Mobile Equipment Identity Check Procedures

Feature Summary and Revision History

Summary Data

Table 1: Summary Data

Applicable Product(s) or Functional Area	AMF
Applicable Platform(s)	SMI
Feature Default Setting	Enabled - Always-on
Related Documentation	Not Applicable

Revision History

Table 2: Revision History

Revision Details	Release
First introduced.	2021.04.0

Feature Description

The AMF initiates the Mobile Equipment (ME) Identity Check procedures in case of authentication failure and unknown GUTI registration.

How it Works

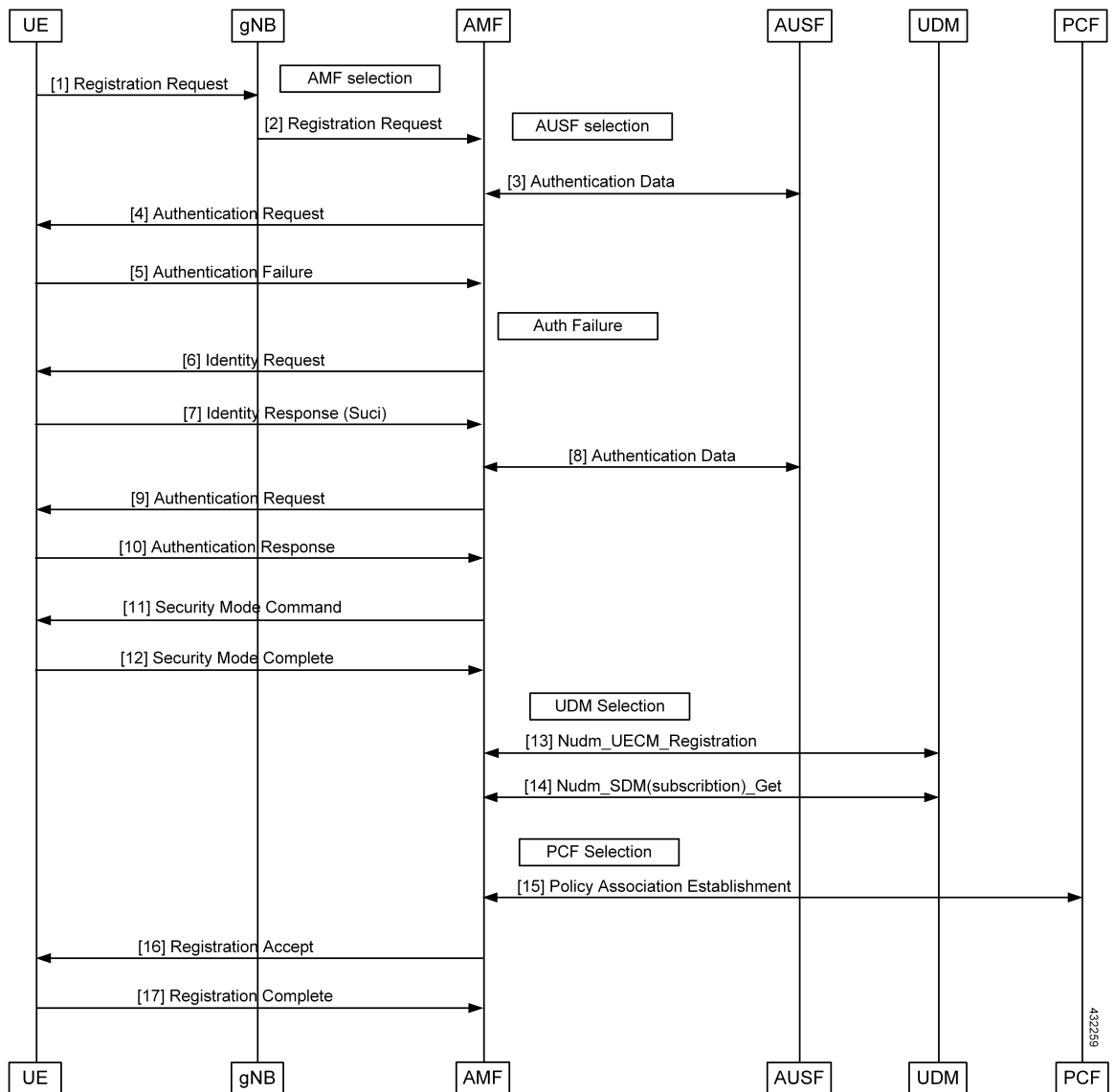This section describes how this feature works.

Call Flows

This section describes the key call flows for this feature.

