Cell	Core Network			Old Core Network	GGSN Site	GSM Databases	
UT	SGSN	DNS Server	MSC VLR	Old SGSN	GGSN	EIR	HLR

This sequence diagram was generated with EventStudio System Designer (http://www.EventHelix.com/EventStudio).

We explore the sequence of interactions involved in a GPRS terminal attaching to the network. The combined attach and PDP context activation of a Class B GPRS terminal will be covered here.

GPRS Attach

1:GMM Attach Request
TMSI, MNC, MCC, LAC, RAC

The terminal initiates the attach procedure after power on. The message contains the previously used TMSI (Temporary Mobile Subscriber Id). The mobile network identity, the location area and routing area information is also included in the message.

Search for the TMSI

The SGSN (Serving GPRS Support Node) searches for TMSI in its database.

2:Identity Request
TMSI

No entry is found for the TMSI, so the SGSN uses the old location area information to identify the old SGSN where this terminal was being served.
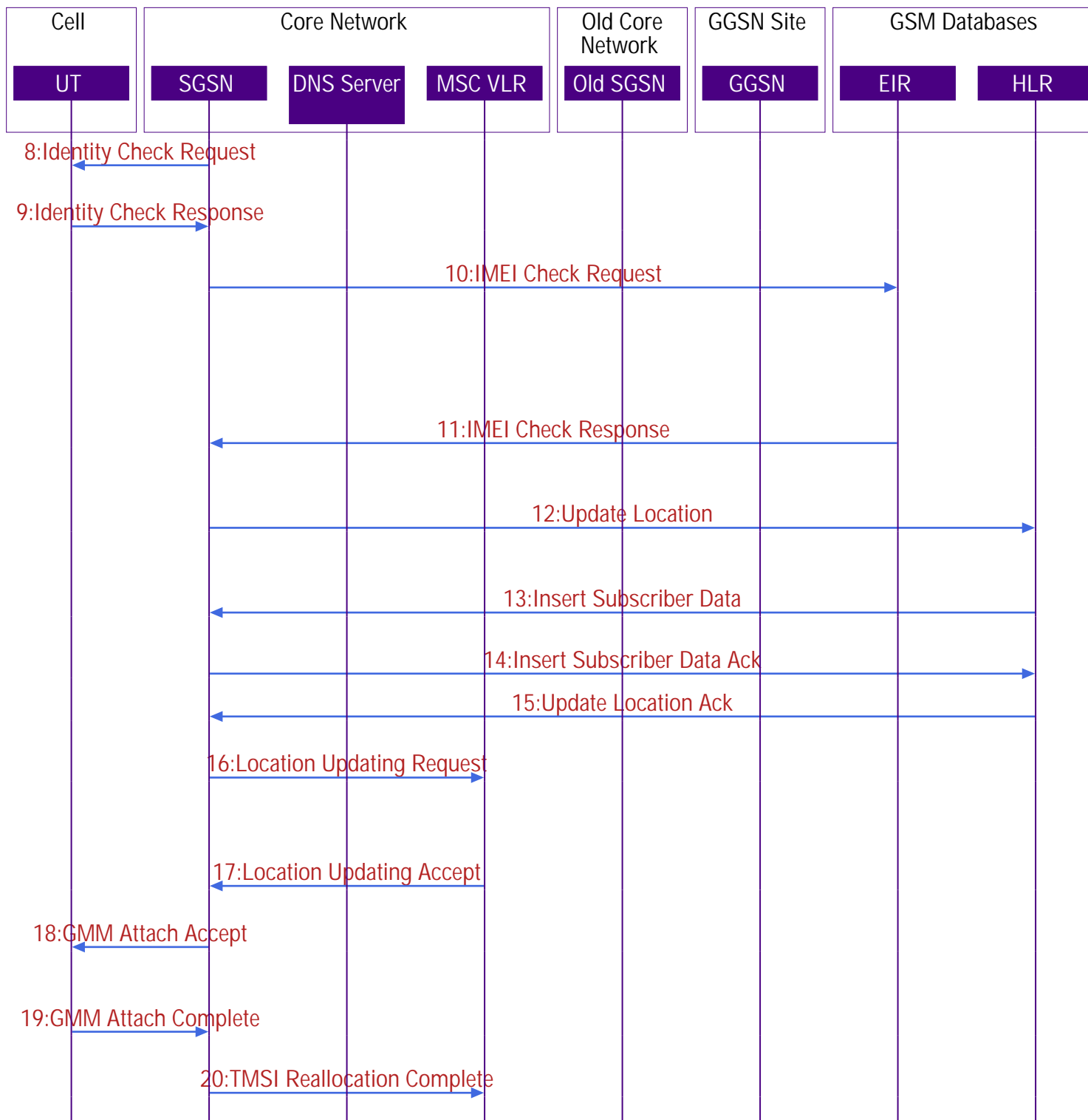
3:Identity Response
IMSI

