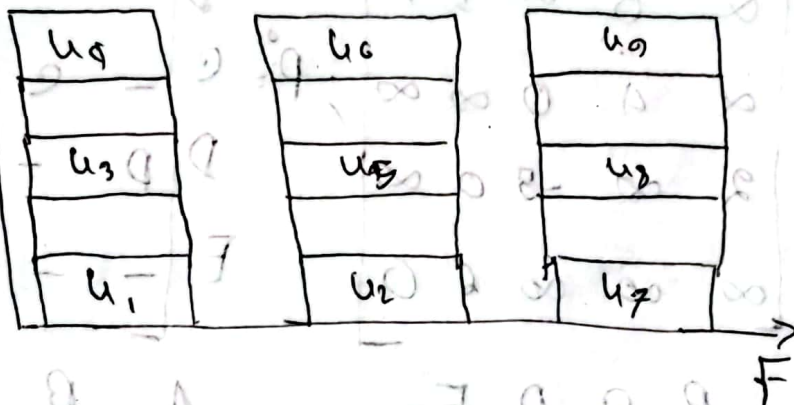
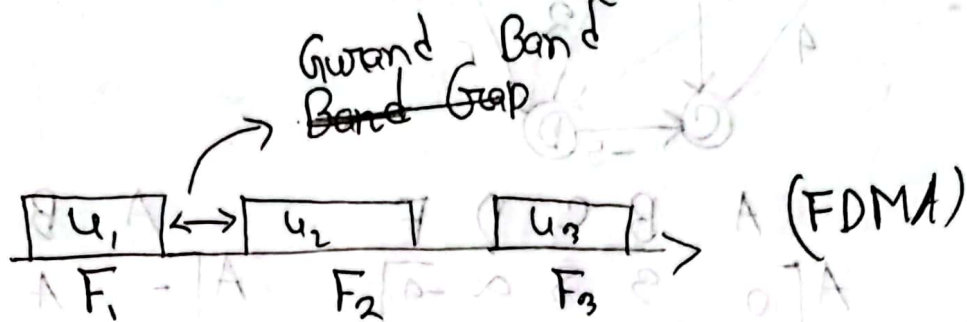


Communication Engineering

Multiple Access Technologies:

- * Frequency Division Multiple Access (FDMA)
- * Time Division Multiple Access (TDMA)
- * Code Division Multiple Access (CDMA)



(TDMA)

Digital Cellular

* Mobile System :

Advantages:

The advantages of Digital Cellular System is:

- three to ten fold capacity increase over analog system.
- reduced RF transmission power & longer battery life.
- international & wide-area roaming capability.
- better security against fraud.
- encryption, capability for information & privacy.
- compatibility with ISDN.
- ability to operate in small (micro cell) environment.

GSM (Global System for mobile communication)

~~The~~ ~~Europ~~

The European TDMA
Digital cellular system

* Developed by Groupe Special Mobile.

* 1982 → Develop

* 1990 → release

Characteristics: → Digital System

- Fully Utilizing the 900 MHz freq. band

- TDMA over radio carriers.

- 8 full rate or 16 half rate TDMA
channel per carrier.

- user authentication.

- Encryption of speech & data transmission over
the radio path full international roaming
capability low speed data services upto
9.6 Kbps.

- compatibility with ISDN for supplementary
services

- Support short message service (SMS)

❑ The common ISDN like supplementary supported by GSM are

- Call forwarding.
- call ~~bar~~ barring
- call waiting
- call hold
- call forwarding
- calling line presentation restriction service
- Advice of charge service.
- close user group service.

❑ The GSM standard has been undergoing continuous extension & inheritance to support more services & more capabilities like

→ HSCSD → High Speed Circuit Switched Data.

→ GPRS → General Packet Radio Service.

→ CAMEL → Customized applications for mobile network enhancement logic.

Camel

Camel, which stands for customized Application for mobile Network Enhanced Logic, is a set of standards developed within the telecommunication industry to provide advanced services and capabilities in mobile networks.

