



# MT-SMS Delivery Reattempt in 5GC

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# MT-SMS Delivery Reattempt procedure in 23.502



- Section 4.13.3.9 in TS 23.502 defines the procedure for MT-SMS delivery re-attempt over 5GC.
  - This however covers ONLY re-attempts when MT-SMS delivery via registered AMF/SMSF failed.

## 4.13.3.9 Unsuccessful Mobile terminating SMS delivery attempt

The procedure of Unsuccessful Mobile terminating SMS delivery is defined as follows:

- If the UE is registered over both 3GPP access and non-3GPP access in the same AMF (i.e. the UE is registered in the same PLMN for both access types):
  - if the MT-SMS delivery over one Access Type has failed, the AMF, based on operator local policy, may re-attempt the MT-SMS delivery over the other Access Type before indicating failure to SMSF;
  - if the MT-SMS delivery on both Access Types has failed, the AMF shall inform the SMSF immediately.
- If the AMF informs the SMSF that it cannot deliver the MT-SMS to the UE, the SMSF sends a failure report to the first SMS-GMSC (which can be co-located with IP-SM-GW or SMS Router) as defined in TS 23.040 [7]. If the SMS-GMSC has more than one entity for SMS transport towards the UE, then upon receiving MT-SMS failure report, the SMS-GMSC, based on operator local policy, may re-attempt the MT-SMS delivery via the other entity.
- After the first SMS-GMSC informs the UDM/HSS that the UE is not able to receive MT-SMS, the UDM shall set its internal URRP-AMF flag.
- If the UDM has not subscribed UE Reachability Notification, it immediately initiates a subscription procedure as specified in clause 4.2.5.2.
- When the AMF detects UE activities, it notifies UDM with UE Activity Notification as described in clause 4.2.5.3. The UDM clears its URRP-AMF flag and alerts related SMSCs to retry MT-SMS delivery.

- A procedure for MT-SMS delivery re-attempt when the UE is not registered in 5GC for SMS service\* in the first place is NOT yet defined in 3GPP though.

(\* ) There is no SMSF registered in UDM when the SMSC requests routing information to UDM.

