

Mobile Networks

Traffic scenarios explained

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Some questions

- ❏ How is it possible to localize a mobile phone in a network?
- ❏ How does the number portability work?
- ❏ How can the network check my prepaid balance?
- ❏ Why emergency numbers appear at my city?
- ❏ How does roaming work?
- ❏ How are SMS transferred through the network?

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Index

- ❏ PSTN architecture overview
 - Call establishment in PSTN.
- ❏ Mobile Network architecture
- ❏ Traffic scenarios in mobile networks
 - Location update
 - Mobile terminating call (MTC)
 - Intelligent network scenarios.
 - Roaming.
 - SMS scenarios

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PSTN architecture

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PSTN calls

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- ❏ Key aspects:
 - Number A, number B
 - Signaling concept
 - B number routing tables
 - Addressing plan
 - B number prefix → next hop
 - Initial address message (IAM)

Mobile Network Architecture

- ❏ Key concepts:
 - IMSI is in SIM card, not MSISDN
 - HLR
 - Relates IMSI → MSISDN (number B)
 - Keeps track of position of MS.

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Location update

Concept of LA.

Types of LU:

- Periodic
- Change of LA
- Switch on / off

7/14

Mobile call

Problems:

- MSCs do not know MS position

Solution: MSCs should ask HLR about MS location → SRI (Send Routing Info).

- Routing tables are static and should route to MS whatever position it has.

Solution: use of fixed numbers associated to MSCs which are temporarily assigned to MS → MSRN (MS roaming number).

8/14

Mobile Call

How to route to B?

9/14

Intelligent network

Some examples of use:

- Emergency numbers that depends on location
- Local number portability
- Dynamic selection of destination
- Closed user groups
- Prepaid services balance check
- Special tariffs

10/14

Intelligent network

| B-Number Table | |
|----------------|------------|
| 1111 | - Vodafone |
| 2222 | - TMN |

11/14

Roaming

Home network vs visited network

- Roaming agreements
- Brief process
- Tariffs

12/14

Short messages service (SMS)

- SMS center: SMSC (preconfigured in MS)
- SMS originated and SMS terminated
- HLR notification to SMSC

The diagram illustrates the SMS service flow. It shows two Mobile Stations (MS) connected to Base Transceiver Stations (BTS), which are connected to Base Station Controllers (BSC). The BSCs are connected to Mobile Switching Centers/VLRs (MSC/VLR). The MSC/VLRs are connected to the Short Message Service Center (SMSC) and the Home Location Register (HLR). The flow starts with an MS sending an SMS (B) to the BSC, which then forwards it to the MSC/VLR. The MSC/VLR sends the message to the SMSC. The SMSC sends the message to the HLR, which then forwards it to the MSC/VLR. The MSC/VLR sends the message to the BSC, which then delivers it to the MS. The HLR also sends an ACK to the SMSC. The SMSC sends an MT-ForwardSM to the HLR, which then forwards it to the MSC/VLR, which finally delivers it to the MS.

Thanks for your attention

Any questions?