TSG-RAN Meeting #14

TSGRP#14(01) 0875

Kyoto, Japan, 11 - 14, December, 2001

Title: **Agreed CRs to TS 25.450**

Source: **TSG-RAN WG3**

Agenda item: **8.3.3/8.3.4/9.4.3**

RP Tdoc	R3 Tdoc	Spec	CR_Num	Rev	Release	CR_Subject	Cat	Cur_Ver	New_Ver	Workitem
RP-010875	R3-013607	25.450	002	1	Rel-5	Addition of Specification Notations Section	F	5.0.0	5.1.0	LCS-INTF
RP-010875	R3-013497	25.453	008	1	Rel-5	Bitstrings ordering	F	5.1.0	5.2.0	LCS-INTF
RP-010875	R3-013608	25.453	009	1	Rel-5	Reference corrections	F	5.1.0	5.2.0	LCS-INTF
RP-010875	R3-013606	25.450	001	1	Rel-5	Reference corrections	F	5.0.0	5.1.0	LCS-INTF
RP-010875	R3-013535	25.453	010	1	Rel-5	Clarification for the definition of the ASN.1 constants	F	5.1.0	5.2.0	LCS-INTF
RP-010875	R3-013494	25.453	012	1	Rel-5	Procedure Code Criticality in Error Indication	F	5.1.0	5.2.0	LCS-INTF
RP-010875	R3-013666	25.453	013	2	Rel-5	Addition of amendment to clarify the PER encoding of bitstrings	F	5.1.0	5.2.0	LCS-INTF
RP-010875	R3-013544	25.453	014	1	Rel-5	Clarification of the Transaction ID	F	5.1.0	5.2.0	LCS-INTF
RP-010875	R3-013642	25.453	015		Rel-5	Correction the Clause 10 Error Handling	F	5.1.0	5.2.0	LCS-INTF

CR-Form-v3

CHANGE REQUEST

⌘   **25.450 CR 001**   ⌘ rev **1** ⌘   Current version: **5.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘   (U)SIM ☐   ME/UE ☐   Radio Access Network **X**   Core Network ☐

Title: ⌘	Reference corrections.	
Source: ⌘	R-WG3	
Work item code: ⌘	LCS-INTF	***Date:*** ⌘ November, 2001
Category: ⌘	**F**	***Release:*** ⌘ REL-5

Use one of the following categories:
F (essential correction)
A (corresponds to a correction in an earlier release)
B (Addition of feature),
C (Functional modification of feature)
D (Editorial modification)
Detailed explanations of the above categories can
be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change: ⌘	Reference for ITU specifications do not indicate month. It may be ambiguous as to which version to use.
Summary of change: ⌘	R1: Updated the WI code

Make explicit that 7/1996 versions ITU specs are to be used.

Impact Analysis:

Impact assessment towards the previous version of the specification (same release):
This CR has isolated impact with the previous version of the specification (same release) because previous implementations may have not been clear which version of specification to apply.

This CR has an impact under protocol point of view.
The impact can be considered isolated because the change affects one system function. |
| **Consequences if not approved:** ⌘ | If not approved, it may not be obvious or explicit which version of ITU specs to use and thus could create interworking problems. |

Clauses affected: ⌘	2

Other specs affected: ⌘	☐ Other core specifications ⌘	
	☐ Test specifications	
	☐ O&M Specifications	

Other comments: ⌘	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

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 TS 25.401: "UTRAN Overall Description".

[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 (7/1996): "Functional description of the signalling connection control part".

[6]   ITU-T Recommendation Q.712 (7/1996): "Definition and function of signalling connection control part messages".

[7]   ITU-T Recommendation Q.713 (7/1996): "Signalling connection control part formats and codes".

[8]   ITU-T Recommendation Q.714 (7/1996): "Signalling connection control part procedures".

[9]   3GPP TS 23.003: "Numbering, Addressing and Identification".

[10]   3GPP TS 23.110: "UMTS Access Stratum Services and Functions".

CR-Form-v4

CHANGE REQUEST

| ⌘ | **25.450** CR **002** | ⌘ | ev | **1** | ⌘ | Current version: | **5.0.0** | ⌘ |

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network **X** Core Network ☐

Title: ⌘	Addition of "Specification Notations" Section
Source: ⌘	R-WG3
Work item code: ⌘	LCS-INTF
Date: ⌘	November 2001

Category: ⌘ **F**

Use one of the following categories:
F (correction)
A (corresponds to a correction in an earlier release)
B (addition of feature),
C (functional modification of feature)
D (editorial modification)
Detailed explanations of the above categories can
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Release: ⌘ REL-5

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change: ⌘	A "Specification Notations" section is missing for Iupc General Aspects and Principles.
Summary of change: ⌘	A "Specification Notations" section was added to Section 3. Some changes to the TS were made for alignment with the new section: - capital letters in messages. Note: "IE" and "Value of an IE" were not included because unused. Revision 1: Category updated and tagging revised. Impact Analysis: Impact assessment towards the previous version of the specification (same release): This CR has [no impact] with the previous version of the specification (same release) because this change is only adding rules on how the notations within the specification shall be written.
Consequences if not approved: ⌘	Notations used within the spec might be unclear/ inconsistent with those used for other Iupc specs.

Clauses affected: ⌘	3, 4

| **Other specs affected:** ⌘ | **X** | Other core specifications | ⌘ | TS 25.410 v3.5.0 CR 030
 TS 25.410 v4.2.0 CR 031
 TS 25.420 v3.3.0 CR 019r1
 TS 25.420 v4.0.0 CR 020r1
 TS 25.425 v3.5.0 CR 038
 TS 25.425 v4.1.0 CR 039
 TS 25.427 v3.8.0 CR 070 |

	TS 25.427 v4.2.0 CR 071
	TS 25.430 v3.6.0 CR 026r1
	TS 25.430 v4.1.0 CR 027r1
	TS 25.435 v3.8.0 CR 066
	TS 25.435 v4.2.0 CR 067
Test specifications	
O&M Specifications	

Other comments: ⌘

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

3 Definitions and abbreviations

3.1 Definitions

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

Standalone A-GPS SMLC (SAS): logical node that interconnects to the RNC over the Iupc interface via the PCAP protocol
This node provides GPS related data to the RNC and may perform the position calculation function.

