1 Scope

The present document specifies the non-access stratum (NAS) procedures in the 5G system (5GS) used by the protocols for:

- mobility management between the user equipment (UE) and the access and mobility management function (AMF) for both 3GPP access and non-3GPP access; and

- session management between the user equipment (UE) and the session management function (SMF) for both 3GPP access and non-3GPP access.

The 5GS mobility management (5GMM) protocol defined in the present document provides procedures for the control of mobility when the user equipment (UE) is using the NG radio access network (NG-RAN), non-3GPP access network, or both. The 5GMM protocol also provides control of security for the NAS protocols.

The 5GS session management (5GSM) protocol defined in the present document provides procedures for the handling of 5GS PDU sessions. Together with the bearer control provided by the access stratum, this protocol is used for the control of user-plane resources.

For both NAS protocols the present document specifies procedures for the support of inter-system mobility between the NG-RAN and the evolved universal terrestrial radio access (E-UTRAN), between the NG-RAN and the non-3GPP access network connected to the EPC, and between the non-3GPP access network connected to the 5G core network (5GCN) and the E-UTRAN.

For both NAS protocols the present document specifies procedures for the support of mobility between the NG-RAN and the non-3GPP access network connected to the 5GCN.

In addition, the present document specifies the procedures in the 5GS for UE policy delivery service between the UE and the policy control function (PCF) for both 3GPP access and non-3GPP access.

The present document is applicable to the UE, the access and mobility management function (AMF), the session management function (SMF), and the PCF in the 5GS.

The clauses and subclauses in the present document are common for both 3GPP access and non-3GPP access unless it is explicitly stated that they apply to 3GPP access only or non-3GPP access only.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document in the same Release as the present document.

[1]   3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[1A]   3GPP TS 22.011: "Service accessibility".

[2]   3GPP TS 22.101: "Service aspects; Service principles".

[3]   3GPP TS 22.261: "Service requirements for the 5G system; Stage 1".

[4]   3GPP TS 23.003: "Numbering, addressing and identification".

[4A]   3GPP TS 23.040: "Technical realization of Short Message Service (SMS)".

[4B]   3GPP TS 23.032: "Universal Geographical Area Description (GAD)".

[5]   3GPP TS 23.122: "Non-Access-Stratum functions related to Mobile Station (MS) in idle mode".

[6]   3GPP TS 23.167: "IP Multimedia Subsystem (IMS) emergency sessions".

[6A]   3GPP TS 23.216: "Single Radio Voice Call Continuity (SRVCC); Stage 2".

[6AB]   3GPP TS 23.256: "Support of Uncrewed Aerial Systems (UAS) connectivity, identification and tracking; Stage 2".

[6B]   3GPP TS 23.273: "5G System (5GS) Location Services (LCS); Stage 2".

[6C]   3GPP TS 23.287: "Architecture enhancements for 5G System (5GS) to support Vehicle-to-Everything (V2X) services".

[6D]   3GPP TS 23.316: "Wireless and wireline convergence access support for the 5G System (5GS)".

[6E]   3GPP TS 23.304: "Proximity based Services (ProSe) in the 5G System (5GS)".

[7]   3GPP TS 23.401: "GPRS enhancements for E-UTRAN access".

[8]   3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

[9]   3GPP TS 23.502: "Procedures for the 5G System; Stage 2".

[10]   3GPP TS 23.503: "Policy and Charging Control Framework for the 5G System; Stage 2".

[10A]   3GPP TS 23.548: "5G System Enhancements for Edge Computing; Stage 2".

[11]   3GPP TS 24.007: "Mobile radio interface signalling layer 3; General aspects".

[12]   3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core Network Protocols; Stage 3".

[13]   3GPP TS 24.011: "Point-to-Point Short Message Service (SMS) support on mobile radio interface".

[13A]   3GPP TS 24.080: "Mobile radio interface layer 3 Supplementary services specification; Formats and coding".

[13B]   3GPP TS 24.193: "Access Traffic Steering, Switching and Splitting; Stage 3".

[13C]   3GPP TS 24.173: "IMS Multimedia telephony communication service and supplementary services; Stage 3".

[13D]   3GPP TS 24.174: "Support of multi-device and multi-identity in the IP Multimedia Subsystem (IMS); Stage 3".

[14]   3GPP TS 24.229: "IP multimedia call control protocol based on Session Initiation Protocol (SIP) and Session Description Protocol (SDP); Stage 3".

[14AA]   3GPP TS 24.237: "IP Multimedia (IM) Core Network (CN) subsystem IP Multimedia Subsystem (IMS) service continuity; Stage 3".

