Source: **TSG CN WG 1**

Title: **CRs to Rel-5 on Work Item IMS-CCR towards 24.008**

Agenda item: **8.1**

Document for: **APPROVAL**

<u>**Introduction**</u>:

This document contains **4** CRs, **Rel-5 to** Work Item **"IMS-CCR"**, that have been agreed by **TSG CN WG1**, and are forwarded to TSG CN Plenary meeting #20 for approval.

Spec	CR	Rev	Cat	Phase	Subject	Version-Current	Version-New	Meeting -2nd-Level	Doc-2nd-Level
24.008	759		F	Rel-5	Alignment of parameter 'signalling information' with other QoS parameters	5.7.0	5.8.0	N1-30	N1-030615
24.008	760		A	Rel-6	Alignment of parameter 'signalling information' with other QoS parameters	6.0.0	6.1.0	N1-30	N1-030616
24.008	763	1	F	Rel-5	Cleanup and correction of the PCO-IE	5.7.0	5.8.0	N1-30	N1-030841
24.008	764	1	A	Rel-6	Cleanup and correction of the PCO-IE	6.0.0	6.1.0	N1-30	N1-030842

CR-Form-v7

CHANGE REQUEST

⌘ **24.008** CR **759** ⌘rev **-** ⌘ Current version: **5.7.0** ⌘

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

Proposed change affects: UICC apps⌘ ☐ ME **X** Radio Access Network ☐ Core Network **X**

Title: ⌘	Alignment of parameter 'signalling information' with other QoS parameters
Source: ⌘	Ericsson, Nokia

Work item code:⌘	IMS-CCR	**Date:** ⌘	12/05/2003

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)*
		Rel-6	*(Release 6)*

Reason for change: ⌘	Alignment of the parameter 'signalling information' with other QoS parameters.
Summary of change:⌘	The enhanced QoS for 'signalling indication' should ba handled as other QoS parameters, in order to have a uniform handling of all QoS parameters. The CR aligns with stage-2 changes approved in SA2#31. A new QoS attribute, Signalling Indication, has been introduced in the QoS IE, see stage 2 specifications; S2-031527 (CR to 23.228), S2-031482 (CR to 23.207).
Consequences if not approved: ⌘	It will not be possible to control the use of the new "signalling flag" in the handset in the same way as other QoS parameters.

Clauses affected: ⌘	10.5.6.5

	Y	N			
Other specs ⌘	X		Other core specifications	⌘	24.229 (CR no. 377)
					27.060 (CR no. 084)
					29.061 (CR no. 087)
affected:		X	Test specifications		
		X	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.

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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.

10.5.6.5   Quality of service

The purpose of the *quality of service* information element is to specify the QoS parameters for a PDP context.

The QoS IE is defined to allow backward compatibility to earlier version of Session Management Protocol.

The *quality of service* is a type 4 information element with a length of 14 octets. The QoS requested by the MS shall be encoded both in the QoS attributes specified in octets 3-5 and in the QoS attributes specified in octets 6-14.

A QoS IE received without octets 6-14 or without octet 14 shall be accepted by a receiving entity.

   NOTE: This behavior is required for interworking with entities supporting an earlier version of the protocol.

The *quality of service* information element is coded as shown in figure 10.5.138/3GPP TS 24.008 and table 10.5.156/3GPP TS 24.008.

8	7	6	5	4	3	2	1	
Quality of service IEI								octet 1
Length of quality of service IE								Octet 2
0 0 spare		Delay class			Reliability class			octet 3
Peak throughput				0 spare	Precedence class			octet 4
0 0 0 spare			Mean throughput					octet 5
Traffic Class			Delivery order		Delivery of erroneous SDU			Octet 6
Maximum SDU size								Octet 7
Maximum bit rate for uplink								Octet 8
Maximum bit rate for downlink								Octet 9
Residual BER				SDU error ratio				Octet 10
Transfer delay					Traffic Handling priority			Octet 11
Guaranteed bit rate for uplink								Octet 12
Guaranteed bit rate for downlink								Octet 13
0 0 0 spare			Signal-ling Indicat-ion	Source Statistics Descriptor				Octet 14

Figure 10.5.138/3GPP TS 24.008: *Quality of service* **information element**

Table 10.5.156/3GPP TS 24.008: *Quality of service* **information element**

Reliability class, octet 3 (see 3GPP TS 23.107)
Bits
3 2 1
In MS to network direction:
0 0 0   Subscribed reliability class
In network to MS direction:
0 0 0   Reserved
In MS to network direction and in network to MS direction:
0 0 1   Acknowledged GTP, LLC, and RLC; Protected data
0 1 0   Unacknowledged GTP; Acknowledged LLC and RLC, Protected data
0 1 1   Unacknowledged GTP and LLC; Acknowledged RLC, Protected data
1 0 0   Unacknowledged GTP, LLC, and RLC, Protected data
1 0 1   Unacknowledged GTP, LLC, and RLC, Unprotected data
1 1 1   Reserved

All other values are interpreted as *Unacknowledged GTP and LLC; Acknowledged RLC, Protected data* in this version of the protocol.

Delay class, octet 3 (see 3GPP TS 22.060 and 3GPP TS 23.107)
Bits
6 5 4
In MS to network direction:
0 0 0   Subscribed delay class
In network to MS direction:
0 0 0   Reserved
In MS to network direction and in network to MS direction:
0 0 1   Delay class 1
0 1 0   Delay class 2
0 1 1   Delay class 3
1 0 0   Delay class 4 (best effort)
1 1 1   Reserved

All other values are interpreted as *Delay class 4 (best effort)* in this version
of the protocol.
Bit 7 and 8 of octet 3 are spare and shall be coded all 0.
Precedence class, octet 4 (see 3GPP TS 23.107)
Bits
3 2 1
In MS to network direction:
0 0 0   Subscribed precedence
In network to MS direction:
0 0 0   Reserved
In MS to network direction and in network to MS direction:
0 0 1   High priority
0 1 0   Normal priority
0 1 1   Low priority
1 1 1   Reserved

All other values are interpreted as *Normal priority* in this version of the protocol.

Bit 4 of octet 4 is spare and shall be coded as 0.

Peak throughput, octet 4 (see 3GPP TS 23.107)
Bits
8 7 6 5
In MS to network direction:
0 0 0 0   Subscribed peak throughput
In network to MS direction:
0 0 0 0   Reserved
In MS to network direction and in network to MS direction:
0 0 0 1   Up to 1 000 octet/s
0 0 1 0   Up to 2 000 octet/s
0 0 1 1   Up to 4 000 octet/s
0 1 0 0   Up to 8 000 octet/s
0 1 0 1   Up to 16 000 octet/s
0 1 1 0   Up to 32 000 octet/s
0 1 1 1   Up to 64 000 octet/s
1 0 0 0   Up to 128 000 octet/s
1 0 0 1   Up to 256 000 octet/s
1 1 1 1   Reserved

All other values are interpreted as *Up to 1 000 octet/s* in this
version of the protocol.
Mean throughput, octet 5 (see 3GPP TS 23.107)
Bits
5 4 3 2 1

In MS to network direction:
0 0 0 0 0   Subscribed mean throughput
In network to MS direction:
0 0 0 0 0   Reserved
In MS to network direction and in network to MS direction:
0 0 0 0 1   100 octet/h
0 0 0 1 0   200 octet/h
0 0 0 1 1   500 octet/h
0 0 1 0 0   1 000 octet/h
0 0 1 0 1   2 000 octet/h
0 0 1 1 0   5 000 octet/h
0 0 1 1 1   10 000 octet/h
0 1 0 0 0   20 000 octet/h
0 1 0 0 1   50 000 octet/h
0 1 0 1 0   100 000 octet/h
0 1 0 1 1   200 000 octet/h
0 1 1 0 0   500 000 octet/h
0 1 1 0 1   1 000 000 octet/h
0 1 1 1 0   2 000 000 octet/h
0 1 1 1 1   5 000 000 octet/h
1 0 0 0 0   10 000 000 octet/h
1 0 0 0 1   20 000 000 octet/h
1 0 0 1 0   50 000 000 octet/h
1 1 1 1 0   Reserved
1 1 1 1 1   Best effort
The value Best effort indicates that throughput shall be made available to the MS on a per need and availability basis.
All other values are interpreted as *Best effort* in this
version of the protocol.