3.2 Abbreviations

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

AAL5	ATM Adaptation Layer type 5
A-GPS	Assisted GPS
ATM	Asynchronous Transfer Mode
CRNC	Controlling Radio Network Controller
GPS	Global Positioning System
GT	Global Title
IP	Internet Protocol
M3UA	SS7 MTP3 User Adaptation Layer
MTP	Message Transfer Part
PCAP	Position Calculation Application Part
RNC	Radio Network Controller
SAS	Standalone A-GPS SMLC
SCCP	Signalling Connection Control Part
SCTP	Stream Control Transmission Protocol
SMLC	Serving Mobile Location Centre
SPC	Signalling Point Code
SRNC	Serving Radio Network Controller
SS7	Signalling System $N^o 7$
SSCF-NNI	Service Specific Co-ordination Function - Network Node Interface
SSCOP	Service Specific Connection Oriented Protocol
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:

[FDD]   This tagging of a word indicates that the word preceding the tag "[FDD]" applies only to FDD. This tagging of a heading indicates that the heading preceding the tag "[FDD]" and the section following the heading applies only to FDD.

[TDD]   This tagging of a word indicates that the word preceding the tag "[TDD]" applies only to TDD, including 3.84Mcps TDD and 1.28Mcps TDD. This tagging of a heading indicates that the heading preceding the tag "[TDD]" and the section following the heading applies only to TDD, including 3.84Mcps TDD and 1.28Mcps TDD.

[3.84Mcps TDD] This tagging of a word indicates that the word preceding the tag "[3.84Mcps TDD]" applies only to 3.84Mcps TDD. This tagging of a heading indicates that the heading preceding the tag "[3.84Mcps TDD]" and the section following the heading applies only to 3.84Mcps TDD.

[1.28Mcps TDD] This tagging of a word indicates that the word preceding the tag "[1.28Mcps TDD]" applies only to 1.28Mcps TDD. This tagging of a heading indicates that the heading preceding the tag "[1.28Mcps TDD]" and the section following the heading applies only to 1.28Mcps TDD.

[FDD - …] This tagging indicates that the enclosed text following the "[FDD - " applies only to FDD. Multiple sequential paragraphs applying only to FDD are enclosed separately to enable insertion of TDD specific (or common) paragraphs between the FDD specific paragraphs.

[TDD - …] This tagging indicates that the enclosed text following the "[TDD - " applies only to TDD including 3.84Mcps TDD and 1.28Mcps TDD. Multiple sequential paragraphs applying only to TDD are enclosed separately to enable insertion of FDD specific (or common) paragraphs between the TDD specific paragraphs.

[3.84Mcps TDD - …] This tagging indicates that the enclosed text following the "[3.84Mcps TDD - " applies only to 3.84Mcps TDD. Multiple sequential paragraphs applying only to 3.84Mcps TDD are enclosed separately to enable insertion of FDD and TDD specific (or common) paragraphs between the 3.84Mcps TDD specific paragraphs.

[1.28Mcps TDD - …] This tagging indicates that the enclosed text following the "[1.28Mcps TDD – " applies only to 1.28Mcps TDD. Multiple sequential paragraphs applying only to 1.28Mcps TDD are enclosed separately to enable insertion of FDD and TDD specific (or common) paragraphs between the 1.28Mcps TDD specific paragraphs.

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

text omitted

4.5 Iupc Interface Characteristics

4.5.1 Uses of SCCP

4.5.1.1 General

The SCCP, [5], [6], [7] and [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 [4].

Both connectionless and connection-oriented procedures are used to support PCAP. TS 25.453 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 [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, unless there is an existing SCCP connection associated with Information Exchange services: in this case, the RNC may rely on the existing SCCP connection to initiate the class-1 elementary procedure.

An SCCP connection is always established by the RNC.

Initiation

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

Termination

- **successful outcome:**

  - The SCCP CONNECTION CONFIRM~~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~~connection refusal~~ message will be sent back to the RNC. This message may contain a PCAP message.
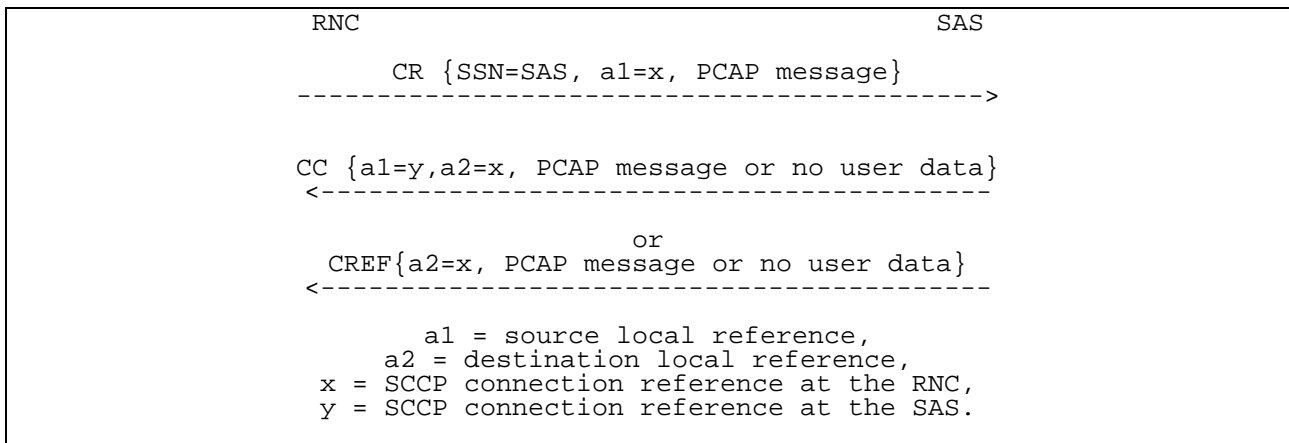
```
            RNC                                        SAS
              CR {SSN=SAS, a1=x, PCAP message}
              ------------------------------------------>


           CC {a1=y,a2=x, PCAP message or no user data}
            <------------------------------------------

                            or
             CREF{a2=x, PCAP message or no user data}
              <------------------------------------------

                  a1 = source local reference,
                a2 = destination local reference,
          x = SCCP connection reference at the RNC,
          y = SCCP connection reference at the SAS.
```

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~~ RELEASED message.

4.5.1.5   General SCCP Abnormal Conditions

If a user-out-of-service information or signalling-point-inaccessible information is received by the RNC, no new attempt to establish SCCP connections towards the affected point code will be started until the corresponding user-in-service information or signalling-point-accessible information is received.

When a user-out-of-service information or signalling-point-inaccessible is received by the RNC, an optional timer may be started. When the timer expires, all the SCCP connections towards the affected point code will be released. When the user-in-service or signalling-point-accessible is received, the timer is stopped.

