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Part 2: Test Suite Structure (TSS) and Test Purposes (TP)

**Technical Specification**

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# Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Core Network and Interoperability Testing (INT).

The present document is part 2 of a multi-part deliverable. Full details of the entire series can be found in part 1 [2].

# Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](http://portal.etsi.org/Help/editHelp!/Howtostart/ETSIDraftingRules.aspx) (Verbal forms for the expression of provisions).

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# 1 Scope

The present document provides the Test Suite Structure (TSS) and Test Purposes (TP) for the test specification for the NAS protocol on the S1-MME interface as specified in ETSI TS 124 301 [1] in compliance with the relevant requirements and in accordance with the relevant guidance given in ISO/IEC 9646-7 [4] and ETSI ETS 300 406 [5].

# 2 References

## 2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non‑specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are necessary for the application of the present document.

[1] ETSI TS 124 301 (V13.9.0): "Universal Mobile Telecommunications System (UMTS); LTE; Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3 (3GPP TS 24.301 version 13.9.0 Release 13)".

[2] ETSI DTS/INT-00136-1: " Core Network and Interoperability Testing (INT); NAS Conformance Testing for the S1-MME interface; (3GPP Release 13); Part 1: Protocol Implementation Conformance Statement (PICS)".

[3] ETSI TS 103 497: "S1AP Conformance Testing for the S1-MME interface;(3GPP™ Release 10);".

[4] ISO/IEC 9646-1: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 1: General concepts".

[5] ISO/IEC 9646-7: "Information technology -- Open Systems Interconnection -- Conformance testing methodology and framework -- Part 7: Implementation Conformance Statements".

[6] ETSI ETS 300 406: "Methods for testing and Specification (MTS); Protocol and profile conformance testing specifications; Standardization methodology".

## 2.2 Informative references

References are either specific (identified by date of publication and/or edition number or version number) or non‑specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

Not applicable.

# 3 Definitions and abbreviations

## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in ETSI TS 124 301 [**1**] and the following apply:

**Abstract Test Method (ATM):** Refer to ISO/IEC 9646‑1 [4].

**Abstract Test Suite (ATS):** Refer to ISO/IEC 9646‑1 [4].

**Implementation Under Test (IUT):** Refer to ISO/IEC 9646‑1 [4].

**Test Purpose (TP):** Refer to ISO/IEC 9646‑1 [4].

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in ETSI TS 124 301 [**1**] and the following apply:

MI Message Information

NAS Non-Access Stratum

S1AP S1 Application Protocol

TP Test Purpose

TSS Test Suite Structure

# 4 Test configurations

## 4.1 Introduction

Test purposes of the present document address the VoLTE functional entitiy MME that is accessible via the standardized S1-MME interface.

## 4.2 Test configuration using the S1-MME interface

The S1-MME interface is located between the eNB and the MME. The NAS messages are transparent for the eNB, therefore only the MME is considered a System Under test (SUT).

**TS**

**SUT**

**S1-MME**

**MME**

**eNB**

Figure 1: Test configuration CF\_S1-MME

# 5 Test Suite Structure (TSS) and Test Purposes (TP)

## 5.1 Test Suite Structure

### 5.1.1 TP naming convention

TPs are numbered, starting at 01, within each group. Groups are organized according to the TSS.

Table 1: TP identifier naming convention scheme

|  |
| --- |
| Identifier: **<TP>\_<iut>\_<scope>\_<nn>**  <tp> = Test Purpose: fixed to "TP"  <interface or protocol> Interface or protocol: NAS  <iut> = type of IUT: MME  <scope> = group MGR EMM / GUTI relocation procedure  MAU EMM / Authentication procedure  MSM EMM / Security mode control procedure  MID EMM / Identification procedure  MEI EMM / EMM information procedure  MAT EMM / Attach procedure  MDE EMM / Detach procedure  MTA EMM / Tracking area updating procedure (S1 mode only)  MSR EMM / Service request procedure  MPA EMM / Paging procedure  MTR EMM / Transport of NAS messages procedure  MGT EMM / Generic transport of NAS messages procedure  MES EMM / EMM Status  SDF ESM / Default EPS bearer context activation procedure  SDE ESM / Dedicated EPS bearer context activation procedure  SCM ESM / EPS bearer context modification procedure  SCD ESM / EPS bearer context deactivation procedure  SPC ESM / UE requested PDN connectivity procedure  SPD ESM / UE requested PDN disconnect procedure  SRA ESM / UE requested bearer resource allocation procedure  SRM ESM / UE requested bearer resource modification procedure  SEI ESM / ESM information request procedure  SNO ESM / Notification procedure  SRR ESM / Remote UE Report procedure  STU ESM / Transport of user data via the control plane procedure  <nn> = sequential number (01 to 99) |

### 5.1.2 Test strategy

As the base specification in ETSI TS 124 301 [1] contains no explicit requirements for testing, the TPs were generated as a result of an analysis of the base standard and the PICS specification ETSI DTS/INT-00136-1 [2].

### 5.1.3 TP structure

Each TP has been written in a manner which is consistent with all other TPs. The intention of this is to make the TPs more readable and checkable. A particular structure has been used which is illustrated in table 2. Table 2 should be read in conjunction with any TP, i.e. please use a TP as an example to facilitate the full comprehension of table 2.

Table 2: Structure of a single TP

|  |  |  |
| --- | --- | --- |
| TP part | Text | Example |
| **Header** | **<Identifier>** | see table 1 |
|  | **<clause number in base ETSI TS 124 301 [**1**]** **>** | **clause 8.2.1** |
|  | **<PICS reference>** | **A.4/3** |
| **Summary** | *Short free text description of the test objective* | Verify that the IUT can successfully process all mandatory IEs in an ATTACH REQUEST received due to attach procedure. |
| **Configuration** | *Test configuration as described in clauses 4.2* | CF\_S1-MME |
| **Initial condition (optional)** | *Free text description of the condition that the IUT has reached before the test purpose applies.* |  |
| **Start point** | Ensure that the IUT in the |  |
|  | <state> *see*ETSI TS 124 301 [1] *clause 8.1* | network initiated detach procedure |
|  | *and/or further actions before stimulus*  *if the action is sending/receiving*  *see* *below for message structure* | having sent a DETACH REQUEST |
| **Stimulus** | <**trigger**>, *see* *below for message structure* | on receipt of an ATTACH REQUEST (see note 2) |
|  | *or* <goal> |  |
| **Reaction** | <**action**>. | sends, saves, does, etc. |
|  | *if the action is sending*  *see* *below for message structure*  <next action>, *etc.* |  |
| **Message structure** | <message type> | Message exchange, etc. (see note 2) |
|  | *a)* containing a(n) <IE name> IE  *b)* indicating <coding of the field>  and *back to a) or b) (see note 3)* |  |
| NOTE 1: Text in italics will not appear in TPs and text between <> is filled in for each TP and may differ from one TP to the next.  NOTE 2: All messages are considered as "valid and compatible" unless otherwise specified in the test purpose. This includes the presence of all NAS mandatory IEs as specified in ETSI TS 124 301 [1]. For better overview of the document there are S1AP messages (ex. DOWNLINK\_NAS\_TRANSPORT) written with underscore character and NAS messages (ex. ATTACH REQUETS) with space character.  NOTE 3: An IE can be embedded into another IE. This is expressed by indentations, e.g. if Message1 contains IE1 and IE2 where IE1 has IE3 embedded this will be expressed like this:  sends/receives Message 1  containing IE1  containing IE3  indicating ...  containing IE2  indicating ... | | |

## 5.2 Test Purposes

### 5.2.1 PICS references

All PICS items referred in this clause are as specified in ETSI DTS/INT-00136-1 [2] unless indicated otherwise by another numbered reference. PICS items are only meant for test selection, therefore only PICS items with status optional or conditional are explicitly mentioned.

