3GPP TS 23.401 V8.3.0 (2008-09)

General Packet Radio Service (GPRS) enhancements for Evolved Universal Terrestrial Radio Access Network (E-UTRAN) access (Release 8)

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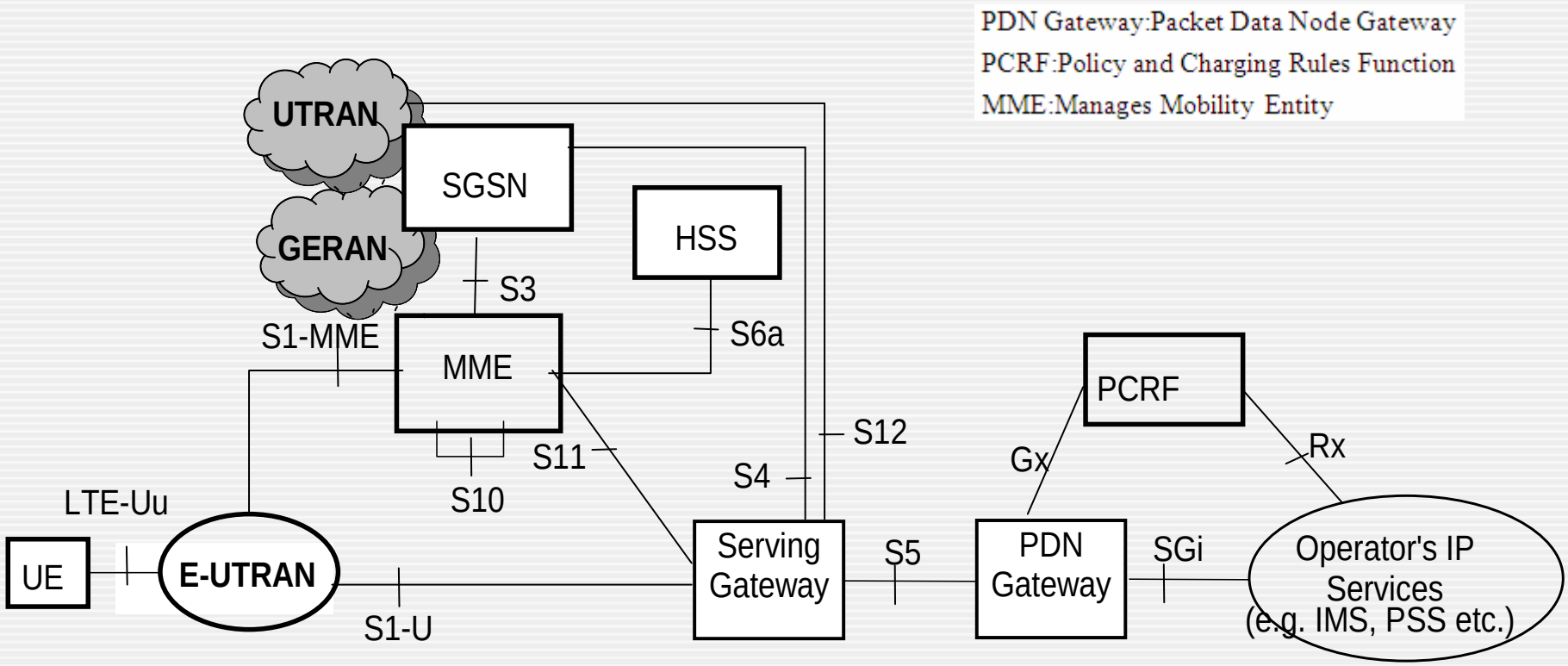
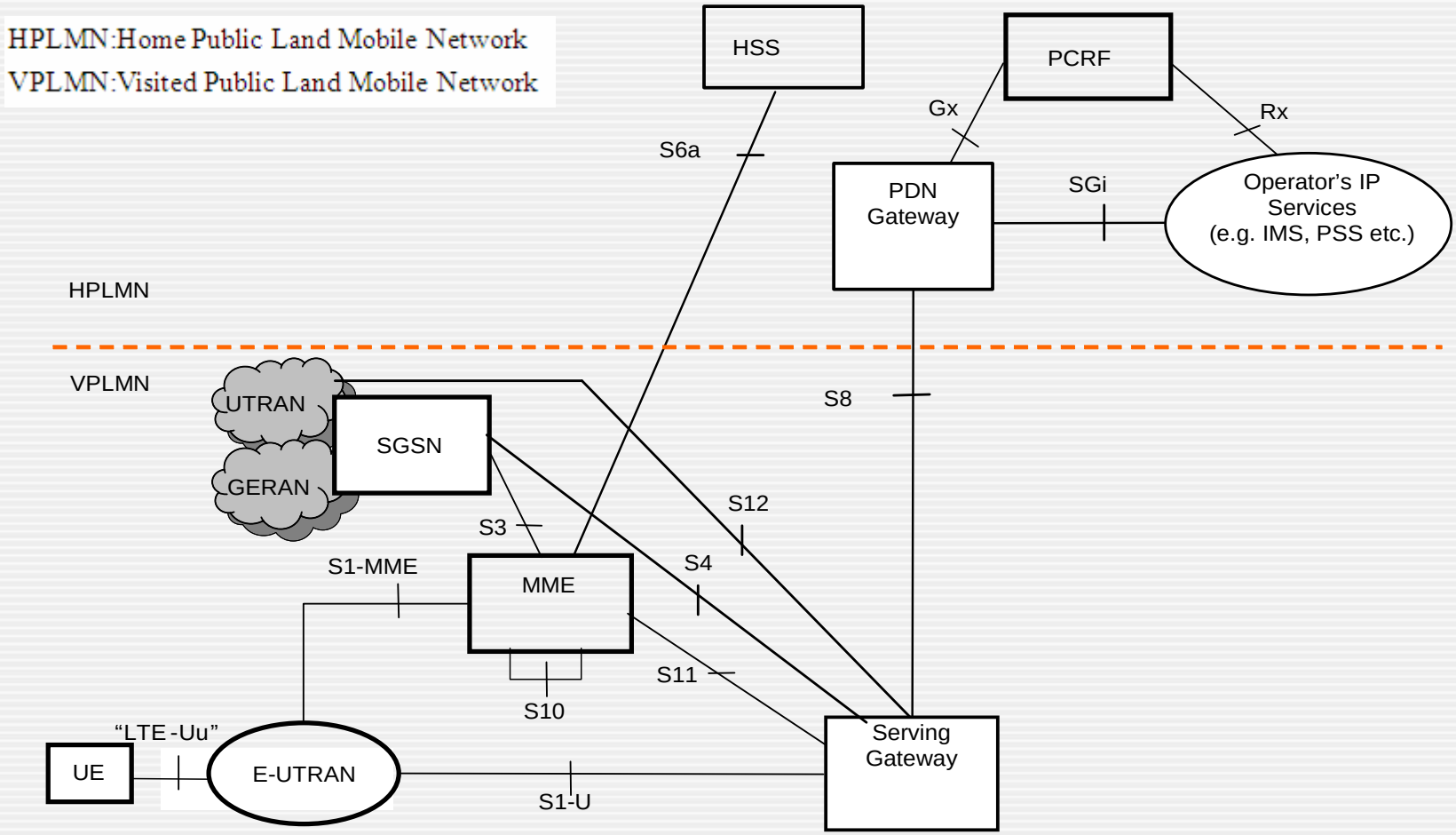
2008.11.25

Non-roaming architecture for 3GPP accesses

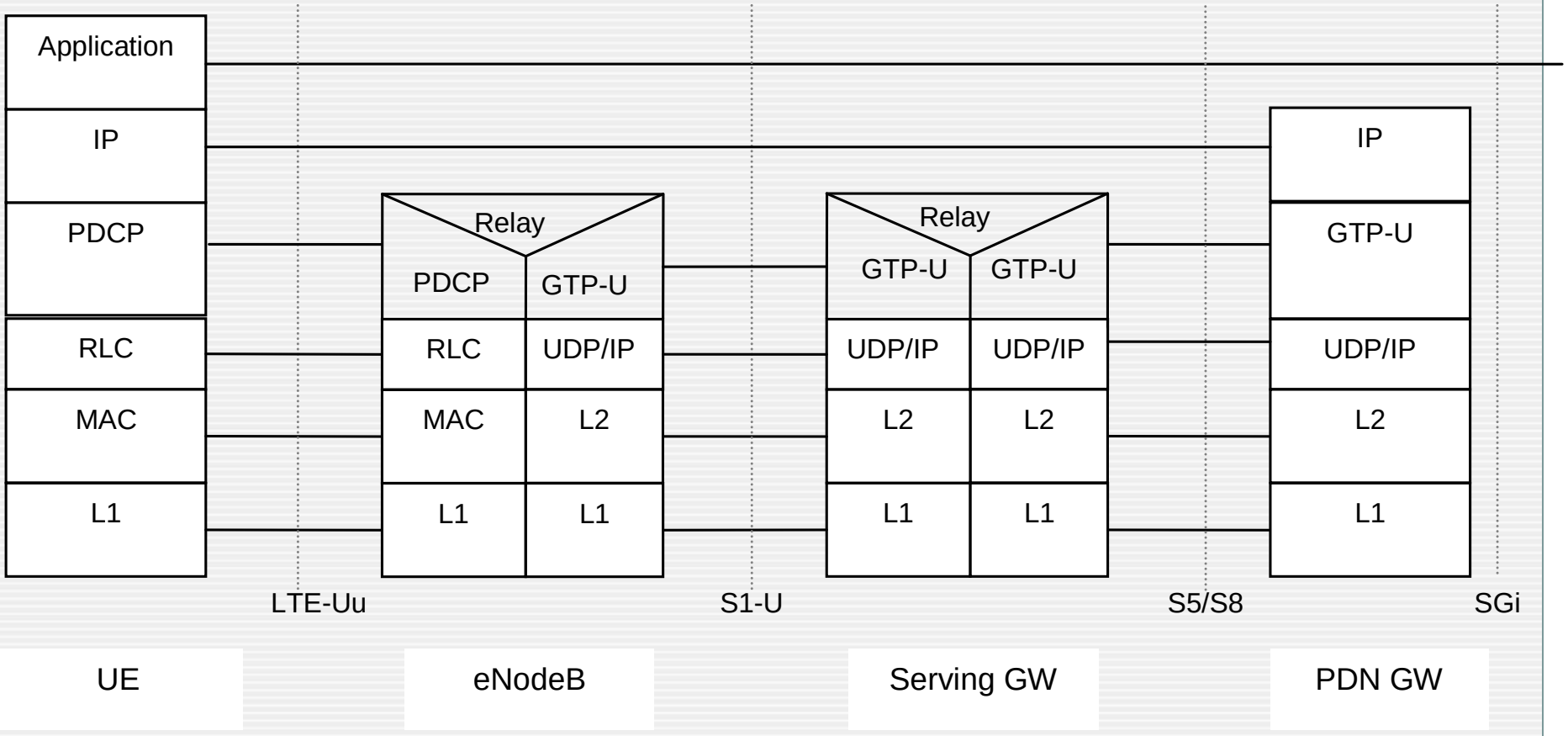


Roaming architecture for 3GPP accesses. Home routed traffic



UE - P-GW user plane with E-UTRAN

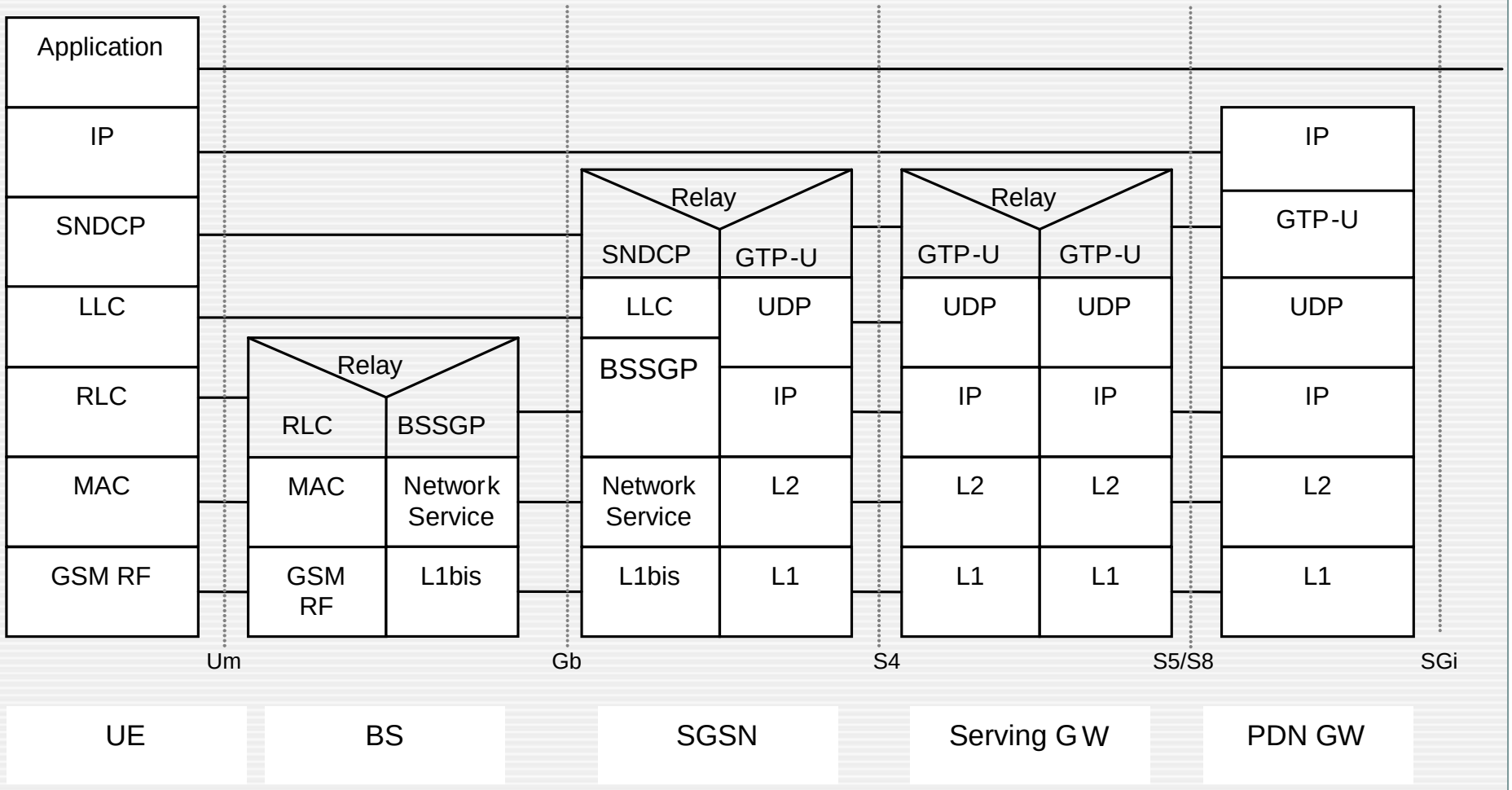
PDCP:Packet Data Convergence Protocol
GTP-U :GPRS Tunnelling Protocol for the user plane