Bits 8 to 6 of octet 5 are spare and shall be coded all 0.

Delivery of erroneous SDUs, octet 6 (see 3GPP TS 23.107)
Bits
3 2 1
In MS to network direction:
0 0 0   Subscribed delivery of erroneous SDUs
In network to MS direction:
0 0 0   Reserved
In MS to network direction and in network to MS direction:
0 0 1   No detect ('-')
0 1 0   Erroneous SDUs are delivered ('yes')
0 1 1   Erroneous SDUs are not delivered ('no')
1 1 1   Reserved

The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol.
The network shall return a negotiated value which is explicitly defined in this version of this protocol.

The MS shall consider all other values as reserved.

Delivery order, octet 6 (see 3GPP TS 23.107)
Bits
5 4 3
In MS to network direction:
0 0   Subscribed delivery order
In network to MS direction:
0 0   Reserved
In MS to network direction and in network to MS direction:
0 1   With delivery order ('yes')
1 0   Without delivery order ('no')
1 1   Reserved

Traffic class, octet 6 (see 3GPP TS 23.107)
Bits
8 7 6
In MS to network direction:
0 0 0   Subscribed traffic class
In network to MS direction:
0 0 0   Reserved
In MS to network direction and in network to MS direction:
0 0 1   Conversational class
0 1 0   Streaming class
0 1 1   Interactive class
1 0 0   Background class
1 1 1   Reserved

The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol.
The network shall return a negotiated value which is explicitly defined in this version of this protocol.

The MS shall consider all other values as reserved.

Maximum SDU size, octet 7 (see 3GPP TS 23.107)
In MS to network direction:
0 0 0 0 0 0 0 0   Subscribed maximum SDU size
1 1 1 1 1 1 1 1   Reserved
In network to MS direction:
0 0 0 0 0 0 0 0   Reserved
1 1 1 1 1 1 1 1   Reserved
In MS to network direction and in network to MS direction:

For values in the range 00000001 to 10010110 the Maximum SDU size value is binary coded in 8 bits, using a granularity of 10 octets, giving a range of values from 10 octets to 1500 octets.
Values above 10010110 are as below:
1 0 0 1 0 1 1 1   1502 octets
1 0 0 1 1 0 0 0   1510 octets
1 0 0 1 1 0 0 1   1520 octets

The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol.
The network shall return a negotiated value which is explicitly defined in this version of this protocol.

The MS shall consider all other values as reserved.

Maximum bit rate for uplink, octet 8
Bits
8 7 6 5 4 3 2 1
In MS to network direction:
0 0 0 0 0 0 0 0   Subscribed maximum bit rate for uplink
In network to MS direction:
0 0 0 0 0 0 0 0   Reserved
In MS to network direction and in network to MS direction:
0 0 0 0 0 0 0 1   The maximum bit rate is binary coded in 8 bits, using a granularity of 1 kbps
0 0 1 1 1 1 1 1   giving a range of values from 1 kbps to 63 kbps in 1 kbps increments.

0 1 0 0 0 0 0 0   The maximum bit rate is 64 kbps + ((the binary coded value in 8 bits –01000000) * 8 kbps)
0 1 1 1 1 1 1 1   giving a range of values from 64 kbps to 568 kbps in 8 kbps increments.

1 0 0 0 0 0 0 0   The maximum bit rate is 576 kbps + ((the binary coded value in 8 bits –10000000) * 64 kbps)
1 1 1 1 1 1 1 0   giving a range of values from 576 kbps to 8640 kbps in 64 kbps increments.

1 1 1 1 1 1 1 1   0kbps

Maximum bit rate for downlink, octet 9 (see 3GPP TS 23.107)

Coding is identical to that of Maximum bit rate for uplink.

In this version of the protocol, for messages specified in the present document, the sending entity shall not request 0 kbps for both the Maximum bitrate for downlink and the Maximum bitrate for uplink at the same time. Any entity receiving a request for 0 kbps in both the Maximum bitrate for downlink and the Maximum bitrate for uplink shall consider that as a syntactical error (see clause 8).

Residual Bit Error Rate (BER), octet 10 (see 3GPP TS 23.107)
Bits
8 7 6 5
In MS to network direction:
0 0 0 0   Subscribed residual BER
In network to MS direction:
0 0 0 0   Reserved
In MS to network direction and in network to MS direction:
The Residual BER value consists of 4 bits. The range is from $5*10^{-2}$ to $6*10^{-8}$.
0 0 0 1 $5*10^{-2}$
0 0 1 0 $1*10^{-2}$
0 0 1 1 $5*10^{-3}$
0 1 0 0 $4*10^{-3}$
0 1 0 1 $1*10^{-3}$
0 1 1 0 $1*10^{-4}$
0 1 1 1 $1*10^{-5}$
1 0 0 0 $1*10^{-6}$
1 0 0 1 $6*10^{-8}$
1 1 1 1   Reserved

The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol. The network shall return a negotiated value which is explicitly defined in this version of the protocol.

The MS shall consider all other values as reserved.

SDU error ratio, octet 10 (see 3GPP TS 23.107)
Bits
4 3 2 1
In MS to network direction:
0 0 0 0   Subscribed SDU error ratio
In network to MS direction:
0 0 0 0   Reserved
In MS to network direction and in network to MS direction:
The SDU error ratio value consists of 4 bits. The range is is from $1*10^{-1}$ to $1*10^{-6}$.
0 0 0 1 $1*10^{-2}$
0 0 1 0 $7*10^{-3}$
0 0 1 1 $1*10^{-3}$
0 1 0 0 $1*10^{-4}$
0 1 0 1 $1*10^{-5}$
0 1 1 0 $1*10^{-6}$
0 1 1 1 $1*10^{-1}$
1 1 1 1   Reserved

The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol. The network shall return a negotiated value which is explicitly defined in this version of the protocol.

The MS shall consider all other values as reserved.

Traffic handling priority, octet 11 (see 3GPP TS 23.107)
Bits
2 1
In MS to network direction:
0 0   Subscribed traffic handling priority
In network to MS direction:
0 0   Reserved
In MS to network direction and in network to MS direction:
0 1   Priority level 1
1 0   Priority level 2
1 1   Priority level 3

The Traffic handling priority value is ignored if the Traffic Class is Conversation class, Streaming class or Background class.

Transfer delay, octet 11 (See 3GPP TS 23.107)
Bits
8 7 6 5 4 3

In MS to network direction:
0 0 0 0 0 0   Subscribed transfer delay
In network to MS direction:
0 0 0 0 0 0   Reserved
In MS to network direction and in network to MS direction:

0 0 0 0 0 1   The Transfer delay is binary coded in 6 bits, using a granularity of 10 ms
0 0 1 1 1 1   giving a range of values from 10 ms to 150 ms in 10 ms increments

0 1 0 0 0 0   The transfer delay is 200 ms + ((the binary coded value in 6 bits – 010000) * 50 ms)
0 1 1 1 1 1   giving a range of values from 200 ms to 950 ms in 50ms increments

1 0 0 0 0 0   The transfer delay is 1000 ms + ((the binary coded value in 6 bits – 100000) * 100 ms)
1 1 1 1 1 0   giving a range of values from 1000 ms to 4000 ms in 100ms increments

1 1 1 1 1 1   Reserved

The Transfer delay value is ignored if the Traffic Class is Interactive class or Background class.
Guaranteed bit rate for uplink, octet 12 (See 3GPP TS 23.107)

Coding is identical to that of Maximum bit rate for uplink.

The Guaranteed bit rate for uplink value is ignored if the Traffic Class is Interactive class or Background class, or Maximum bit rate for uplink is set to 0 kbps.
Guaranteed bit rate for downlink, octet 13(See 3GPP TS 23.107)

Coding is identical to that of Maximum bit rate for uplink.

The Guaranteed bit rate for downlink value is ignored if the Traffic Class is Interactive class or Background class, or Maximum bit rate for downlink is set to 0 kbps.

Source Statistics Descriptor, octet 14 (see 3GPP TS 23.107)
Bits
4 3 2 1
In MS to network direction
0 0 0 0   unknown
0 0 0 1   speech

The network shall consider all other values as unknown.

In network to MS direction
Bits 4 to 1 of octet 14 are spare and shall be coded all 0.

Signalling Indication, octet 14 (see 3GPP TS 23.107)
Bit
5
In MS to network direction and in network to MS direction:
0   Not optimised for signalling traffic
1   Optimised for signalling traffic

If set to '1' the QoS of the PDP context is optimised for signalling

~~In the network to MS direction this bit shall be ignored by the MS.~~

Bits 8 to 6 of octet 14 are spare and shall be coded all 0.

CR-Form-v7

CHANGE REQUEST

⌘	**24.008** CR	**760**	⌘rev	**-**	⌘	Current version:	**6.0.0**	⌘

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

Proposed change affects: UICC apps⌘ ☐   ME **X** Radio Access Network ☐   Core Network **X**

Title: ⌘	Alignment of parameter 'signalling information' with other QoS parameters	
Source: ⌘	Ericsson, Nokia	
Work item code:⌘	IMS-CCR	**Date:** ⌘ 12/05/2003
Category: ⌘ **A**		**Release:** ⌘ Rel-6

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)*
Rel-6 *(Release 6)*

Reason for change: ⌘	Alignment of the parameter 'signalling information' with other QoS parameters.
Summary of change:⌘	The enhanced QoS for 'signalling indication' should ba handled as other QoS parameters, in order to have a uniform handling of all QoS parameters. The CR aligns with stage-2 changes approved in SA2#31. A new QoS attribute, Signalling Indication, has been introduced in the QoS IE, see stage 2 specifications; S2-031527 (CR to 23.228), S2-031482 (CR to 23.207).
Consequences if ⌘ **not approved:**	It will not be possible to control the use of the new "signalling flag" in the handset in the same way as other QoS parameters.

Clauses affected: ⌘	10.5.6.5	

	Y	N		
Other specs ⌘	X		Other core specifications ⌘	24.229 (CR no.377) 27.060 (CR no. 084) 29.061 (CR no. 087)
affected:		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘	

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10.5.6.5   Quality of service

The purpose of the *quality of service* information element is to specify the QoS parameters for a PDP context.

The QoS IE is defined to allow backward compatibility to earlier version of Session Management Protocol.

The *quality of service* is a type 4 information element with a length of 14 octets. The QoS requested by the MS shall be encoded both in the QoS attributes specified in octets 3-5 and in the QoS attributes specified in octets 6-14.

A QoS IE received without octets 6-14 or without octet 14 shall be accepted by a receiving entity.

NOTE: This behavior is required for interworking with entities supporting an earlier version of the protocol.

The *quality of service* information element is coded as shown in figure 10.5.138/3GPP TS 24.008 and table 10.5.156/3GPP TS 24.008.

8	7	6	5	4	3	2	1	
	Quality of service IEI							octet 1

8 7 6 5 4 3 2 1	
Quality of service IEI	octet 1
Length of quality of service IE	Octet 2
0 0 spare	Delay class	Reliability class	octet 3
Peak throughput	0 spare	Precedence class	octet 4
0 0 0 spare	Mean throughput	octet 5
Traffic Class	Delivery order	Delivery of erroneous SDU	Octet 6
Maximum SDU size	Octet 7
Maximum bit rate for uplink	Octet 8
Maximum bit rate for downlink	Octet 9
Residual BER	SDU error ratio	Octet 10
Transfer delay	Traffic Handling priority	Octet 11
Guaranteed bit rate for uplink	Octet 12
Guaranteed bit rate for downlink	Octet 13
0 0 0 spare	Signal-ling Indicat-ion	Source Statistics Descriptor	Octet 14

Figure 10.5.138/3GPP TS 24.008: *Quality of service* **information element**

Table 10.5.156/3GPP TS 24.008: *Quality of service* **information element**

Reliability class, octet 3 (see 3GPP TS 23.107) Bits 3 2 1 In MS to network direction: 0 0 0   Subscribed reliability class In network to MS direction: 0 0 0   Reserved In MS to network direction and in network to MS direction: 0 0 1   Acknowledged GTP, LLC, and RLC; Protected data 0 1 0   Unacknowledged GTP; Acknowledged LLC and RLC, Protected data 0 1 1   Unacknowledged GTP and LLC; Acknowledged RLC, Protected data 1 0 0   Unacknowledged GTP, LLC, and RLC, Protected data 1 0 1   Unacknowledged GTP, LLC, and RLC, Unprotected data 1 1 1   Reserved All other values are interpreted as *Unacknowledged GTP and LLC; Acknowledged RLC, Protected data* in this version of the protocol. Delay class, octet 3 (see 3GPP TS 22.060 and 3GPP TS 23.107) Bits 6 5 4 In MS to network direction: 0 0 0   Subscribed delay class In network to MS direction: 0 0 0   Reserved In MS to network direction and in network to MS direction: 0 0 1   Delay class 1 0 1 0   Delay class 2 0 1 1   Delay class 3 1 0 0   Delay class 4 (best effort) 1 1 1   Reserved

All other values are interpreted as *Delay class 4 (best effort)* in this version
of the protocol.
Bit 7 and 8 of octet 3 are spare and shall be coded all 0.
Precedence class, octet 4 (see 3GPP TS 23.107)
Bits
3 2 1
In MS to network direction:
0 0 0   Subscribed precedence
In network to MS direction:
0 0 0   Reserved
In MS to network direction and in network to MS direction:
0 0 1   High priority
0 1 0   Normal priority
0 1 1   Low priority
1 1 1   Reserved

All other values are interpreted as *Normal priority* in this version of the protocol.

Bit 4 of octet 4 is spare and shall be coded as 0.

Peak throughput, octet 4 (see 3GPP TS 23.107)
Bits
8 7 6 5
In MS to network direction:
0 0 0 0   Subscribed peak throughput
In network to MS direction:
0 0 0 0   Reserved
In MS to network direction and in network to MS direction:
0 0 0 1   Up to 1 000 octet/s
0 0 1 0   Up to 2 000 octet/s
0 0 1 1   Up to 4 000 octet/s
0 1 0 0   Up to 8 000 octet/s
0 1 0 1   Up to 16 000 octet/s
0 1 1 0   Up to 32 000 octet/s
0 1 1 1   Up to 64 000 octet/s
1 0 0 0   Up to 128 000 octet/s
1 0 0 1   Up to 256 000 octet/s
1 1 1 1   Reserved

All other values are interpreted as *Up to 1 000 octet/s* in this
version of the protocol.
Mean throughput, octet 5 (see 3GPP TS 23.107)
Bits
5 4 3 2 1

In MS to network direction:
0 0 0 0 0   Subscribed mean throughput
In network to MS direction:
0 0 0 0 0   Reserved
In MS to network direction and in network to MS direction:
0 0 0 0 1   100 octet/h
0 0 0 1 0   200 octet/h
0 0 0 1 1   500 octet/h
0 0 1 0 0   1 000 octet/h
0 0 1 0 1   2 000 octet/h
0 0 1 1 0   5 000 octet/h
0 0 1 1 1   10 000 octet/h
0 1 0 0 0   20 000 octet/h
0 1 0 0 1   50 000 octet/h
0 1 0 1 0   100 000 octet/h
0 1 0 1 1   200 000 octet/h
0 1 1 0 0   500 000 octet/h
0 1 1 0 1   1 000 000 octet/h
0 1 1 1 0   2 000 000 octet/h
0 1 1 1 1   5 000 000 octet/h
1 0 0 0 0   10 000 000 octet/h
1 0 0 0 1   20 000 000 octet/h
1 0 0 1 0   50 000 000 octet/h
1 1 1 1 0   Reserved
1 1 1 1 1   Best effort
The value Best effort indicates that throughput shall be made available to the MS on a per need and availability basis.
All other values are interpreted as *Best effort* in this
version of the protocol.

Bits 8 to 6 of octet 5 are spare and shall be coded all 0.

Delivery of erroneous SDUs, octet 6 (see 3GPP TS 23.107)
Bits
3 2 1
In MS to network direction:
0 0 0   Subscribed delivery of erroneous SDUs
In network to MS direction:
0 0 0   Reserved
In MS to network direction and in network to MS direction:
0 0 1   No detect ('-')
0 1 0   Erroneous SDUs are delivered ('yes')
0 1 1   Erroneous SDUs are not delivered ('no')
1 1 1   Reserved

The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol.
The network shall return a negotiated value which is explicitly defined in this version of this protocol.

The MS shall consider all other values as reserved.

Delivery order, octet 6 (see 3GPP TS 23.107)
Bits
5 4 3
In MS to network direction:
0 0   Subscribed delivery order
In network to MS direction:
0 0   Reserved
In MS to network direction and in network to MS direction:
0 1   With delivery order ('yes')
1 0   Without delivery order ('no')
1 1   Reserved

Traffic class, octet 6 (see 3GPP TS 23.107)
Bits
8 7 6
In MS to network direction:
0 0 0   Subscribed traffic class
In network to MS direction:
0 0 0   Reserved
In MS to network direction and in network to MS direction:
0 0 1   Conversational class
0 1 0   Streaming class
0 1 1   Interactive class
1 0 0   Background class
1 1 1   Reserved

The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol.
The network shall return a negotiated value which is explicitly defined in this version of this protocol.

The MS shall consider all other values as reserved.

Maximum SDU size, octet 7 (see 3GPP TS 23.107)
In MS to network direction:
0 0 0 0 0 0 0 0   Subscribed maximum SDU size
1 1 1 1 1 1 1 1   Reserved
In network to MS direction:
0 0 0 0 0 0 0 0   Reserved
1 1 1 1 1 1 1 1   Reserved
In MS to network direction and in network to MS direction:

For values in the range 00000001 to 10010110 the Maximum SDU size value is binary coded in 8 bits, using a
granularity of 10 octets, giving a range of values from 10 octets to 1500 octets.
Values above 10010110 are as below:
1 0 0 1 0 1 1 1   1502 octets
1 0 0 1 1 0 0 0   1510 octets
1 0 0 1 1 0 0 1   1520 octets

The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol.
The network shall return a negotiated value which is explicitly defined in this version of this protocol.

The MS shall consider all other values as reserved.

Maximum bit rate for uplink, octet 8
Bits
8 7 6 5 4 3 2 1
In MS to network direction:
0 0 0 0 0 0 0 0   Subscribed maximum bit rate for uplink
In network to MS direction:
0 0 0 0 0 0 0 0   Reserved
In MS to network direction and in network to MS direction:
0 0 0 0 0 0 0 1   The maximum bit rate is binary coded in 8 bits, using a granularity of 1 kbps
0 0 1 1 1 1 1 1   giving a range of values from 1 kbps to 63 kbps in 1 kbps increments.

0 1 0 0 0 0 0 0   The maximum bit rate is 64 kbps + ((the binary coded value in 8 bits −01000000) * 8 kbps)
0 1 1 1 1 1 1 1   giving a range of values from 64 kbps to 568 kbps in 8 kbps increments.

1 0 0 0 0 0 0 0   The maximum bit rate is 576 kbps + ((the binary coded value in 8 bits −10000000) * 64 kbps)
1 1 1 1 1 1 1 0   giving a range of values from 576 kbps to 8640 kbps in 64 kbps increments.

1 1 1 1 1 1 1 1   0kbps

Maximum bit rate for downlink, octet 9 (see 3GPP TS 23.107)

Coding is identical to that of Maximum bit rate for uplink.

In this version of the protocol, for messages specified in the present document, the sending entity shall not request 0 kbps for both the Maximum bitrate for downlink and the Maximum bitrate for uplink at the same time. Any entity receiving a request for 0 kbps in both the Maximum bitrate for downlink and the Maximum bitrate for uplink shall consider that as a syntactical error (see clause 8).

Residual Bit Error Rate (BER), octet 10 (see 3GPP TS 23.107)
Bits
8 7 6 5
In MS to network direction:
0 0 0 0   Subscribed residual BER
In network to MS direction:
0 0 0 0   Reserved
In MS to network direction and in network to MS direction:
The Residual BER value consists of 4 bits. The range is from $5*10^{-2}$ to $6*10^{-8}$.
0 0 0 1 $5*10^{-2}$
0 0 1 0 $1*10^{-2}$
0 0 1 1 $5*10^{-3}$
0 1 0 0 $4*10^{-3}$
0 1 0 1 $1*10^{-3}$
0 1 1 0 $1*10^{-4}$
0 1 1 1 $1*10^{-5}$
1 0 0 0 $1*10^{-6}$
1 0 0 1 $6*10^{-8}$
1 1 1 1   Reserved

The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol. The network shall return a negotiated value which is explicitly defined in this version of the protocol.

The MS shall consider all other values as reserved.

SDU error ratio, octet 10 (see 3GPP TS 23.107)
Bits
4 3 2 1
In MS to network direction:
0 0 0 0   Subscribed SDU error ratio
In network to MS direction:
0 0 0 0   Reserved
In MS to network direction and in network to MS direction:
The SDU error ratio value consists of 4 bits. The range is is from $1*10^{-1}$ to $1*10^{-6}$.
0 0 0 1 $1*10^{-2}$
0 0 1 0 $7*10^{-3}$
0 0 1 1 $1*10^{-3}$
0 1 0 0 $1*10^{-4}$
0 1 0 1 $1*10^{-5}$
0 1 1 0 $1*10^{-6}$
0 1 1 1 $1*10^{-1}$
1 1 1 1   Reserved

The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol. The network shall return a negotiated value which is explicitly defined in this version of the protocol.

The MS shall consider all other values as reserved.

Traffic handling priority, octet 11 (see 3GPP TS 23.107)
Bits
2 1
In MS to network direction:
0 0   Subscribed traffic handling priority
In network to MS direction:
0 0   Reserved
In MS to network direction and in network to MS direction:
0 1   Priority level 1
1 0   Priority level 2
1 1   Priority level 3

The Traffic handling priority value is ignored if the Traffic Class is Conversation class, Streaming class or Background class.

Transfer delay, octet 11 (See 3GPP TS 23.107)
Bits
8 7 6 5 4 3

In MS to network direction:
0 0 0 0 0 0   Subscribed transfer delay
In network to MS direction:
0 0 0 0 0 0   Reserved
In MS to network direction and in network to MS direction:

0 0 0 0 0 1   The Transfer delay is binary coded in 6 bits, using a granularity of 10 ms
0 0 1 1 1 1   giving a range of values from 10 ms to 150 ms in 10 ms increments

0 1 0 0 0 0   The transfer delay is 200 ms + ((the binary coded value in 6 bits – 010000) * 50 ms)
0 1 1 1 1 1   giving a range of values from 200 ms to 950 ms in 50ms increments

1 0 0 0 0 0   The transfer delay is 1000 ms + ((the binary coded value in 6 bits – 100000) * 100 ms)
1 1 1 1 1 0   giving a range of values from 1000 ms to 4000 ms in 100ms increments

1 1 1 1 1 1   Reserved

The Transfer delay value is ignored if the Traffic Class is Interactive class or Background class.
Guaranteed bit rate for uplink, octet 12 (See 3GPP TS 23.107)

Coding is identical to that of Maximum bit rate for uplink.

The Guaranteed bit rate for uplink value is ignored if the Traffic Class is Interactive class or Background class, or Maximum bit rate for uplink is set to 0 kbps.
Guaranteed bit rate for downlink, octet 13(See 3GPP TS 23.107)

Coding is identical to that of Maximum bit rate for uplink.

The Guaranteed bit rate for downlink value is ignored if the Traffic Class is Interactive class or Background class, or Maximum bit rate for downlink is set to 0 kbps.

Source Statistics Descriptor, octet 14 (see 3GPP TS 23.107)
Bits
4 3 2 1
In MS to network direction
0 0 0 0   unknown
0 0 0 1   speech

The network shall consider all other values as unknown.

In network to MS direction
Bits 4 to 1 of octet 14 are spare and shall be coded all 0.

Signalling Indication, octet 14 (see 3GPP TS 23.107)
Bit
5
In MS to network direction and in network to MS direction:
0   Not optimised for signalling traffic
1   Optimised for signalling traffic

If set to '1' the QoS of the PDP context is optimised for signalling

~~In the network to MS direction this bit shall be ignored by the MS.~~

Bits 8 to 6 of octet 14 are spare and shall be coded all 0.

CR-Form-v7

CHANGE REQUEST

⌘   **24.008** CR   **763**   ⌘**rev**   **1**   ⌘   Current version: **5.7.0**   ⌘

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

Proposed change affects: UICC apps⌘ ☐   ME **X**   Radio Access Network ☐   Core Network **X**

Title: ⌘	Cleanup and correction of the PCO-IE	
Source: ⌘	Ericsson	
Work item code:⌘	IMS-CCR	***Date:*** ⌘ 20/05/2003
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)*
Rel-6	*(Release 6)*

Reason for change: ⌘	Correction of the text describing the coding of PCO-IE.
Summary of change:⌘	Correction of the text describing the coding of PCO-IE. Correction of reference [99].
Consequences if not approved: ⌘	Possible misunderstanding of the coding.

Clauses affected: ⌘	2, 10.5.6.3

	Y	N		
Other specs affected: ⌘		X	Other core specifications	⌘
		X	Test specifications	
		X	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/specs/CR.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://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.

$$**** \quad 1^{st} \quad change \quad ****$$

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]   Void.

[2]   Void.

[2a]   3GPP TR 21.905 "Vocabulary for 3GPP Specifications"

[3]   3GPP TS 22.002: "Circuit Bearer Services (BS) supported by a Public Land Mobile Network (PLMN)".

[4]   3GPP TS 22.003: "Teleservices supported by a Public Land Mobile Network (PLMN)".

[5]   3GPP TS 42.009: "Security aspects".

[5a]   3GPP TS 33.102: "3G security; Security architecture".

[6]   3GPP TS 22.011: "Service accessibility".

[7]   3GPP TS 42.017: "Subscriber Identity Modules (SIM); Functional characteristics".

[8]   3GPP TS 22.101: "Service aspects; Service principles".

[8a]   3GPP TS 22.001: "Principles of circuit telecommunication services supported by a Public Land Mobile Network (PLMN)".

[8b]   3GPP TS 23.038: "Alphabets and language-specific information".

[9]   3GPP TS 23.101: "General UMTS Architecture".

[9a]   3GPP TS 23.108: "Mobile radio interface layer 3 specification core network protocols; Stage 2 (structured procedures)".

[10]   3GPP TS 23.003: "Numbering, addressing and identification".

[11]   3GPP TS 43.013: "Discontinuous Reception (DRX) in the GSM system".

[12]   3GPP TS 23.014: "Support of Dual Tone Multi-Frequency (DTMF) signalling".

[12a]   Void.

[13]   3GPP TS 43.020: "Security-related network functions".

[14]   3GPP TS 23.122: "Non-Access-Stratum functions related to Mobile Station (MS) in idle mode".

[15]   3GPP TS 24.002: "GSM-UMTS Public Land Mobile Network (PLMN) access reference configuration".

[16]   3GPP TS 44.003: "Mobile Station - Base Station System (MS - BSS) interface; Channel structures and access capabilities".

[17]   3GPP TS 44.004: "Layer 1; General requirements".

[18]   3GPP TS 44.005: "Data Link (DL) layer; General aspects".

[19]   3GPP TS 44.006: "Mobile Station - Base Station System (MS - BSS) interface; Data Link (DL) layer specification".

[19a]   3GPP TS 25.321: "Medium Access Control (MAC) protocol specification".

[19b]   3GPP TS 25.322: "Radio Link Control (RLC) protocol specification".

[19c]   3GPP TS 25.413: "UTRAN Iu interface RANAP signalling".

[20]   3GPP TS 24.007: "Mobile radio interface signalling layer 3; General aspects".

[21]   3GPP TS 24.010: "Mobile radio interface layer 3; Supplementary services specification; General aspects".

[22]   3GPP TS 24.011: "Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[23]   3GPP TS 24.012: "Short Message Service Cell Broadcast (SMSCB) support on the mobile radio interface".

[23a]   3GPP TS 44.071: "Location Services (LCS); Mobile radio interface layer 3 specification."

[23b]   3GPP TS 44.031 "Location Services LCS); Mobile Station (MS) - Serving Mobile Location Centre (SMLC); Radio Resource LCS Protocol (RRLP)".

[23c]   3GPP TS 25.331: "Radio Resource Control (RRC) protocol specification"

[24]   3GPP TS 24.080: "Mobile radio Layer 3 supplementary service specification; Formats and coding".

[25]   3GPP TS 24.081: "Line identification supplementary services; Stage 3".

[26]   3GPP TS 24.082: "Call Forwarding (CF) supplementary services; Stage 3".

[27]   3GPP TS 24.083: "Call Waiting (CW) and Call Hold (HOLD) supplementary services; Stage 3".

[28]   3GPP TS 24.084: "MultiParty (MPTY) supplementary services; Stage 3".

[29]   3GPP TS 24.085: "Closed User Group (CUG) supplementary services; Stage 3".

[30]   3GPP TS 24.086: "Advice of Charge (AoC) supplementary services; Stage 3".

[31]   3GPP TS 24.088: "Call Barring (CB) supplementary services; Stage 3".

[32]   3GPP TS 45.002: "Multiplexing and multiple access on the radio path".

[33]   3GPP TS 45.005: "Radio transmission and reception".

[34]   3GPP TS 45.008: "Radio subsystem link control".

[35]   3GPP TS 45.010: "Radio subsystem synchronization".

[36]   3GPP TS 27.001: "General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".

[36a]   3GPP TS 27.060: "Mobile Station (MS) supporting Packet Switched Services ".

[37]   3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[38]   3GPP TS 29.007: "General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".

[39]   3GPP TS 51.010: "Mobile Station (MS) conformance specification".

[40]   3GPP TS 51.021: "GSM radio aspects base station system equipment specification".

[41]   ISO/IEC 646 (1991): "Information technology - ISO 7-bit coded character set for information interchange".

[42]   ISO/IEC 6429: "Information technology - Control functions for coded character sets".

[43]   ISO 8348 (1987): "Information technology -- Open Systems Interconnection -- Network Service Definition".

[44]   ITU-T Recommendation E.163: "Numbering plan for the international telephone service".

[45]   ITU-T Recommendation E.164: "The international public telecommunication numbering plan".

[46]   ITU-T Recommendation E.212: "The international identification plan for mobile terminals and mobile users".

[47]   ITU-T Recommendation F.69 (1993): "The international telex service - Service and operational provisions of telex destination codes and telex network identification codes".

[48]   ITU-T Recommendation I.330: "ISDN numbering and addressing principles".

[49]   ITU-T Recommendation I.440 (1989): "ISDN user-network interface data link layer - General aspects".

[50]   ITU-T Recommendation I.450 (1989): "ISDN user-network interface layer 3 General aspects".

[51]   ITU-T Recommendation I.500 (1993): "General structure of the ISDN interworking recommendations".

[52]   ITU-T Recommendation T.50: "International Reference Alphabet (IRA) (Formerly International Alphabet No. 5 or IA5) - Information technology - 7-bit coded character set for information interchange".

[53]   ITU Recommendation Q.931: ISDN user-network interface layer 3 specification for basic control".

[54]   ITU-T Recommendation V.21: "300 bits per second duplex modem standardized for use in the general switched telephone network".

[55]   ITU-T Recommendation V.22: "1200 bits per second duplex modem standardized for use in the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[56]   ITU-T Recommendation V.22bis: "2400 bits per second duplex modem using the frequency division technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[57]   Void.

[58]   ITU-T Recommendation V.26ter: "2400 bits per second duplex modem using the echo cancellation technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[59]   ITU-T Recommendation V.32: "A family of 2-wire, duplex modems operating at data signalling rates of up to 9600 bit/s for use on the general switched telephone network and on leased telephone-type circuits".

[60]   ITU-T Recommendation V.110: "Support by an ISDN of data terminal equipments with V-Series type interfaces".

[61]   ITU-T Recommendation V.120: "Support by an ISDN of data terminal equipment with V-Series type interfaces with provision for statistical multiplexing".

[62]   ITU-T Recommendation X.21: "Interface between Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) for synchronous operation on public data networks".

[63]   Void.

[64]   Void.

[65]   ITU-T Recommendation X.30: "Support of X.21, X.21 bis and X.20 bis based Data Terminal Equipments (DTEs) by an Integrated Services Digital Network (ISDN)".

[66]   ITU-T Recommendation X.31: "Support of packet mode terminal equipment by an ISDN".

[67]   Void.

[68]   Void.

[69]   ITU-T Recommendation X.121: "International numbering plan for public data networks".

[70]   ETSI ETS 300 102-1: "Integrated Services Digital Network (ISDN); User-network interface layer 3; Specifications for basic call control".

[71]   ETSI ETS 300 102-2: "Integrated Services Digital Network (ISDN); User-network interface layer 3; Specifications for basic call control; Specification Description Language (SDL) diagrams".

[72]   ISO/IEC 10646: "Information technology -- Universal Multiple-Octet Coded Character Set (UCS)".

[73]   3GPP TS 22.060: "General Packet Radio Service (GPRS); Service Description; Stage 1".

[74]   3GPP TS 23.060: "General Packet Radio Service (GPRS); Service Description; Stage 2".

[75]   3GPP TS 43.064: "General Packet Radio Service (GPRS); Overall description of the GPRS radio interface; Stage 2".

[76]   3GPP TS 44.060: "General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol".

[77]   IETF RFC 1034: "Domain names - concepts and facilities".

[78]   3GPP TS 44.065: "Mobile Station (MS) - Serving GPRS Support Node (SGSN); Subnetwork Dependent Convergence Protocol (SNDCP)".

[78a]   3GPP TS 44.064: "Mobile Station - Serving GPRS Support Node (MS-SGSN) Logical Link Control (LLC) Layer Specification".

[79]   ITU Recommendation I.460: "Multiplexing, rate adaption and support of existing interfaces".

[80]   3GPP TS 26.111: "Codec for Circuit Switched Multimedia Telephony Service; Modifications to H.324".

[81]   3GPP TS 23.107: "Quality of Service (QoS) concept and architecture".

[82]   3GPP TS 43.022: "Functions related to Mobile Station (MS) in idle mode and group receive mode".

[83]   3GPP TS 26.103: "Speech Codec List for GSM and UMTS".

[84]   3GPP TS 44.018: "Mobile radio interface layer 3 specification, Radio Resource Control Protocol".

[85]   3GPP TS 48.008: "Mobile-services Switching Centre – Base Station System (MSC – BSS) interface; layer 3 specification".

[86]   3GPP TS 48.018: "General Packet Radio Service (GPRS); Base Station System (BSS) - Serving GPRS Support Node (SGSN); BSS GPRS Protocol (BSSGP)".

[87]   3GPP TS 43.055: "Dual Transfer Mode (DTM); Stage 2".

[88]   3GPP TS 23.067: "enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 2".

[88a]   3GPP TS 23.093: "Technical realization of Completion of Calls to Busy Subscriber (CCBS); Stage 2".

[89]   3GPP TS 22.042: "Network Identity and Time Zone (NITZ), Stage 1".

[90]   3GPP TS 23.040: "Technical realization of Short Message Service (SMS)".

[91]   3GPP TS 44.056: "GSM Cordless Telephony System (CTS), (Phase 1) CTS Radio Interface Layer 3 Specification".

[92]   3GPP TS 23.226: "Global Text Telephony; Stage 2 "

[93]   3GPP TS 26.226: "Cellular Text Telephone Modem (CTM), General Description "

[94]   3GPP TS 23.236: "Intra Domain Connection of RAN Nodes to Multiple CN Nodes"

[95]   3GPP TS 24.229: "IP Multimedia Call Control Protocol based on SIP and SDP"

[96]   3GPP TS 23.205: "Bearer-independent circuit-switched core network; Stage 2".

[97]   3GPP TS 23.172: "UDI/RDI Fallback and Service Modification; Stage 2".

[98]   3GPP TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode"

[99]   RFC 3513 (April 2003): "Internet Protocol Version 6 (IPv6) Addressing Architecture".RFC 2373 (July 1998): "IP Version 6 Addressing Architecture".

[100]   3GPP TS 29.207: "Policy control over Go interface".

[101]   3GPP TS 21.111: "USIM and IC card requirements".

[102]   RFC 1661 (July 1994): "The Point-to-Point Protocol (PPP)".

[103]   RFC 3232 (January 2002): "Assigned Numbers: RFC 1700 is Replaced by an On-line Database".

<p align="center">****   2nd change   ****</p>

10.5.6.3   Protocol configuration options

The purpose of the *protocol configuration options* information element is to:

-    transfer external network protocol options associated with a PDP context activation, and

-    transfer additional (protocol) data (e.g. configuration parameters, error codes or messages/events) associated with an external protocol or an application.

The *protocol configuration options* is a type 4 information element with a minimum length of 32 octets and a maximum length of 253 octets.

The *protocol configuration options* information element is coded as shown in figure 10.5.136/3GPP TS 24.008 and table 10.5.154/3GPP TS 24.008.
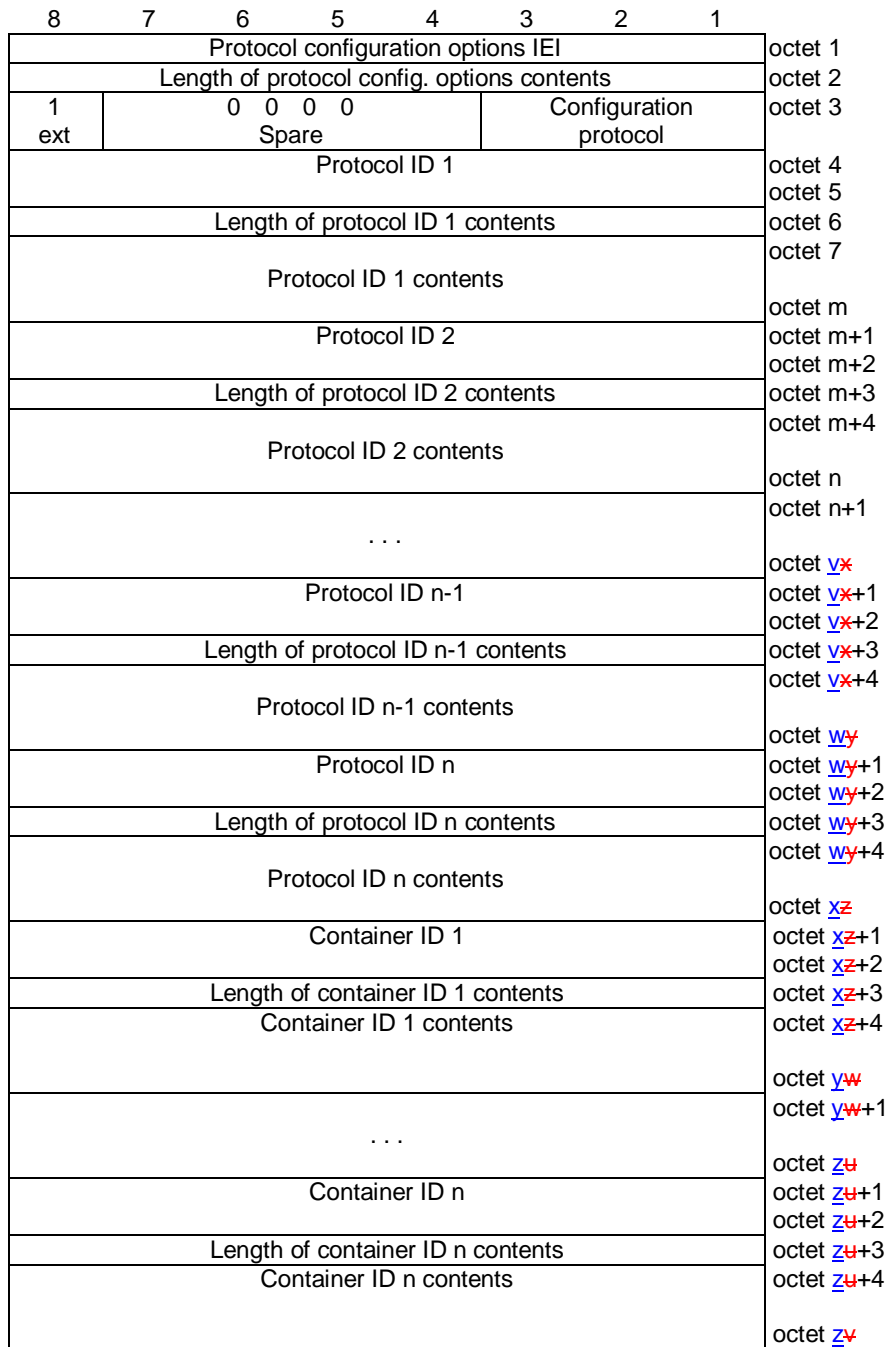
8	7	6	5	4	3	2	1	
Protocol configuration options IEI								octet 1
Length of protocol config. options contents								octet 2
1 ext	0 0 0 0 Spare				Configuration protocol			octet 3
Protocol ID 1								octet 4 octet 5
Length of protocol ID 1 contents								octet 6
Protocol ID 1 contents								octet 7 octet m
Protocol ID 2								octet m+1 octet m+2
Length of protocol ID 2 contents								octet m+3
Protocol ID 2 contents								octet m+4 octet n
. . .								octet n+1 octet v~~x~~
Protocol ID n-1								octet v~~x~~+1 octet v~~x~~+2
Length of protocol ID n-1 contents								octet v~~x~~+3
Protocol ID n-1 contents								octet v~~x~~+4 octet w~~y~~
Protocol ID n								octet w~~y~~+1 octet w~~y~~+2
Length of protocol ID n contents								octet w~~y~~+3
Protocol ID n contents								octet w~~y~~+4 octet x~~z~~
Container ID 1								octet x~~z~~+1 octet x~~z~~+2
Length of container ID 1 contents								octet x~~z~~+3
Container ID 1 contents								octet x~~z~~+4 octet y~~w~~
. . .								octet y~~w~~+1 octet z~~u~~
Container ID n								octet z~~u~~+1 octet z~~u~~+2
Length of container ID n contents								octet z~~u~~+3
Container ID n contents								octet z~~u~~+4 octet z~~v~~

Figure 10.5.136/3GPP TS 24.008: *Protocol configuration options* **information element**

Table 10.5.154/3GPP TS 24.008: *Protocol configuration options* information element

---

Configuration protocol (octet 3)
Bits
3 2 1
0 0 0   PPP for use with IP PDP type

All other values are interpreted as PPP in this version of the protocol.

After octet 3, i.e. from octet 4 to octet z̶v̶, two logical lists are defined:

-    the Configuration protocol options list (octets 4 to x̶z̶), and

-    the Additional parameters list (octets x̶z̶+1 to z̶v̶).

Configuration protocol options list (octets 4 to x̶z̶)

The *configuration protocol options list* contains a variable number of logical units,
they may occur in an arbitrary order within the *configuration protocol options list*.

Each unit is of variable length and consists of a:

-    protocol identifier (2 octets);
-    the length of the protocol identifier contents of the unit (1 octet); and
-    the protocol identifier contents itself (n octets).