The old SGSN responds with the GPRS mobile's IMSI (International Mobile Subscriber Identity) to the SGSN.

4:Identity Request

The SGSN asks the terminal to identify itself.

5:Identity Response

The terminal responds back.

6:Authentication Request
RAND

The SGSN authenticates the GPRS mobile by sending a RAND value (a random value).

7:Authentication Response
SRES

The computed SRES value is passed to the SGSN.

Cell
- UT

Core Network
- SGSN
- DNS Server
- MSC VLR

Old Core Network
- Old SGSN

GGSN Site
- GGSN

GSM Databases
- EIR
- HLR

8:Identity Check Request

The SGSN then requests the identity of the GPRS mobile.

9:Identity Check Response

GPRS mobile responds back with the identity.

10:IMEI Check Request

Verify that that GPRS mobile being used by the user is not a stolen one. The IMEI (Internaional Mobile Equipment Identity) obtained from the GPRS mobile is sent to the Equipment Identification Register (EIR).

11:IMEI Check Response

The EIR clears the subscriber and responds back to the SGSN with the status.

12:Update Location

The SGSN now informs the Home Location Register (HLR) about the new location of the GPRS mobile.

13:Insert Subscriber Data

The HLR updates the new SGSN with all the subscriber information.

14:Insert Subscriber Data Ack

The SGSN responds back to the HLR.

15:Update Location Ack

The HLR now responds back to the SGSN's "Update Location" message.