Camel Purpose:

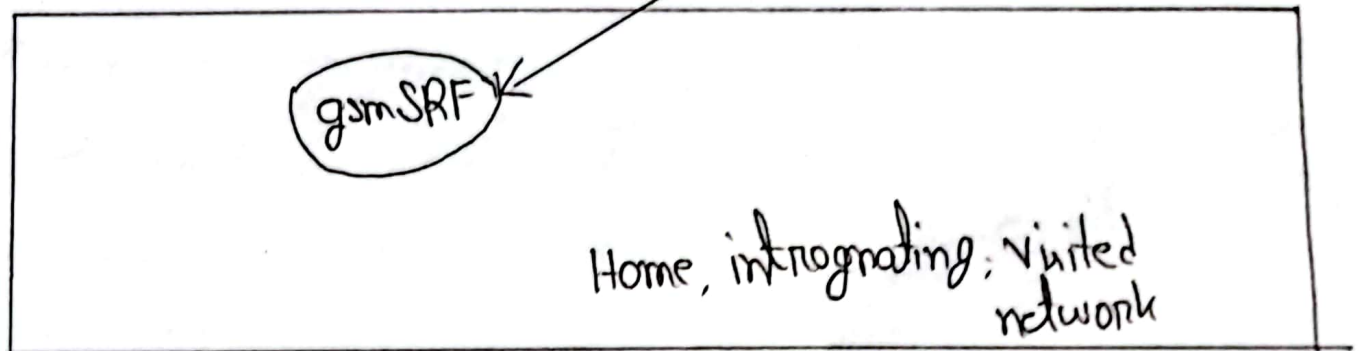
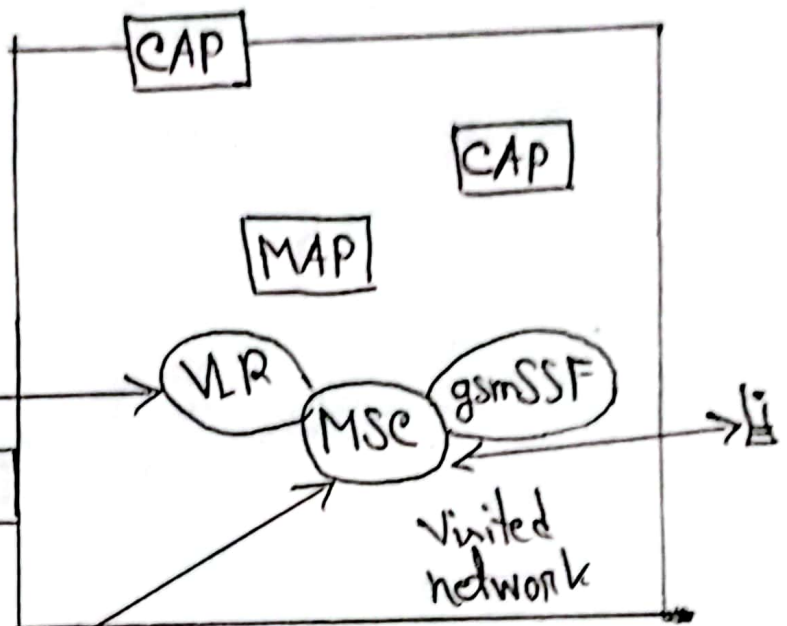
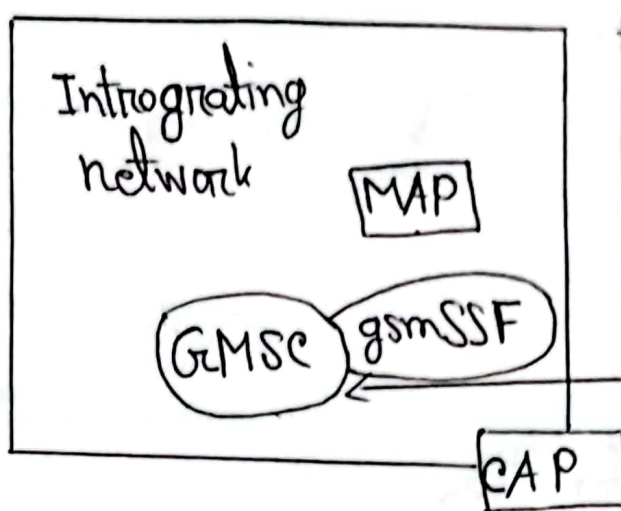
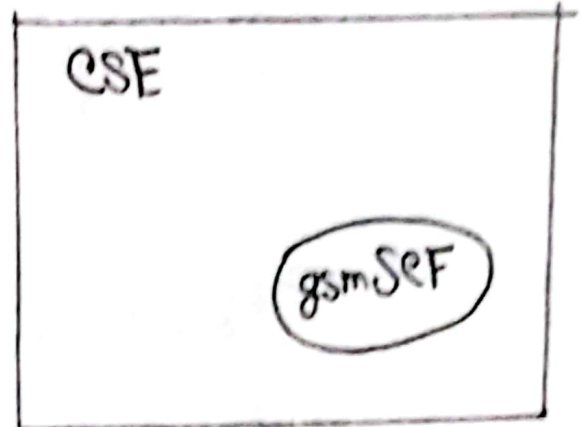
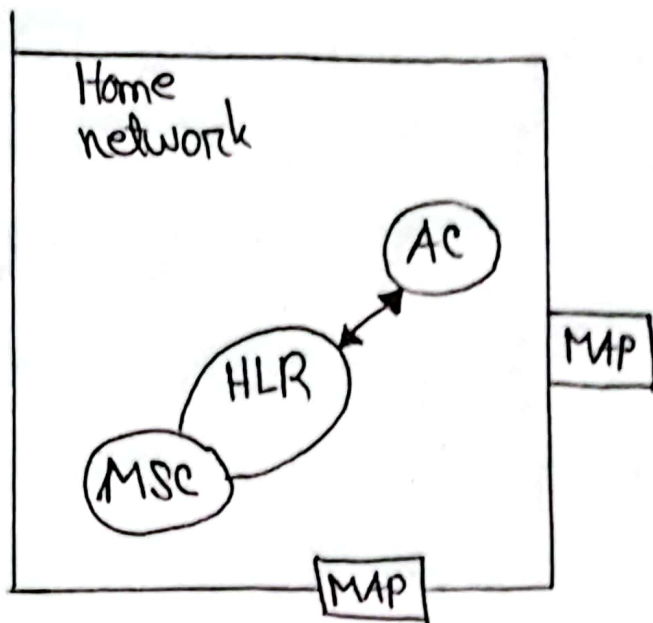
- It was introduced to enable the development of customized & advance services in mobile network.
- It allows network operator to create & deploy new services without modifying the core network elements.

Camel Services:

- It enables the creation of a variety of services.
- It including prepaid & postpaid services, call forwarding.
- It has ability customize services based on subscriber.

Evolution:

- It has evolved over time to keep pace with advancement in mobile networks.



HSCSD

HSCSD is a technology used in Communication engineering enhance the data transfer rate over GSM networks.

Enhancement:

It achieves this by using multiple time slots in GSM network for a single user during a data session.

Data Rates:

It offers significantly higher data rates, ranging from 14.4 to 59.6 kbps.

Efficient use:

It optimizes the use of available resources in GSM network.

Evolution:

It serves as an evolutionary step in improving data transfer rates over GSM networks.

^{used} GPRS
GPRS for wireless communication that extends the capabilities of the Global System for GSM.

Packet switching:

- It uses packet-switching technology, which means that data is divided into packets before transmission. Each packet is then sent individually & can take different routes to reach the destination.

Data transmission Rate:

- It provides data transfer rates ranging from 56 up to 114 kbps.

Enhancement:

- It has further enhanced with technologies like Enhanced Data Rates for GSM.

Application:

- It has been widely used for various mobile data applications, including mobile internet, email & other services.