

# GSM TECHNOLOGY



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## GSM Technology

What is GSM technology

GSM stands for Global System for Mobile Communications. Just like computers, mobile phones have evolved over time. There were first generation mobile phones in the 70's, there are 2nd generation mobile phones in the 80's and 90's, and now there are 3rd generation mobile phones which we call as 3G phones. So this GSM is called a 2nd generation, or 2G communications technology.



Now, GSM makes use of two principles. The first called Time division Multiplexing is very simple. Let's say that one of your friends possesses the new and sleek Apple's I Phone. Everyone wants to try a hand at your new accessory. What do you'll do? You lend it to your friend Time for some time, then you let John listen to music on it, then you let Linda check her e-mails on it, and finally you let Nancy search on Google. So what did you do? You allowed each of your friends to share you IPhone for some time. That is, you allowed you IPhone to be shared in time.

On the same lines, in GSM, the radio frequency say 890 MHz is shared by different users in time. This means if user A, B, C and D all talk at the same time. You assign the 890 MHz frequency to A for some time and allow him to talk, then you assign 890 band to B for sometime to speak, then to C , and finally to D, before coming back to A. So the process continues in a round robin fashion, as long as A, B, C, and D want to talk. This way many users talk at same time on the same frequency. This has to be done, because as we now frequency or Bandwidth is a scarce resource and is not available in plentiful, so it must be shared.

Now the second principle that GSM uses is Frequency Division Multiplex. In Frequency Division Multiplex, users A, B, C and D, all use different frequency say 890, 900, 910, 920 for their respective communications. A very good example of this is Radio broadcasting. Because all the radio operators like Rad FM, Go FM, and Radio Mirchi want to operate in the same area, they use different frequencies for communication 91.0FM, 93.5FM, 94.6 FM, 108FM. So to listen to different communications, you have to tune in the receiver set to different frequencies.

Now, GSM uses a combination of TDMA and FDMA. This means that users A and B are not only sharing the channel in time but also frequency. This means that user A is on the channel 890Mhz for 2 seconds, then jumps to 900Mhz channel for the next to seconds, then jumps to 910Mhz for the next 2 seconds and so on... Thus, each user is uses a different frequency at different time slots. This is called Frequency Hopping.

## GSM overall efficiency

For Subscribers	For Operators
Low cost entry handsets	Economies of scale due to dominant market share
Wide choice and availability of handsets	Choice of multiple vendors
International roaming	Capex optimization
Easy subscription	Lower subscriber acquisition cost
	Seamless interoperability

Which is the better one?

Under this topic I thought to contrast the two technologies GSM and CDMA. In the beginning, GSM was in fact superior. It had more services and allowed more data transfer. But CDMA, facing the advantages of the competitor standard, soon delivered the same features found on GSM. Nowadays, it is not possible to say that GSM services are better than CDMA. Multimedia messages, video, high-speed Internet access, digital camera and even PDA function are some of the features we can find on both technologies. The new CDMA 1XRTT technology, which previews what G3 cell phones will bring, is more advanced than EDGE, technology from the beginning of 3G generation, allowing higher transfer rates.

Even the GSM SIM card advantage, that allows you to change your cell phone and keep your phone list, is being supplanted by some CDMA operators with a service that allows you to store your phone book on the operator's database, allowing you to recover your phone book even if your cell phone is stolen (which is not possible with GSM, since if your cell phone is stolen, your SIM card will be stolen together). Notice that recently a new accessory called SIM backup was released, which allows you to backup the data stored in your SIM card. Also some GSM operators are offering a similar backup service.

So, nowadays both technologies are equiparated in technology, but this picture won't be like that in the future. After all, CDMA evolution ground is wider and in a few years it will be superior than GSM. This means that GSM operators will disappear? Not at all. They will migrate over CDMA and the war will continue.

## Future of GSM technology

In the future the number of GSM subscribers around the world is set to increase by 40 million per month, adding up to almost half a billion new users by the end of the year. To meet this demand more than one billion mobile phones and terminals are expected to be sold.

Growth is primarily being driven by new network deployments and capacity expansions in high-growth markets such as Asia and Africa, while more than 10 million new subscribers are being added every month across China and India.

Ulf Ewaldsson, head of Product Area Radio at Ericsson, says: "The fast expansion occurring in high-growth markets shows no sign of slowing down. In India alone, Ericsson is currently installing a new GSM base station every 15 minutes and every month more than 6 million new subscriptions are taken out. In April, 121 million of the 1.1 billion Indians had a mobile phone."



The economies of scale offered by mature GSM technology is one reason behind today's expansion in high-growth markets. The GSM experts are now seeing the effects of scale in several dimensions. GSM technology has become affordable to many more people and terminals are cheaper, however there are still many issues to address before all the needs of these new subscribers can be met.