# MT-SMS Delivery Reattempt procedure

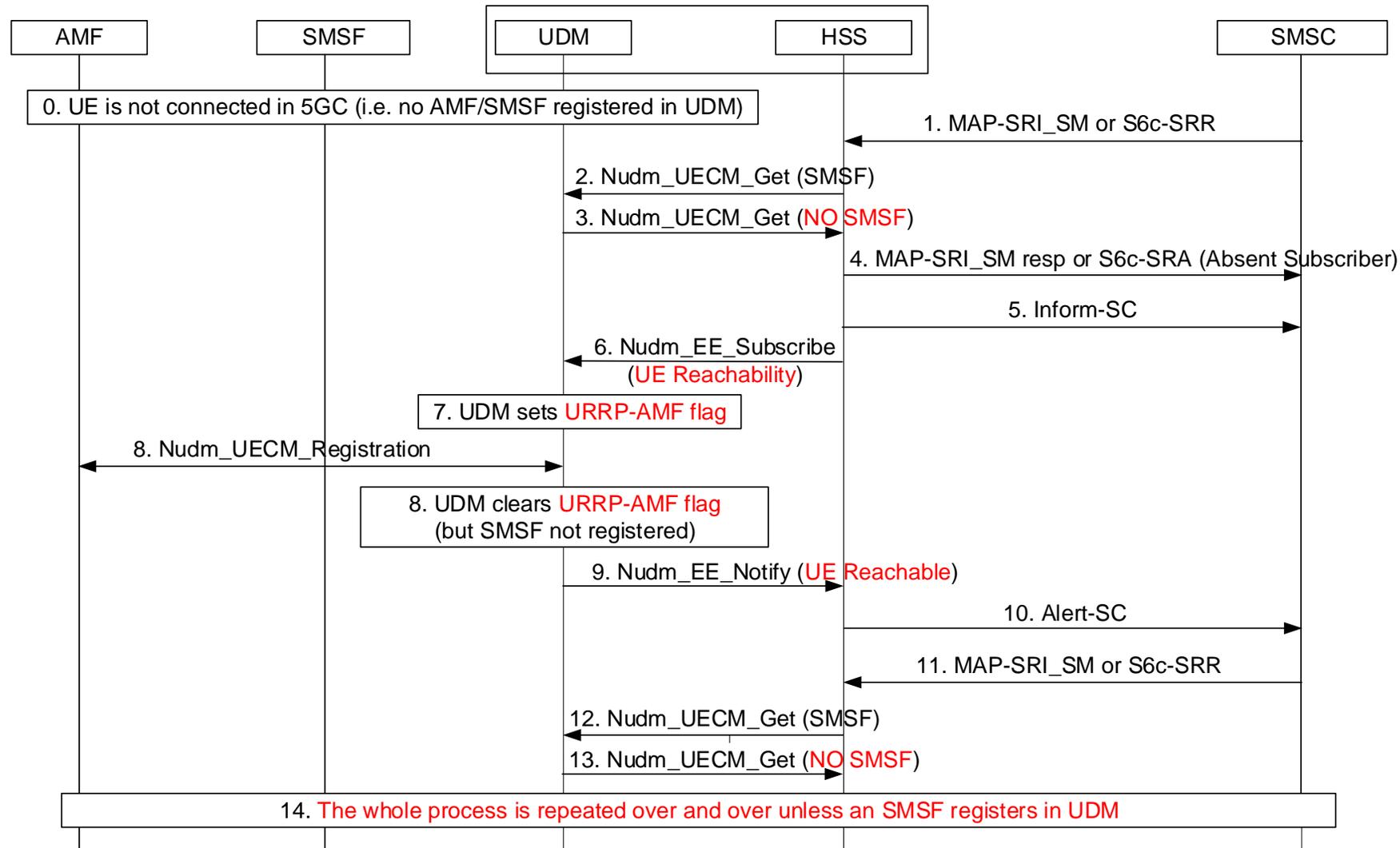
## UE not Registered in 5GC for SMS



- A UE is NOT registered in 5GC for SMS service when ...
  - UE is not registered in 5GC at all (i.e. not registered in UDM via an AMF).
  - UE is registered in 5GC via an AMF but the AMF has not selected an SMSF (e.g. when UE did not indicate support for SMS, VPLMN does not support SMS over NAS, ...).
- A solution to specify MT-SMS Delivery Reattempt when UE is not Registered in 5GC for SMS could be **based on the following:**
  - HSS/UDM informs the SMSC that the user is absent (e.g. MAP SRIforSM Answer **when SMSC initiates a query to HSS/UDM for MT-SMS delivery for a UE**), and that it will be notified when it becomes available for SMS service again (e.g. MAP Inform SC). This is a basic aspect currently missing in 23.502.
  - Additionally, the HSS/UDM could subscribe to **UE reachability status notification** similarly as specified for the case where the MT-SMS failed over the registered AMF/SMSF.
- However, the use of the UE reachability notification for this case is NOT a valid solution as in 5GC reachability is managed and reported by the AMF, while the SMS Transport service is managed by the SMSF instead.
  - I.e. if HSS/UDM alerts SMSC upon detecting an event for UE reachability in an AMF (i.e. when the AMF registers in UDM) but while an SMSF is not yet registered in UDM, endless loops of unsuccessful MT-SMS delivery re-attempts will take place as illustrated in next slide.