[14A]   3GPP TS 24.250: "Protocol for Reliable Data Service; Stage 3".

[15]   3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3".

[16]   3GPP TS 24.302: "Access to the 3GPP Evolved Packet Core (EPC) via non-3GPP access networks; Stage 3"

[17]   3GPP TS 24.368: "Non-Access Stratum (NAS) configuration Management Object (MO)".

[18]   3GPP TS 24.502: "Access to the 3GPP 5G System (5GS) via non-3GPP access networks; Stage 3".

[19]   3GPP TS 24.526: "UE policies for 5G System (5GS); Stage 3".

[19BA]   3GPP TS 24.539: "5G System (5GS); Network to TSN translator (TT) protocol aspects; Stage 3".

[19A]   3GPP TS 24.535: "Device-Side Time-Sensitive Networking (TSN) Translator (DS-TT) to Network-Side TSN Translator (NW-TT) protocol aspects; Stage 3".

[19B]   3GPP TS 24.587: "Vehicle-to-Everything (V2X) services in 5G System (5GS); Protocol aspects; Stage 3"

[19C]   3GPP TS 24.588: "Vehicle-to-Everything (V2X) services in 5G System (5GS); User Equipment (UE) policies; Stage 3"

[19D]   Void.

[19E]   3GPP TS 24.554: "Proximity-service (ProSe) in 5G System (5GS) protocol aspects; Stage 3".

[19F]   3GPP TS 24.555: "Proximity-services (ProSe) in 5G System (5GS); User Equipment (UE) policies; Stage 3".

[20]   3GPP TS 24.623: "Extensive Markup Language (XML) Configuration Access Protocol (XCAP) over the Ut interface for Manipulating Supplementary Services".

[20AA]   3GPP TS 29.500: "5G System; Technical Realization of Service Based Architecture; Stage 3".

[20A]   3GPP TS 29.502: "5G System; Session Management Services; Stage 3".

[20AB]   3GPP TS 29.503: "5G System; Unified Data Management Services; Stage 3".

[20B]   3GPP TS 29.518: "5G System; Access and Mobility Management Services; Stage 3".

[21]   3GPP TS 29.525: "5G System; UE Policy Control Service; Stage 3".

[21A]   3GPP TS 29.526: "5G System; Network Slice-Specific Authentication and Authorization (NSSAA) services; Stage 3".

[21B]   3GPP TS 29.256: "5G System; Uncrewed Aerial Systems Network Function (UAS-NF); Aerial Management Services; Stage 3.

[22]   3GPP TS 31.102: "Characteristics of the Universal Subscriber Identity Module (USIM) application".

[22A]   3GPP TS 31.111: "USIM Application Toolkit (USAT)".

[22B]   3GPP TS 31.115: "Secured packet structure for (Universal) Subscriber Identity Module (U)SIM Toolkit applications".

[23]   3GPP TS 33.102: "3G security; Security architecture".

[23A]   3GPP TS 33.401: "3GPP System Architecture Evolution; Security architecture".

[24]   3GPP TS 33.501: "Security architecture and procedures for 5G System".

[24A]   3GPP TS 33.535: "Authentication and Key Management for Applications (AKMA) based on 3GPP credentials in the 5G System (5GS)".

[24B]   3GPP TS 33.256: "Security aspects of Uncrewed Aerial Systems (UAS)".

[25]   3GPP TS 36.323: "NR; Packet Data Convergence Protocol (PDCP) specification".

[25A]   3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC) protocol specification".

[25B]   3GPP TS 36.300: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Universal Terrestrial Radio Access Network (E-UTRAN); Overall description".

[25C]   3GPP TS 36.304: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) procedures in idle mode".

[25D]   3GPP TS 36.306: "Evolved Universal Terrestrial Radio Access (E-UTRA); User Equipment (UE) radio access capabilities".

[25E]   3GPP TS 36.321: "Evolved Universal Terrestrial Radio Access (E-UTRA); Medium Access Control (MAC) protocol specification".

[26]   3GPP TS 37.355: "LTE Positioning Protocol (LPP)".

[26A]   3GPP TS 38.355: "Sidelink Positioning Protocol (SLPP); Protocol specification".

[27]   3GPP TS 38.300: "NR; NR and NG-RAN Overall Description; Stage 2".

[28]   3GPP TS 38.304: "New Generation Radio Access Network; User Equipment (UE) procedures in Idle mode".

[28A]   3GPP TS 38.306: "New Generation Radio Access Network; User Equipment (UE) radio access capabilities".

[29]   3GPP TS 38.323: "Evolved Universal Terrestrial Radio Access (E-UTRA); Packet Data Convergence Protocol (PDCP) specification".