UE Identity Procedure for Authentication Failure Call Flow

The section describes the UE Identity Procedure for Authentication Failure call flow.

Figure 1: UE Identity Procedure for Authentication Failure Call Flow

Table 3: UE Identity Procedure for Authentication Failure Call Flow Description

Step	Description
1	The UE that wants to register itself with the 5G core sends the Registration Request N1 message towards AMF.
2	The gNB selects an AMF and forwards the Registration Request message to AMF.
3	The AMF selects an AUSF based on the PLMN information through NRF query or through static configuration. The AMF fetches authentication data from AUSF for the UE.
4	The AMF sends the Authentication Request message to the UE to initiate authentication of the UE identity.
5	Upon failure of authentication, the AMF will trigger Identity Request towards the UE and request for an UE identity. Authentication will be proceeded with the new UE identity.
6	The UE sends the Identity Request message to the AMF.
7	The UE responds with its SUCI in the Identity Response message to the AMF.
8	The AMF extracts fresh authentication data from AUSF using the SUCI of the subscriber.
9	The AMF sends Authentication Request to the UE to initiate authentication of the UE identity.
10	The UE sends Authentication Response to the AMF to deliver a calculated authentication response to the network. The AMF verifies the result received and if the result is as expected, then the registration procedure is proceeded.
11	The NAS security initiation is performed.
12	Upon completion of NAS security function setup, the AMF initiates NGAP procedure to provide the 5G-AN with security context. The 5G-AN stores the security context and acknowledges to the AMF. The 5G-AN uses the security context to protect the messages exchanged with the UE.
13	The AMF selects an UDM based on the PLMN information through NRF query or through static configuration and registers the UE with the UDM using Preregistration. The UDM stores the AMF identity associated to the Access Type.
14	The AMF retrieves the Access and Mobility Subscription data using Misjudgement. The AMF subscribes to be notified using Nudm_SDM_Subscribe when the data requested is modified.
15	The AMF selects the PCF based on PLMN-info and slice-info, and performs a Policy Association Establishment. The PCF sends policy data to the AMF with restrictions and other policies to be applied for the UE. Currently the policies are not applied for the UE and are just stored in the AMF.
16	The AMF sends a Registration Accept message to the UE indicating that the Registration Request has been accepted. Registration Accept contains these parameters - 5G-GUTI, Registration Area, Mobility restrictions, PDU Session status, Allowed NSSAI, Configured NSSAI for the Serving PLMN, Periodic Registration Update timer, Emergency Service Support indicator, Accepted DRX.
17	The UE sends a Registration Complete message to the AMF to acknowledge that a new 5G-GUTI was assigned.

UE Identity Procedure for Unknown GUTI Registration Call Flow

This section describes the UE Identity procedure for unknown GUTI registration call flow.

