

2 G ARCHITECTURE– GSM, GPRS AND OTHERS

Lesson 07

Localization and Calling

LOCALIZATION

- A process by which mobile service identifies a mobile station, authenticates,
- MSC provides Service through BSC and BTS either at the home location of the MS or at a visiting location

CONNECTION SETUP

- Users want instantaneous connection setup for a call and want service on demand even while they are on the move
- The mobile service providers, on the other hand, will provide service(s) to the user only after identification of MS and verification of services subscribed

LOCALIZATION MECHANISM OF THE GSM

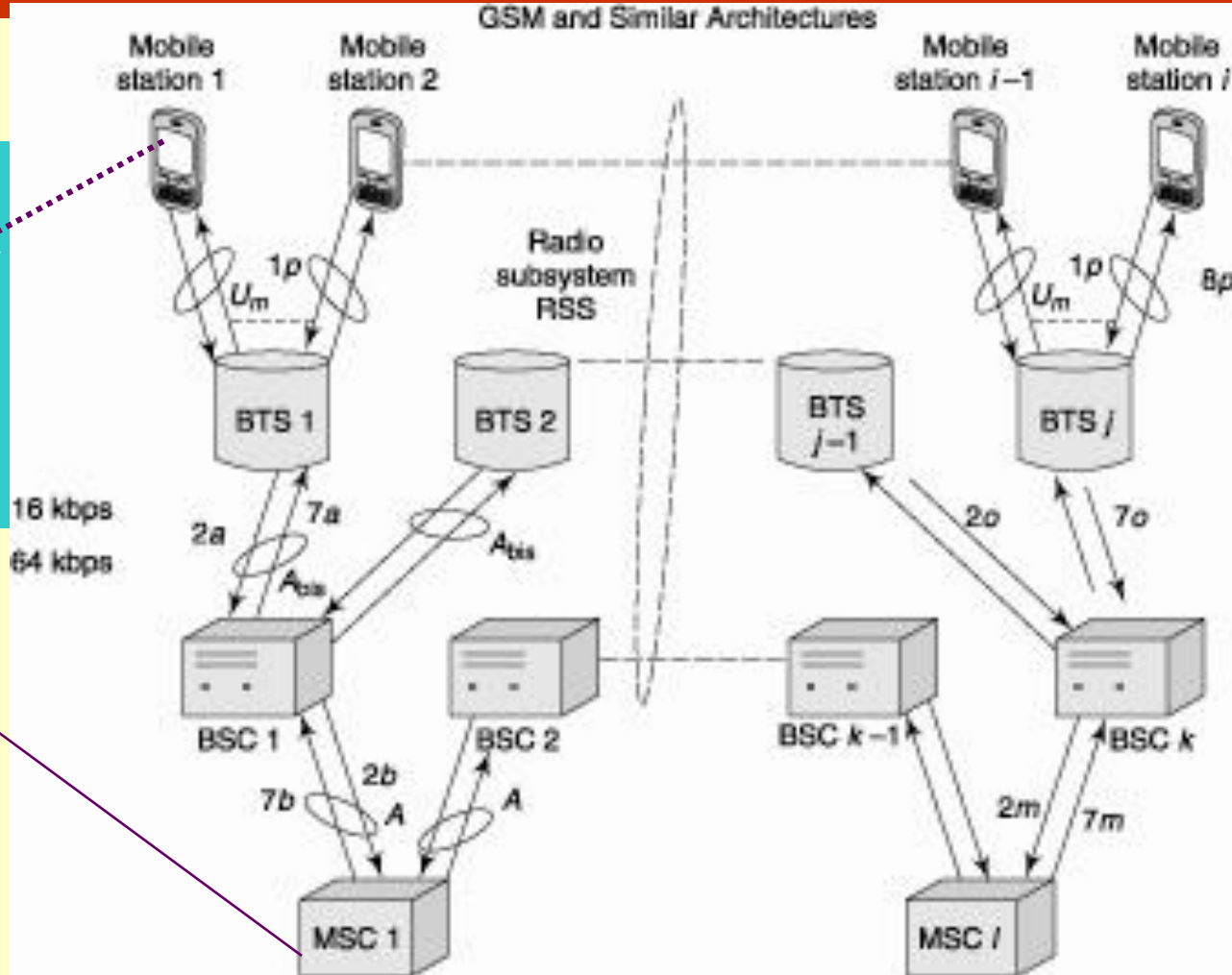
- Only after identifying the mobile station (MS) of the user
- Only Verifying the services subscribed

NSS (NETWORK SUBSYSTEM) OF GSM ARCHITECTURE

- Periodically updates the location of those MSs when not switched off and are not struck off (or blocked) from the list of subscribers to given mobile service
- The SIM in a mobile station MS_i stores location-area identification (LAI)

MSC SENDING LAI FOR STORE AT SIM IN MOBILE STATION

LAI updated by VLR through MSC



LAI

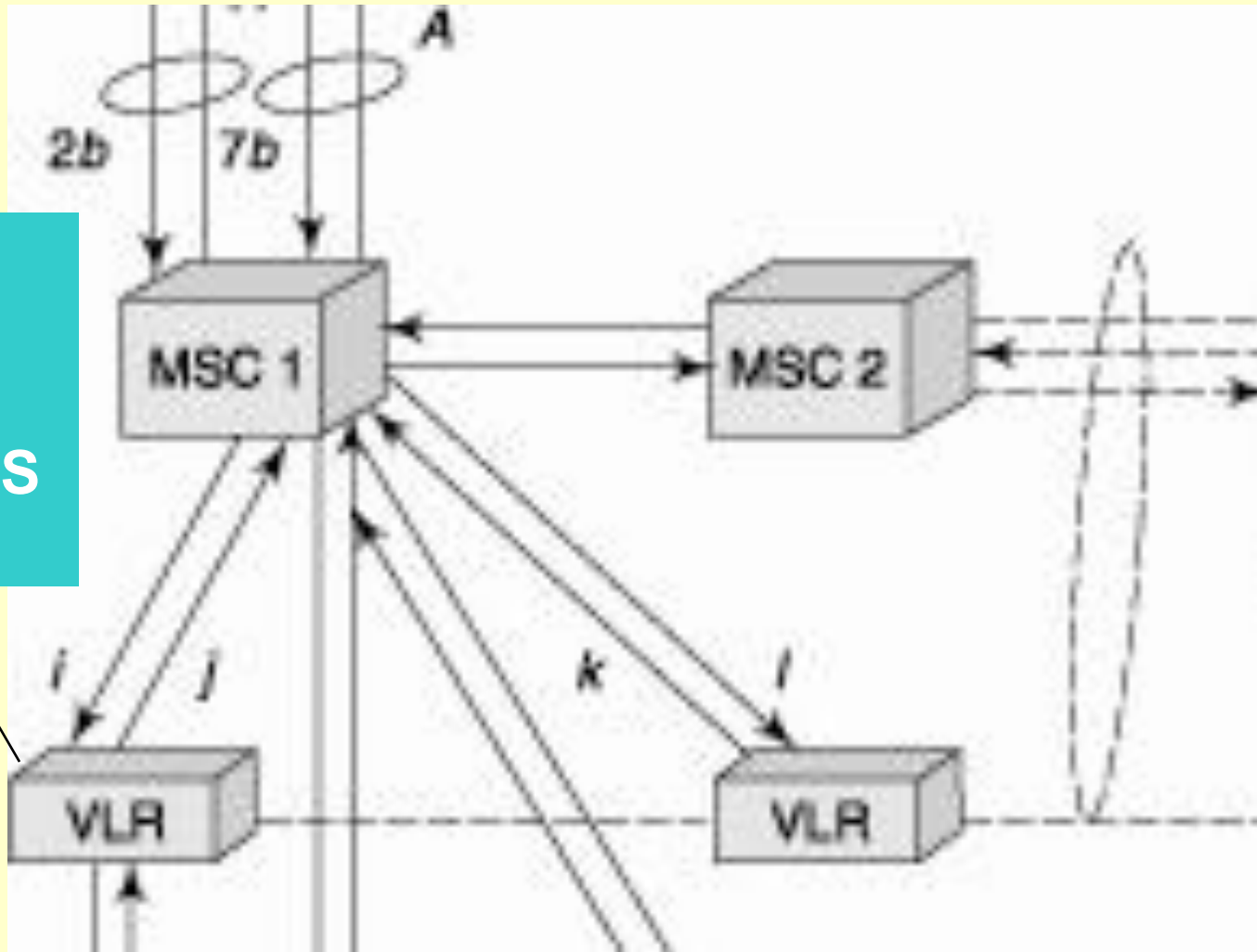
- Location information

TMSI

- Temporary mobile subscriber identity (TMSI)

VLR FOR SENDING TMSI FOR BTS AND MOBILE STATION THROUGH MSC AND BSC

For Mobile station and BTS a TMSI



MAIN FUNCTIONS OF HLR

- Registration of information regarding IMSI (international mobile subscriber identity)
- MSISDN (mobile station international subscriber ISDN number)
- Roaming restrictions

MAIN FUNCTIONS OF HLR

- Call forwarding
- Mobile subscriber roaming number (MSRN)
- Present VLR
- Present MSC

MSISDN

- Internationally used code of the country followed destination area code in a country and subscriber number
- The identical coding scheme for address used in the ISDN network employing a fixed wire or fiber line)

PRESENT VLR AND MSC INFORMATION

- Can change when the user MS moves into another location area but the HLR which stores this information remains the same

MAIN FUNCTIONS OF VLR

- Registration of information pertaining to currently associated MSs
- Information about their HLR, IMSI, and MSISDN
- Storing information of the MSs which are in its location area and to which the MSC (associated with the given VLR) is currently network services

