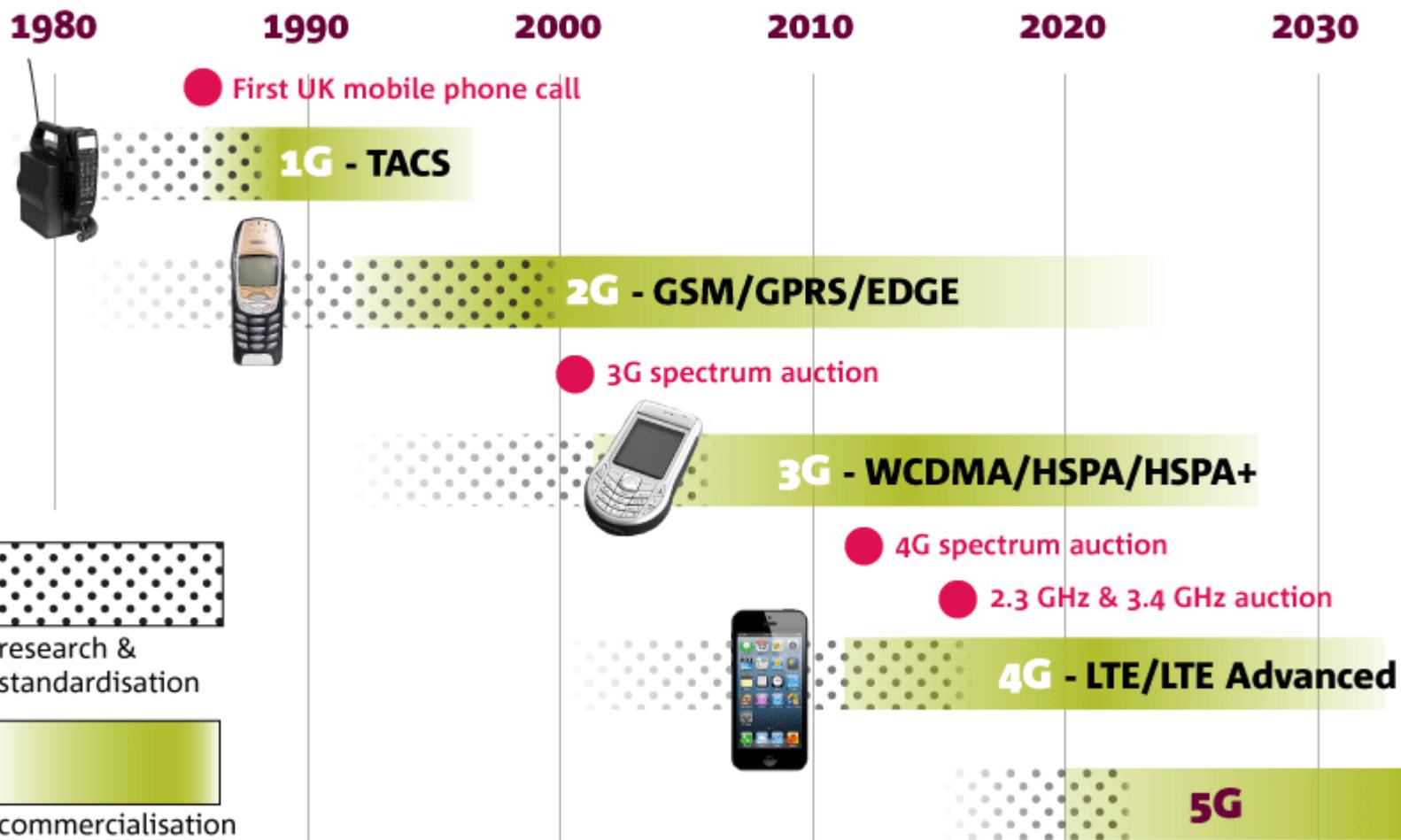
Comparison

	1G	2G	3G	4G	5G
Period	1980 – 1990	1990 – 2000	2000 – 2010	2010 – (2020)	(2020 - 2030)
Bandwidth	150/900MHz	900MHz	100MHz	100MHz	1000x BW pr unit area
Frequency	Analog signal (30 KHz)	1.8GHz (digital)	1.6 – 2.0 GHz	2 – 8 GHz	3 – 300 GHz
Data rate	2kbps	64kbps	144kbps – 2Mbps	100Mbps – 1Gbps	1Gbps <
Characteristic	First wireless communication	Digital	Digital broadband, increased speed	High speed, all IP	
Technology	Analog cellular	Digital cellular (GSM)	CDMA, UMTS, EDGE	LTE, WiFi	WWWW

