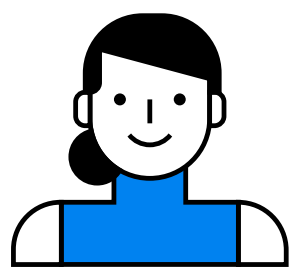


5G Voice

in a nutshell.

Learn it in 5 minutes!

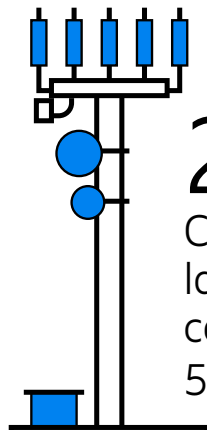


One aspect which could be seen as a hygiene factor for all 5G smartphones buyers is that a phone is still a phone! Users should be able to make regular service providers voice calls whether camping on 5G, 4G, 3G, 2G, or even Wi-Fi.

A 5G smartphone will not connect to a 5G network unless it can detect a voice-capable network.

Users must be able to make regular voice calls, emergency calls, and send SMS messages on 5G smartphones.

620M
5G subscriptions globally by June 2022*



210+
CSPs have launched commercial 5G services*

It is, however, quite advanced to make this voice service work in mobile networks, and when adding yet another radio access, 5G, the network will need to be further evolved to support this. It will take several years before 5G is fully rolled out everywhere in the world, and there are several steps in the network evolution which must be taken into consideration when enabling voice services on 5G smartphones and other 5G voice-capable devices.

The mobile network infrastructure used for VoLTE is also used for 5G voice calls

IMS continues as service engine for voice services in 5G

User advantages

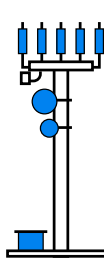
- Smartphones with high 5G data speeds
- HD voice+ codec (EVS - Enhanced Voice Service) for improved voice and music quality within calls (for example announcements, sharing music from a concert during a voice call). Though optional, EVS can also be used in 4G networks
- Superior voice quality in dense areas (for example shopping malls, sports arenas, factories) with high 5G-midband coverage, enabling higher voice bitrates
- Privacy protection reinforced with a new security mechanism for subscribers' identification
- Enabler for future 5G voice centric use case innovations (for example real-time voice translation, real-time interaction)

Service provider values

- Long-term reduced total-cost-of-ownership with fewer generations of networks to maintain
- If 2G/3G networks are closed down to re-farm spectrum for 4G and 5G, voice services will be supported via 4G and 5G instead
- More capacity for voice and video in dense city areas covered with wide 5G mid-band radio spectrum



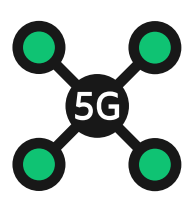
5G Core + IMS (VoLTE)



5G Radio Access



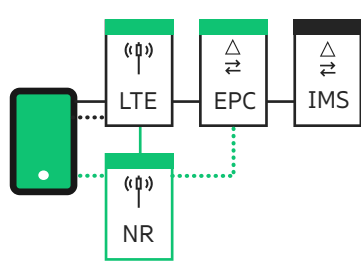
HD Voice+ (Enhanced Voice Services - EVS codec)



Different generation of 5G smartphones use different mobile network functionalities to enable voice calls

4G/5G Dual Connectivity (Non Standalone)

Voice over 4G while using 5G as a data boost



Advantages

- Enables early market launch of smartphones with high 5G data speeds

Drawbacks

- Reduced voice up-link coverage due to the user equipment power sharing between 4G and 5G accesses
- Shorter battery time on 5G smartphones
- More complex and costly smartphones

Mobile network

- SW upgrade of 4G and 5G Radio Access Network
- SW upgrade of EPC

5G devices

- 5G smartphone with support for dual 4G/5G connectivity
- VoLTE-enabled

EPS Fallback (Standalone)

5G for data traffic, falling back to voice and data over 4G during voice call

Advantages

- Enables early market launch of smartphones with high 5G speeds
- Improved voice up-link coverage vs dual-connectivity phones
- Enables 5G unique business opportunities and reduced cost of network operation
- Enables smartphones in networks supporting new 5G standalone specific capabilities such as slicing and real-time sensitive services.
- Fast Return to the high 5G data speeds while not being on a call: just a couple of hundred milliseconds after the EPS Fallback call has completed

Drawbacks

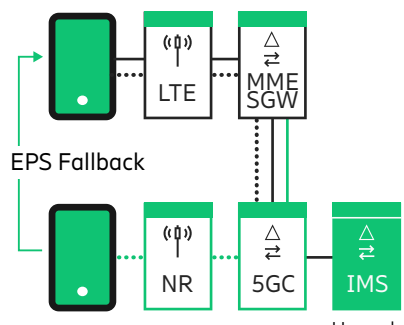
- No 5G data speeds while making voice calls
- Somewhat longer call setup time due to fallback from 5G to 4G

Mobile network

- SW upgrade of IMS
- SW upgrade of 5G Core
- SW upgrade of 5G Radio Access Network

5G devices

- 5G smartphone with support for EPS Fallback
- Backwards compatible with earlier functionalities



4G Voice

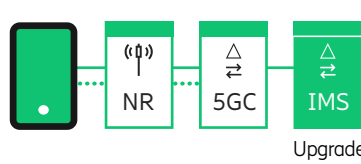
4G Data

5G Voice, new and enhancements

5G Data, new and enhancements

Voice over NR (Standalone)

5G for voice and data, seamless mobility between 4G and 5G with voice handover



Advantages

- Always high 5G data speeds also while making phone calls
- Improved voice quality between 5G smartphones with HD voice+
- Improved video calling experience
- Enables new 5G unique services that interact with voice and video calling
- Possibility to use lower 5G frequency bands for excellent indoor and wide area voice coverage

Drawbacks

- If spotty and limited 5G coverage, there could be many voice handovers, deteriorating call reliability

Mobile network

- SW upgrade of IMS
- Upgrade to 5G core network (5GC) built on service-based architecture (SBA) with tight interworking with EPC
- SW upgrade of 4G and 5G Radio Access Network

5G devices

- 5G smartphone with support for voice over NR (VoNR) and video over NR (ViNR)

Deep Dive Learning
5G Voice
[Read 5G Voice Papers](#) | [Listen 5G Voice Webinar](#)

*<https://www.ericsson.com/en/reports-and-papers/mobility-report/reports/june-2022>