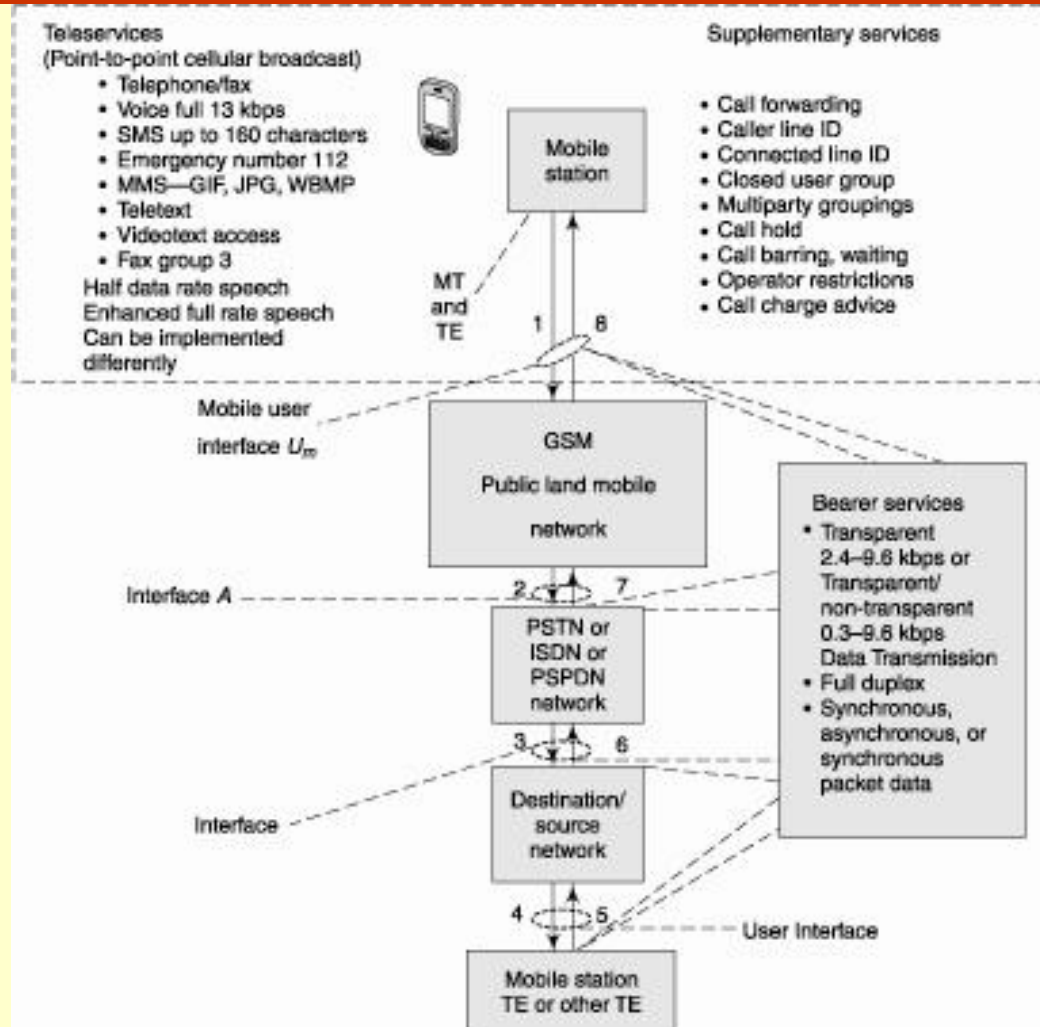
MAIN FUNCTIONS OF VLR

- Registration of any new MS that moves into the VLR's location area. It copies the information from the HLR of that MS
- Deregistration of an MS, if the MS dissociates from the MSC associated with the given VLR and moves out to another location area

COMMUNICATION BETWEEN A MOBILE STATION TE AND ANOTHER TE

- The other TE could be a mobile station TE or other TE (such as a PSTN phone)
- The caller TE to be an MS communicating to the other TE via the path 1–2–3–4–5–6–7–8
- The caller TE can also be a PSTN phone

COMMUNICATION BETWEEN A MOBILE STATION TE AND ANOTHER TE



COMMUNICATION BETWEEN A MOBILE STATION TE AND ANOTHER TE

- Different methods and protocols are used for establishing connection and maintaining communication in calling to and from mobile devices in a GSM PLMN network

VARIOUS TYPES OF CALLS HANDLED BY A GSM NETWORK

- Calls originating from a mobile TE to a PSTN destination TE (Mobile→ PSTN Calls)
- Calls originating from a mobile TE to a mobile destination TE (Mobile → Mobile Calls)

VARIOUS TYPES OF CALLS HANDLED BY A GSM NETWORK

- Calls originating from a PSTN TE to a mobile destination TE (PSTN → Mobile Calls)
- Message exchanges between the mobile station and the base transceiver (Mobile station ↔ Base transceiver message exchanges)
- Refer Section 3.5.1 to 3.5.4 for additional details

SUMMARY

- Localization process
- A mobile station identified, authenticated, and provided service by MSC
- Calling
- Use of Interfaces

End of Lesson 7
Localization and Calling