# MT-SMS Delivery Reattempt procedure

## UE not Registered in 5GC for SMS – UE Reachability Issue



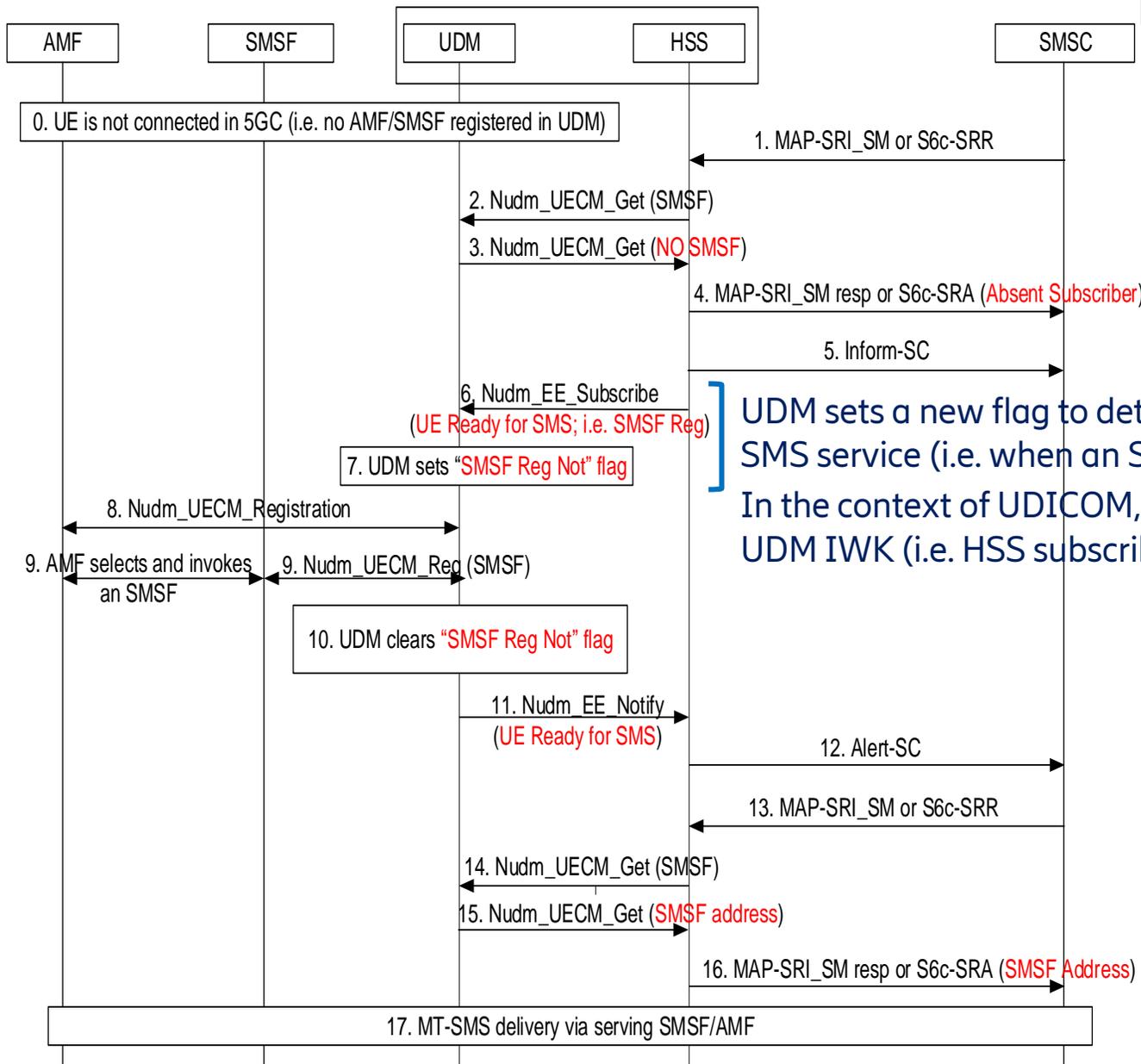
# MT-SMS Delivery Reattempt procedure

## UE not Registered in 5GC for SMS – Proposal



- This DP proposes a solution to specify MT-SMS Delivery Reattempt when the MT-SMS failed due to the UE not Registered in 5GC for SMS service based on the following steps:
  - The HSS/UDM informs the SMSC that the user is absent (MAP SRIforSM Response) and that it will be notified when it becomes available for SMS service again (MAP InformSC).
  - Additionally, the UDM sets a new flag to detect when a UE becomes reachable for SMS service (i.e. when an SMSF is registered in UDM).
  - In the context of UDICOM, the setting of the new flag in UDM requires interworking between HSS and UDM (i.e. HSS subscribes in UDM to be notified to the event of SMSF registration in UDM).
  - When UDM receives an SMSF registration for a UE for which the SMSF registration notification flag is set, the UDM clears the flag and alerts the related SCs to retry the MT-SMS delivery.

# MT-SMS Delivery Reattempt procedure $\equiv$ UE not Registered in 5GC for SMS Proposal



HSS informs SMSC that UE is absent and that it will be notified when UE becomes available for SMS service again

UDM sets a new flag to detect when a UE becomes reachable for SMS service (i.e. when an SMSF is registered in UDM).  
 In the context of UDICOM, setting of the new flag requires HSS-UDM IWK (i.e. HSS subscribes in UDM to be notified to SMSF reg).

When UDM receives an SMSF registration for a UE for which the SMSF registration notification flag is set, the UDM clears the flag and alerts related SCs to retry the MT-SMS delivery.

MT-SMS delivery procedure over registered SMSF/AMF is triggered.

# MT-SMS Delivery Reattempt procedure

## UE not Registered in 5GC for SMS – Proposal



- An accompanying CR to this DP proposes updates in TS 23.502 to complete the MT SMS delivery re-attempt procedure to cover the case when the MT-SMS failed due to the UE is not Registered in 5GC for SMS service.
  - The SA2 CR covers the behaviour in a combined HSS/UDM towards the SMSC and including the handling of the new flag for SMSF registration notification as shown in previous slides.
  - The interworking aspects between HSS and UDM in the context of UDICOM will be proposed for TS 23.632 being currently specified in CT4.