16:Location Updating Request

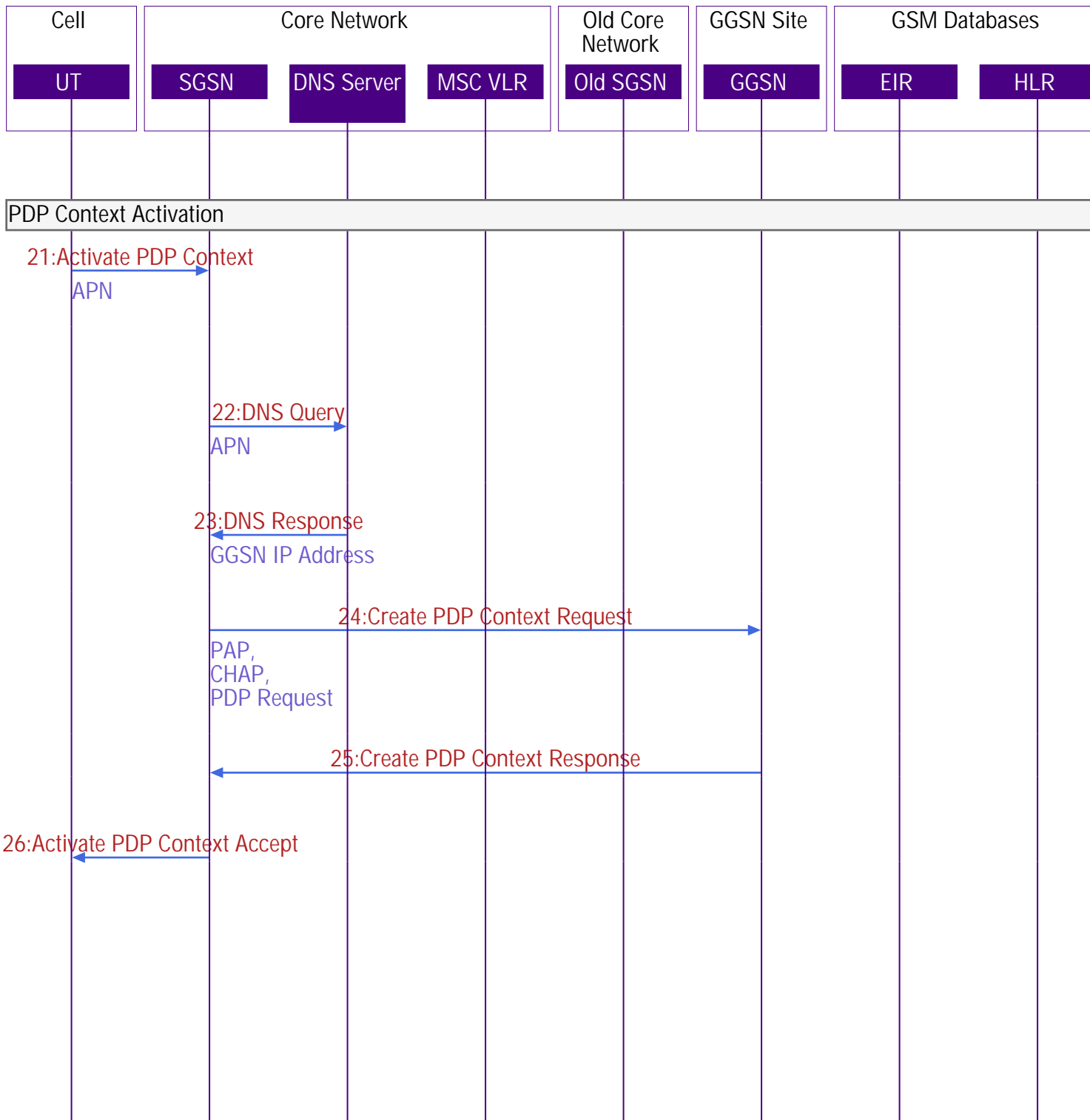The mobile had initiated a combined attach, so the SGSN also updates the location information at the MSC-VLR that will handle the voice calls.

17:Location Updating Accept

The MSC informs the SGSN that it has finished the location update.

18:GMM Attach Accept

The SGSN responds back to the original GRPS combined attach request from the mobile.

19:GMM Attach Complete

The GPRS mobile acknowledges the receipt of "Attach Accept".

20:TMSI Reallocation Complete

The Attach Complete signals the completion of the attach procedure.

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This is passed to the MSC-VLR as "TMSI Reallocation Complete".

PDP Context Activation

21:Activate PDP Context
APN

The GPRS mobile now initiates the PDP context activation procedure to obtain the IP address for the device. The Access Point Name (APN) specified by the service provider is passed as a parameter.

22:DNS Query
APN

The SGSN initiates a DNS query to find the GGSN corresponding to the APN specified by the mobile. (GGSN - Global GPRS Support Node.)

23:DNS Response
GGSN IP Address

The DNS provides the GGSN IP address.

24:Create PDP Context Request
PAP,
CHAP,
PDP Request

The SGSN routes the PDP context activation request to the GGSN corresponding to the APN.

25:Create PDP Context Response

The GGSN responds back to the SGSN, indicating completion of the PDP context activation procedure.

26:Activate PDP Context Accept

The SGSN replies back to the GPRS mobile. This signals completion of the PDP context activation.