UE - P-GW user plane with E-UTRAN

- **GPRS Tunnelling Protocol for the user plane (GTP-U):** This protocol tunnels user data between eNodeB and the S-GW as well as between the S-GW and the P-GW in the backbone network. GTP shall encapsulate all end user IP packets ◦
- **MME** controls the user plane tunnel establishment and establishes User Plane Bearers between eNodeB and S-GW.
- **UDP/IP:** These are the backbone network protocols used for routeing user data and control signalling ◦
- **LTE-Uu:**The radio protocols of E-UTRAN between the UE and the eNodeB ◦

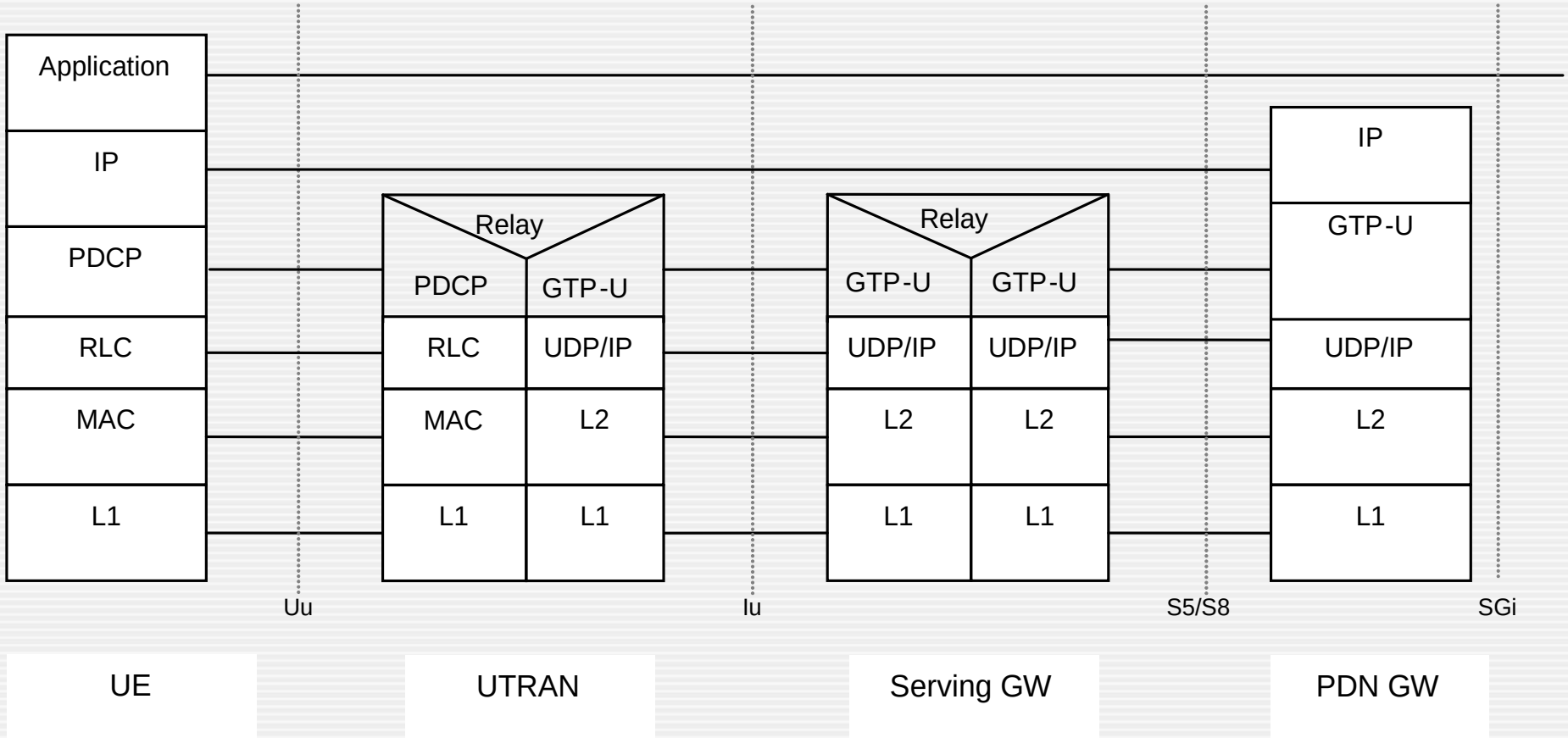
UE - PDN GW user plane with 2G access via the S4 interface



UE - PDN GW user plane with 2G access via the S4 interface

- **GPRS Tunnelling Protocol for the user plane (GTP-U):** This protocol tunnels user data between SGSN and the S-GW as well as between the S-GW and the P-GW in the backbone network. GTP shall encapsulate all end user IP packets ◦
- **UDP/IP:** These are the backbone network protocols used for routeing user data and control signalling ◦

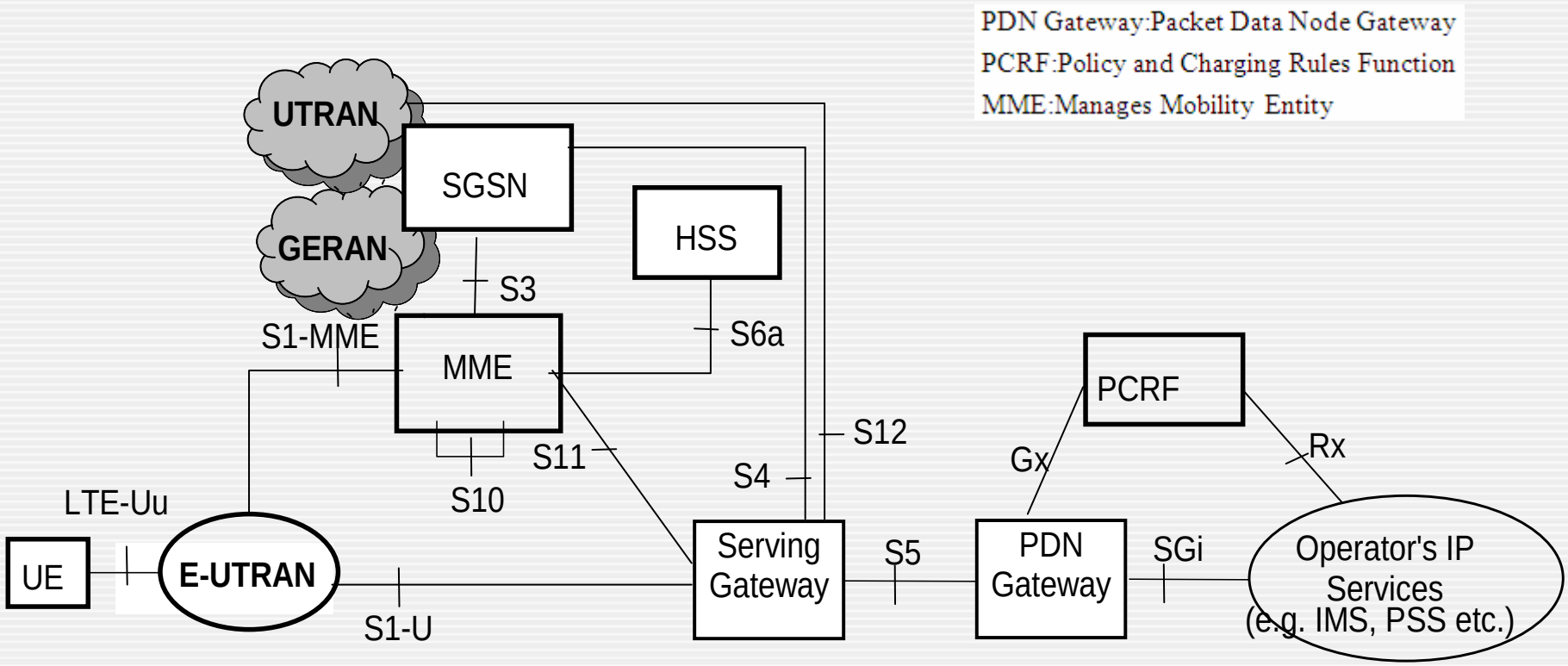
UE - PDN GW user plane with 3G access via the S12 interface



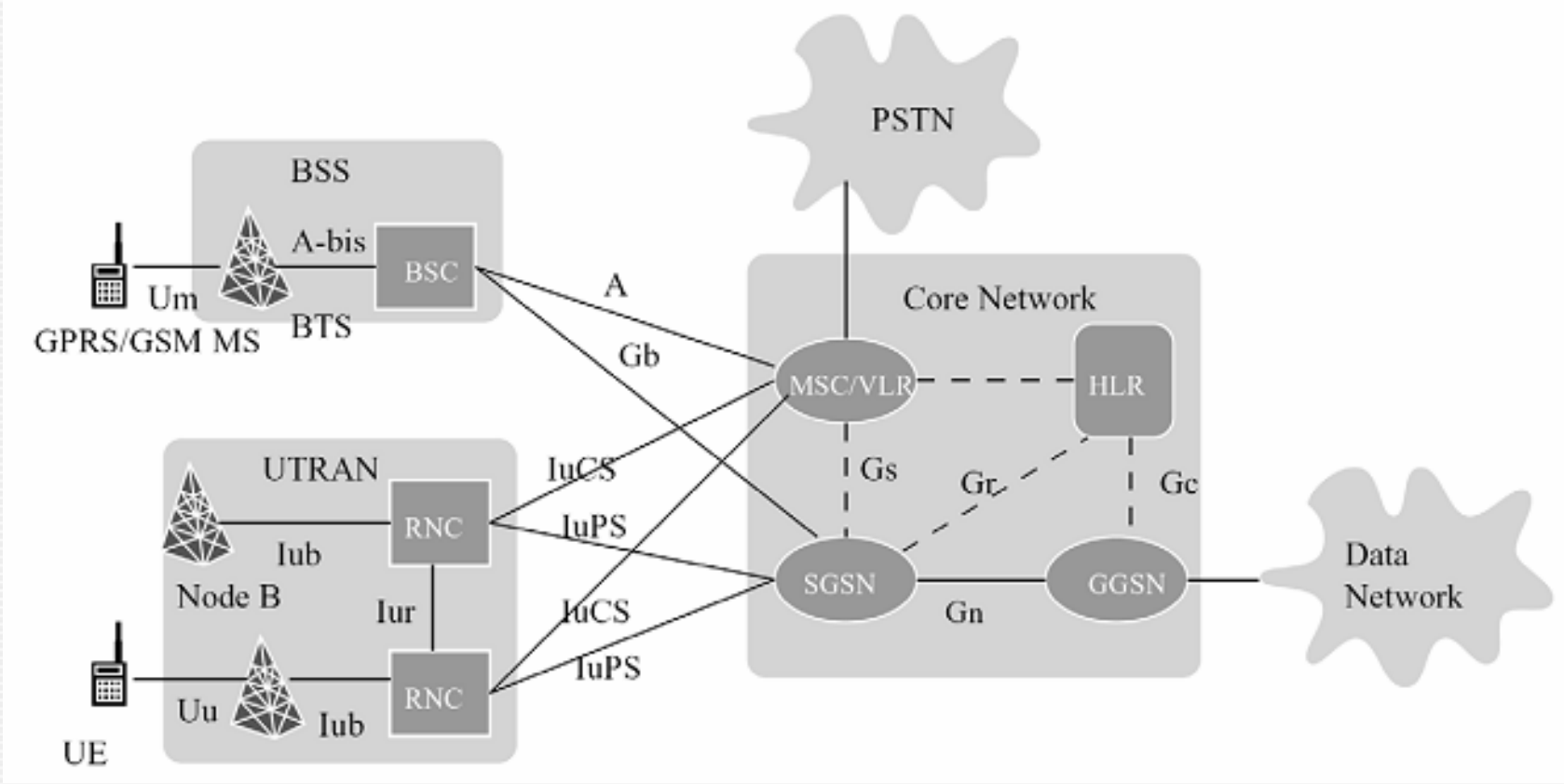
UE - PDN GW user plane with 3G access via the S12 interface

