

Differences between TDMA, CDMA, and FDMA

With acknowledgement and appreciation to My Lord on Yahoo Answers

TDMA

Time division multiple access (TDMA) is a channel access method for shared medium (usually radio) networks. It allows several users to share the same frequency channel by dividing the signal into different timeslots. The users transmit in rapid succession, one after the other, each using his own timeslot. This allows multiple stations to share the same transmission medium (e.g. radio frequency channel) while using only the part of its bandwidth they require. TDMA is used in the digital 2G cellular systems such as Global System for Mobile Communications (GSM), IS-136, Personal Digital Cellular (PDC) and iDEN, and in the Digital Enhanced Cordless Telecommunications (DECT) standard for portable phones. It is also used extensively in satellite systems, and combat-net radio systems.

TDMA is a type of Time-division multiplexing, with the special point that instead of having one transmitter connected to one receiver, there are multiple transmitters. In the case of the uplink from a mobile phone to a base station this becomes particularly difficult because the mobile phone can move around and vary the timing advance required to make its transmission match the gap in transmission from its peers

CDMA

Code division multiple access (CDMA) is a form of multiplexing and a method of multiple access that divides up a radio channel not by time (as in time division multiple access), nor by frequency (as in frequency-division multiple access), but instead by using different pseudo-random code sequences for each user. CDMA is a form of "spread-spectrum" signaling, since the modulated coded signal has a much higher bandwidth than the data being communicated.

CDMA also refers to digital cellular telephony systems that make use of this multiple access scheme, such as those pioneered by QUALCOMM, and W-CDMA by the International Telecommunication Union or ITU.

CDMA has been used in many communications and navigation systems, including the Global Positioning System and in the OmniTRACS satellite system for transportation logistics

FDMA

Frequency Division Multiple Access or FDMA is an access technology that is used by radio systems to share the radio spectrum. The terminology "multiple access" implies the sharing of the resource amongst users, and the "frequency division" describes how the sharing is done: by allocating users with different carrier frequencies of the radio spectrum.

This technique relies upon sharing of the available radio spectrum by the communications signals that must pass through that spectrum. The terminology "multiple access" indicates how the radio spectrum resource is intended to be used: by enabling more than one communications signal to pass within a particular band; and the "frequency division" indicates how the sharing is accomplished: by allocating individual frequencies for each communications signal within the band.

In an FDMA scheme, the given Radio Frequency (RF) bandwidth is divided into adjacent frequency segments. Each segment is provided with bandwidth to enable an associated communications signal to pass through a transmission environment with an acceptable level of interference from communications signals in adjacent frequency segments