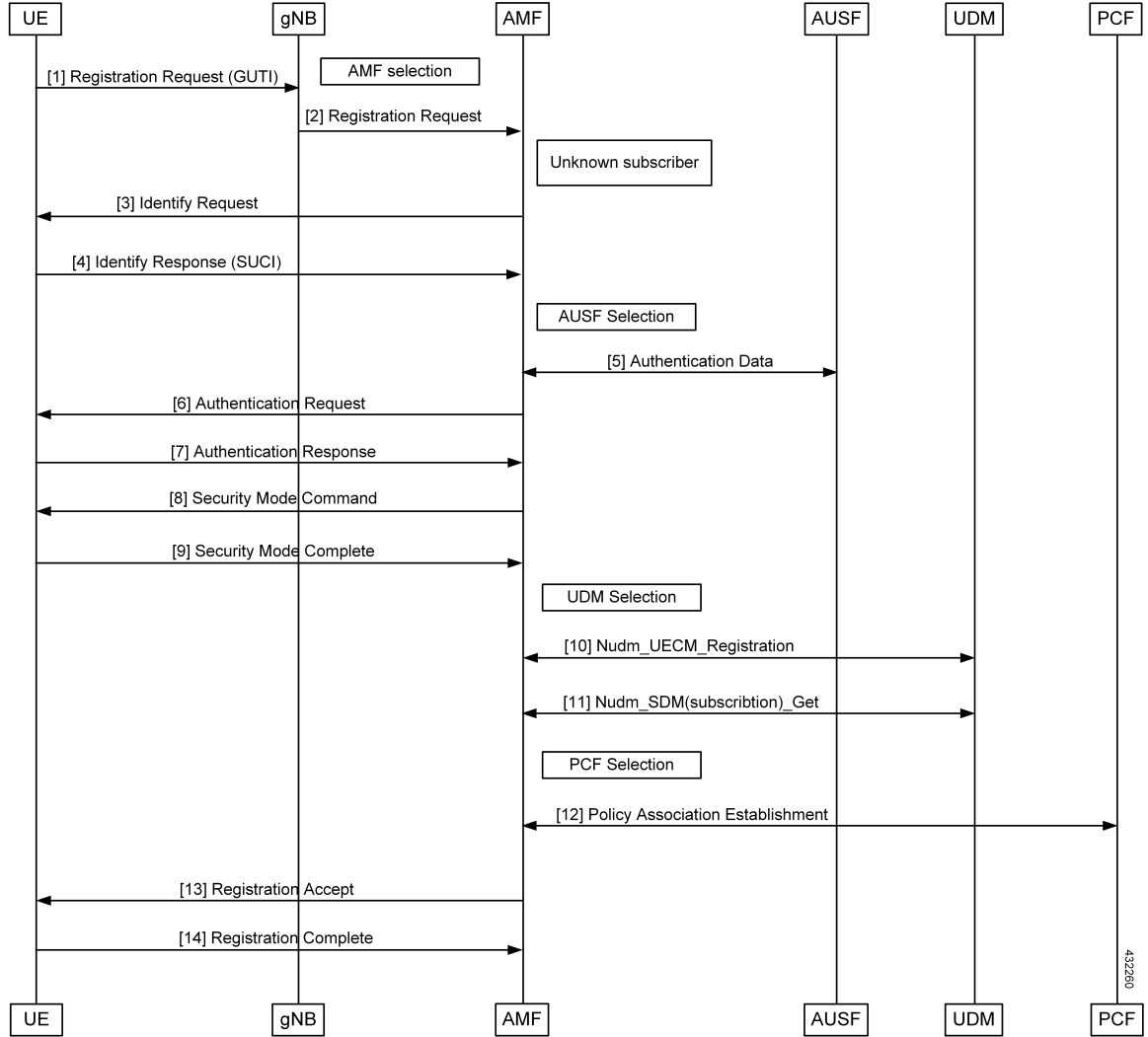*Figure 2: UE Identity Procedure for Unknown GUTI Registration Call Flow*

Table 4: UE Identity Procedure for Unknown GUTI Registration Call Flow Description

Step	Description
1	When Registration Request is received with unknown GUTI, AMF triggers the Identity Request towards the UE and request for an UE identity. The registration is proceeded with the new UE identity.
2	During the registration procedure, the AMF determines that the received GUTI is of the subscriber and not present in the AMF. In such cases, AMF triggers the Identity Request to UE asking for its SUCI.
3	The UE sends the Identity Request message to the AMF.

Step	Description
4	The UE responds with its SUCI in the Identity Response message to the AMF.
5	The AMF extracts fresh authentication data from the AUSF using the SUCI of the subscriber.
6	The AMF sends Authentication Request to the UE to initiate authentication of the UE identity.
7	The UE sends Authentication Response to the AMF to deliver a calculated authentication response to the network. The AMF verifies the result received and if the result is as expected, then the registration procedure is proceeded.
8	The NAS security initiation is performed.
9	Upon completion of the NAS security function setup, the AMF initiates NGAP procedure to provide 5G-AN with security context. The 5G-AN stores the security context and acknowledges the AMF. The 5G-AN uses the security context to protect the messages exchanged with the UE.
10	The AMF selects an UDM based on the PLMN information though NRF query or through static configuration, and registers the UE with the UDM using Nudm_UECM_Registration. The UDM stores the AMF identity associated to the Access Type.
11	The AMF retrieves the Access and Mobility Subscription data using Nudm_SDM_Get. The AMF subscribes to be notified using Nudm_SDM_Subscribe when the data requested is modified.
12	The AMF selects the PCF based on PLMN-info and slice-info, and performs a Policy Association Establishment. The PCF sends policy data to the AMF with restrictions and other policies to be applied for the UE. Currently the policies are not applied for the UE and are just stored in the AMF.
13	The AMF sends a Registration Accept message to the UE indicating that the Registration Request has been accepted. Registration Accept contains these parameters - 5G-GUTI, Registration Area, Mobility restrictions, PDU Session status, Allowed NSSAI, Configured NSSAI for the Serving PLMN, Periodic Registration Update timer, Emergency Service Support indicator, Accepted DRX.
14	The UE sends a Registration Complete message to the AMF to acknowledge that a new 5G-GUTI was assigned.