- **GPRS Tunnelling Protocol for the user plane (GTP-U):** This protocol tunnels user data between UTRAN and the S-GW as well as between the S-GW and the P-GW in the backbone network. GTP shall encapsulate all end user IP packets ◦
- **UDP/IP:** These are the backbone network protocols used for routeing user data and control signalling ◦
- The drawing shown SGSN controls the user plane tunnel establishment and establish a Direct Tunnel between UTRAN and S-GW ◦

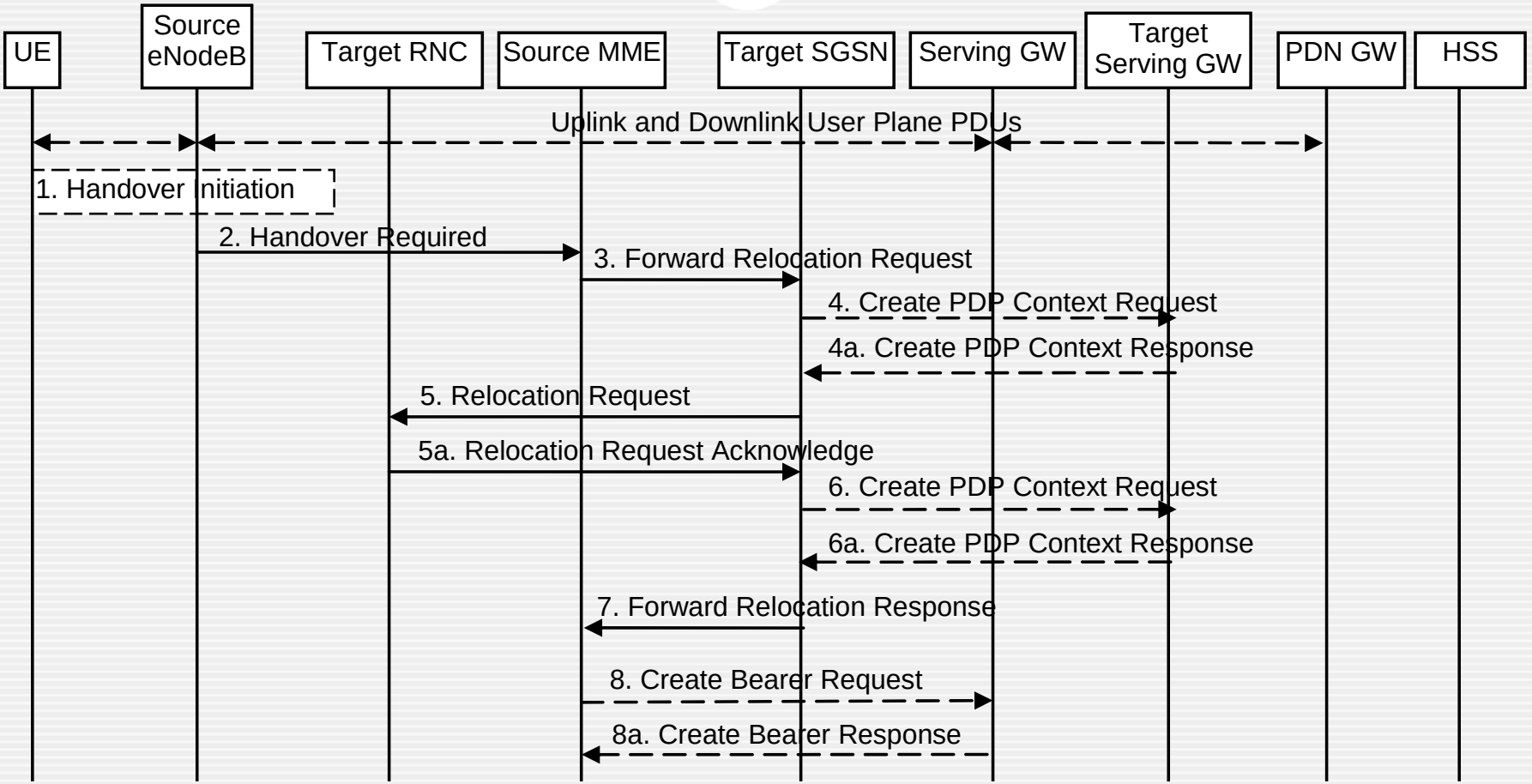
Non-roaming architecture for 3GPP accesses



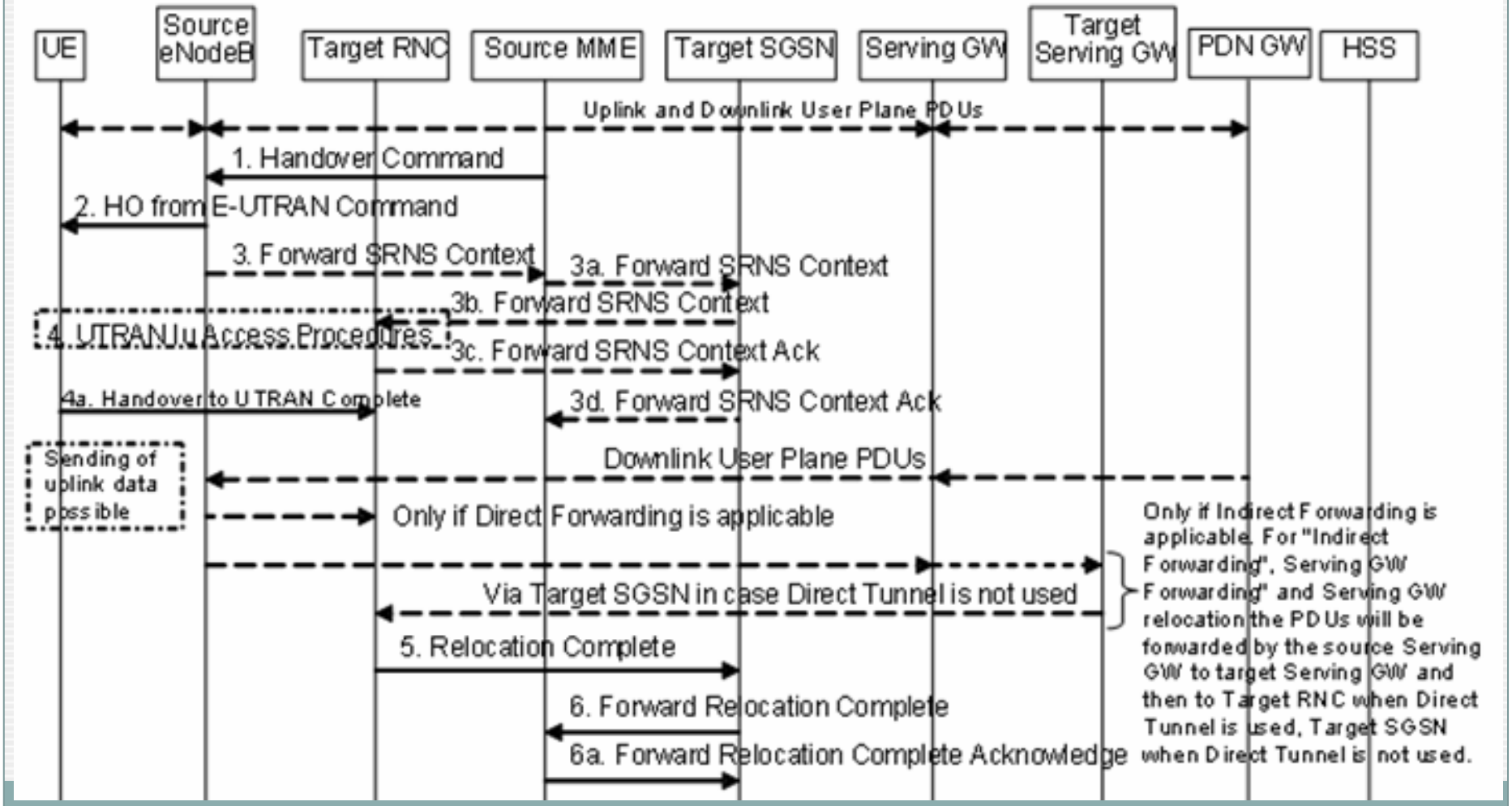
GSM/GPRS/UMTS Network Architectures



E-UTRAN to UTRAN Iu mode Inter RAT handover Preparation phase



E-UTRAN to UTRAN Iu mode Inter RAT handover Execution phase

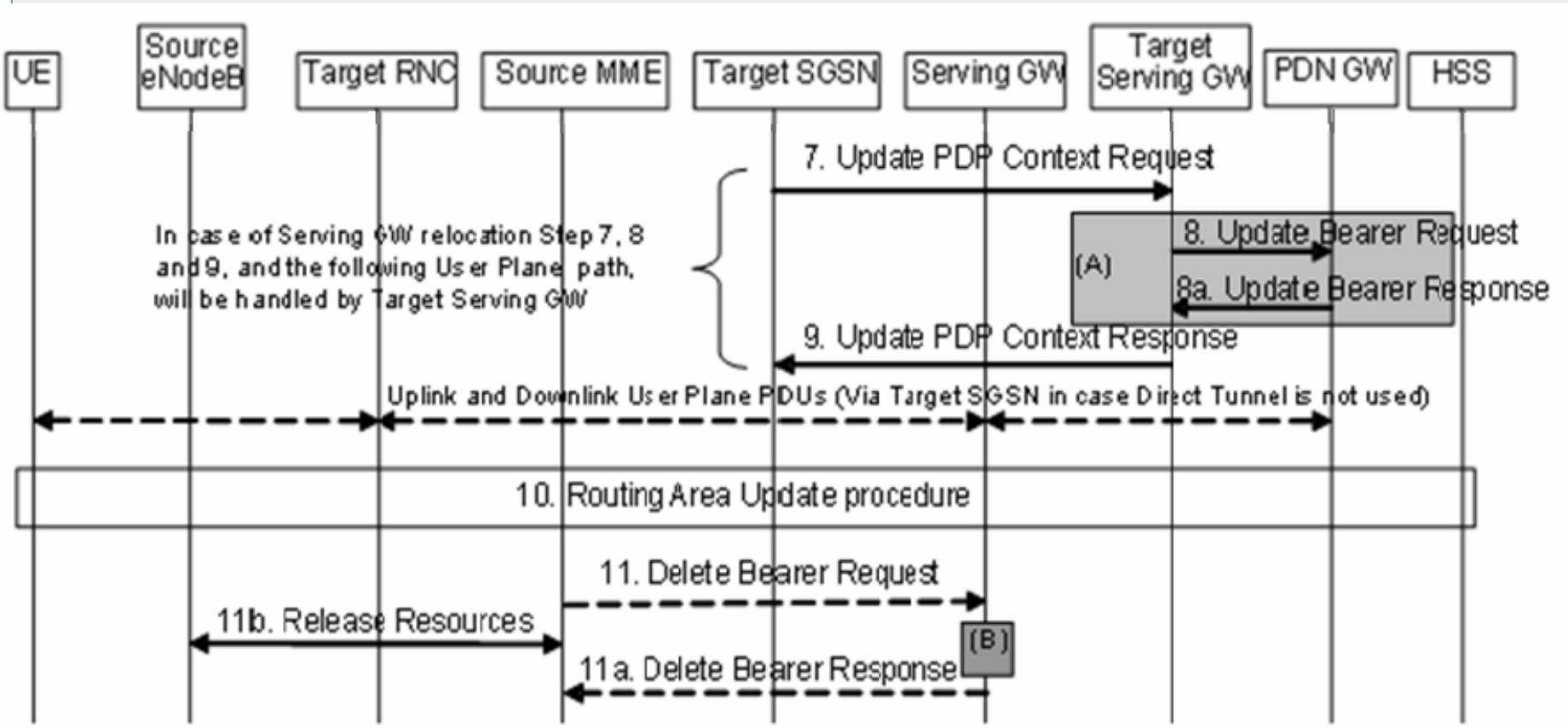


E-UTRAN to UTRAN Iu mode Inter RAT handover Execution phase

SRNS CONTEXT:

- This message is sent either by source eNodeB to the target SGSN or by the Target SGSN to the Target RNC。
- Information includes RAB ID、DL/UL GTP-PDU Sequence Number、DL/UL N-PDU Sequence Number、ROHC Context。

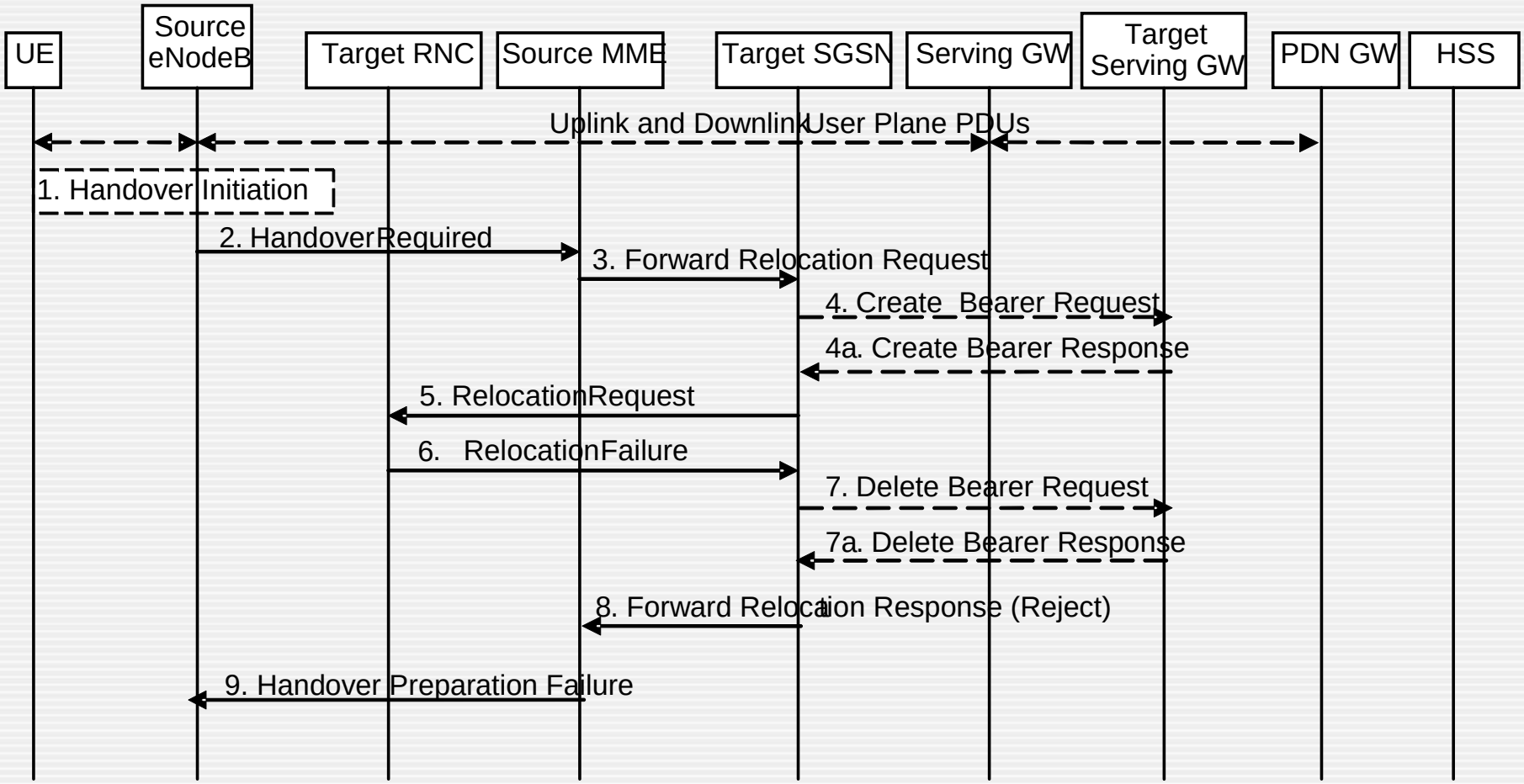
E-UTRAN to UTRAN Iu mode Inter RAT handover Execution phase



E-UTRAN to UTRAN Iu mode Inter RAT handover Execution phase

Step 8: The Serving GW (for Serving GW relocation this will be the Target Serving GW) may inform the PDN GW(s) the change of for example for Serving GW relocation or the RAT type that e.g. can be used for charging, by sending the message Update Bearer Request. The PDN GW must acknowledge the request with the message Update Bearer Response. In the case of Serving GW relocation, the PDN GW updates its context field and returns an Update Bearer Response (PDN GW address and TEID, MSISDN, etc.) message to the Serving GW. The MSISDN is included if the PDN GW has it stored in its UE context.

E-UTRAN to UTRAN Iu mode Inter RAT handover Reject



E-UTRAN to UTRAN Iu mode Inter RAT handover Reject

Step 6: In case the Target RNC fails to allocate any resources for any of the requested RABs it sends a Relocation Failure (Cause) message to the Target SGSN. When the Target SGSN receives the Relocation Failure message from Target RNC the Target SGSN clears any reserved resources for this UE.

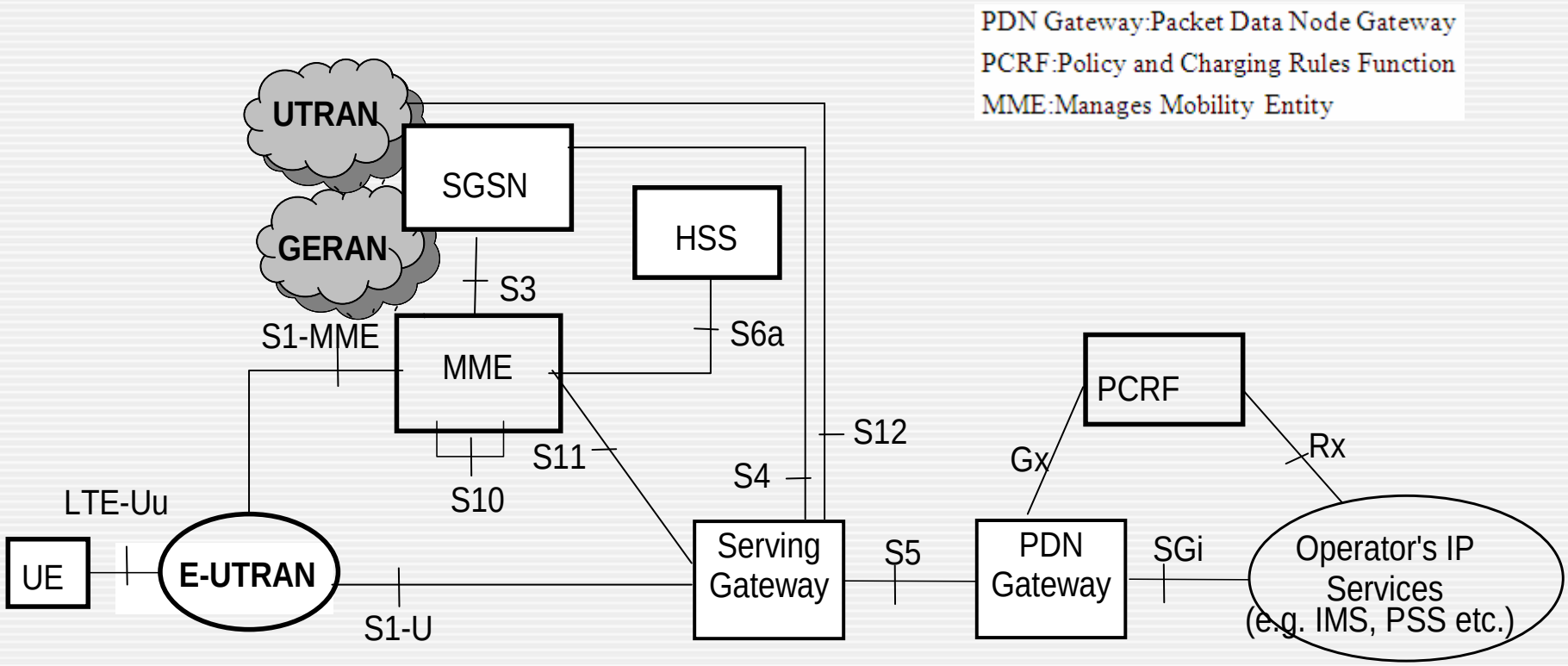
Step 7: This step is only performed in case of Serving GW relocation. The Target SGSN deletes the EPS bearer resources by sending Delete PDP Context Request (Cause, TEID) messages to the Target Serving GW. The Target Serving GW acknowledges with Delete PDP Context Response (TEID) messages.

E-UTRAN to UTRAN Iu mode Inter RAT handover Reject

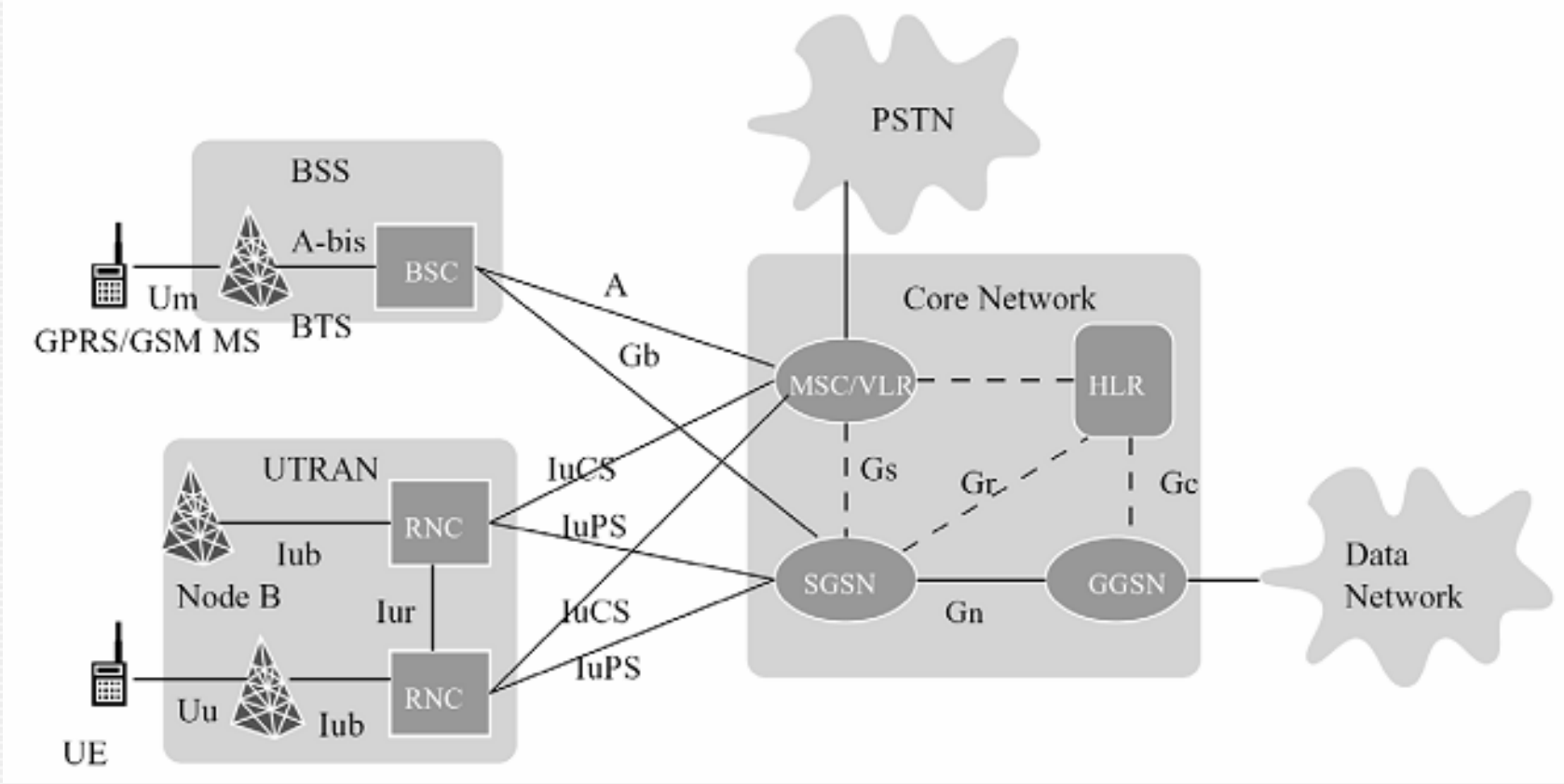
Step 8: The Target SGSN sends the Forward Relocation Response (Cause) message to the Source MME.

Step 9: When the Source MME receives the Forward Relocation Response message it send a Handover Preparation Failure (Cause) message to the Source eNodeB.

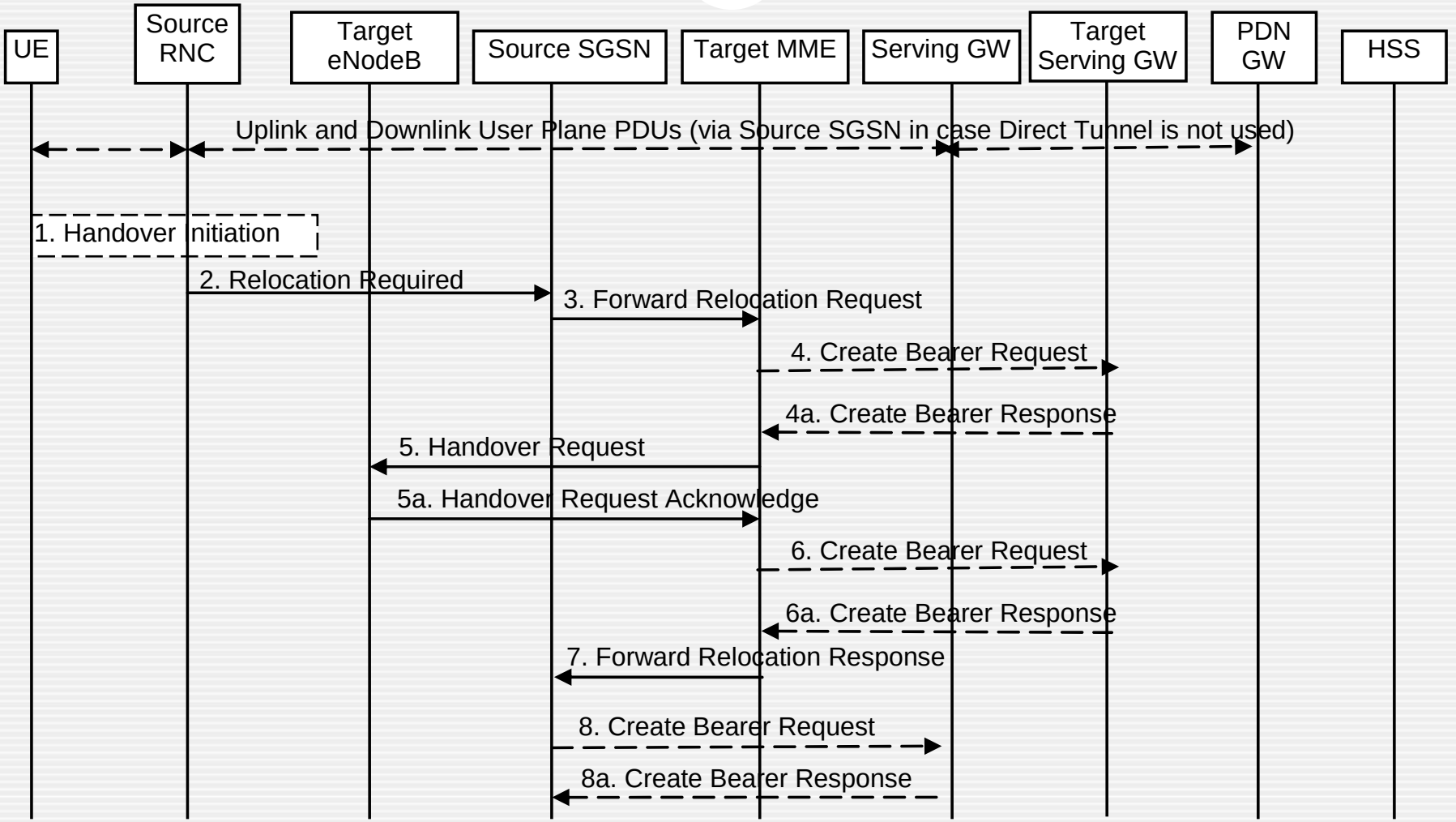
Non-roaming architecture for 3GPP accesses