### 5.2.2 S1\_MME interface NAS – MME Role

#### 5.2.2.1 Test selection

The IUT takes the role of the MME; PICS A.2/1.

Test purposes contains S1AP message with NAS-PDU content. S1AP message content with required IEs is present within 5.2.3 S1-MME Messages subclause.

#### 5.2.2.2 Elementary procedures for EPS mobility management

##### 5.2.2.2.1 GUTI reallocation group

|  |  |  |
| --- | --- | --- |
| TP\_NAS\_MME\_MGR\_01 | Standards Reference:  Clause 5.4.1 and  8.2.16 | PICS item:  PICS A.4/1 |
| Summary: | Verify that the IUT can send a GUTI REALLOCATION COMMAND message with all mandatory IEs to indicate GUTI reallocation procedure. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** a GUTI reallocation procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating **GUTI REALOCATION COMMAND**  containing an EPS\_mobile\_identity. | |
| Comments: |  | |

##### 5.2.2.2.2 Authentication group

|  |  |  |
| --- | --- | --- |
| TP\_NAS\_MME\_MAU\_01 | Standards Reference:  Clause 5.4.2 and  8.2.7 | PICS item:  PICS A.4/2 |
| Summary: | Verify that the IUT can send an AUTHENTICATION REQUEST message with all mandatory IEs to indicate authentication procedure. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** an authentication procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **AUTHENTICATION REQUEST**  containing a NAS\_key\_set\_identifier  containing a Spare\_half\_octet  containing an Authentication\_parameter\_RAND  containing an Authentication\_parameter\_AUTN. | |
| Comments: | Preamble action: Attached procedure is exchanged. | |

|  |  |  |
| --- | --- | --- |
| TP\_NAS\_MME\_MAU\_02 | Standards Reference:  Clause 5.4.2.2 and 5.4.2.5 and  8.2.6 | PICS item:  PICS A.4/2.1 |
| Summary: | Verify that the IUT can send an AUTHENTICATION REQUEST message to indicate authentication procedure and in case if authentication response is not valid and the IMSI was used for identification in the initial NAS message the IUT sends AUTHENTICATION REJECT message. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** an authentication procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **AUTHENTICATION REQUEST**  containing a NAS\_key\_set\_identifier  containing a Spare\_half\_octet  containing an Authentication\_parameter\_RAND  containing an Authentication\_parameter\_AUTN  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **AUTHENTICATION RESPONSE**  containing an Authentication\_response\_parameter  indicating wrong response  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **AUTHENTICATION REJECT**. | |
| Comments: | Preamble action: Attached procedure is exchanged. | |

|  |  |  |
| --- | --- | --- |
| TP\_NAS\_MME\_MAU\_03 | Standards Reference:  Clause 5.4.2.6¶3 and 5.4.2.7 (item c) and 8.2.7 and 8.2.18 | PICS item:  PICS A.4/2.2 and A.4/2.2.1 |
| Summary: | Verify that the IUT can send an AUTHENTICATION REQUEST indicating invalid MAC code (in the AUTN parameter) and when receives AUTHENTICATION FAILURE the IUT sends IDENTITY REQUEST to obtain the IMSI from the UE. In case the identification procedure shows an incorrect GUTI/IMSI mapping the IUT sends new AUTHENTICATION REQUEST. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** an authentication procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **AUTHENTICATION REQUEST**  containing a NAS\_key\_set\_identifier  containing a Spare\_half\_octet  containing an Authentication\_parameter\_RAND  containing an Authentication\_parameter\_AUTN  indicating invalid AUTN code  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **AUTHENTICATION FAILURE**  containing an EMM\_cause  indicating cause #20 “MAC failure”  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **IDENTITY REQUEST**  containing an Identity\_type 2  indicating an IMSI  containing a Spare\_half\_octet  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **IDENTITY RESPONSE**  containing a Mobile\_identity  indicating an incorrect IMSI  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **AUTHENTICATION REQUEST**  containing a NAS\_key\_set\_identifier  containing a Spare\_half\_octet  containing an Authentication\_parameter\_RAND  containing an Authentication\_parameter\_AUTN. | |
| Comments: | Preamble action: Attached procedure is exchanged. | |

|  |  |  |
| --- | --- | --- |
| TP\_NAS\_MME\_MAU\_04 | Standards Reference:  Clause 5.4.2.6¶3 and 5.4.2.7 (item c) and 8.2.6 and 8.2.18 | PICS item:  PICS A.4/2.2 and A.4/2.2.2 |
| Summary: | Verify that the IUT can send an AUTHENTICATION REQUEST indicating invalid MAC code (in the AUTN parameter) and when receives AUTHENTICATION FAILURE the IUT sends IDENTITY REQUEST to obtain the IMSI from the UE. In case the identification procedure shows a correct GUTI/IMSI mapping the IUT sends AUTHENTICATION REJECT. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** an authentication procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **AUTHENTICATION REQUEST**  containing a NAS\_key\_set\_identifier  containing a Spare\_half\_octet  containing an Authentication\_parameter\_RAND  containing an Authentication\_parameter\_AUTN  indicating invalid AUTN code  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **AUTHENTICATION FAILURE**  containing an EMM\_cause  indicating cause #20 “MAC failure”  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **IDENTITY REQUEST**  containing an Identity\_type 2  indicating an IMSI  containing a Spare\_half\_octet  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **IDENTITY RESPONSE**  containing a Mobile\_identity  indicating an correct IMSI  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **AUTHENTICATION REJECT**. | |
| Comments: | Preamble action: Attached procedure is exchanged. | |

|  |  |  |
| --- | --- | --- |
| TP\_NAS\_MME\_MAU\_05 | Standards Reference:  Clause 5.4.2.6¶5 and 5.4.2.7 (item d) and 8.2.7 and 8.2.18 | PICS item:  PICS A.4/2.3 and A.4/2.3.1 |
| Summary: | Verify that the IUT can send an AUTHENTICATION REQUEST indicating non-EPS authentication unacceptable (“separation bit” in the AMF field of AUTN supplied by the core network is 0) and when receives AUTHENTICATION FAILURE the IUT sends IDENTITY REQUEST to obtain the IMSI from the UE. In case the identification procedure shows an incorrect GUTI/IMSI mapping the IUT sends new AUTHENTICATION REQUEST. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** an authentication procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **AUTHENTICATION REQUEST**  containing a NAS\_key\_set\_identifier  containing a Spare\_half\_octet  containing an Authentication\_parameter\_RAND  containing an Authentication\_parameter\_AUTN  indicating “separation bit” in the AMF field of AUTN supplied by the core network is 0  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **AUTHENTICATION FAILURE**  containing an EMM\_cause  indicating cause #26 “non-EPS authentication unacceptable”  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **IDENTITY REQUEST**  containing an Identity\_type 2  indicating an IMSI  containing a Spare\_half\_octet  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **IDENTITY RESPONSE**  containing a Mobile\_identity  indicating an incorrect IMSI  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **AUTHENTICATION REQUEST**  containing a NAS\_key\_set\_identifier  containing a Spare\_half\_octet  containing an Authentication\_parameter\_RAND  containing an Authentication\_parameter\_AUTN. | |
| Comments: | Preamble action: Attached procedure is exchanged. | |