If for any reason an SCCP connection is released, the optional timer expires or a connection refusal is received while any of the SAS procedures are being performed or while a dedicated resource is still allocated, the procedures associated to that SCCP connection shall be terminated (at both the RNC side and the SAS side).

text omitted

CR-Form-v4

CHANGE REQUEST

⌘ **25.453** CR **008** ⌘ ev **1** ⌘ Current version: **5.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network **X** Core Network ☐

Title: ⌘	Bitstrings ordering	
Source: ⌘	R-WG3	
Work item code: ⌘	LCS-INTF	***Date:*** ⌘ October, 2001

Category: ⌘ **F**	***Release:*** ⌘ REL-5
Use one of the following categories:	*Use one of the following releases:*
F (correction)	*2 (GSM Phase 2)*
A (corresponds to a correction in an earlier release)	*R96 (Release 1996)*
B (addition of feature),	*R97 (Release 1997)*
C (functional modification of feature)	*R98 (Release 1998)*
D (editorial modification)	*R99 (Release 1999)*
Detailed explanations of the above categories can	*REL-4 (Release 4)*
be found in 3GPP TR 21.900.	*REL-5 (Release 5)*

Reason for change: ⌘	At RAN3 #23, a correction was presented for NBAP and RNSAP in order to clarify the order of bits in bitstrings. It was then agreed that the same clarification was to be added also to PCAP.
Summary of change: ⌘	A clarification is added in subclause 9.2.1. This explains how to interpret the order of bits when specifying bitstrings. Rev1: the WI code was changed.
Consequences if not approved: ⌘	If this CR is not approved, there is a risk of incompatibility due to inconsistent interpretations of the bit ordering. Impact Analysis: Impact assessment towards the previous version of the specification (same release): This CR has no impact on the previous version of the specification (same release) for implementations aligned with the added clarification. For implementations based otherwise on different assumptions, this CR may have isolated/non isolated impact, depending on the single implementation choices.

Clauses affected: ⌘	9.2.1	
Other specs ⌘	**X** Other core specifications ⌘	CR 512 and CR 513 on 25.433, CR 449 and 450 on 25.423
affected:	☐ Test specifications	
	☐ O&M Specifications	
Other comments: ⌘		

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

9.2 Information Element Functional Definitions and Contents

9.2.1 General

Clause 9.2 presents the PCAP IE definitions in tabular format. The corresponding ASN.1 definitions are presented in clause 9.3. In case there is contradiction between the tabular format in clause 9.2 and the ASN.1 definition, the ASN.1 shall take precedence, except for the definition of conditions for the presence of conditional elements, where the tabular format shall take precedence.

When specifying information elements which are to be represented by bitstrings, if not otherwise specifically stated in the semantics description of the concerned IE or elsewhere, the following principle applies with regards to the ordering of bits:

- The first bit (leftmost bit) contains the most significant bit (MSB);

- The last bit (rightmost bit) contains the least significant bit (LSB);

- When importing bitstrings from other specifications, the first bit of the bitstring contains the first bit of the concerned information;

CR-Form-v3

CHANGE REQUEST

✿ **25.453** CR **009** ✿ rev **1** ✿ Current version: **5.1.0** ✿

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ✿ symbols.*

Proposed change affects: ✿ (U)SIM ☐ ME/UE ☐ Radio Access Network **X** Core Network ☐

Title: ✿	Reference corrections.	
Source: ✿	R-WG3	
Work item code: ✿	LCS-INTF	**Date:** ✿ November, 2001
Category: ✿ **F**		**Release:** ✿ REL-5

Use <u>one</u> of the following categories:
F (essential correction)
A (corresponds to a correction in an earlier release)
B (Addition of feature),
C (Functional modification of feature)
D (Editorial modification)
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2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change: ✿	Reference for ITU specifications do not indicate month. It may be ambiguous as to which version to use. Also, US Government specification (ICD-GPS-200) does not indicate any date.
Summary of change: ✿	R1:Updated the WI code

Make explicit that 12/1997 versions ITU specs are to be used. Also indicate appropriate date for ICD-GPS-200.

Impact Analysis:

Impact assessment towards the previous version of the specification (same release):
This CR has isolated impact with the previous version of the specification (same release) because previous implementations may have not been clear which version of specification to apply.

This CR has an impact under protocol point of view.
The impact can be considered isolated because the change affects one system function. |
| **Consequences if not approved:** ✿ | If not approved, it may not be obvious or explicit which version of ITU specs or US Government spec to use and thus could create interworking problems. |

Clauses affected: ✿	2

Other specs affected: ✿	☐ Other core specifications ✿	
	☐ Test specifications	
	☐ O&M Specifications	

Other comments: ✿	

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[1]   3GPP TS 25.450: "UTRAN Iupc interface general aspects and principles".

[2]   3GPP TS 25.451: "UTRAN Iupc interface layer 1".

[3]   3GPP TS 25.452: "UTRAN Iupc interface signalling transport".

[4]   3GPP TS 25.331: "Radio Resource Control (RRC) Protocol Specification".

[5]   3GPP TS 25.401: "UTRAN Overall Description".

[6]   3GPP TS 25.305: "Stage 2 functional specification of UE positioning in UTRAN".

[7]   ITU-T Recommendation X.680 (12/~~19~~97): "Information technology - Abstract Syntax Notation One (ASN.1): Specification of basic notation".

[8]   ITU-T Recommendation X.681 (12/~~19~~97): "Information technology - Abstract Syntax Notation One (ASN.1): Information object specification".

[9]   ITU-T Recommendation X.691 (12/~~19~~97): "Information technology - ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)".

[10]   ICD-GPS-200: (12 April 2000) "Navstar GPS Space Segment/Navigation User Interface".

[11]   3GPP TS 23.032: "Universal Geographical Area Description (GAD)".

[12]   3GPP TR 25.921: "Guidelines and principles for protocol description and error handling".

3GPP TSG-RAN3 Meeting #25   *R3-013535*
Makuhari, Japan, 26ᵗʰ – 30ᵗʰ November 2001

CR-Form-v3

CHANGE REQUEST

⌘   **25.453 CR 010**   ⌘ rev **1** ⌘ Current version: **5.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘   (U)SIM ☐   ME/UE ☐   Radio Access Network **X**   Core Network ☐

Title:	⌘	Clarification for the definition of the ASN.1 constants
Source:	⌘	R-WG3

Work item code: ⌘	LCS-INTF		***Date:*** ⌘	November 2001
Category: ⌘	**F**		***Release:*** ⌘	REL-5

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
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be found in 3GPP TR 21.900.