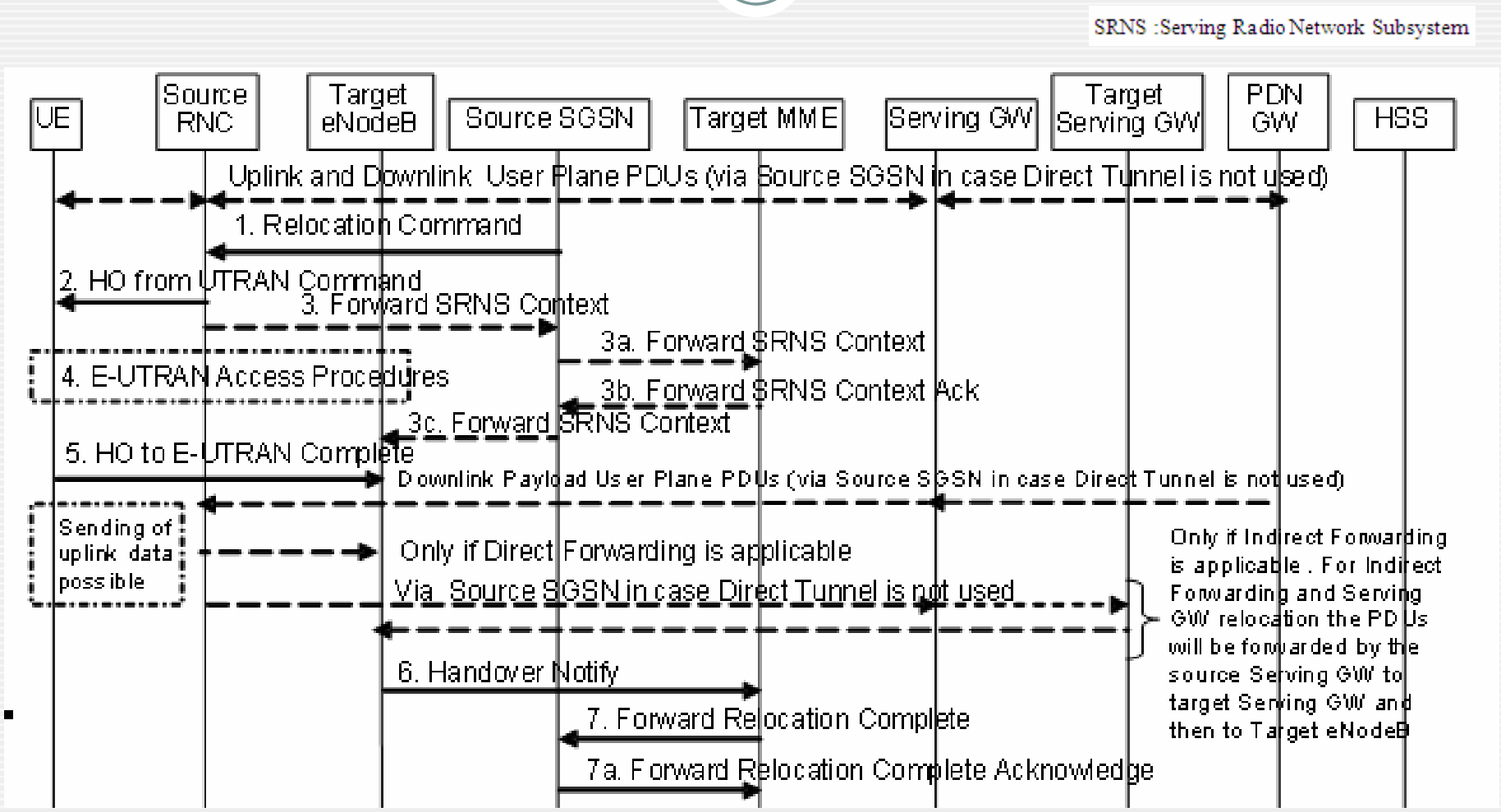
GSM/GPRS/UMTS Network Architectures



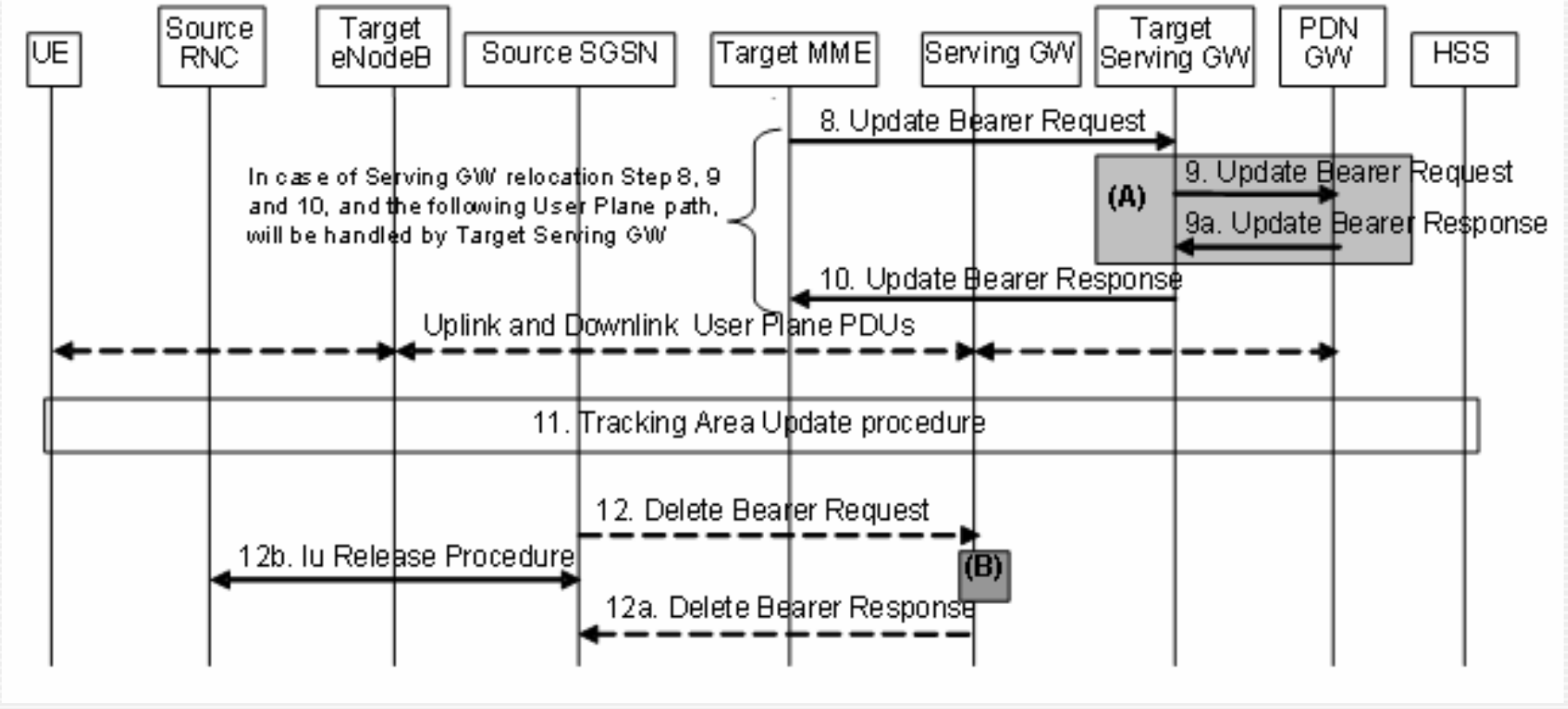
UTRAN Iu mode to E-UTRAN Inter RAT handover Preparation phase



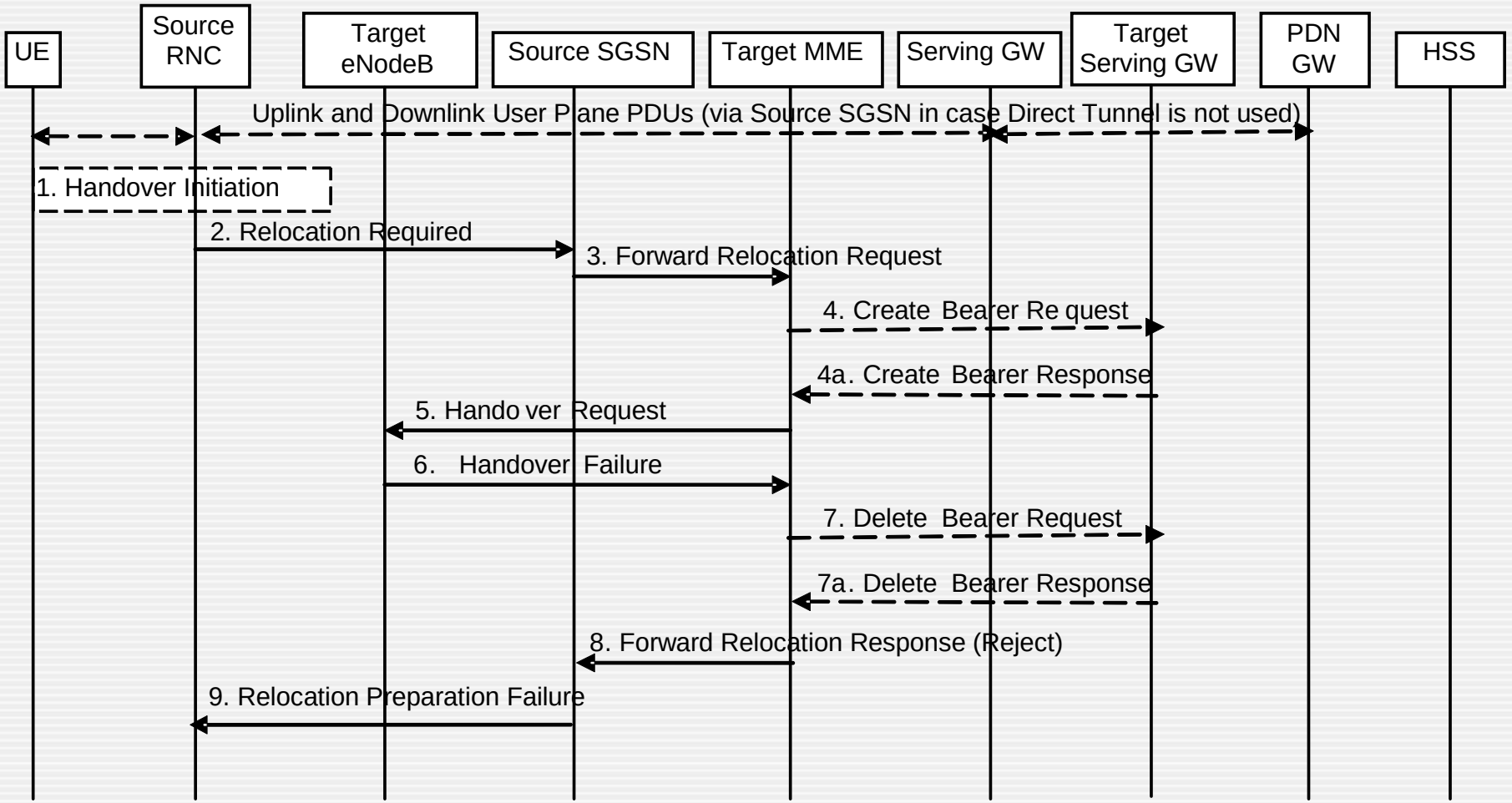
UTRAN Iu mode to E-UTRAN Inter RAT handover Execution phase(1/2)



UTRAN Iu mode to E-UTRAN Inter RAT handover Execution phase(2/2)



