2 G Architecture– GSM, GPRS and Others

Lesson 06

GSM Subscriber Address and Identities

MS'S SUBSCRIBER IDENTITY MODULE (SIM)

- Card which inserts n the mobile station (MS)
- GSM service provider provides that

SIM

- Uniquely identifies MS to the service
- Enables the MS to connect to the GSM network
- When the MS connects to GSM subsystems, the SIM saves a temporary (dynamic) mobile cipher key for encryption, temporary mobile subscriber identity (TMSI), and location area identification (LAI)

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SIM

- Information which does not change when the MS moves into another location
- (i) international mobile subscriber identity (IMSI)
- (ii) card serial number and type

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SIM

- Contains a PIN (personal identification number)

- Using the PIN, the MS is unlocked when it seeks connection to another MS

- The user can use the PIN to lock or unlock the MS

SIM Functions

- Stores the PUK (PIN unblocking key) which enables the subscriber to unlock the SIM if it is accidentally locked due to some reason

- Stores a 128-bit authentication key provided by the service provider

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SIM Functions

- The MS authenticates by a switching centre through an algorithm using this key and a 128-bit random number dynamically sent by authentication centre

- If the MS is not authenticated, the service to that number is blocked

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SIM

- Also stores the international mobile subscriber identity (IMSI)
- IMSI─ a unique 15 digit number allocated to each mobile user
- IMSI three parts— a three digit mobile country code (MCC), a mobile network code (MNC) consisting of two digits, and the mobile subscriber identity number (MSIN) with up to 10 digits

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LAI

- Location information which is updated by the MSC which covers the MS's current location area

Temporary mobile subscriber identity (TMSI)

- The SIM also saves a assigned by the VLR associated to the current MSC

- The location update recorded at the VLR (visitor location register) and the LAI is updated at the SIM card in MS*i* via the MSC, BSC, and BTS covering its current location (interfaces *j*, 7*b*, 7*a*, and 8*a)*

IMSI

- Helps the MS in obtaining the cipher key, TMSI, and LAI from the mobile service provider during connection setup
- TMSI used to identify an MS during a connection for protecting the user ID from hackers or eavesdroppers

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IMSI

- Same IMSI all over the globe
- Identical coding scheme
- Helps service providers in identifying and locating an MS

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IMSI

- Helps the MS in obtaining the cipher key, TMSI, and LAI from the mobile service provider during connection setup
- TMSI used to identify an MS during a connection for protecting the user ID from hackers or eavesdroppers

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The equipment identity register (EIR)

- Stores the international mobile equipment identity (IMEI) numbers for the entire network

- IMEI enables the MSC in identifying the type of terminal, mobile equipment manufacturer, and model and helps the network in locating the device in case it is stolen or misplaced

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EIR THREE LISTS

- A *black list* that includes mobile stations which have been reported stolen or are currently locked due to some reason.

- A *white list* which records all MSs that are valid and operating.

- A *grey list* including all those MSs that may not be functioning properly.

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Summary

- SIM
- IMSI
- TMSI
- EIR

End of Lesson 06

GSM Subscriber Address and Identities