**Unit-I**

**Second Generation (2G) Mobile Services**

Second generation (2G) mobile phones switched from analog system of 1G to digital system. It was commercially launched in 1991 as GSM standard in Finland. As with 1G phones, 2G phones didn’t have any worldwide standardizations. 2G systems were also known as personal communications services (PCM).

**Advantages of 2G over 1G**

* It allows voice signals to be digitized and compressed. So, they are more efficient on frequency spectrum than 1G.
* They introduced data services for mobile in form of SMS text messaging.
* Data and voice signals are digitally encrypted. So, security against eavesdropping and fraud increased manifold.
* Digital signals consume less battery power. And so mobile sets are much more energy efficient than their 1G counterparts.

**Popular 2G Systems**

Several 2G systems were developed, the notable among which are as follows −

* **D – AMPS (Digital Advanced Mobile Phone Systems)** : D-AMPS was a digital version of advanced mobile phone systems (AMPS) that coexisted with AMPS. It used time division multiplexing (TDM) for multiple calls.
* **GSM (Global System for Mobile Communications)** : 2G was launched through GSM. It is the most widely globally used technology. It uses frequency division multiplexing (FDM) and time division multiplexing (TDM) for handling multiple calls simultaneously.
* **CDMA (Code Division Multiple Access)** : It uses a different technology from the above and was standardized by International Standards IS-95.

**Three primary benefits of 2G networks over their predecessors were:**

1. Digitally encrypted phone conversations.
2. Significantly more efficient use of the radio frequency spectrum enabling more users per frequency band.
3. Data services for mobile, starting with [SMS](https://en.wikipedia.org/wiki/Short_Message_Service) text messages.

2G technologies enabled the various networks to provide the services such as text messages, picture messages, and MMS (multimedia messages). All text messages sent over 2G are digitally encrypted, allowing the transfer of data in such a way that only the intended receiver can receive and read it.

After 2G was launched, the previous mobile wireless network systems were retroactively dubbed [1G](https://en.wikipedia.org/wiki/1G). While radio signals on 1G networks are [analog](https://en.wikipedia.org/wiki/Analog_signal), radio signals on 2G networks are [digital](https://en.wikipedia.org/wiki/Digital_data). Both systems use digital signaling to connect the radio towers (which listen to the devices) to the rest of the mobile system.

With [General Packet Radio Service](https://en.wikipedia.org/wiki/General_Packet_Radio_Service) (GPRS), 2G offers a theoretical maximum [transfer speed](https://en.wikipedia.org/wiki/Bandwidth_(computing)) of 40 kbit/s. (Enhanced Data Rates for GSM Evolution), there is a theoretical maximum transfer speed of 384 kbit/s.