UTRAN Iu mode to E-UTRAN Inter RAT handover Reject



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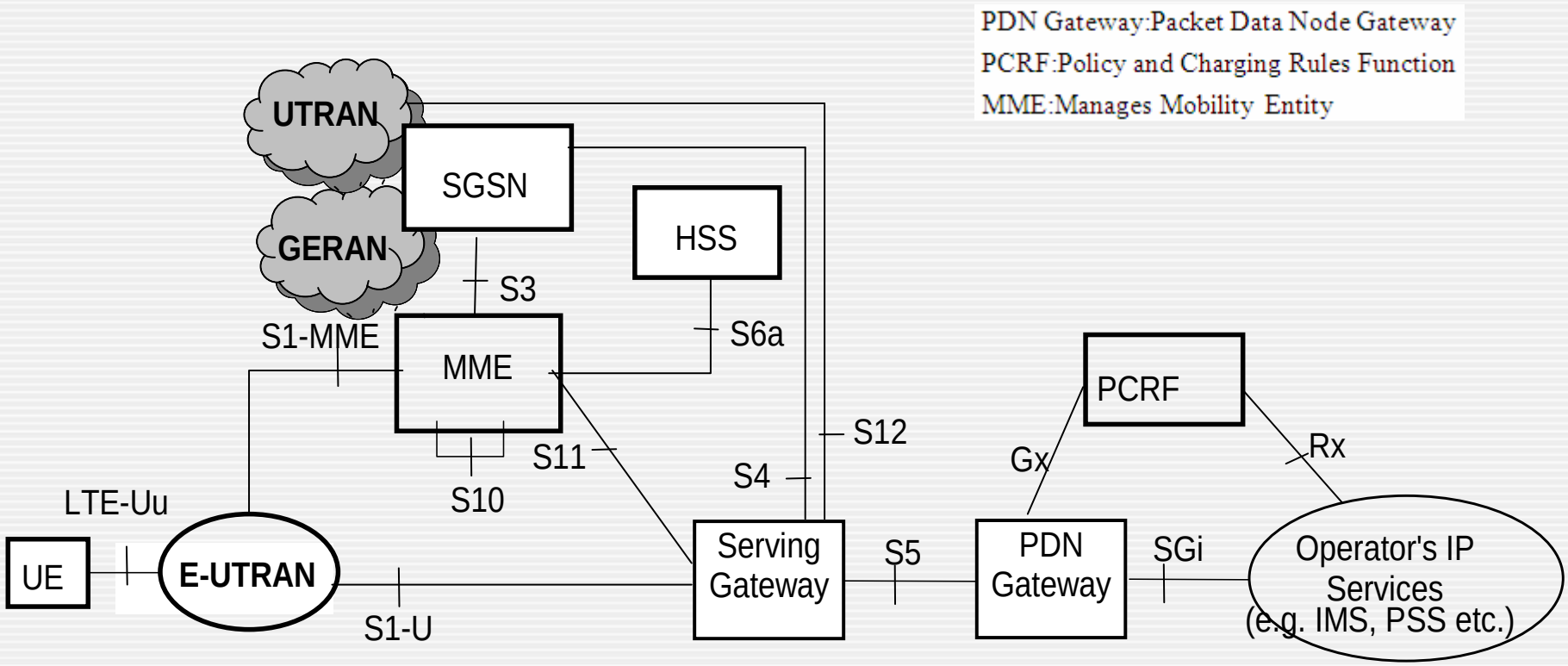

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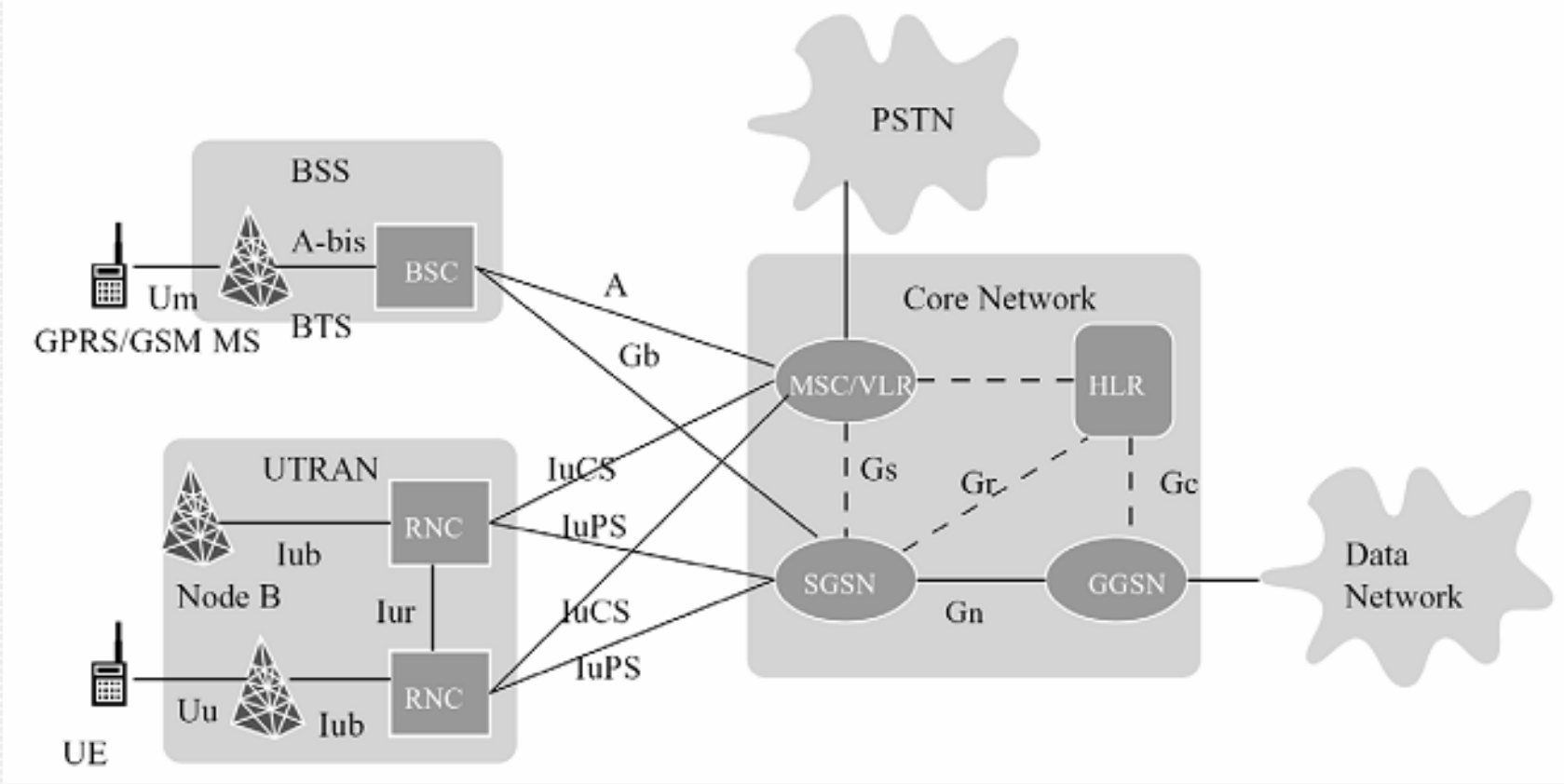
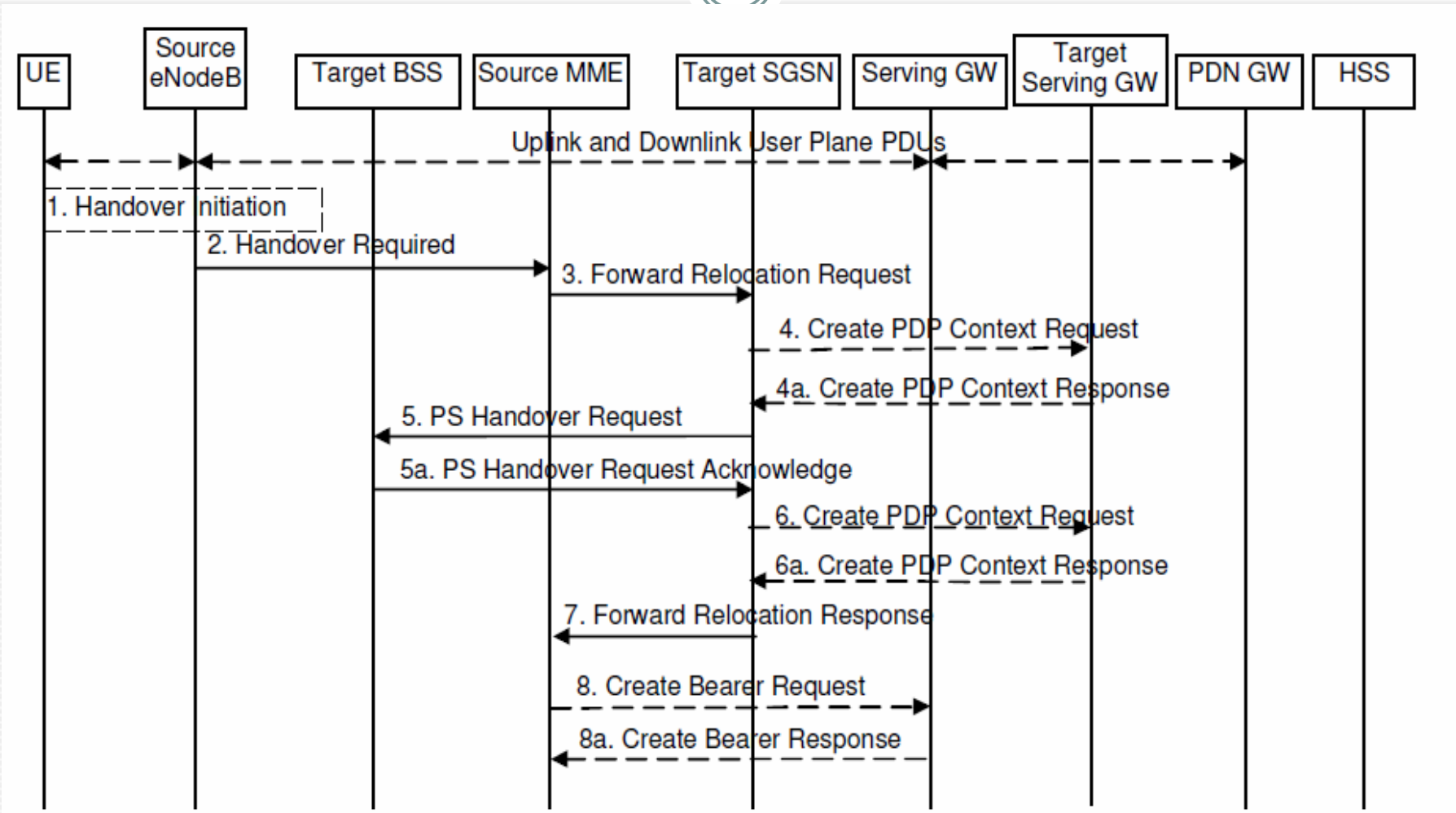
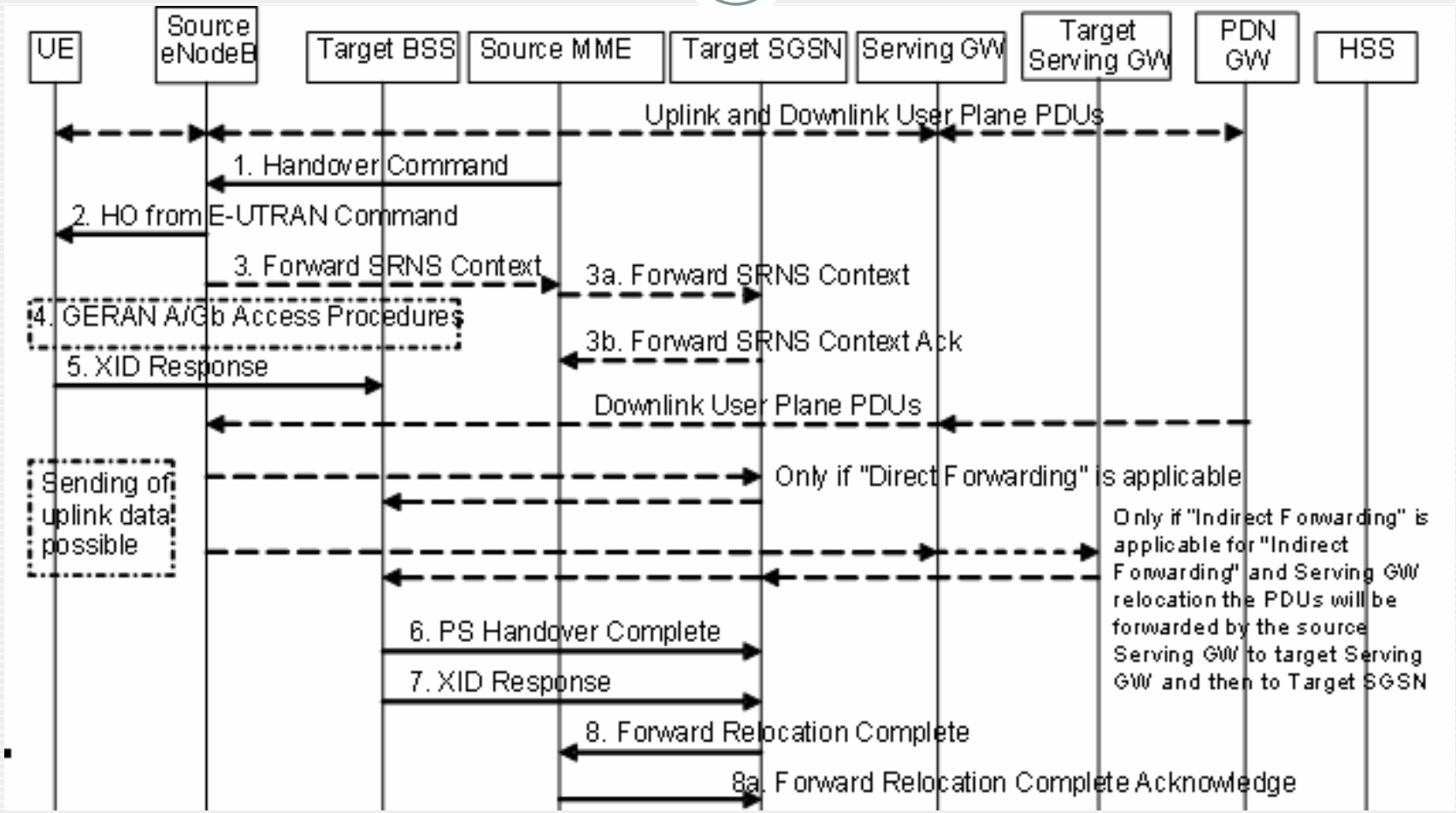


