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.

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.

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

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.

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

The SGSN asks the terminal to identify itself.

The terminal responds back.

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

The computed SRES value is passed to the SGSN.

The SGSN then requests the identity of the GPRS mobile.

GPRS mobile responds back with the identity.
IMEI Check Request
IMEI Check Response
Update Location
Insert Subscriber Data
Insert Subscriber Data Ack
Update Location Ack
Location Updating Request
Location Updating Accept
GMM Attach Accept
GMM Attach Complete
TMSI Reallocation Complete
Activate PDP Context
APN
PDP Context Activation
Activate PDP Context
APN
The GPRS mobile now initiates the PDP context activation procedure to obtain the IP address.

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

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

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

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

The SGSN responds back to the HLR.

The HLR now responds back to the SGSN’s “Update Location” message.

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.

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

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

The GPRS mobile acknowledges the receipt of “Attach Accept”.

The Attach Complete signals the completion of the attach procedure. This is passed to the MSC-VLR as “TMSI Reallocation Complete”.

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

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

The DNS provides the GGSN IP address.

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

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

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