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R99   *(Release 1999)*
REL-4   *(Release 4)*
REL-5   *(Release 5)*

Reason for change:	⌘	Rev.1 Work Item code was changed to LCS-INTF. Rev.0 In the current PCAP specification, several extension IEs have been introduced. Of course, these IEs are also added in the ASN.1 modules. But these extension IEs do not fully rely on the existing ASN.1 definitions. The assignment of IDs of the extension IEs in the Constants module does not utilise the definition of the ProtocolExtensionID. In stead, these extension IEs utilise the definition of the ProtocolIE-ID. This unclear definition does not cause a syntax error, but this might cause confusion. Therefore, this CR proposes to replace the ProtocolExtensionID by the ProtocolIE-ID and remove the definition of the ProtocolExtensionID.
Summary of change: ⌘	-	In chapter 9.3.5, the definition of the ProtocolExtensionID was removed.
	-	In chapter 9.3.7, the ProtocolExtensionID in the class definition of the PCAP-PROTOCOL-EXTENSION was replaced by the ProtocolIE-ID.
Consequences if not approved:	⌘	If this CR is not approved, the ASN.1 modules will be less clear. Impact Analysis Impact assessment towards the previous version of the specification (same release): This CR has no impact with the previous version of the specification (same release) because the range of ProtocolIE-ID and ProtocolExtensionID are the same and the replacement of ProtocolExtensionID would not result in any change of bits on the line.

Clauses affected:	⌘	9.3.5 and 9.3.7

Other specs	⌘	**X**	Other core specifications	⌘	CR496 on TS 25.423 V3.7.0 (R99)
					CR497 on TS 25.423 V4.2.0 (REL-4)
					CR551 on TS 25.433 V3.7.0 (R99)
					CR552 on TS 25.433 V4.2.1 (REL-4)
affected:			Test specifications		
			O&M Specifications		
Other comments:	⌘				

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

9.3.5 Common Definitions

```
-- *************************************************************
--
-- Common definitions
--
-- *************************************************************

PCAP-CommonDataTypes {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) pcap(8) version1 (1) pcap-CommonDataTypes (3)  }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- *************************************************************
--
-- Extension constants
--
-- *************************************************************

maxPrivateIEs                               INTEGER ::= 65535
maxProtocolExtensions                       INTEGER ::= 65535
maxProtocolIEs                              INTEGER ::= 65535


-- *************************************************************
--
-- Common Data Types
--
-- *************************************************************
Criticality     ::= ENUMERATED { reject, ignore, notify }

Presence        ::= ENUMERATED { optional, conditional, mandatory }

PrivateIE-ID    ::= CHOICE {
    local           INTEGER (0..65535),
    global          OBJECT IDENTIFIER
}


ProcedureCode       ::= INTEGER (0..255)

ProtocolExtensionID ::= INTEGER (0..65535)

ProtocolIE-ID       ::= INTEGER (0..maxProtocolIEs)

TransactionID       ::= CHOICE {
    shortTID            INTEGER (0..127),
    longTID             INTEGER (0..32767)
}
```

```
TriggeringMessage   ::= ENUMERATED { initiating-message, successful-outcome, unsuccessful-outcome, outcome }

END
```

<Not affected part is omitted>

9.3.7   Container Definitions

```
-- ****************************************************************
--
-- Container definitions
--
-- ****************************************************************

PCAP-Containers {
itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)
umts-Access (20) modules (3) pcap(8) version1 (1) pcap-Containers (5) }

DEFINITIONS AUTOMATIC TAGS ::=

BEGIN

-- ****************************************************************
--
-- IE parameter types from other modules.
--
-- ****************************************************************

IMPORTS
    Criticality,
    Presence,
    PrivateIE-ID,
    ProtocolExtensionID,
    ProtocolIE-ID,
    maxPrivateIEs,
    maxProtocolExtensions,
    maxProtocolIEs
FROM PCAP-CommonDataTypes;

-- ****************************************************************
--
-- Class Definition for Protocol IEs
--
-- ****************************************************************

PCAP-PROTOCOL-IES ::= CLASS {
    &id                ProtocolIE-ID       UNIQUE,
    &criticality       Criticality,
    &Value,
```

```
    &presence           Presence
}
WITH SYNTAX {
    ID                  &id
    CRITICALITY         &criticality
    TYPE                &Value
    PRESENCE            &presence
}


-- ****************************************************************
--
-- Class Definition for Protocol Extensions
--
-- ****************************************************************

PCAP-PROTOCOL-EXTENSION ::= CLASS {
    &id                 ProtocolIE-IDProtocolExtensionID UNIQUE,
    &criticality        Criticality,
    &Extension,
    &presence           Presence
}
WITH SYNTAX {
    ID                  &id
    CRITICALITY         &criticality
    EXTENSION           &Extension
    PRESENCE            &presence
}
```

CR-Form-v4

CHANGE REQUEST

⌘	**25.453**	CR	**012**	⌘ rev	**1**	⌘ Current version:	**5.1.0**	⌘

For **HELP** *on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘   (U)SIM ☐   ME/UE ☐   Radio Access Network **X**   Core Network ☐

Title: ⌘	Procedure Code Criticality in Error Indication	

Source: ⌘	R-WG3

Work item code: ⌘	LCS-INTF	***Date:*** ⌘	2001-11-27

Category: ⌘	**F**	***Release:*** ⌘	REL-5

Use one of the following categories:
F (correction)
A (corresponds to a correction in an earlier release)
B (addition of feature),
C (functional modification of feature)
D (editorial modification)
Detailed explanations of the above categories can
be found in 3GPP TR 21.900.

Use one of the following releases:
2   (GSM Phase 2)
R96   (Release 1996)
R97   (Release 1997)
R98   (Release 1998)
R99   (Release 1999)
REL-4   (Release 4)
REL-5   (Release 5)

Reason for change: ⌘	It is stated in the semantics description for the Procedure Criticality IE within the Criticality Diagnostics IE that the value "Ignore" shall never be used. This was true as long as this IE was only used when reporting an error on procedure code level. But since it is now also used within the ERROR INDICATION message to identify the message being reported, the value "Ignore" must also be allowed.
Summary of change: ⌘	The statement that the value "Ignore" shall never be used for the Procedure Code IE within the Criticality Diagnostics IE is removed. Impact analysis Impact assessment towards the previous version of the specification (same release): This CR has isolated impact because the contradiction between what is stated within the semantics description for the Criticality Diagnostics IE and the description in chapter 10 of the usage of ERROR INDICATION when reporting errors may lead to different implementations. This CR has impact under functional point of view. The impact can be considered isolated because the change only affects one function, i.e. Error Indication.
Consequences if not approved: ⌘	If this CR is not approved, there is a contradiction between what is stated within the semantics description for the Criticality Diagnostics IE and the description in chapter 10 of the usage of ERROR INDICATION when reporting errors.

Clauses affected: ⌘	9.2.2.4

Other specs	⌘ **X**	Other core specifications ⌘	CR382 25.413 3.7.0 CR383 25.413 4.2.0 CR071 25.419 3.6.0 CR072 25.419 4.2.0 CR508 25.423 3.7.0

affected:		Test specifications O&M Specifications	CR509 25.423 4.2.0 CR561 25.433 3.7.0 CR562 25.433 4.2.1
Other comments:	⌘		

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2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

9.2.2.4 Criticality Diagnostics

The *Criticality Diagnostics* IE is sent by the RNC or the SAS when parts of a received message have not been comprehended or are missing. It contains information about which IE was not comprehended or is missing.

For further details on how to use the *Criticality Diagnostics* IE, see annex A.

Table 25

IE/Group Name	Presence	Range	IE type and reference	Semantics description
Procedure Code	O		INTEGER (0..255)	
Triggering Message	O		ENUMERATED(initiating message, successful outcome, unsuccessful outcome, outcome)	The Triggering Message is used only if the Criticality Diagnostics is part of Error Indication.
Procedure Criticality	O		ENUMERATED(reject, ignore, notify)	This Procedure Criticality is used for reporting the Criticality of the Triggering message (Procedure). ~~The value 'ignore' shall never be used.~~
Transaction ID	O		Transaction ID	
Information Element Criticality Diagnostics		*0..<maxnoof errors>*		
>IE Criticality	M		ENUMERATED(reject, ignore, notify)	The IE Criticality is used for reporting the criticality of the triggering IE. The value 'Ignore" shall never be used.
>IE Id	M		INTEGER (0..65535)	The IE Id of the not understood or missing IE as defined in the ASN.1 part of the specification.
>Repetition Number	O		INTEGER (0..255)	The *Repetition Number* IE gives - in case of a not understood IE: The number of occurrences of the reported IE up to and including the not understood occurrence - in case of a missing IE: The number of occurrences up to but not including the missing occurrence. Note: All the counted occurrences of the reported IE must have the same topdown hierachical message structure of IEs with assigned criticality above them.
>Message Structure	O		9.2.2.23	The *Message Structure* IE describes the structure where the not understood or missing IE was detected. This IE is included if the not understood IE is not the top level of the message.
>Type of Error	M		ENUMERATED(not understood, missing, …)	

Table 26

Range bound	Explanation
maxnooferrors	Maximum number of IE errors allowed to be reported with a single message.

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CHANGE REQUEST

⌘   **25.453** CR **013**   ⌘ ev **2** ⌘   Current version: **5.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘   (U)SIM ☐   ME/UE ☐   Radio Access Network **X**   Core Network ☐

Title:	⌘	Addition of amendment to clarify the PER encoding of bitstrings
Source:	⌘	R-WG3

Work item code: ⌘	LCS-INTF		***Date:*** ⌘	November, 2001

Category:	⌘ **F**	***Release:*** ⌘	REL-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2   (GSM Phase 2)
R96   (Release 1996)
R97   (Release 1997)
R98   (Release 1998)
R99   (Release 1999)
REL-4   (Release 4)
REL-5   (Release 5)

Reason for change:	⌘	There is a lack of specification w.r.t. PER encoding of bitstrings in X691. A clarification will appear in the 2002 version of X.691, but as RAN3 specifications refer to the 1997 version, this amendement will not automatically apply to RAN3 specifications. Therefore a specific clarification is needed within the RAN3 TSs. For further reasoning, please refer to document R3-013363.
Summary of change: ⌘		A clarification was added to subclause 9.4. Rev.1: a slight rewording of the added note was performed and the reference to X.680 was reformulated. The WI code was corrected. Rev2: the linking was corrected.
Consequences if not approved:	⌘	If this CR is not approved, PCAP will still refer to an incomplete specification w.r.t. to the PER encoding of bitstrings.

Impact Analysis:

Impact assessment towards the previous version of the specification (same release):

This CR has no impact on the previous version of the specification (same release) for implementations aligned with the added clarification. For implementations based otherwise on different assumptions, this CR may have isolated/non isolated impact, depending on the single implementation choices. It must be stated that this interpretation is the assumed one in ITU-T and the clarification was added only for completeness. |

Clauses affected:	⌘	9.4

Other specs	⌘	**X**	Other core specifications	⌘ CR 074 SABP R4, CR 570 NBAP R99, CR 073 SABP R99, CR 571 NBAP R4, CR 520 RNSAP R4, CR 385 RANAP R99, CR 386

| Affected: | ☐ | Test specifications | RANAP R4, CR 519 RNSAP R99 |
| | ☐ | O&M Specifications | |

Other comments: ⌘

How to create CRs using this form:

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1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

9.4   Message Transfer Syntax

PCAP shall use the ASN.1 Basic Packed Encoding Rules (BASIC-PER) Aligned Variant as transfer syntax, as specified in [97].

The following encoding rules apply in addition to what has been specified in X.691 [9]:

When a bitstring value is placed in a bit-field as specified in 15.6 to 15.11 in [9], the leading bit of the bitstring value shall be placed in the leading bit of the bit-field, and the trailing bit of the bitstring value shall be placed in the trailing bit of the bit-field.

NOTE - When using the "bstring" notation, the leading bit of the bitstring value is on the left, and the trailing bit of the bitstring value is on the right. The term 'leading bit' is to be interpreted as equal to the term 'first bit' defined in [7].

CR-Form-v4

CHANGE REQUEST

⌘ **25.453** CR **014** ⌘ ev **1** ⌘ Current version: **5.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network **X** Core Network ☐

Title: ⌘	Clarification of the Transaction ID	
Source: ⌘	R-WG3	
Work item code: ⌘	LCS-INTF	***Date:*** ⌘ 21 Nov. 2001

Category: ⌘ **F**

Use <u>one</u> of the following categories:
F (correction)
A (corresponds to a correction in an earlier release)
B (addition of feature),
C (functional modification of feature)
D (editorial modification)
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Release: ⌘ REL-5

Use <u>one</u> of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change: ⌘	The Transaction ID is used to associate all the messages belonging to the same procedure: messages belonging to the same procedure shall use the same transaction ID. The type of the Transaction ID is defined as a choice with two kinds of encoding (short and long). However, it is not clear if the UTRAN nodes should consider the Transaction ID value or also its kind of encoding when decoding. This ambiguity can cause error scenarios.
Summary of change: ⌘	R1: WI code has been included R0: Clarification added in the semantics description of the tabular format of Transaction ID IE: "The Transaction ID shall be interpreted for its integer value, not for the type of encoding ("short" or "long")". <u>Impact Analysis</u>: Impact assessment towards the previous version of the specification (same release): This CR has [isolated impact] with the previous version of the specification (same release) because within some existing implementations the Transaction ID could be interpreted using not only its value but also its type, and it could trigger an Error Indication in some cases when in fact the procedure should have succeded. ONLY if there is impact: This CR has an impact under [protocol] point of view. The impact [can] be considered isolated because the change affects only to some isolated implementations that consider both the value and type of encoding when interpreting the Transaction ID.
Consequences if not approved: ⌘	If this CR is not approved, the interpretation of the Transaction ID would remain unclear and it could lead to multi-vendor interoperability problems.
Clauses affected: ⌘	9.2.2.28

Other specs	⌘	**X**	Other core specifications	⌘	TS 25.433 v3.7.0 CR-576 (R99)
					TS 25.433 v4.2.1 CR-577 (REL-4)
					TS 25.423 v3.7.0 CR-528 (R99)
					TS 25.423 v4.2.0 CR-529 (REL-4)
affected:			Test specifications		
			O&M Specifications		
Other comments:	⌘				

How to create CRs using this form:

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1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

9.2.2.28 Transaction ID

The Transaction ID is used to associate all the messages belonging to the same procedure. Messages belonging to the same procedure shall use the same Transaction ID.

The Transaction ID is determined by the initiating peer of a procedure.

The Transaction ID shall uniquely identify a procedure among all ongoing parallel procedures using the same procedure code, and initiated by the same protocol peer.

Table 66

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Transaction ID			CHOICE INTEGER (0..127) or INTEGER (0..32767)	The Transaction ID shall be interpreted for its integer value, not for the type of encoding ("short" or "long").

CR-Form-v3

CHANGE REQUEST

| ⌘ | **25.453** | CR | **015** | ⌘ | rev | | ⌘ | Current version: | **5.1.0** | ⌘ |

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘   (U)SIM ☐   ME/UE ☐   Radio Access Network **X**   Core Network ☐

Title:	⌘	Correction the Clause 10 Error Handling
Source:	⌘	R-WG3
Work item code:	⌘ LCF-INTF	***Date:*** ⌘ 2001 November
Category:	⌘ **F**	***Release:*** ⌘ Rel5

Use <u>one</u> of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature)*,
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use <u>one</u> of the following releases:
2   *(GSM Phase 2)*
R96   *(Release 1996)*
R97   *(Release 1997)*
R98   *(Release 1998)*
R99   *(Release 1999)*
REL-4   *(Release 4)*
REL-5   *(Release 5)*

Reason for change:	⌘	If the receiver detect an error (e.g. transfer syntax error, abstract syntax error) in the receiving message but there is no unsuccessful response message to report the error, the Error Indication procedure is specified to use to report the error. The *Procedure Code* IE and the *Triggering Message* Criticality IE in the Diagnostics IE is specified to include in the Error Indication procedure so that the sender who sent the erroneous message can understand which procedure had the error. However, this was not clearly specified in error cases such as "transfer syntax error (Subclause 10.2)", "not comprehended Type of Message IE (Subclause 10.3.4.1A)" and "IEs or IE groups received in wrong order or with too many occurrences or erroneously present (Subclause 10.3.6)".This could lead to a situation e.g. the sender who sent the erroneous message can not understand what was the Error Indication procedure corresponding to and cause the traffic load if the sender resent the initiating (erroneous) message unlimitedly.
		Other corrections are needed in the case of "Ignore and Notify Sender" and "Notify" in Missing IE or IE group (10.3.5) to have consistency description with 10.3.4.2.
Summary of change:	⌘	This CR is to state that optional information elements other than those which have been currently stated may also be included if available, within the message that is used to report the error.
		The corrections are also done in the case of "Ignore and Notify Sender" and "Notify" in Missing IE or IE group (10.3.5).
Consequences if not approved:	⌘	If this is not approved, in some error cases it would be not possible for the node who receives the ERROR INDICATION message to know which procedure is the ERROR INDICATION message corresponding to.
		Impact Analysis:
		Impact assessment towards the previous version of the specification (same

release):

This CR has [isolated impact] with the previous version of the specification (same release) because some existing implementation may interpret that optional information can not be included when reporting the error.

ONLY if there is impact:

This CR has an impact under [functional/protocol] point of view.
The impact [can] be considered isolated because the change affects error handling.

Clauses affected:	⌘	10.1, 10.3.5	
Other specs	⌘	**X**	Other core specifications	⌘	25.413 v3.7.0 CR399 25.413 v4.2.0 CR400 25.419 v3.6.0 CR079 25.419 v4.2.0 CR080 25.423 v3.7.0 CR533 25.423 v4.2.0 CR534 25.433 v3.7.0 CR539 25.433 v4.2.1 CR540
affected:			Test specifications		
			O&M Specifications		
Other comments:	⌘			

How to create CRs using this form:

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

10 Handling of Unknown, Unforeseen and Erroneous Protocol Data

10.1 General

Protocol Error cases can be divided into three classes:

- Transfer Syntax Error.

- Abstract Syntax Error.

- Logical Error.

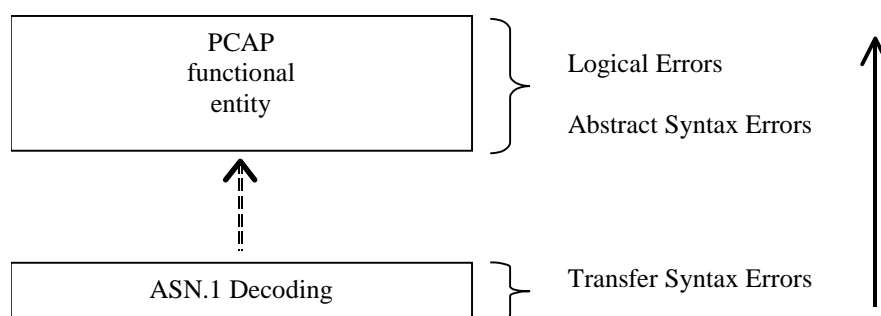Protocol errors can occur in the following functions within a receiving node.

Figure 10: Protocol Errors in PCAP

The information stated in subclauses 10.2, 10.3 and 10.4, to be included in the message used when reporting an error, is what at minimum shall be included. Other optional information elements within the message may also be included, if available. This is also valid for the case when the reporting is done with a response message. The latter is an exception to what is stated in subclause 4.1.

10.2 Transfer Syntax Error

A Transfer Syntax Error occurs when the receiver is not able to decode the received physical message. Transfer syntax errors are always detected in the process of ASN.1 decoding. If a Transfer Syntax Error occurs, the receiver should initiate Error Indication procedure with appropriate cause value for the Transfer Syntax protocol error.

Examples for Transfer Syntax Errors are:

- Violation of value ranges in ASN.1 definition of messages. e.g.: If an IE has a defined value range of 0 to 10 (ASN.1: INTEGER (0..10)), and 12 will be received, then this will be treated as a transfer syntax error.

- Violation in list element constraints. e.g.: If a list is defined as containing 1 to 10 elements, and 12 elements will be received, than this case will be handled as a transfer syntax error.

- Missing mandatory elements in ASN.1 SEQUENCE definitions (as sent by the originator of the message).

- Wrong order of elements in ASN.1 SEQUENCE definitions (as sent by the originator of the message).

10.3 Abstract Syntax Error

10.3.1 General

An Abstract Syntax Error occurs when the receiving functional PCAP entity:

1) receives IEs or IE groups that cannot be understood (unknown IE id);

2) receives IEs for which the logical range is violated (e.g.: ASN.1 definition: 0 to 15, the logical range is 0 to 10 (values 11 to 15 are undefined), and 12 will be received; this case will be handled as an abstract syntax error using criticality information sent by the originator of the message);

3) does not receive IEs or IE groups but according to the specified presence of the concerning object, the IEs or IE groups should have been present in the received message;

4) receives IEs or IE groups that are defined to be part of that message in wrong order or with too many occurrences of the same IE or IE group;

5) receives IEs or IE groups but according to the conditional presence of the concerning object and the specified condition, the IEs or IE groups should not have been present in the received message.

Cases 1 and 2 (not comprehended IE/IE group) are handled based on received Criticality information. Case 3 (missing IE/IE group) is handled based on Criticality information and Presence information for the missing IE/IE group specified in the version of the specification used by the receiver. Case 4 (IEs or IE groups in wrong order or with too many occurrences) and Case 5 (erroneously present conditional IEs or IE groups) result in rejecting the procedure.

If an Abstract Syntax Error occurs, the receiver shall read the remaining message and shall then for each detected Abstract Syntax Error that belong to cases 1-3 act according to the Criticality Information and Presence Information for the IE/IE group due to which Abstract Syntax Error occurred in accordance with subclauses 10.3.4 and 10.3.5. The handling of cases 4 and 5 is specified in subclause 10.3.6.

10.3.2 Criticality Information

In the PCAP messages there is criticality information set for individual IEs and/or IE groups. This criticality information instructs the receiver how to act when receiving an IE or an IE group that is not comprehended, i.e. the entire item (IE or IE group) which is not (fully or partially) comprehended shall be treated in accordance with its own criticality information as specified in subclause 10.3.4.

In addition, the criticality information is used in case of the missing IE/IE group abstract syntax error (see subclause 10.3.5).

The receiving node shall take different actions depending on the value of the Criticality Information. The three possible values of the Criticality Information for an IE/IE group are:

- Reject IE.

- Ignore IE and Notify Sender.

- Ignore IE.

The following rules restrict when a receiving entity may consider an IE, an IE group, or an EP not comprehended (not implemented), and when action based on criticality information is applicable:

1. IE or IE group: When one new or modified IE or IE group is implemented for one EP from a standard version, then other new or modified IEs or IE groups specified for that EP in that standard version shall be considered comprehended by a receiving entity (some may still remain unsupported).

NOTE: This restriction is not applicable to a sending entity for constructing messages.

2. EP: The comprehension of different EPs within a standard version or between different standard versions is not mandated. Any EP that is not supported may be considered not comprehended, even if another EP from that standard version is comprehended, and action based on criticality shall be applied.

When the criticality information cannot even be decoded in a not comprehended IE or IE group, the Error Indication procedure shall be initiated with an appropriate cause value

10.3.3   Presence Information

For many IEs/IE groups which are optional according to the ASN.1 transfer syntax, PCAP specifies separately if the presence of these IEs/IE groups is optional or mandatory with respect to RNS application by means of the presence field of the concerning object of class PCAP-PROTOCOL-IES, PCAP -PROTOCOL-IES-PAIR, PCAP -PROTOCOL-EXTENSION or PCAP -PRIVATE-IES.

The presence field of the indicated classes supports three values:

1. Optional;

2. Conditional;

3. Mandatory.

If an IE/IE group is not included in a received message and the presence of the IE/IE group is mandatory or the presence is conditional and the condition is true according to the version of the specification used by the receiver, an abstract syntax error occurs due to a missing IE/IE group.

If an IE/IE group is included in a received message and the presence of the IE/IE group is conditional and the condition is false according to the version of the specification used by the receiver, an abstract syntax error occurs due to this erroneously present conditional IE/IE group.

10.3.4   Not comprehended IE/IE group

10.3.4.1   Procedure Code

The receiving node shall treat the different types of received criticality information of the *Procedure Code* IE according to the following:

Reject IE:

-   If a message is received with a *Procedure Code* IE marked with "*Reject IE*" which the receiving node does not comprehend, the receiving node shall reject the procedure using the Error Indication procedure.

Ignore IE and Notify Sender:

-   If a message is received with a *Procedure Code* IE marked with "*Ignore IE and Notify Sender*" which the receiving node does not comprehend, the receiving node shall ignore the procedure and initiate the Error Indication procedure.

Ignore IE:

-   If a message is received with a *Procedure Code* IE marked with "*Ignore IE*" which the receiving node does not comprehend, the receiving node shall ignore the procedure.

When using the Error Indication procedure to reject a procedure or to report an ignored procedure it shall include the *Procedure Code* IE, the *Triggering Message* IE, and the *Procedure Criticality* IE in the *Criticality Diagnostics* IE.

10.3.4.1A   Type of Message

When the receiving node cannot decode the *Type of Message* IE, the Error Indication procedure shall be initiated with an appropriate cause value.

10.3.4.2   IEs other than the Procedure Code and Type of Message

The receiving node shall treat the different types of received criticality information of an IEs/IE group other than the *Procedure Code* IE according to the following:

Reject IE:

- If a message *initiating* a procedure is received containing one or more IEs/IE groups marked with "*Reject IE*" which the receiving node does not comprehend; none of the functional requests of the message shall be executed. The receiving node shall reject the procedure and report the rejection of one or more IEs/IE groups using the message normally used to report unsuccessful outcome of the procedure. In case the information received in the initiating message was insufficient to determine a value for all IEs that are required to be present in the message used to report the unsuccessful outcome of the procedure, the receiving node shall instead terminate the procedure and initiate the Error Indication procedure.

- If a message *initiating* a procedure that does not have a message to report unsuccessful outcome is received containing one or more IEs/IE groups marked with "*Reject IE*" which the receiving node does not comprehend, the receiving node shall terminate the procedure and initiate the Error Indication procedure.

- If a *response* message is received containing one or more IEs/IE groups marked with "*Reject IE*", that the receiving node does not comprehend, the receiving node shall consider the procedure as unsuccessfully terminated and initiate local error handling.

Ignore IE and Notify Sender:

- If a message *initiating* a procedure is received containing one or more IEs/IE groups marked with "*Ignore IE and Notify Sender*" which the receiving node does not comprehend, the receiving node shall ignore the content of the not comprehended IEs/IE groups, continue with the procedure as if the not comprehended IEs/IE groups were not received (except for the reporting) using the understood IEs/IE groups, and report in the response message of the procedure that one or more IEs/IE groups have been ignored. In case the information received in the initiating message was insufficient to determine a value for all IEs that are required to be present in the response message, the receiving node shall instead terminate the procedure and initiate the Error Indication procedure.

- If a message *initiating* a procedure that does not have a message to report the outcome of the procedure is received containing one or more IEs/IE groups marked with "*Ignore IE and Notify Sender*" which the receiving node does not comprehend, the receiving node shall ignore the content of the not comprehended IEs/IE groups, continue with the procedure as if the not comprehended IEs/IE groups were not received (except for the reporting) using the understood IEs/IE groups, and initiate the Error Indication procedure to report that one or more IEs/IE groups have been ignored.

- If a *response* message is received containing one or more IEs/IE groups marked with "*Ignore IE and Notify Sender*" which the receiving node does not comprehend, the receiving node shall ignore the content of the not comprehended IEs/IE groups, continue with the procedure as if the not comprehended IEs/IE groups were not received (except for the reporting) using the understood IEs/IE groups and initiate the Error Indication procedure.

Ignore IE:

- If a message *initiating* a procedure is received containing one or more IEs/IE groups marked with "*Ignore IE*" which the receiving node does not comprehend, the receiving node shall ignore the content of the not comprehended IEs/IE groups and continue with the procedure as if the not comprehended IEs/IE groups were not received using the understood IEs/IE groups.

- If a *response* message is received containing one or more IEs/IE groups marked with "*Ignore IE*" which the receiving node does not comprehend, the receiving node shall ignore the content of the not comprehended IEs/IE groups.

When reporting not comprehended IEs/IE groups marked with "*Reject IE*" or "*Ignore IE and Notify Sender*" using a response message defined for the procedure, the *Information Element Criticality Diagnostics* IE shall be included in the *Criticality Diagnostics* IE for each reported IE/IE group. The *Repetition Number* IE shall be included in the *Information Element Criticality Diagnostics* IE if the reported IE/IE group was part of a "SEQUENCE OF" definition.

When reporting not comprehended IEs/IE groups marked with "*Reject IE*" or "*Ignore IE and Notify Sender*" using the Error Indication procedure, the *Procedure Code* IE, the *Triggering Message* IE, *Procedure Criticality* IE, the *Transaction Id* IE, and the *Information Element Criticality Diagnostics* IE shall be included in the *Criticality Diagnostics* IE for each reported IE/IE group. The *Repetition Number* IE shall be included in the *Information Element Criticality Diagnostics* IE if the reported IE/IE group was part of a "SEQUENCE OF" definition.

10.3.5 Missing IE or IE group

The receiving node shall treat the missing IE/IE group according to the criticality information for the missing IE/IE group in the received message specified in the version of the present document used by the receiver:

Reject IE:

- If a received message *initiating* a procedure is missing one or more IEs/IE groups with specified criticality "*Reject IE*"; none of the functional requests of the message shall be executed. The receiving node shall reject the procedure and report the missing IEs/IE groups using the message normally used to report unsuccessful outcome of the procedure. In case the information received in the initiating message was insufficient to determine a value for all IEs that are required to be present in the message used to report the unsuccessful outcome of the procedure, the receiving node shall instead terminate the procedure and initiate the Error Indication procedure.

- If a received message *initiating* a procedure that does not have a message to report unsuccessful outcome is missing one or more IEs/IE groups with specified criticality "*Reject IE*", the receiving node shall initiate the Error Indication procedure.

- If a received *response* message is missing one or more IEs/IE groups with specified criticality "*Reject IE*, the receiving node shall consider the procedure as unsuccessfully terminated and initiate local error handling.

Ignore IE and Notify Sender:

- If a received message *initiating* a procedure is missing one or more IEs/IE groups with specified criticality "*Ignore IE and Notify Sender*", the receiving node shall ignore that those IEs are missing and continue with the procedure based on the other IEs/IE groups present in the message and report in the response message of the procedure that one or more IEs/IE groups were missing. In case the information received in the initiating message was insufficient to determine a value for all IEs that are required to be present in the response message, the receiving node shall instead terminate the procedure and initiate the Error Indication procedure.

- If a received message *initiating* a procedure that does not have a message to report the outcome of the procedure is missing one or more IEs/IE groups with specified criticality "*Ignore IE and Notify Sender*", the receiving node shall ignore that those IEs are missing and continue with the procedure based on the other IEs/IE groups present in the message and initiate the Error Indication procedure to report that one or more IEs/IE groups were missing.

- If a received *response* message is missing one or more IEs/IE groups with specified criticality "*Ignore IE and Notify Sender*", the receiving node shall ignore that those IEs are missing and continue with the procedure based on the other IEs/IE groups present in the message and initiate the Error Indication procedure to report that one or more IEs/IE groups were missing.

Ignore IE:

- If a received message *initiating* a procedure is missing one or more IEs/IE groups with specified criticality "*Ignore IE*", the receiving node shall ignore that those IEs are missing and continue with the procedure based on the other IEs/IE groups present in the message.

- If a received *response* message is missing one or more IEs/IE groups with specified criticality "*Ignore IE*", the receiving node shall ignore that those IEs/IE groups are missing.

When reporting missing IEs/IE groups with specified criticality "*Reject IE*" or "*Ignore IE and Notify Sender*" using a response message defined for the procedure, the *Information Element Criticality Diagnostics* IE shall be included in the *Criticality Diagnostics* IE for each reported IE/IE group.

When reporting missing IEs/IE groups with specified criticality "*Reject IE*" or "*Ignore IE and Notify Sender*" using the Error Indication procedure, the *Procedure Code* IE, the *Triggering Message* IE, *Procedure Criticality* IE, the *Transaction Id* IE, and the *Information Element Criticality Diagnostics* IE shall be included in the *Criticality Diagnostics* IE for each reported IE/IE group.

10.3.6 IEs or IE groups received in wrong order or with too many occurrences or erroneously present

If a message with IEs or IE groups in wrong order or with too many occurrences is received or if IEs or IE groups with a conditional presence are present when the condition is not met (i.e. erroneously present), the receiving node shall behave according to the following:

- If a message *initiating* a procedure is received containing IEs or IE groups in wrong order or with too many occurrences or erroneously present, none of the functional requests of the message shall be executed. The receiving node shall reject the procedure and report the cause value "Abstract Syntax Error (Falsely Constructed Message)" using the message normally used to report unsuccessful outcome of the procedure. In case the information received in the initiating message was insufficient to determine a value for all IEs that are required to be present in the message used to report the unsuccessful outcome of the procedure, the receiving node shall instead terminate the procedure and initiate the Error Indication.

- If a message *initiating* a procedure that does not have a message to report unsuccessful outcome is received containing IEs or IE groups in wrong order or with too many occurrences or erroneously present, the receiving node shall terminate the procedure and initiate the Error Indication procedure, and use cause value "Abstract Syntax Error (Falsely Constructed Message)".

- If a *response* message is received containing IEs or IE groups in wrong order or with too many occurrences or erroneously present, the receiving node shall consider the procedure as unsuccessfully terminated and initiate local error handling.