|  |  |  |
| --- | --- | --- |
| TP\_NAS\_MME\_MAU\_06 | Standards Reference:  Clause 5.4.2.6¶3 and 5.4.2.7 (item d) and 8.2.6 and 8.2.18 | PICS item:  PICS A.4/2.3 and A.4/2.3.2 |
| Summary: | Verify that the IUT can send an AUTHENTICATION REQUEST indicating non-EPS authentication unacceptable (“separation bit” in the AMF field of AUTN supplied by the core network is 0) and when receives AUTHENTICATION FAILURE the IUT sends IDENTITY REQUEST to obtain the IMSI from the UE. In case the identification procedure shows a correct GUTI/IMSI mapping the IUT sends AUTHENTICATION REJECT. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** an authentication procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **AUTHENTICATION REQUEST**  containing a NAS\_key\_set\_identifier  containing a Spare\_half\_octet  containing an Authentication\_parameter\_RAND  containing an Authentication\_parameter\_AUTN  indicating indicating “separation bit” in the AMF field of AUTN supplied by the core network is 0  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **AUTHENTICATION FAILURE**  containing an EMM\_cause  indicating cause #26 “non-EPS authentication unacceptable”  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **IDENTITY REQUEST**  containing an Identity\_type 2  indicating an IMSI  containing a Spare\_half\_octet  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **IDENTITY RESPONSE**  containing a Mobile\_identity  indicating an correct IMSI  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **AUTHENTICATION REJECT**. | |
| Comments: | Preamble action: Attached procedure is exchanged. | |

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| TP\_NAS\_MME\_MAU\_07 | Standards Reference:  Clause 5.4.2.6¶7 and 5.4.2.7 (item e) and 8.2.7 and 8.2.18 | PICS item:  PICS A.4/2.4 |
| Summary: | Verify that the IUT can send an AUTHENTICATION REQUEST indicating invalid SQN failure (if the UE finds the SQN to be out of range in the AUTN parameter) and when receives AUTHENTICATION FAILURE the IUT obtain new vectors from HSS and sends new AUTHENTICATION REQUEST. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** an authentication procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **AUTHENTICATION REQUEST**  containing a NAS\_key\_set\_identifier  containing a Spare\_half\_octet  containing an Authentication\_parameter\_RAND  containing an Authentication\_parameter\_AUTN  indicating SQN out of range  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **AUTHENTICATION FAILURE**  containing an EMM\_cause  indicating cause #21 “synch failure”  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **AUTHENTICATION REQUEST**  containing a NAS\_key\_set\_identifier  containing a Spare\_half\_octet  containing an Authentication\_parameter\_RAND  containing an Authentication\_parameter\_AUTN. | |
| Comments: | Preamble action: Attached procedure is exchanged. | |

##### 5.2.2.2.3 Security mode control group

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| TP\_NAS\_MME\_MSM\_01 | Standards Reference:  Clause 5.4.3 and  8.2.20 | PICS item:  PICS A.4/3 |
| Summary: | Verify that the IUT can send a SECURITY MODE CONTROL message with all mandatory IEs to indicate NAS security mode procedure. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** a NAS security mode procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating a **SECURITY MODE COMMAND**  containing a NAS\_security algorithms  containing a NAS\_key\_set\_identifier  containing a Spare\_half\_octet  containing a UE\_security\_capability. | |
| Comments: |  | |

##### 5.2.2.2.4 Identification group

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| --- | --- | --- |
| TP\_NAS\_MME\_MID\_01 | Standards Reference:  Clause 5.4.4 and  8.2.18 | PICS item:  PICS A.4/4 |
| Summary: | Verify that the IUT can send an IDENTITY REQUEST message with all mandatory IEs to indicate identification procedure. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** identification procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **IDENTITY REQUEST**  containing an Identity\_type\_2  containing a Spare\_half\_octet. | |
| Comments: |  | |

##### 5.2.2.2.5 EMM information group

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| TP\_NAS\_MME\_MEI\_01 | Standards Reference:  Clause 5.4.5 and  8.2.13 | PICS item:  PICS A.4/5 |
| Summary: | Verify that the IUT can send an EMM INFORMATION message with all mandatory IEs to indicate EMM information procedure. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** EMM information procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **EMM INFORMATION**. | |
| Comments: |  | |

##### 5.2.2.2.6 Attach group

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| TP\_NAS\_MME\_MAT\_01 | Standards Reference:  Clause 5.5.1¶8, 5.5.1.2.5A¶1 and  8.2.1, 8.2.3 | PICS item:  NOT PICS A.4/6.1 |
| Summary: | Verify that the IUT rejects a NAS ATTACH REQUEST containing an attach type set to “EPS emergency attach” if an attach for emergency bearer services is not supported by the IUT. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an INITIAL\_UE\_MESSAGE** (seeMI\_S1AP\_NAS\_01)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **ATTACH REQUEST**  containing an EPS\_attach\_type  indicating an EPS emergency attach  containing a NAS\_key\_set\_identifier  containing an EPS\_mobile\_identity  containing a UE\_network\_capability  containing an ESM\_message\_container  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **ATTACH REJECT**  containing an EMM\_cause  indicating cause #5 ‘IMEI not accepted’ **or**  indicating other appropriate cause value. | |
| Comments: |  | |

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| TP\_NAS\_MME\_MAT\_02 | Standards Reference:  Clause 5.5.1.2.4¶4(1st dashed line) and 8.2.1, 8.2.2 | PICS item:  PICS A.3/3.1 and A.4/6 |
| Summary: | Verify that the IUT accepts a NAS ATTACH REQUEST containing PDN CONNECTIVITY REQUEST message in the ESM message container information element to request PDN connectivity and the UE indicated support of EMM-REGISTERED without PDN connection in the UE network capability IE and the IUT supports EMM-REGISTERED without PDN connection and PDN connection is restricted according to the user's subscription data then the IUT sends the ATTACH ACCEPT message together with an ESM DUMMY MESSAGE contained in the ESM message container information element. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an INITIAL\_UE\_MESSAGE** (seeMI\_S1AP\_NAS\_01)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **ATTACH REQUEST**  containing an EPS\_attach\_type  indicating an EPS attach  containing a NAS\_key\_set\_identifier  containing an EPS\_mobile\_identity  containing a UE\_network\_capability  indicating EMM-REGISTERED without PDN connection supported  containing an ESM\_message\_container  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **PDN CONNECTIVITY REQUEST**  containing a Request\_type  indicating appropriate value (initial request)  containing a PDN\_type  indicating appropriate value (IPv4)  **sends an INITIAL\_CONTEXT\_SETUP\_REQUEST** (see MI\_S1AP\_CTX\_01)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **ATTACH ACCEPT**  containing an EPS\_attach\_result  containing a Spare\_half\_octet  containing a GPRS\_timer  containing a TAI\_list  containing an ESM\_message\_container  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating an **ESM DUMMY MESSAGE.** | |
| Comments: |  | |

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| --- | --- | --- |
| TP\_NAS\_MME\_MAT\_03 | Standards Reference:  Clause 5.5.1.2.4¶4(2nd dashed line) and 8.2.1, 8.2.2 | PICS item:  PICS A.3/3.1 and A.4/6 |
| Summary: | Verify that the IUT accepts a NAS ATTACH\_REQUEST containing PDN CONNECTIVITY REQUEST message in the ESM message container information element to request PDN connectivity and the UE indicated support of EMM-REGISTERED without PDN connection in the UE network capability IE the IUT sends the ATTACH ACCEPT message together with an ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message contained in the ESM message container information element to activate the default bearer. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an INITIAL\_UE\_MESSAGE** (seeMI\_S1AP\_NAS\_01)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **ATTACH REQUEST**  containing an EPS\_attach\_type  indicating an EPS attach  containing a NAS\_key\_set\_identifier  containing an EPS\_mobile\_identity  containing a UE\_network\_capability  containing an ESM\_message\_container  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **PDN CONNECTIVITY REQUEST**  containing a Request\_type  indicating appropriate value (initial request)  containing a PDN\_type  indicating appropriate value (IPv4)  **sends an INITIAL\_CONTEXT\_SETUP\_REQUEST** (see MI\_S1AP\_CTX\_01)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **ATTACH ACCEPT**  containing an EPS\_attach\_result  containing a Spare\_half\_octet  containing a GPRS\_timer  containing a TAI\_list  containing an ESM\_message\_container  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating an **ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST.** | |
| Comments: |  | |

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| --- | --- | --- |
| TP\_NAS\_MME\_MAT\_04 | Standards Reference:  Clause 5.5.1.2.4¶5 and 8.2.1, 8.2.2 | PICS item:  PICS A.3/3.1 and A.4/6 |
| Summary: | Verify that the IUT accepts a NAS ATTACH\_REQUEST containing ESM DUMMY MESSAGE message in the ESM message container information element to request PDN connectivity and the UE indicated support of EMM-REGISTERED without PDN connection in the UE network capability IE the IUT sends the ATTACH ACCEPT message together with an ESM DUMMY MESSAGE message contained in the ESM message container information element to activate the default bearer. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an INITIAL\_UE\_MESSAGE** (seeMI\_S1AP\_NAS\_01)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **ATTACH REQUEST**  containing an EPS\_attach\_type  indicating an EPS attach  containing a NAS\_key\_set\_identifier  containing an EPS\_mobile\_identity  containing a UE\_network\_capability  indicating EMM-REGISTERED without PDN connection supported  containing an ESM\_message\_container  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **ESM DUMMY MESSAGE**  **sends an INITIAL\_CONTEXT\_SETUP\_REQUEST** (see MI\_S1AP\_CTX\_01)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **ATTACH ACCEPT**  containing an EPS\_attach\_result  containing a Spare\_half\_octet  containing a GPRS\_timer  containing a TAI\_list  containing an ESM\_message\_container  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating an **ESM DUMMY MESSAGE.** | |
| Comments: |  | |

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| TP\_NAS\_MME\_MAT\_05 | Standards Reference:  Clause 5.5.1.2.4 (2nd paragraph after NOTE 4) and 8.2.1, 8.2.2 | PICS item:  PICS A.4/6 |
| Summary: | Verify that the IUT accepts a NAS ATTACH\_REQUEST containing Additional update type IE containing ‘control plane CIoT EPS optimization’ then the IUT sends the ATTACH ACCEPT message with EPS network feature support IE indicating ‘control plane CIoT EPS optimization supported’. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an INITIAL\_UE\_MESSAGE** (seeMI\_S1AP\_NAS\_01)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **ATTACH REQUEST**  containing an EPS\_attach\_type  indicating an EPS attach  containing a NAS\_key\_set\_identifier  containing an EPS\_mobile\_identity  containing a UE\_network\_capability  containing an ESM\_message\_container  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **ESM DUMMY MESSAGE**  containing an Additional\_update\_type  indicating ‘control plane CIoT EPS optimization’  **sends an INITIAL\_CONTEXT\_SETUP\_REQUEST** (see MI\_S1AP\_CTX\_01)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **ATTACH ACCEPT**  containing an EPS\_attach\_result  containing a Spare\_half\_octet  containing a GPRS\_timer  containing a TAI\_list  containing an ESM\_message\_container  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating an **ESM DUMMY MESSAGE**  containing an EPS\_network\_feature\_support  indicating ‘control plane CIoT EPS optimization supported’. | |
| Comments: |  | |

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| TP\_NAS\_MME\_MAT\_06 | Standards Reference:  Clause 5.5.1.2.4A¶2 and 8.2.1, 8.2.2 | PICS item:  PICS A.4/6.6 |
| Summary: | Verify that the IUT accepts the attach request for EPS services only in NB-S1 mode and after receipt of a NAS ATTACH\_REQUEST containing Additional update type IE containing ‘SMS only’ sends the ATTACH ACCEPT message containing EPS attach result IE with value ‘EPS only’ and containing the Additional update result IE with value ‘SMS only’ and containing appropriate SMS service status value. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an INITIAL\_UE\_MESSAGE** (seeMI\_S1AP\_NAS\_01)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **ATTACH REQUEST**  containing an EPS\_attach\_type  indicating an EPS attach  containing a NAS\_key\_set\_identifier  containing an EPS\_mobile\_identity  containing a UE\_network\_capability  containing an ESM\_message\_container  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **ESM DUMMY MESSAGE**  containing an Additional\_update\_type  indicating ‘SMS only’  **sends an INITIAL\_CONTEXT\_SETUP\_REQUEST** (see MI\_S1AP\_CTX\_01)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **ATTACH ACCEPT**  containing an EPS\_attach\_result  indicating ‘EPS only’  containing a Spare\_half\_octet  containing a GPRS\_timer  containing a TAI\_list  containing an ESM\_message\_container  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating an **ESM DUMMY MESSAGE**  containing an Additional\_update\_result  indicating ‘SMS only’  containing an SMS\_service\_status. | |
| Comments: |  | |

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| TP\_NAS\_MME\_MAT\_07 | Standards Reference:  Clause 5.5.1.2.5¶7 (2nd dashed list) and  8.2.1, 8.2.3 and 8.3.19, 8.3.20 | PICS item:  PICS A.3/3.1 and A.4/6 |
| Summary: | Verify that the IUT rejects a NAS ATTACH REQUEST in case if EMM-REGISTERED without PDN connection is not supported by the UE or the IUT and PDN CONNECTIVITY REQUEST is included in the request then the IUT sends a NAS ATTACH REJECT message with a PDN CONNECTIVITY REJECT message contained in the ESM message container IE. EMM cause IE is set to ‘ESM failure’ or ‘No sutable cells in tracking area’. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an INITIAL\_UE\_MESSAGE** (seeMI\_S1AP\_NAS\_01)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **ATTACH REQUEST**  containing an EPS\_attach\_type  indicating an EPS attach  containing a NAS\_key\_set\_identifier  containing an EPS\_mobile\_identity  containing a UE\_network\_capability  indicating EMM-REGISTERED without PDN connection not supported  containing an ESM\_message\_container  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **PDN CONNECTIVITY REQUEST**  containing a Request\_type  indicating appropriate value (initial request)  containing a PDN\_type  indicating appropriate value (IPv4)  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **ATTACH REJECT**  containing an EMM\_cause  indicating cause #19 ‘ESM failure’ **or**  indicating cause #15 ‘No sutable cells in tracking area’  containing an ESM\_message\_container  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **PDN CONNECTIVITY REJECT**  containing an ESM\_cause  indicating appropriate value. | |
| Comments: |  | |

##### 5.2.2.2.7 Detach group

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| TP\_NAS\_MME\_MDE\_01 | Standards Reference:  Clause 5.5.2.2.2¶1, 5.5.2.2.3¶1 and  8.2.11.1 | PICS item:  PICS A.4/7.1 |
| Summary: | Verify that the IUT accepts a NAS DETACH\_REQUEST with Switch off bit set to ‘normall detach’ and sends the DETACH ACCEPT message. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **DETACH REQUEST**  containing a Detach\_type  containing a Switch\_off bit  indicating ‘normal detach’  containing a Type\_of\_detach  indicating value from the Table 3  containing a NAS\_key\_set\_identifier  containing a EPS\_mobile\_identity  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **DETACH ACCEPT**. | |
| Comments: |  | |

Table 3: Type\_of\_detach

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| --- | --- |
| test purpose  variants | Type\_of\_detach: |
| VA\_01 | EPS detach |
| VA\_02 | IMSI detach |
| VA\_03 | Combined EPS/IMSI detach |

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| TP\_NAS\_MME\_MDE\_02 | Standards Reference:  Clause 5.5.2.2.2¶1, 5.5.2.2.3¶1 and  8.2.11.1 | PICS item:  PICS A.4/7.1 |
| Summary: | Verify that the IUT accepts a NAS DETACH\_REQUEST with Switch\_off bit set to ‘switch off’ and does not send the DETACH ACCEPT message. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **DETACH REQUEST**  containing a Detach\_type  containing a Switch\_off bit  indicating ‘switch off’  containing a Type\_of\_detach  indicating value from the Table 3  containing a NAS\_key\_set\_identifier  containing a EPS\_mobile\_identity  **not sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **DETACH ACCEPT**. | |
| Comments: |  | |

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| --- | --- | --- |
| TP\_NAS\_MME\_MDE\_03 | Standards Reference:  Clause 5.5.2.3 and  8.2.11.2 | PICS item:  PICS A.4/7.2 |
| Summary: | Verify that the IUT can send an DETACH REQUEST message with all mandatory IEs to indicate network initiated detach procedure. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** network initiated detach procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **DETACH REQUEST**  containing a Detach\_type  containing a Spare\_half\_octet. | |
| Comments: |  | |

##### 5.2.2.2.8 Tracking area updating group

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| TP\_NAS\_MME\_MTA\_01 | Standards Reference:  Clause 5.5.3.2.4¶1 and  8.2.26 | PICS item:  PICS A.4/8 |
| Summary: | Verify that the IUT accepts a NAS TRACKING AREA UPDATE REQUEST and sends the TRACKING AREA UPDATE ACCEPT message. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating a **TRACKING AREA UPDATE REQUEST**  containing an EPS\_update\_type  containing a NAS\_key\_set\_identifier  containing a EPS\_mobile\_identity  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating a **TRACKING AREA UPDATE ACCEPT**  containing an EPS\_update\_result  containing a Spare\_half\_octet. | |
| Comments: |  | |

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| TP\_NAS\_MME\_MTA\_02 | Standards Reference:  Clause 5.5.3.2.5 and  8.2.28 | PICS item:  PICS A.4/8 |
| Summary: | Verify that the IUT does not accept a NAS TRACKING AREA UPDATE REQUEST and sends the TRACKING AREA UPDATE REJECT message. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating a **TRACKING AREA UPDATE REQUEST**  containing an EPS\_update\_type  containing a NAS\_key\_set\_identifier  containing an EPS\_mobile\_identity  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating a **TRACKING AREA UPDATE REJECT**  containing an EMM\_cause. | |
| Comments: |  | |

##### 5.2.2.2.9 Service request group

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| TP\_NAS\_MME\_MSR\_01 | Standards Reference:  Clause 5.6.1.5 and  8.2.24, 8.2.25 | PICS item:  PICS A.4/9.1.1 |
| Summary: | Verify that the IUT does not accept a SERVICE REQUEST and sends the SERVICE REJECT message. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an INITIAL\_UE\_MESSAGE** (see MI\_S1AP\_NAS\_01)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  indicating a **SERVICE REQUEST**  containing a KSI\_and\_sequence\_number  containing a Short\_MAC  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating a **SERVICE REJECT**  containing an EMM\_cause. | |
| Comments: | Preamble action: Attached procedure is exchanged. | |

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| TP\_NAS\_MME\_MSR\_02 | Standards Reference:  Clause 5.6.1.5 and  8.2.24, 8.2.15 | PICS item:  PICS A.4/9.1.2 |
| Summary: | Verify that the IUT does not accept a EXTENDED SERVICE REQUEST and sends the SERVICE REJECT message. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **EXTENDED SERVICE REQUEST**  containing a Service\_type  containing a NAS\_key\_set\_identifier  containing a Mobile\_identity  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating a **SERVICE REJECT**  containing an EMM\_cause. | |
| Comments: | Preamble action: Attached procedure is exchanged and EXTENDED SERVICE REQUEST is enabled. | |

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| TP\_NAS\_MME\_MSR\_03 | Standards Reference:  Clause 5.6.1.5 and  8.2.24, 8.2.33 | PICS item:  PICS A.4/9.1.3 |
| Summary: | Verify that the IUT does not accept a CONTROL PLANE SERVICE REQUEST and sends the SERVICE REJECT message. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an INITIAL\_UE\_MESSAGE** (see MI\_S1AP\_NAS\_01)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating a **CONTROL PLANE SERVICE REQUEST**  containing a Control\_plane\_service\_type  containing a NAS\_key\_set\_identifier  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating a **SERVICE REJECT**  containing an EMM\_cause. | |
| Comments: |  | |

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| --- | --- | --- |
| TP\_NAS\_MME\_MSR\_04 | Standards Reference:  Clause 5.6.1.4.2 and  8.2.33, 8.2.34 | PICS item:  PICS A.4/9.1.3 |
| Summary: | Verify that the IUT accepts a CONTROL PLANE SERVICE REQUEST with Control plane service type indicating ‘mobile terminating request’ and sends the SERVICE ACCEPT message. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an INITIAL\_UE\_MESSAGE** (see MI\_S1AP\_NAS\_01)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating a **CONTROL PLANE SERVICE REQUEST**  containing a Control\_plane\_service\_type  indicating ‘mobile terminating request’  containing a NAS\_key\_set\_identifier  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating a **SERVICE ACCEPT**. | |
| Comments: |  | |

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| --- | --- | --- |
| TP\_NAS\_MME\_MSR\_05 | Standards Reference:  Clause 5.6.1.4.2 and  8.2.33, 8.2.34 | PICS item:  PICS A.4/9.1.3 |
| Summary: | Verify that the IUT accepts a CONTROL PLANE SERVICE REQUEST with Control plane service type indicating ‘mobile originating request’ and sends the SERVICE ACCEPT message. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an INITIAL\_UE\_MESSAGE** (see MI\_S1AP\_NAS\_01)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating a **CONTROL PLANE SERVICE REQUEST**  containing a Control\_plane\_service\_type  indicating ‘mobile originating request’  containing a NAS\_key\_set\_identifier  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating a **SERVICE ACCEPT**. | |
| Comments: |  | |

##### 5.2.2.2.10 Paging group

|  |  |  |
| --- | --- | --- |
| TP\_NAS\_MME\_MPA\_01 | Standards Reference:  Clause 5.6.2.3.1 and  8.2.9 | PICS item:  PICS A.4/10.2 |
| Summary: | Verify that the IUT can send a CS SERVICE NOTIFICATION message with all mandatory IEs to indicate a paging for CS fallback procedure. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** paging procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating a **CS SERVICE NOTIFICATION**  containing a Paging\_identity. | |
| Comments: |  | |

##### 5.2.2.2.11 Transport of NAS messages group

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| --- | --- | --- |
| TP\_NAS\_MME\_MTR\_01 | Standards Reference:  Clause 5.6.3 and  8.2.12 | PICS item:  PICS A.4/11 |
| Summary: | Verify that the IUT can send an DOWNLINK NAS TRANSPORT message with all mandatory IEs to indicate transport of NAS message procedure. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** transport of NAS message procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating a **DOWNLINK NAS TRANSPORT**  containing a NAS\_message\_container. | |
| Comments: |  | |

##### 5.2.2.2.12 Generic transport of NAS messages group

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| --- | --- | --- |
| TP\_NAS\_MME\_MGT\_01 | Standards Reference:  Clause 5.6.4 and  8.2.31 | PICS item:  PICS A.4/12 |
| Summary: | Verify that the IUT can send an DOWNLINK GENERIC NAS TRANSPORT message with all mandatory IEs to indicate generic transport of NAS message procedure. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** generic transport of NAS message procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating a **DOWNLINK GENERIC NAS TRANSPORT**  containing a Generic\_message\_container\_type  containing a Generic\_message\_container. | |
| Comments: |  | |

##### 5.2.2.2.13 EMM STATUS

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| --- | --- | --- |
| TP\_NAS\_MME\_MES\_01 | Standards Reference:  Clause 5.7and  8.2.14 | PICS item:  PICS A.4/13 |
| Summary: | Verify that the IUT can send an EMM STATUS message with all mandatory IEs to indicate error condition detected upon receipt of EMM protocol data. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** generic transport of NAS message procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing a Security\_header\_type  containing a Message\_type  indicating an **EMM STATUS**  containing an EMM\_cause. | |
| Comments: |  | |

#### 5.2.2.3 Elementary procedures for EPS session management

##### 5.2.2.3.1 Default EPS bearer context activation procedure

|  |  |  |
| --- | --- | --- |
| TP\_NAS\_MME\_SDF\_01 | Standards Reference:  Clause 6.4.1 and 8.3.6 | PICS item:  PICS A.5/1 |
| Summary: | Verify that the IUT can send an ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message with all mandatory IEs to indicate the default bearer context activation procedure. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** the default bearer context activation procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating an **ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST**  containing an EPS\_quality\_of\_service  containing an Access\_point\_name  containing a PDN\_address. | |
| Comments: |  | |

##### 5.2.2.3.2 Dedicated EPS bearer context activation procedure

|  |  |  |
| --- | --- | --- |
| TP\_NAS\_MME\_SDE\_01 | Standards Reference:  Clause 6.4.2 and 8.3.3 | PICS item:  PICS A.5/2 |
| Summary: | Verify that the IUT can send an ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST message with all mandatory IEs to indicate the dedicated bearer context activation procedure. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** the dedicated bearer context activation procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating an **ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST**  containing a Linked\_EPS\_bearer\_identity  containing a Spare\_half\_octet  containing an EPS\_quality\_of\_service  containing a Trafic\_flow\_template. | |
| Comments: |  | |

##### 5.2.2.3.3 EPS bearer context modification procedure

|  |  |  |
| --- | --- | --- |
| TP\_NAS\_MME\_SCM\_01 | Standards Reference:  Clause 6.4.3 and 8.3.18 | PICS item:  PICS A.5/3 |
| Summary: | Verify that the IUT can send a MODIFY EPS BEARER CONTEXT REQUEST message with all mandatory IEs to indicate the EPS bearer context modification procedure. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** the EPS bearer context modification procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **MODIFY EPS BEARER CONTEXT REQUEST**. | |
| Comments: |  | |

##### 5.2.2.3.4 EPS bearer context deactivation procedure

|  |  |  |
| --- | --- | --- |
| TP\_NAS\_MME\_SCD\_01 | Standards Reference:  Clause 6.4.4 and 8.3.12 | PICS item:  PICS A.5/4 |
| Summary: | Verify that the IUT can send a DEACTIVATE EPS BEARER CONTEXT REQUEST message with all mandatory IEs to indicate the EPS bearer context deactivation procedure. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** the EPS bearer context deactivation procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **DEACTIVATE EPS BEARER CONTEXT REQUEST**  containing an ESM\_cause. | |
| Comments: |  | |

##### 5.2.2.3.5 UE requested PDN connectivity procedure

|  |  |  |
| --- | --- | --- |
| TP\_NAS\_MME\_SPC\_01 | Standards Reference:  Clause 6.5.1, 6.5.1.3 and  8.3.20, 8.3.6 | PICS item:  PICS A.5/5 |
| Summary: | Verify that the IUT accepts a PDN CONNECTIVITY REQUEST and sends the ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST message. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **PDN CONNECTIVITY REQUEST**  containing a PDN\_type  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating an **ACTIVATE DEFAULT EPS BEARER CONTEXT REQUEST**  containing an EPS\_quality\_of\_service  containing an Access\_point\_name  containing a PDN\_address. | |
| Comments: |  | |

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| --- | --- | --- |
| TP\_NAS\_MME\_SPC\_02 | Standards Reference:  Clause 6.5.1, 6.5.1.4 and  8.3.19, 8.3.20 | PICS item:  PICS A.5/5 |
| Summary: | Verify that the IUT can not accepts a PDN CONNECTIVITY REQUEST due to unknown PDN type value and sends the PDN CONNECTIVITY REJECT message with appropriate ESM cause value. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **PDN CONNECTIVITY REQUEST**  containing a PDN\_type  indicating unknown value  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **PDN CONNECTIVITY REJECT**  containing an ESM\_cause  indicating ‘unknown PDN type’ with #28. | |
| Comments: |  | |

##### 5.2.2.3.6 UE requested PDN disconnect procedure

|  |  |  |
| --- | --- | --- |
| TP\_NAS\_MME\_SPD\_01 | Standards Reference:  Clause 6.5.2, 6.5.2.3 and  8.3.22, 8.3.12 | PICS item:  PICS A.5/6 |
| Summary: | Verify that the IUT accepts a PDN DISCONNECT REQUEST and sends the DEACTIVATE EPS BEARER CONTEXT REQUEST message. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **PDN DISCONNECT REQUEST**  containing a Linked\_EPS\_bearer\_identity  indicating linked value  containing a Spare\_half\_octet  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **DEACTIVATE EPS BEARER CONTEXT REQUEST**  containing an ESM\_cause  indicating appropriate ESM cause value. | |
| Comments: |  | |

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| --- | --- | --- |
| TP\_NAS\_MME\_SPD\_02 | Standards Reference:  Clause 6.5.2, 6.5.2.4 and  8.3.21, 8.3.22 | PICS item:  PICS A.5/6 |
| Summary: | Verify that the IUT can not accepts a PDN DISCONNECT REQUEST due to unknown PDN type value and sends the PDN DISCONNECT REJECT message with appropriate ESM cause value. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **PDN DISCONNECT REQUEST**  containing a Linked\_EPS\_bearer\_identity  indicating invalid value  containing a Spare\_half\_octet  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **PDN DISCONNECT REJECT**  containing an ESM\_cause  indicating ‘invalid EPS bearer identity’ with #43. | |
| Comments: |  | |

##### 5.2.2.3.7 UE requested bearer resource allocation procedure

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| --- | --- | --- |
| TP\_NAS\_MME\_SRA\_01 | Standards Reference:  Clause 6.5.3, 6.5.3.3 and  8.3.8, 8.3.3, 8.3.18 | PICS item:  PICS A.5/7 |
| Summary: | Verify that the IUT accepts a BEARER RESOURCE ALLOCATION REQUEST and sends the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST or MODIFY EPS BEARER CONTEXT REQUEST message. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **BEARER RESOURCE ALLOCATION REQUEST**  containing a Linked\_EPS\_bearer\_identity  indicating linked value  containing a Spare\_half\_octet  containing a Traffic\_flow\_aggregate\_description  containing a length\_indicator  indicating value ‘1’  containing a TFT\_operation\_code  indicating value ‘000’  containing a E\_bit  indicating value ‘0’  containing a number\_of\_packet\_filters  indicating zero  containing an EPS\_quality\_of\_service  containing a length\_indicator  indicating value ‘1’  containing a QCI  indicating zero  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating an **ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST**  containing a Linked\_EPS\_bearer\_identity  containing a Spare\_half\_octet  containing an EPS\_quality\_of\_service  containing a Trafic\_flow\_template  **or**  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **MODIFY EPS BEARER CONTEXT REQUEST**. | |
| Comments: |  | |

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| --- | --- | --- |
| TP\_NAS\_MME\_SRA\_02 | Standards Reference:  Clause 6.5.3, 6.5.3.4 and  8.3.7, 8.3.8 | PICS item:  PICS A.5/7 |
| Summary: | Verify that the IUT can not accepts a BEARER RESOURCE ALLOCATION REQUEST due to unknown PDN type value and sends the BEARER RESOURCE ALLOCATION REJECT message with appropriate ESM cause value. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **BEARER RESOURCE ALLOCATION REQUEST**  containing a Linked\_EPS\_bearer\_identity  indicating invalid value  containing a Spare\_half\_octet  containing a Traffic\_flow\_aggregate\_description  containing a length\_indicator  indicating value ‘1’  containing a TFT\_operation\_code  indicating value ‘000’  containing a E\_bit  indicating value ‘0’  containing a number\_of\_packet\_filters  indicating zero  containing an EPS\_quality\_of\_service  containing a length\_indicator  indicating value ‘1’  containing a QCI  indicating zero  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **BEARER RESOURCE ALLOCATION REJECT**  containing an ESM\_cause  indicating ‘invalid EPS bearer identity’ with #43. | |
| Comments: |  | |

##### 5.2.2.3.8 UE requested bearer resource modification procedure

|  |  |  |
| --- | --- | --- |
| TP\_NAS\_MME\_SRM\_01 | Standards Reference:  Clause 6.5.4, 6.5.4.3 and  8.3.10, 8.3.12, 8.3.3, 8.3.18 | PICS item:  PICS A.5/8 |
| Summary: | Verify that the IUT accepts a BEARER RESOURCE MODIFICATION REQUEST and sends the ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST or MODIFY EPS BEARER CONTEXT REQUEST or DEACTIVATE EPS BEARER CONTEXT REQUEST message. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **BEARER RESOURCE MODIFICATION REQUEST**  containing a Linked\_EPS\_bearer\_identity  indicating linked value  containing a Spare\_half\_octet  containing a Traffic\_flow\_aggregate\_description  containing a length\_indicator  indicating value ‘1’  containing a TFT\_operation\_code  indicating value ‘000’  containing a E\_bit  indicating value ‘0’  containing a number\_of\_packet\_filters  indicating zero  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02) **or**  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating an **ACTIVATE DEDICATED EPS BEARER CONTEXT REQUEST**  containing a Linked\_EPS\_bearer\_identity  containing a Spare\_half\_octet  containing an EPS\_quality\_of\_service  containing a Trafic\_flow\_template  **or**  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02) **or**  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **MODIFY EPS BEARER CONTEXT REQUEST**  **or**  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02) **or**  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **DEACTIVATE EPS BEARER CONTEXT REQUEST**  containing an ESM\_cause  indicating appropriate ESM cause value. | |
| Comments: |  | |

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| --- | --- | --- |
| TP\_NAS\_MME\_SRM\_02 | Standards Reference:  Clause 6.5.4, 6.5.4.4 and  8.3.9, 8.3.10 | PICS item:  PICS A.5/8 |
| Summary: | Verify that the IUT can not accepts a BEARER RESOURCE MODIFICATION REQUEST due to unknown PDN type value and sends the BEARER RESOURCE MODIFICATION REJECT message with appropriate ESM cause value. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **BEARER RESOURCE MODIFICATION REQUEST**  containing a Linked\_EPS\_bearer\_identity  indicating invalid value  containing a Spare\_half\_octet  containing a Traffic\_flow\_aggregate\_description  containing a length\_indicator  indicating value ‘1’  containing a TFT\_operation\_code  indicating value ‘000’  containing a E\_bit  indicating value ‘0’  containing a number\_of\_packet\_filters  indicating zero  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **BEARER RESOURCE MODIFICATION REJECT**  containing an ESM\_cause  indicating ‘invalid EPS bearer identity’ with #43. | |
| Comments: |  | |

##### 5.2.2.3.9 ESM information request procedure

|  |  |  |
| --- | --- | --- |
| TP\_NAS\_MME\_SEI\_01 | Standards Reference:  Clause 6.6.1, 6.6.1.2 and  8.3.13 | PICS item:  PICS A.5/9 |
| Summary: | Verify that the IUT can send an ESM INFORMATION REQUEST message with all mandatory IEs to indicate an ESM information request procedure. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** ESM information request procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **ESM INFORMATION REQUEST.** | |
| Comments: |  | |

##### 5.2.2.3.10 Notification procedure

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| --- | --- | --- |
| TP\_NAS\_MME\_SNO\_01 | Standards Reference:  Clause 6.6.2, 6.6.2.2 and  8.3.18A | PICS item:  PICS A.5/10 |
| Summary: | Verify that the IUT can send a NOTIFICATION message with all mandatory IEs to indicate a notification procedure. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** notification procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **NOTIFICATION**  containing a Notification\_indicator. | |
| Comments: |  | |

##### 5.2.2.3.11 Remote UE Report procedure

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| --- | --- | --- |
| TP\_NAS\_MME\_SRR\_01 | Standards Reference:  Clause 6.6.3, 6.6.3.2 and  8.3.23, 6.3.24 | PICS item:  PICS A.5/11 |
| Summary: | Verify that the IUT accepts a REMOTE UE REPORT and sends the REMOTE UE REPORT RESPONSE message. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **on receipt of an UPLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_03)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **REMOTE UE REPORT**  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02) **or**  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **REMOTE UE REPORT RESPONSE**. | |
| Comments: |  | |

##### 5.2.2.3.12 Transport of user data via the control plane procedure

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| --- | --- | --- |
| TP\_NAS\_MME\_STU\_01 | Standards Reference:  Clause 6.6.4, 6.6.4.2 and  8.3.25 | PICS item:  PICS A.5/12 |
| Summary: | Verify that the IUT can send an ESM DATA TRANSPORT message with all mandatory IEs to indicate a transport of user data via the control plane procedure. | |
| Configuration: | CF\_S1-MME | |
| Test purpose: | Ensure that the IUT  **to indicate** transport of user data via the control plane procedure,  **sends a DOWNLINK\_NAS\_TRANSPORT** (see MI\_S1AP\_NAS\_02)  containing a NAS-PDU  containing a Protocol\_discriminator  containing an EPS\_bearer\_identity  containing a Procedure\_transaction\_identity  containing a Message\_type  indicating a **ESM DATA TRANSPORT**  containing an User\_data\_container. | |
| Comments: |  | |

### 5.2.3 S1-MME Messages

#### 5.2.3.1 General overview

S1AP messages carry NAS message content between eNB and MME. Following S1AP messages are used within 5.2.2 S1\_MME interface NAS – MME Role clause.

NOTE: NAS-PDU content of the S1AP messages is described in detail in 5.2.2 S1\_MME interface NAS – MME Role clause. This NOTE is common for all following S1AP Messages.

#### 5.2.3.2 E-RAB procedure

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| MI\_S1AP\_RAB\_01 | Standards Reference:  ETSI TS 136 413  Clause 8.2.1 and 9.1.3.1 |  |
| Summary: | The IUT is able to send an E-RAB\_SETUP\_REQUEST to indicate an E-RAB Setup procedure. | |
| Configuration: | CF\_S1-MME | |
| S1AP message: | Ensure that the IUT  **sends an E-RAB\_SETUP\_REQUEST**  containing an MME\_UE\_S1AP\_ID  containing an eNB\_UE\_S1AP\_ID  containing an E-RAB\_to\_be\_Setup\_List  containing an E-RAB\_to\_be\_Setup Item 1  containing an E-RAB\_ID  containing an E-RAB\_Level\_QoS\_Parameters  containing QCI  indicating value 5  containing a Transport\_Layer\_Address  containing a GTP-TEID  containing a NAS-PDU (see NOTE). | |
| Comments: |  | |

#### 5.2.3.3 Initial context procedure

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| MI\_S1AP\_CTX\_01 | Standards Reference:  ETSI TS 136 413  Clause 8.3.1 and 9.1.4.1 |  |
| Summary: | The IUT is able to send an INITIAL\_CONTEXT\_SETUP\_REQUEST to indicate an Initial context setup procedure. | |
| Configuration: | CF\_S1-MME | |
| S1AP message: | Ensure that the IUT  **sends an INITIAL\_CONTEXT\_SETUP\_REQUEST**  containing an MME\_UE\_S1AP\_ID  containing an eNB\_UE\_S1AP\_ID  containing a UE\_Aggregate\_Maximum\_Bit\_Rate  containing an E-RAB\_to\_be\_Setup\_List  containing an E-RAB\_to\_be\_Setup Item 1  containing an E-RAB\_ID  containing an E-RAB\_Level\_QoS\_Parameters  containing QCI  indicating value 5  containing a Transport\_Layer\_Address  containing a GTP-TEID  containing a NAS-PDU (see NOTE)  containing a UE\_Security\_Capabilities  containing a Security\_Key. | |
| Comments: |  | |

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| MI\_S1AP\_CTX\_02 | Standards Reference:  ETSI TS 136 413  Clause 8.3.1 and 9.1.4.2 |  |
| Summary: | The IUT is able to receive an INITIAL\_CONTEXT\_SETUP\_RESPONSE to indicate an Initial context setup procedure. | |
| Configuration: | CF\_S1-MME | |
| S1AP message: | Ensure that the IUT  **receives an INITIAL\_CONTEXT\_SETUP\_RESPONSE**  containing an MME\_UE\_S1AP\_ID  containing an eNB\_UE\_S1AP\_ID  containing an E-RAB\_Failed\_to\_Setup\_List  containing an E-RAB\_List Item 1  containing an E-RAB\_ID  containing a Cause  indicating an appropriate cause value. | |
| Comments: | This S1AP message does not contain NAS content. | |

#### 5.2.3.4 NAS transport procedure

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| MI\_S1AP\_NAS\_01 | Standards Reference:  ETSI TS 136 413  Clause 8.6.2.1 and 9.1.7.1 |  |
| Summary: | The IUT is able to receive an INITIAL\_UE\_MESSAGE to indicate a NAS transport procedure. | |
| Configuration: | CF\_S1-MME | |
| S1AP message: | Ensure that the IUT  **receives an INITIAL\_UE\_MESSAGE**  containing an eNB\_UE\_S1AP\_ID  containing a NAS-PDU (see NOTE)  containing a TAI  containing a PLMN\_Identity  containing a TAC  containing an E-UTRAN\_CGI  containing a PLMN\_Identity  containing a Cell\_Identity  containing a RRC\_Establishment\_Cause. | |
| Comments: |  | |

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| MI\_S1AP\_NAS\_02 | Standards Reference:  ETSI TS 136 413  Clause 8.6.2.2 and 9.1.7.2 |  |
| Summary: | The IUT is able to send a DOWNLINK\_NAS\_TRANSPORT to indicate a NAS transport procedure. | |
| Configuration: | CF\_S1-MME | |
| S1AP message: | Ensure that the IUT  **sends a DOWNLINK\_NAS\_TRANSPORT**  containing an MME UE S1AP ID  containing an eNB\_UE\_S1AP\_ID  containing a NAS-PDU (see NOTE). | |
| Comments: |  | |

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| MI\_S1AP\_NAS\_03 | Standards Reference:  ETSI TS 136 413  Clause 8.6.2.3 and 9.1.7.3 |  |
| Summary: | The IUT is able to receive an UPLINK\_NAS\_TRANSPORT to indicate a NAS transport procedure. | |
| Configuration: | CF\_S1-MME | |
| S1AP message: | Ensure that the IUT  **receives an UPLINK\_NAS\_TRANSPORT**  containing an MME UE S1AP ID  containing an eNB\_UE\_S1AP\_ID  containing a NAS-PDU (see NOTE)  containing a TAI  containing a PLMN\_Identity  containing a TAC  containing an E-UTRAN\_CGI  containing a PLMN\_Identity  containing a Cell\_Identity  containing a RRC\_Establishment\_Cause. | |
| Comments: |  | |

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| MI\_S1AP\_NAS\_04 | Standards Reference:  ETSI TS 136 413  Clause 8.6.2.4 and 9.1.7.4 |  |
| Summary: | The IUT is able to receive a NAS\_NON\_DELIVERY\_INDICATION to indicate a NAS transport procedure. | |
| Configuration: | CF\_S1-MME | |
| S1AP message: | Ensure that the IUT  **receives a NAS\_NON\_DELIVERY\_INDICATION**  containing an MME UE S1AP ID  containing an eNB\_UE\_S1AP\_ID  containing a NAS-PDU (see NOTE)  containing a Cause. | |
| Comments: |  | |

# History

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| --- | --- | --- |
| **Document history** | | |
| V0.0.1 | February 2017 | STF526: First skeleton draft |
| V0.0.2 | May 2017 | STF526: Early draft version |
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