E-UTRAN to GERAN A/Gb mode Inter RAT handover Preparation phase



E-UTRAN to GERAN A/Gb mode Inter RAT handover Execution phase



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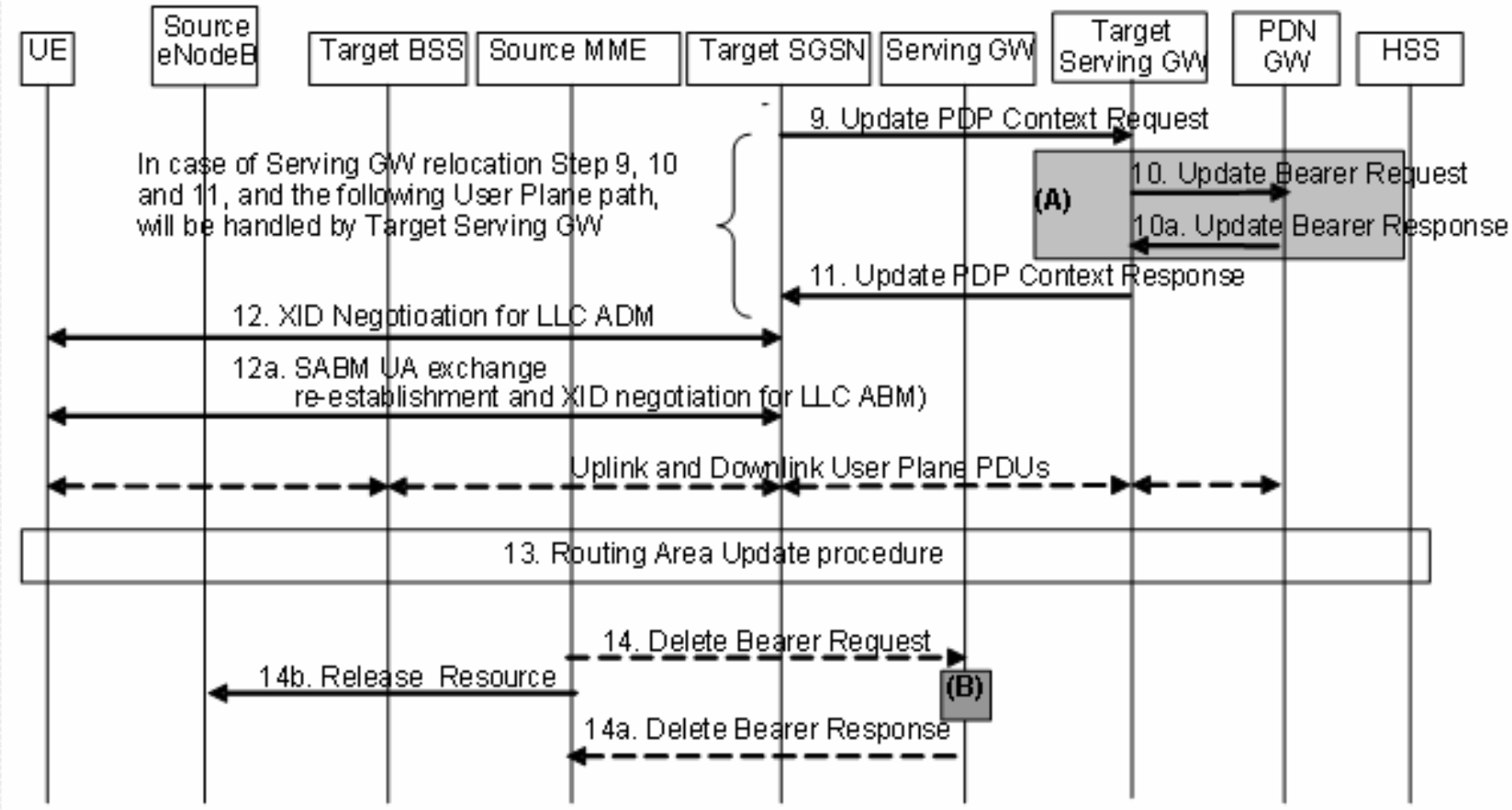
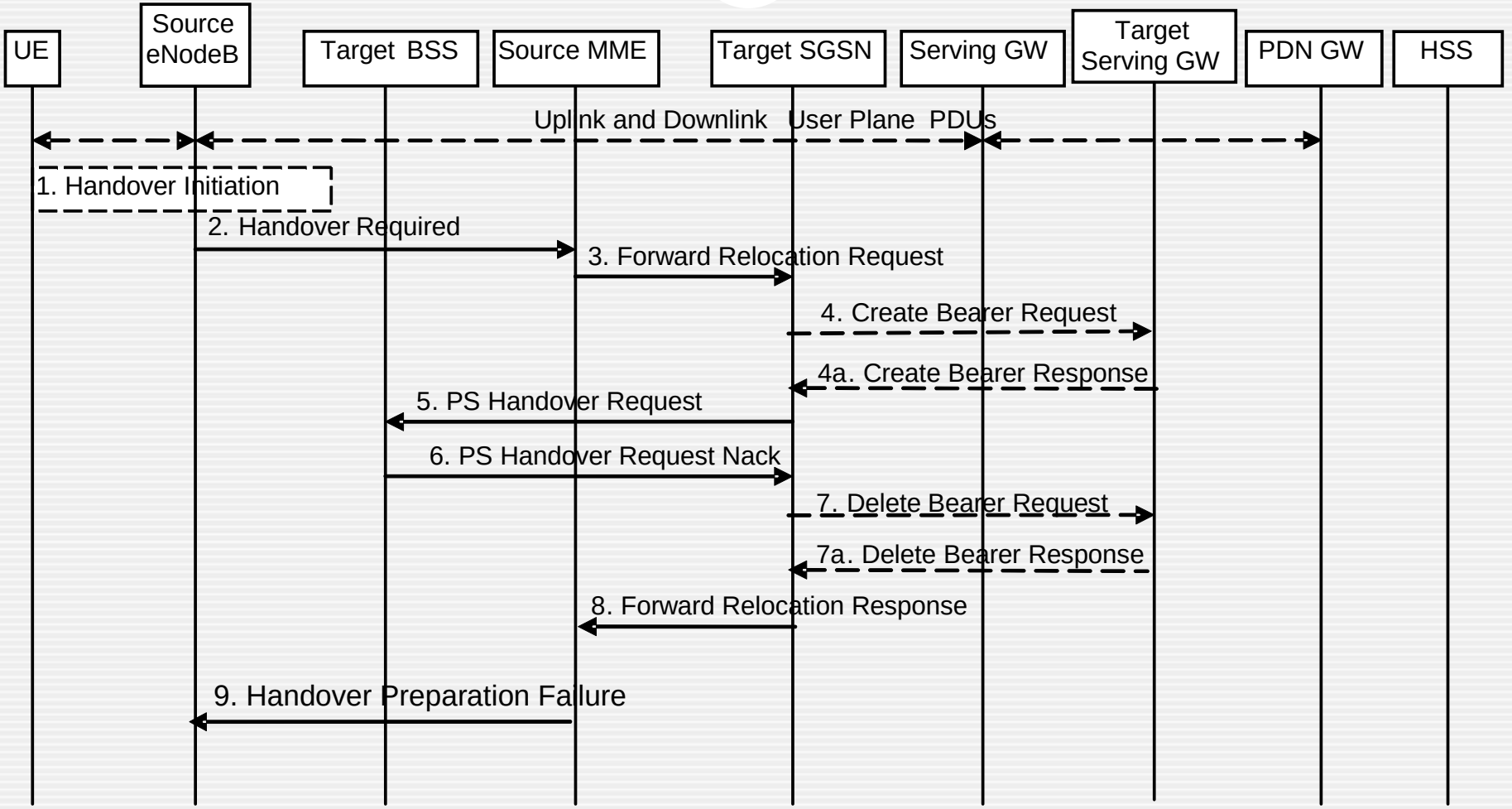


E-UTRAN to GERAN A/Gb mode Inter RAT handover Reject



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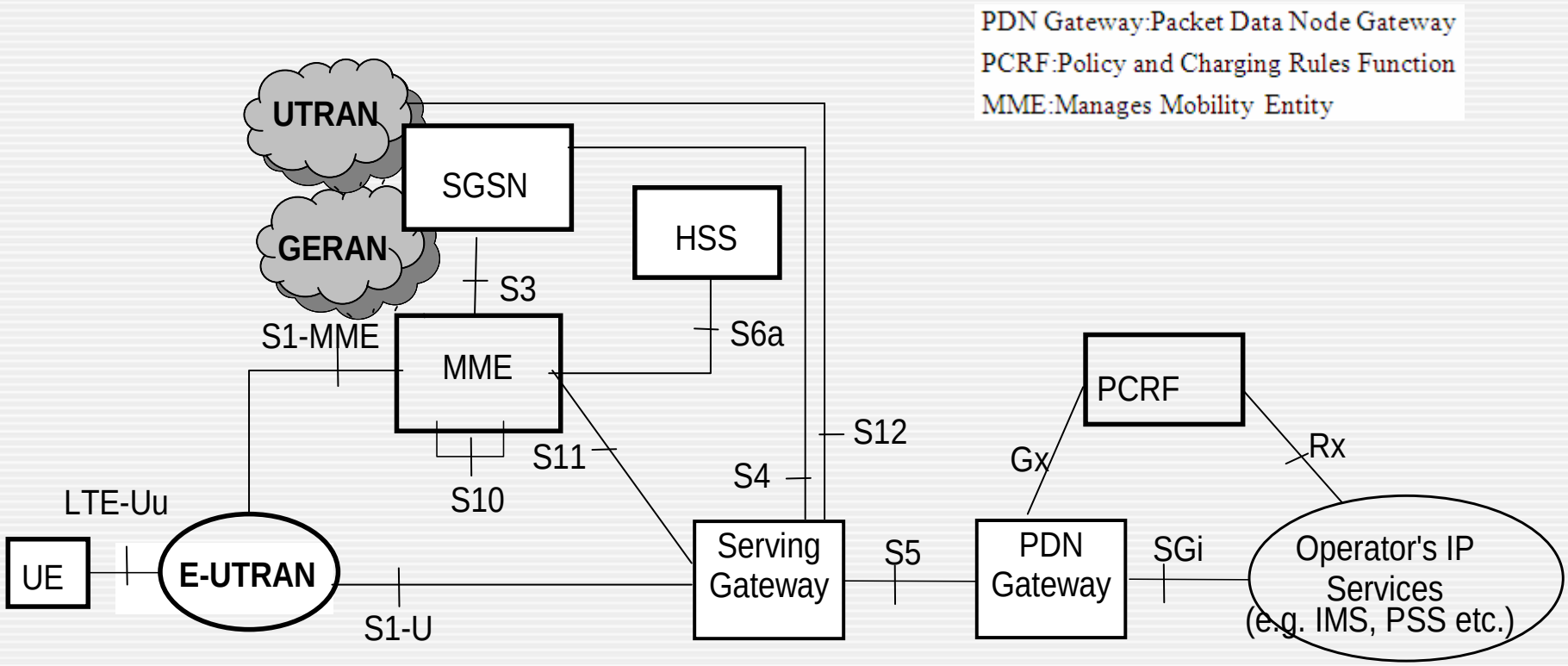