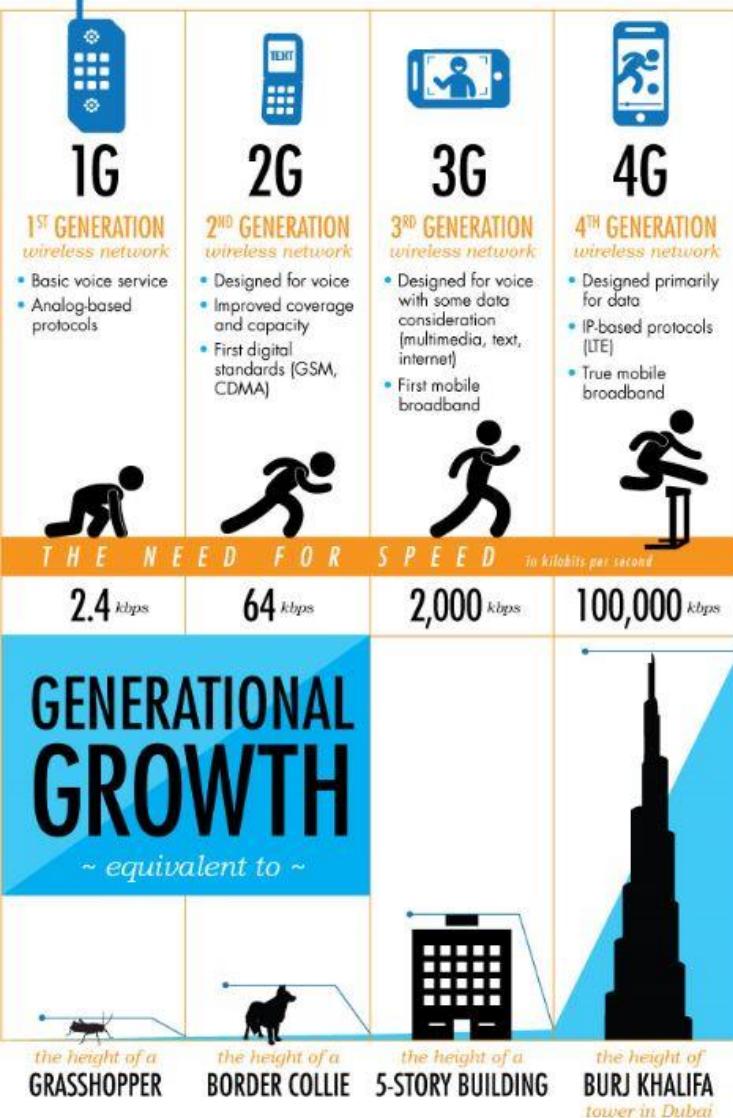
- <https://www.linedin.com/pulse/evolution-mobile-communication-from-1g-4g-5g-6g-7g-pmp-cfps>

Comparison

Evolution of mobile phone communications

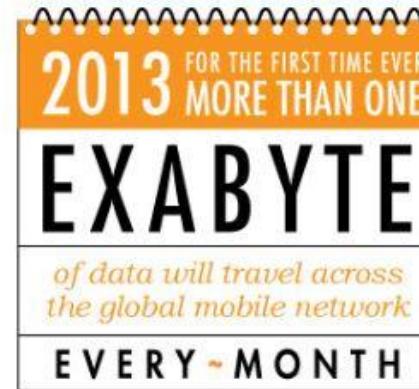


EVOLUTION OF THE G



Comparison

WHERE ARE WE HEADING?



10.8 EXABYTES ~ per month ~

2013

2016

1 EXABYTE ~ is equivalent to ~ 1 BILLION GIGABYTES

~ or ~



WHAT'S DRIVING THIS GROWTH? SMARTPHONE USERS

~ among other things ~

2013 1 in 3

2017 1 in 2

