

What is CDMA?

Code Division Multiple Access (CDMA) is a digital cellular technology used for mobile communication. CDMA was an innovative use of **direct sequence spread spectrum technology** used to provide a multiple access scheme for mobile telecommunications and other wireless systems.

CDMA used the property of DSSS that unless the transmitter and receiver used the same spreading code for both ends of the process, the signal could not be decoded and in this way, it was able to provide a means of enabling a variety of different users to use the same channel to access a base station without mutual interference.

In this way, using CDMA different users were allocated different codes rather than different slots, channels, etc

A Simple Analogy to understand CDMA concept:

Let's take a simple analogy to understand the concept of CDMA. Assume we have a few students gathered in a classroom who would like to talk to each other simultaneously. Nothing would be audible if everyone starts speaking at the same time. Either they must take turns to speak or use different languages to communicate.

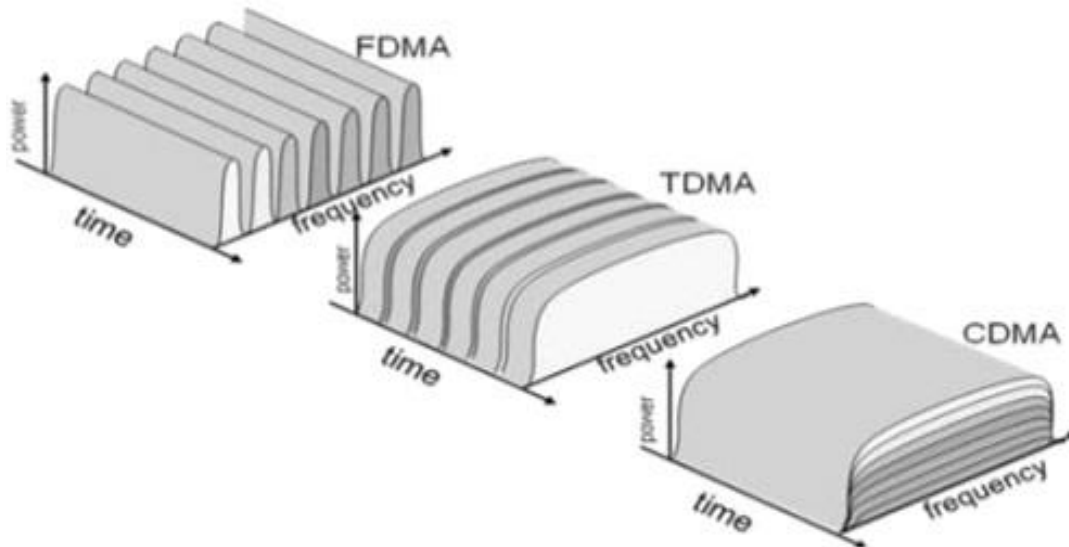
The second option is quite similar to CDMA — students speaking the same language can understand each other, while other languages are perceived as noise and rejected. Similarly, in radio CDMA, each group of users is given a shared code. Many codes occupy the same channel, but only those users associated with a particular code can communicate.

Salient Features of CDMA

CDMA, which is based on the spread spectrum technique has following salient features –

- In CDMA, every channel uses the full available spectrum.
- Individual conversations are encoded with a pseudo-random digital sequence and then transmitted using a wide frequency range.
- CDMA consistently provides better capacity for voice and data communications, allowing more subscribers to connect at any given time.
- CDMA is the common platform on which 3G technologies are built. For 3G, CDMA uses 1x EV-DO and EV-DV.

Code Division Multiple Access system is very different from **time and frequency multiplexing**. In this system, a user has access to the whole bandwidth for the entire duration. The basic principle is that different CDMA codes are used to distinguish among the different users.



Disadvantages of CDMA :

- Time synchronization is required
- It can't offer international roaming, a large GSM advantage
- The CDMA system performance degrades with an increase in the number of users
- In while we are using CDMA, code length can be carefully selected, because it can induce delay
- When the number of users increases, the overall quality of service decreases.
- Self-jamming problem
- The near-far problem arises when we are using CDMA techniques
- Higher cost due to the greater equipment
- Reduce capacity because gradual transfer increases the use of radio resources

Difference between GSM and CDMA:

1. GSM supports transmitting data and voice both at once, but CDMA have not this feature.
2. in GSM, the customer information is put on a SIM card which can be moved to a new mobile phone. Whereas only mobile phones

from a set of whitelisted companies can be used with a CDMA network.

3. More security is provided in **CDMA technology as compared with the GSM technology** as encryption is inbuilt in the CDMA

SERIAL NO.	GSM	CDMA
1. Full form	Global System for Mobile communication.	Code Division Multiple Access.
2. Technology used	FDMA(Frequency division multiple access) and TDMA (Time division multiple access).	CDMA(Code division multiple access).
3. Availability	GSM is globally widely used and available.	CDMA is available in fewer countries and carriers.
4. Data speed rate	42Mbps in HSPA (3G).	3.6Mbps in CDMA.
5.Features	GSM supports transmitting data and voice both at once.	CDMA does not support this feature.
6. Customer Information	Stored in a SIM card.	Stored in a headset or phone.