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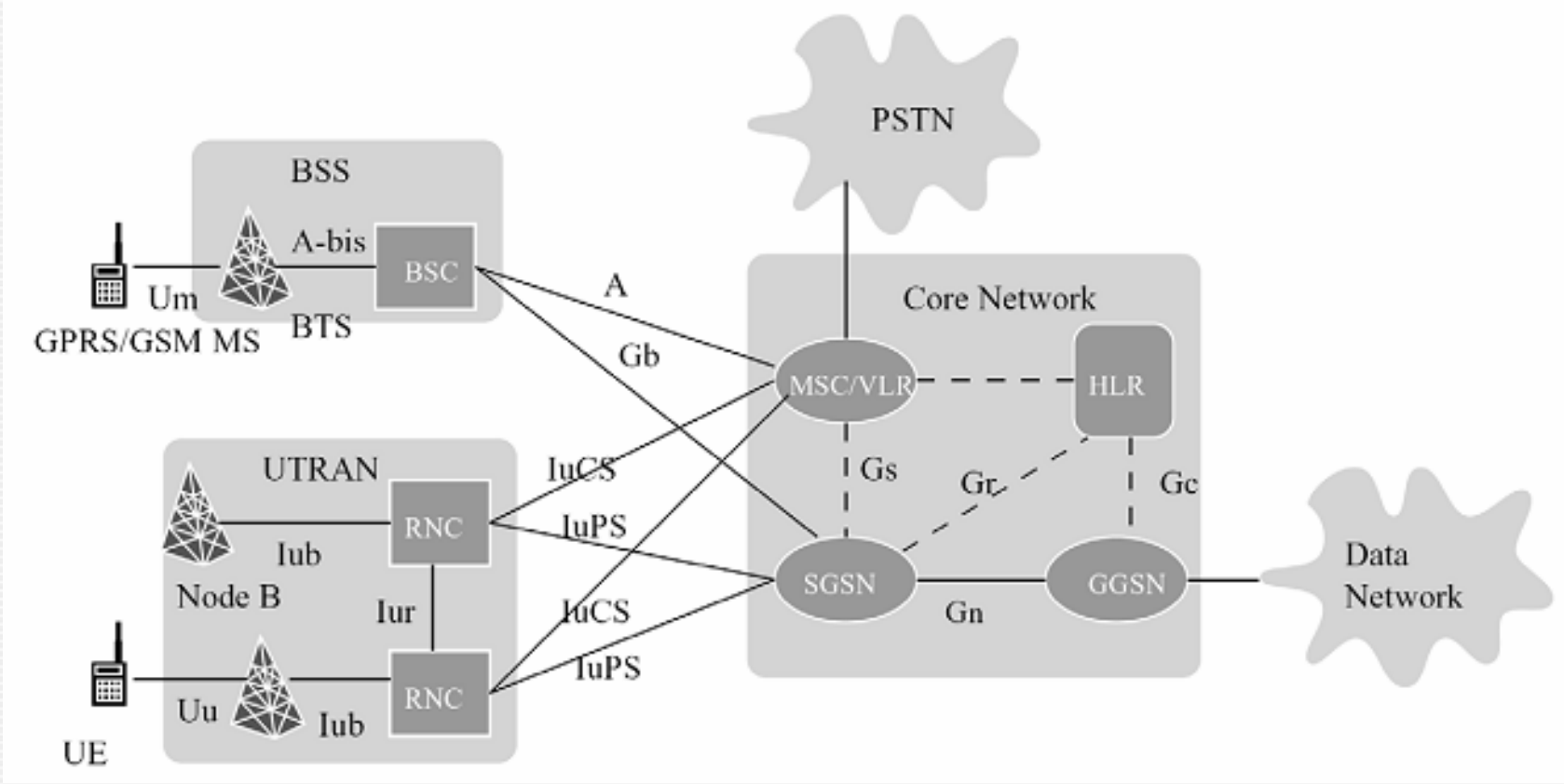
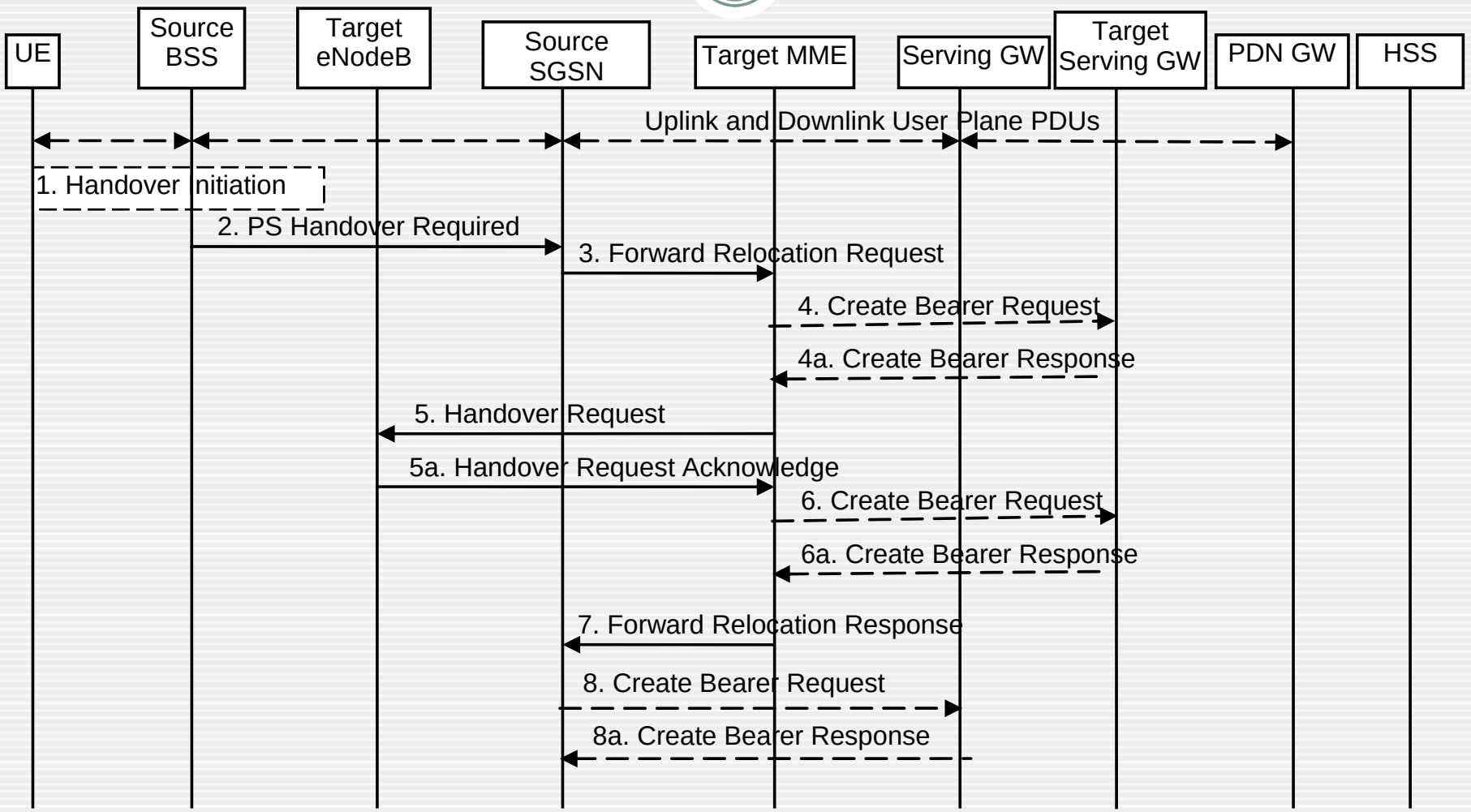
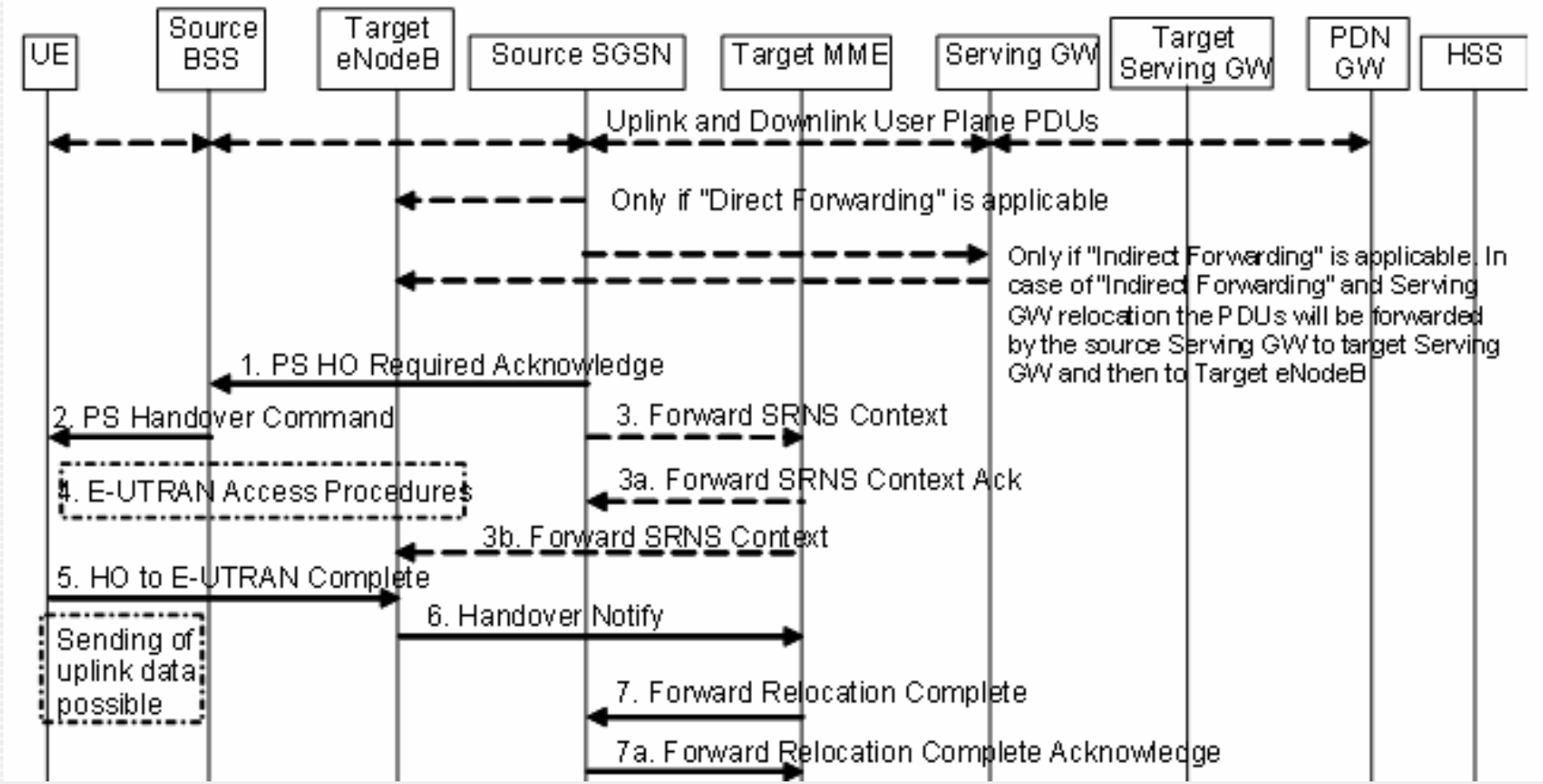


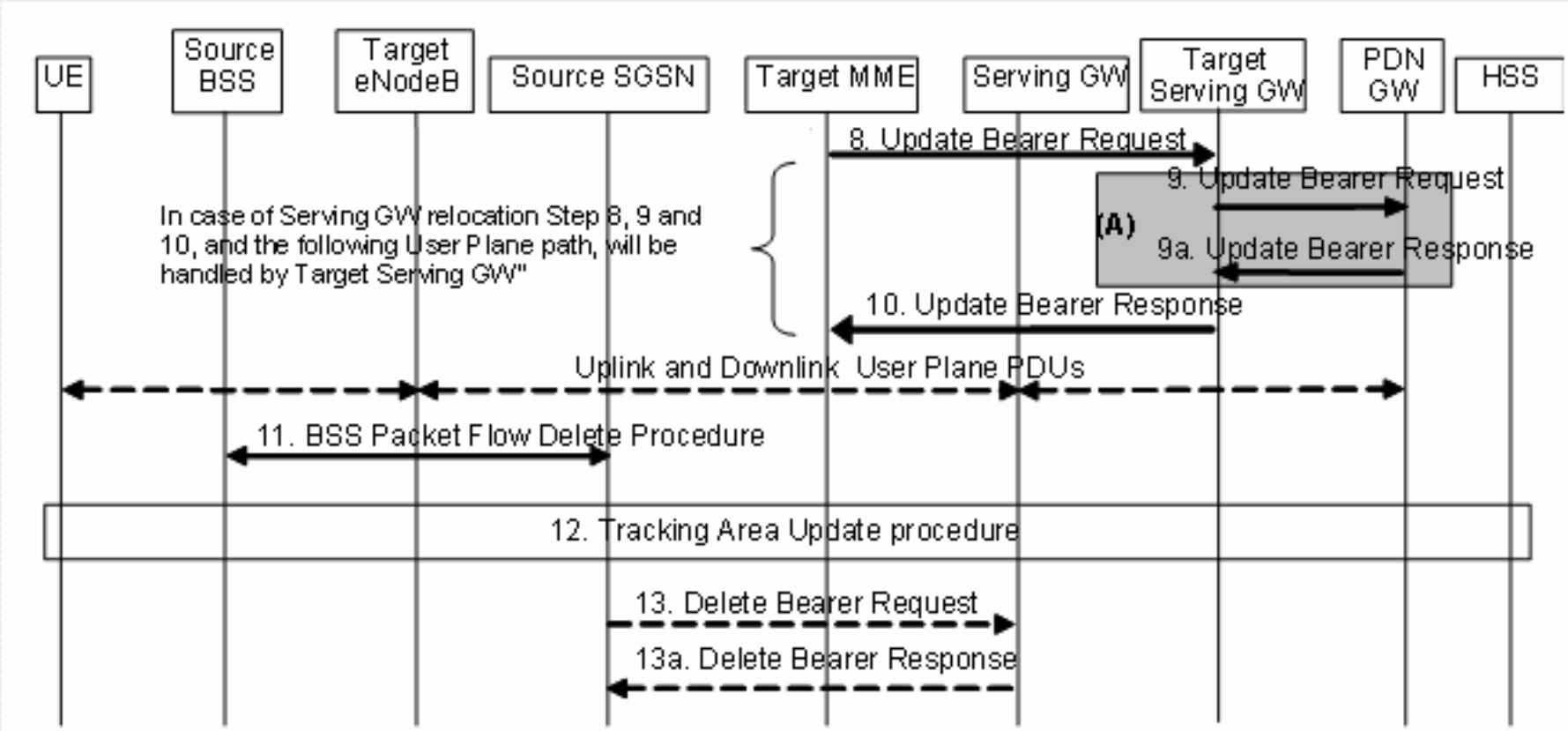
GERAN A/Gb mode to E-UTRAN Inter RAT handover Preparation phase



GERAN A/Gb mode to E-UTRAN Inter RAT handover Execution phase



GERAN A/Gb mode to E-UTRAN Inter RAT handover Execution phase



GERAN A/Gb mode to E-UTRAN Inter RAT handover Execution phase

Step 12: The UE initiates a Tracking Area Update procedure when one of the conditions listed in clause "Triggers for tracking area update" applies. The target MME knows that an IRAT Handover has been performed for this UE as it received the bearer context(s) by handover messages and therefore the target MME performs only a subset of the TA update procedure, specifically it excludes the context transfer procedures between source SGSN and target MME.

GERAN A/Gb mode to E-UTRAN Inter RAT handover Reject