[30]   3GPP TS 38.331: "NR; Radio Resource Control (RRC); Protocol Specification".

[31]   3GPP TS 38.413: "NG Radio Access Network (NG-RAN); NG Application Protocol (NGAP)".

[31A]   IEEE Std 802.3™-2022: "Ethernet".

[31AA]   3GPP TS 38.509: "Special conformance testing functions for User Equipment (UE)".

[32]   IETF RFC 768: "User Datagram Protocol".

[33]   IETF RFC 793: "Transmission Control Protocol."

[33A]   IETF RFC 3095: "RObust Header Compression (ROHC): Framework and four profiles: RTP, UDP, ESP and uncompressed".

[33B]   Void.

[33C]   Void.

[33D]   IETF RFC 8415: "Dynamic Host Configuration Protocol for IPv6 (DHCPv6)".

[33E]   IETF RFC 2131: "Dynamic Host Configuration Protocol".

[33F]   IETF RFC 2132: "DHCP Options and BOOTP Vendor Extensions".

[34]   IETF RFC 3748: "Extensible Authentication Protocol (EAP)".

[34A]   IETF RFC 3843: "RObust Header Compression (ROHC): A Compression Profile for IP".

[35]   Void.

[35A]   IETF RFC 4122: "A Universally Unique IDentifier (UUID) URN Namespace".

[36]   IETF RFC 4191: "Default Router Preferences and More-Specific Routes".

[36A]   IETF RFC 5905: "Network Time Protocol Version 4: Protocol and Algorithms Specification".

[37]   IETF RFC 7542: "The Network Access Identifier".

[38]   IETF RFC 4303: "IP Encapsulating Security Payload (ESP)".

[38A]   IETF RFC 4815: "RObust Header Compression (ROHC): Corrections and Clarifications to RFC 3095".

[38B]   IETF RFC 4861: "Neighbor Discovery for IP version 6 (IPv6)".

[39]   IETF RFC 4862: "IPv6 Stateless Address Autoconfiguration".

[39A]   IETF RFC 5225: "RObust Header Compression (ROHC) Version 2: Profiles for RTP, UDP, IP, ESP and UDP Lite".

[39B]   IETF RFC 5795: "The RObust Header Compression (ROHC) Framework".

[40]   IETF RFC 5448: "Improved Extensible Authentication Protocol Method for 3rd Generation Authentication and Key Agreement (EAP-AKA')".

[40A]   IETF RFC 6603: "Prefix Exclude Option for DHCPv6-based Prefix Delegation".

[40B]   IETF RFC 6846: "RObust Header Compression (ROHC): A Profile for TCP/IP (ROHC-TCP)".

[41]   IETF RFC 7296: "Internet Key Exchange Protocol Version 2 (IKEv2)".

[42]   ITU-T Recommendation E.212: "The international identification plan for public networks and subscriptions", 2016-09-23.

[43]   IEEE Std 802-2014: "IEEE Standard for Local and Metropolitan Area Networks: Overview and Architecture" (30 June 2014).

[43A]   Void

[43B]   IEEE Std 1588™-2019: "IEEE Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems".

[43C]   Void.

[43D]   Void.

[43E]   Void.

[44]   Void.

[45]   Void.

[46]   Void.

[47]   Void.

[48]   IEEE: "Guidelines for Use of Extended Unique Identifier (EUI), Organizationally Unique Identifier (OUI), and Company ID (CID)".

[49]   BBF TR-069: "CPE WAN Management Protocol".

[50]   BBF TR-369: "User Services Platform (USP)".

[51]   3GPP TS 37.340: "Evolved Universal Terrestrial Radio Access (E-UTRA) and NR; Multi-connectivity; Stage 2".

[52]   IETF RFC 8106:"IPv6 Router Advertisement Options for DNS Configuration".

[53]   3GPP TS 23.247: "Architectural enhancements for 5G multicast-broadcast services; Stage 2".

[54]   3GPP TS 23.380: "IMS Restoration Procedures".

[55]   IETF RFC 3948: "UDP Encapsulation of IPsec ESP Packets".

[56]   3GPP TS 33.503: "Security Aspects of Proximity based Services (ProSe) in the 5G System (5GS)".

[57]   3GPP TS 33.246: "Security of Multimedia Broadcast/Multicast Service (MBMS)".

[58]   3GPP TS 38.321: "NR; Medium Access Control (MAC); Protocol specification".

[59]   IEEE Std 802.11™-2020: "Information Technology- Telecommunications and information exchange between systems-Local and metropolitan area networks-Specific requirements-Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications".