

# ETSI TS 125 450 V17.0.0 (2022-04)



**Universal Mobile Telecommunications System (UMTS);  
UTRAN Iu-PS interface general aspects and principles  
(3GPP TS 25.450 version 17.0.0 Release 17)**

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650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B  
Association à but non lucratif enregistrée à la  
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# 1 Scope

The present document is an introduction to the TSG RAN TS 25.45z series of UMTS Technical Specifications that define the Iupc Interface. The Iupc interface is a logical interface for the interconnection of Stand-Alone SMLC (SAS) and Radio Network Controller (RNC) components of the Universal Terrestrial Radio Access Network (UTRAN) for the UMTS system.

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# 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.
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- [1] Void
- [2] 3GPP TS 25.451: "UTRAN Iupc Interface: Layer 1".
- [3] 3GPP TS 25.452: "UTRAN Iupc Interface: Signalling Transport".
- [4] 3GPP TS 25.453: "UTRAN Iupc Interface PCAP Signalling".
- [5] ITU-T Recommendation Q.711 (1996-07): "Functional description of the signalling connection control part".
- [6] ITU-T Recommendation Q.712 (1996-07): "Definition and function of signalling connection control part messages".
- [7] ITU-T Recommendation Q.713 (1996-07): "Signalling connection control part formats and codes".
- [8] ITU-T Recommendation Q.714 (1996-07): "Signalling connection control part procedures".
- [9] 3GPP TS 23.003: "Numbering, Addressing and Identification".
- [10] Void
- [11] 3GPP TS 25.305: "Stage 2 functional specification of UE positioning in UTRAN"

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# 3 Definitions and abbreviations

## 3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

**Stand-Alone SMLC (SAS):** As defined in TS 25.305 [11].

**RNC Centric:** In this mode of operation (defined in TS 25.305 [11]), the RNC is responsible for position method selection and initiation of the selected positioning method. Once a position method is selected, the RNC may interact with the SAS to exchange data as well as for execution of the selected positioning method.

**SAS Centric:** In this mode of operation (defined in TS 25.305 [11]), the SAS is responsible for position method selection and initiation of the selected positioning method. Once a position method is selected, the SAS may interact with the RNC to exchange data to enable it to execute the selected positioning method.

## 3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

GANSS	Galileo and Additional Navigation Satellite Systems
GNSS	Global Navigation Satellite System
GPS	Global Positioning System
GT	Global Title
M3UA	SS7 MTP3 User Adaptation Layer
PCAP	Position Calculation Application Part
RNC	Radio Network Controller
SAS	Stand-Alone SMLC
SCCP	Signalling Connection Control Part
SMLC	Serving Mobile Location Centre
SPC	Signalling Point Code
SRNC	Serving Radio Network Controller
SS7	Signalling System N° 7
SSN	Sub-System Number
UE	User Equipment
UMTS	Universal Mobile Telecommunication System
UTRAN	Universal Terrestrial Radio Access Network

## 3.3 Specification Notations

For the purposes of the present document, the following notations apply:

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**Procedure** When referring to a procedure in the specification, the Procedure Name is written with the first letters in each word in upper case characters followed by the word "procedure", e.g. RNSAP Basic Mobility Procedures.

**Message** When referring to a message in the specification, the MESSAGE NAME is written with all letters in upper case characters followed by the word "message", e.g. RADIO LINK SETUP REQUEST message.

**Frame** When referring to a control or data frame in the specification, the CONTROL/DATA FRAME NAME is written with all letters in upper case characters followed by the words "control/data frame", e.g. DCH data frame.

## 4 General Aspects

### 4.1 Introduction

The logical interface between a RNC and a SAS within the UTRAN is referred to the Iupc interface.

### 4.2 Iupc Interface General Principles

The general principles for the specification of the Iupc interface are as follows:

- the Iupc interface should be open;
- complex functionality shall as far as possible be avoided over Iupc. Advanced optimisation solutions may be added in later versions of the standard;
- from a logical standpoint, the Iupc is a point-to-point signalling interface between an RNC and SAS within the UTRAN, even though there may not be a direct physical connection between these two nodes;
- one RNC may connect to one SAS. One SAS may provide services to one RNC;
- neither the physical structure nor any internal protocols of the RNC or SAS shall be visible over Iupc and are thus not limiting factors, e.g., when introducing future technology.



## 4.3 Iupc Interface Specification Objectives

The Iupc interface specifications shall facilitate the following:

- inter-connection of RNCs and SASs from different manufacturers;
- separation of Iupc interface Application functionality and Transport Network functionality to facilitate introduction of future technology.

## 4.4 Iupc Interface Capabilities

### 4.4.1 General

The Iupc interface connects a RNC and a SAS.

### 4.4.2 Position Calculation Services

The Iupc interface enables an SRNC and a SAS to exchange information that is related to the positioning of a single UE. These exchanges involve the transfer of UE Positioning measurement data or UE position estimate data.

### 4.4.3 Information Exchange Services

The Iupc interface enables an RNC to request specific GNSS (GPS or GANSS) related data from an SAS on demand, on modification, or at regular intervals.

### 4.4.4 SAS Centric Position Services

The Iupc interface enables an RNC and a SAS to exchange information that is related to the positioning of a single UE, using SAS Centric mode of operation.

## 4.5 Iupc Interface Characteristics

### 4.5.1 Uses of SCCP

#### 4.5.1.1 General

The SCCP, ITU-T Rec. Q.711 [5], ITU-T Rec. Q.712 [6], ITU-T Rec. Q.713 [7] and ITU-T Rec. Q.714 [8], is used to transport messages between the RNC and SAS. One user function of the SCCP, called Positioning Calculation Application Part (PCAP), is defined TS 25.453 [4].

Both connectionless and connection-oriented procedures are used to support PCAP. TS 25.453 [4] explain whether connection oriented or connectionless services should be used for a layer 3 procedure.

#### 4.5.1.2 SCCP Addressing

The inclusion of caller party address in SCCP message is mandatory. PCAP may use SSN, SPC and/or GT and any combination of them as addressing schemes for the SCCP. When GT addressing is utilised, the following settings shall be used:

- SSN Indicator = 1 (PCAP SSN as defined in TS 23.003 [9]).
- Global Title Indicator = 0100 (GT includes translation type, numbering plan, encoding scheme and nature of address indicator).
- Translation Type = 0000 0000 (not used).
- Numbering Plan = 0001 (E.163/4).

- Nature of Address Indicator = 000 0100 (International Significant Number).
- Encoding Scheme = 0001 or 0010 (BCD, odd or even).
- Routing indicator = 0 or 1 (route on GT or PC/SSN).

When used, the GT shall be the E.164 address of the relevant node.

### 4.5.1.3 SCCP connection establishment

#### Information Exchange services

A new SCCP connection is established when the RNC initiates a class-1 elementary procedure for Information Exchange services and there is no signalling bearer existing for this purpose.

An SCCP connection is always established by the RNC.

#### SAS Centric Position services

A new SCCP connection is established when the RNC initiates a class-1 elementary procedure, with respect to each new positioning request, for SAS Centric Position services.

An SCCP connection is always established by the RNC.

#### Initiation

The RNC sends SCCP CONNECTION REQUEST message to the SAS. A PCAP message is included in the user data field of the SCCP CONNECTION REQUEST message. Termination

- **successful outcome:**
  - The SCCP CONNECTION CONFIRM message, which may optionally contain a PCAP message in the user data field, is returned to the RNC.
- **unsuccessful outcome:**
  - If the SCCP signalling connection establishment fails, an SCCP CONNECTION REFUSAL message will be sent back to the RNC. This message may contain a PCAP message.

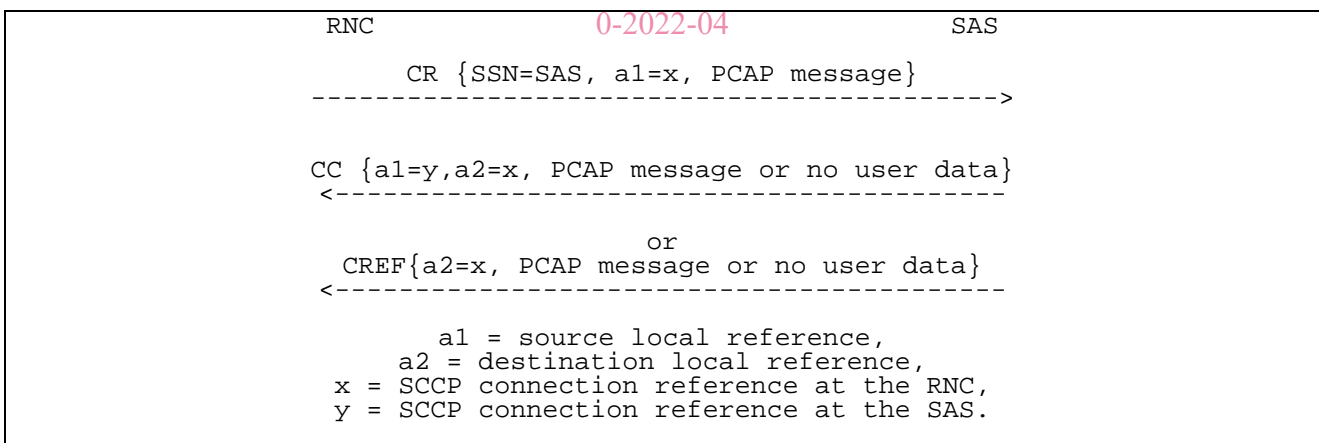


Figure 1: Setting-up of RNC Initiated SCCP Signalling Connection with SAS

### 4.5.1.4 SCCP connection release

This procedure is always initiated by the RNC. An SCCP connection is released when the RNC realises that a given signalling connection is no longer required. This is accomplished by the RNC sending a SCCP RELEASED message.