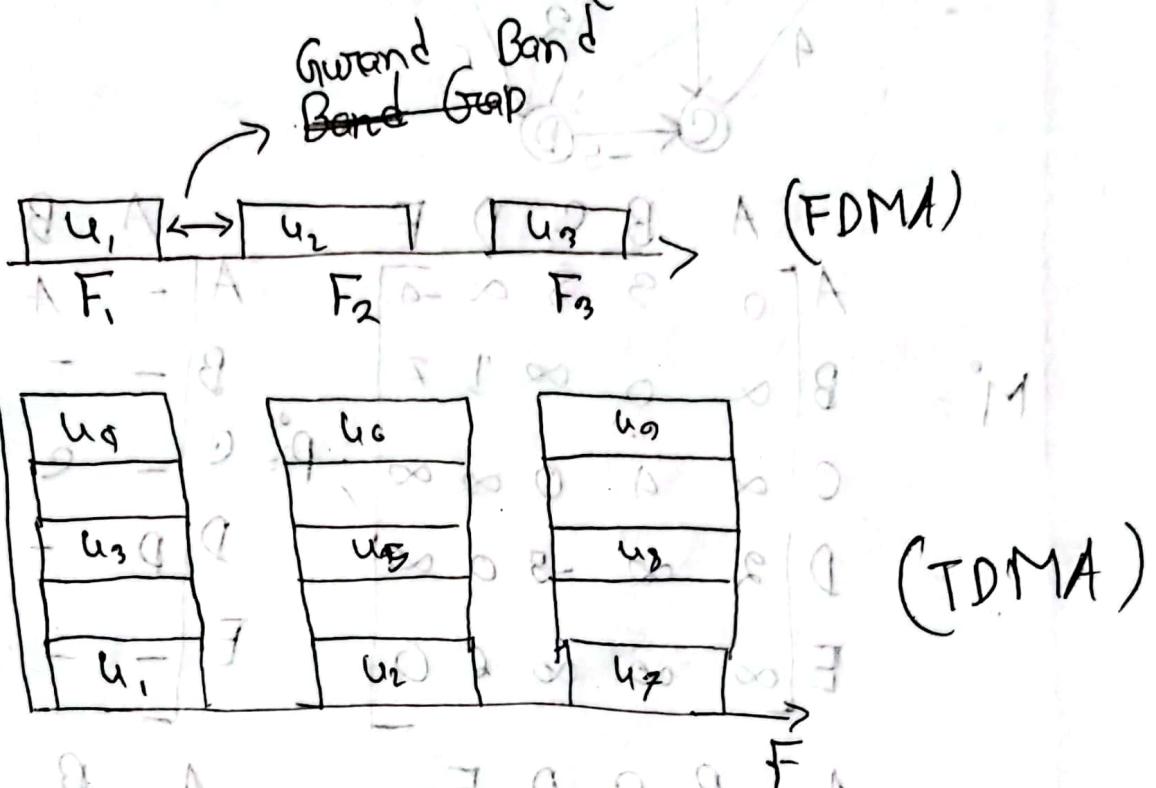


Communication Engineering

Multiple Access Technologies:

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



Digital Cellular

* Mobile System :

Advantages:

The advantages of Digital Cellular System :

- 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 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 carrier
- 8 full rate or 16 half rate TDMA channels 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 ~~bear~~ barring

- call waiting

- call hold

- call conferencing

- calling line presentation restriction service

- Advice of charge service.

- closed 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 application for mobile network enhance 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:

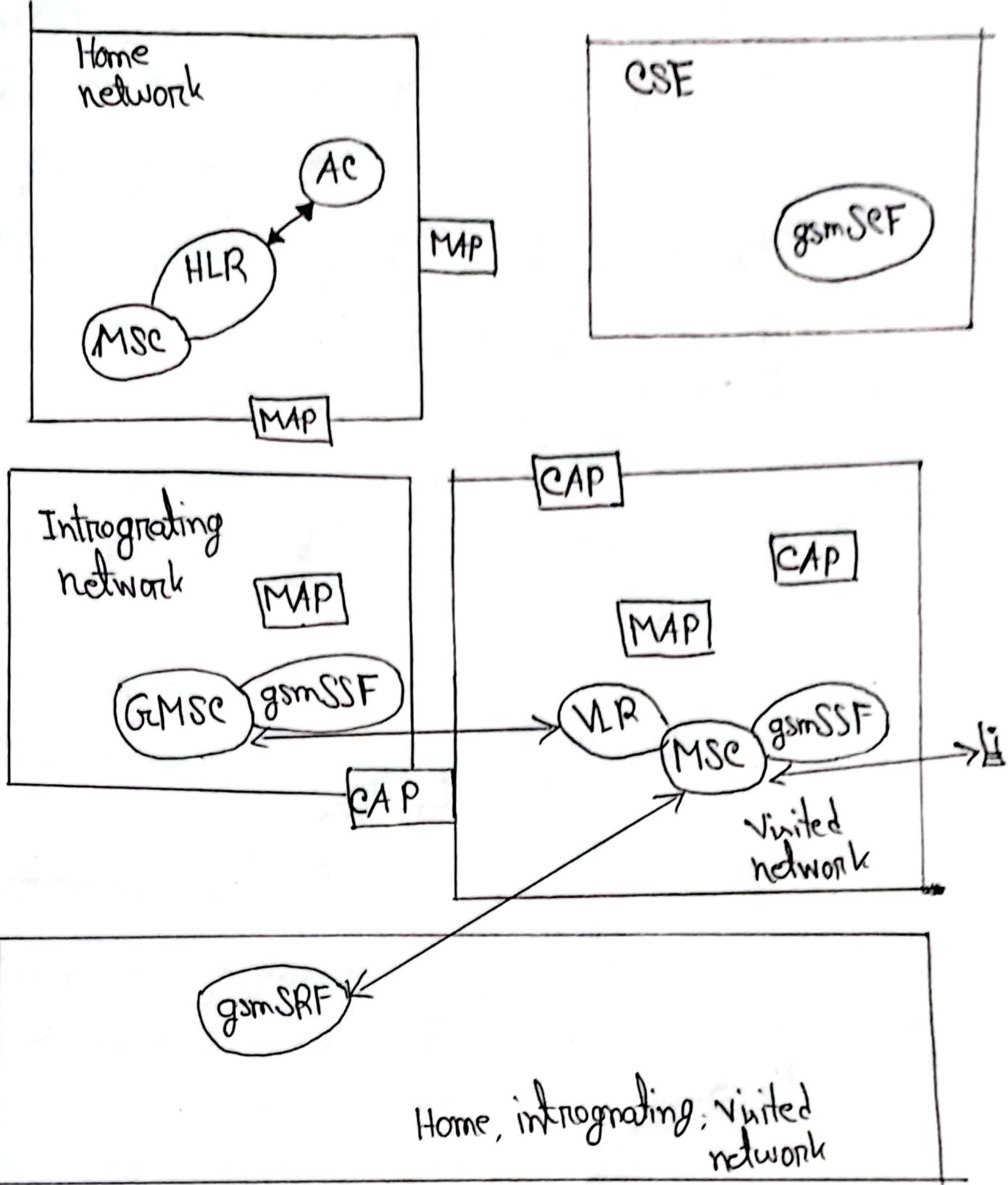
- It was introduced to enable the development of customized & advance services in mobile network
- It allows network operator to create & deploy new services without modifying the core network elements.

Camel Services:

- It enables the creation of a variety of services.
- It includes prepaid & postpaid services, call forwarding.
- It has ability to 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 57.6 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.