FACTS ABOUT LTE
- LTE can make cellular networks much faster and more efficient. In fact, LTE can improve the performance of cellular networks by up to 50 times. This means that you can download and upload things much faster, and you can stream high quality multimedia content or play games with less lag or buffering.
- LTE also has better spectral efficiency, meaning it can use the available radio frequency spectrum (the part of the electromagnetic spectrum that cellular networks use to transmit signals) more efficiently, allowing more devices to connect to the network at the same time without causing interference.
- The peak data rates for LTE are 300Mbps (megabits per second) for downlink (when data is being transmitted from the network to the device) and 75Mbps for uplink (when data is being transmitted from the device to the network).
- Under very good signal conditions, data rates beyond 300Mbps can be achieved on LTE networks. This is because LTE uses a technique called carrier aggregation, which allows multiple frequency bands to be used simultaneously to increase the available bandwidth and improve data transmission rates.
- LTE's support for high data rates makes it suitable for data intensive applications such as VOIP (VOIP is a technology that allows people to make voice calls over the internet, rather than using traditional phone lines. VOIP calls can require a significant amount of bandwidth, particularly if the call is a video call or if it involves multiple people on the call) and high-speed cellular modems (devices that allow people to connect their computers or other devices to the internet using a cellular network).
- LTE supports both Time Division Duplex (TDD) and Frequency Division Duplex (FDD) modes of operation. In FDD mode, the uplink and downlink transmissions use different frequencies. In TDD mode, both the uplink and downlink transmissions share the same frequency band, but are separated in time.
- In LTE, the amount of carrier bandwidth (1.4 MHz up to 20 MHz) used can be adjusted based on the network's needs, and can be allocated dynamically based on the current network conditions. This flexibility in carrier bandwidth allows the network to adapt to changing demands for data, and provides a way to optimize network resources.
- In LTE, all devices are required to support MIMO (Multiple Input Multiple Output) transmissions. MIMO works by using multiple antennas on both the transmitting and receiving devices to send and receive multiple data streams over the same radio frequency carrier. This allows the base station to transmit several data streams to a single device, or to multiple devices simultaneously. MIMO technology is particularly useful in environments with high levels of interference or signal degradation, as it can improve the reliability and robustness of wireless communications.
- In LTE, all interfaces between network nodes are now IP-based providing a myriad of advantages. For one, IP is a widely-used standard protocol that is familiar to most network administrators, making it easier to manage and troubleshoot. It eliminates the need for expensive and complex legacy technologies.
- In LTE networks, QoS is standardized on all interfaces. QoS mechanisms help to ensure that different types of traffic (such as voice, video, and data) are prioritized appropriately based on their specific requirements.
- LTE technology can be used alongside existing 2G and 3G networks, allowing for seamless handover (the process of transferring an ongoing call or data session from one cell or base station to another as a mobile device moves from one coverage area to another) and roaming between different networks.

ADVANTAGES OF LTE
- High throughput: High data rates can be achieved in both downlink as well as uplink.
- Low latency: Time required to connect to the network is in the range of a few hundred milliseconds.
- Power efficiency: LTE supports power-saving states that allow devices to quickly enter and exit low-power modes, which can help to extend battery life and improve overall power efficiency.
- Seamless Connection: LTE will also support seamless connection to existing networks such as GSM, CDMA and WCDMA.
- Plug and play: When a user connects a new device, the system will automatically detect it, configure it, and begin using it without the user having to do anything else.
- Simple architecture: Because of Simple architecture low operating expenditure (OPEX).

LTE VS LTE ADVANCED VS LTE ADVANCED PRO

	Lte	Lte *advanced*	Lte *Advanced Pro*
DL Modulation Scheme	QPSK, 16QAM, 64QAM	QPSK, 16QAM, 64QAM, 256QAM	QPSK, 16QAM, 64QAM, 256QAM
UL Modulation Scheme	QPSK, 16QAM, 64QAM	QPSK, 16QAM, 64QAM	QPSK, 16QAM, 64QAM, 256QAM
DL Peak Data Rate	300 Mbps	1 Gbps	3 Gbps
UL Peak Data Rate	75 Mbps	500 Mbps	
Carrier aggregation	Not supported	Supported	Supported
Max Aggreg. Carrier	-	5	32
3GPP standard	Release 8, 9	Release 10, 11, 12	Release 13 and beyond
Latency	10 ms	10 ms	2 ms
Total Carrier Bandwidth	20 MHz	100 MHz	640 MHz
Spectrum Resources	700 MHz - 2.6 GHz	450 MHz - 3.8 GHz	450 MHz - 3.8 GHz, 5.1GHz - 5.9 GHz