The *protocol identifier* field contains the hexadecimal coding of the configuration
protocol identifier. Bit 8 of the first octet of the *protocol identifier* field contains the
most significant bit and bit 1 of the second octet of the *protocol identifier* field
contains the least significant bit.

If the *configuration protocol options list* contains a protocol identifier that is not
supported by the receiving entity the corresponding unit shall be discarded.

The *length of the protocol identifier contents* field contains the binary coded
representation of the length of the *protocol identifier contents* field of a unit. The first
bit in transmission order is the most significant bit.

The *protocol identifier contents* field of each unit contains information specific to the
configuration protocol specified by the *protocol identifier.*

PPP

At least the following protocol identifiers (as defined in RFC 3232̶1̶7̶0̶0̶[103]) shall be
supported in this version of the protocol:

-    C021H (LCP;
-    C023H (PAP);
-    C223H (CHAP); and
-    8021H (IPCP).

The support of other protocol identifiers is implementation dependent and outside
the scope of the present document.

The *protocol identifier contents* field of each unit corresponds to a "Packet" as
defined in RFC 1661 [102] that is stripped off the "Protocol" and the "Padding"
octets.

The detailed coding of the *protocol identifier contents* field is specified in the RFC
that is associated with the protocol identifier of that unit.

Additional parameters list (octets x̶z̶+1 to z̶v̶)

The *additional parameters list* is included when special parameters and/or requests
(associated with a PDP context) need to be transferred between the MS and the
network. These parameters and/or requests are not related to a specific
configuration protocol (e.g. PPP), and therefore are not encoded as the "Packets"
contained in the *configuration protocol options list*.

The *additional parameters list* contains a list of special parameters, each one in a

---

separate container. The type of the parameter carried in a container is identified by a specific *container identifier*. In this version of the protocol, the following container identifiers are specified:

MS to network direction:

- 0001H (P-CSCF Address Request);

- 0002H (IM CN Subsystem Signaling Flag); and

- 0003H (DNS Server Address Request); and.

- 0004H (Not Supported).

Network to MS direction:

- 0001H (P-CSCF Address);

- 0002H (IM CN Subsystem Signaling Flag);

- 0003H (DNS Server Address); and

- 0004H (Policy Control rejection code).

If the *additional parameters list* contains a container identifier that is not supported by the receiving entity the corresponding unit shall be discarded.

The *container identifier* field is encoded as the *protocol identifier* field and the *length of container identifier contents* field is encoded as the *length of the protocol identifier contents* field.

When the *container identifier* indicates P-CSCF Address Request or DNS Server Address Request, the *container identifi*er contents field is empty and the *length of container identifier contents* indicates a length equal to zero. If the *container identifier contents* field is not empty, it shall be ignored.

When the *container identifier* indicates IM CN Subsystem Signaling Flag (see 3GPP TS 24.229 [95]), the *container identifier contents* field is empty and the *length of container identifier contents* indicates a length equal to zero. If the *container identifier contents* field is not empty, it shall be ignored. In Network to MS direction this information may be used by the MS to indicate to the user whether the requested dedicated signalling PDP context was successfully established.

When the *container identifier* indicates P-CSCF Address, the *container identifier contents* field contains one IPv6 address corresponding to a P-CSCF address (see 3GPP TS 24.229 [95]). This IPv6 address is encoded as an 128-bit address according to RFC 2373 [99]. When there is need to include more than one P-CSCF address, then more logical units with *container identifier* indicating P-CSCF Address are used.

When the *container identifier* indicates DNS Server Address, the *container identifier contents* field contains one IPv6 DNS server address (see 3GPP TS 27.060 [36a]). This IPv6 address is encoded as an 128-bit address according to RFC 2373 [99]. When there is need to include more than one DNS server address, then more logical units with *container identifier* indicating DNS Server Address are used.

When the *container identifier* indicates Policy Control rejection code, the *container identifier contents* field contains a Go interface related cause code from the GGSN to the UE (see 3GPP TS 29.207 [100]). The *length of container identifier contents* indicates a length equal to one. If the *container identifier contents* field is empty or its actual length is greater than one octect, then it shall be ignored by the receiver.

NOTE 1: The *additional parameters list* and the *configuration protocol options list* are logically separated since they carry different type of information. The beginning of the *additional parameters list* is marked by a logical unit, which has an identifier (i.e. the first two octets) equal to a *container identifier* (i.e. it is not a *protocol identifier*).

NOTE 2: The *additional parameters list* is discarded by a receiver, which does not

support this list (e.g. a R99 GGSN).

CR-Form-v7

CHANGE REQUEST

⌘   **24.008** CR   **764**   ⌘**rev** **1** ⌘ Current version: **6.0.0** ⌘

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

Proposed change affects: UICC apps⌘ [ ]   ME [X] Radio Access Network [ ]   Core Network [X]

Title: ⌘	Cleanup and correction of the PCO-IE
Source: ⌘	Ericsson

Work item code:⌘	IMS-CCR	***Date:*** ⌘	19/05/2003

Category: ⌘ **A**   ***Release:*** ⌘ Rel-6

Use <u>one</u> of the following categories:	*Use <u>one</u> 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)*
	Rel-6 (Release 6)

Reason for change: ⌘	Correction of the text describing the coding of PCO-IE.
Summary of change:⌘	Correction of the text describing the coding of PCO-IE. Correction of reference [99].
Consequences if not approved: ⌘	Possible misunderstanding of the coding.

Clauses affected: ⌘	2, 10.5.6.3

	Y	N	
Other specs affected: ⌘		X	Other core specifications ⌘
		X	Test specifications
		X	O&M Specifications

Other comments: ⌘	

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.

$$\text{****} \quad 1^{st} \quad \text{change} \quad \text{****}$$

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]   Void.

[2]   Void.

[2a]   3GPP TR 21.905 "Vocabulary for 3GPP Specifications"

[3]   3GPP TS 22.002: "Circuit Bearer Services (BS) supported by a Public Land Mobile Network (PLMN)".

[4]   3GPP TS 22.003: "Teleservices supported by a Public Land Mobile Network (PLMN)".

[5]   3GPP TS 42.009: "Security aspects".

[5a]   3GPP TS 33.102: "3G security; Security architecture".

[6]   3GPP TS 22.011: "Service accessibility".

[7]   3GPP TS 42.017: "Subscriber Identity Modules (SIM); Functional characteristics".

[8]   3GPP TS 22.101: "Service aspects; Service principles".

[8a]   3GPP TS 22.001: "Principles of circuit telecommunication services supported by a Public Land Mobile Network (PLMN)".

[8b]   3GPP TS 23.038: "Alphabets and language-specific information".

[9]   3GPP TS 23.101: "General UMTS Architecture".

[9a]   3GPP TS 23.108: "Mobile radio interface layer 3 specification core network protocols; Stage 2 (structured procedures)".

[10]   3GPP TS 23.003: "Numbering, addressing and identification".

[11]   3GPP TS 43.013: "Discontinuous Reception (DRX) in the GSM system".

[12]   3GPP TS 23.014: "Support of Dual Tone Multi-Frequency (DTMF) signalling".

[12a]   Void.

[13]   3GPP TS 43.020: "Security-related network functions".

[14]   3GPP TS 23.122: "Non-Access-Stratum functions related to Mobile Station (MS) in idle mode".

[15]   3GPP TS 24.002: "GSM-UMTS Public Land Mobile Network (PLMN) access reference configuration".

[16]   3GPP TS 44.003: "Mobile Station - Base Station System (MS - BSS) interface; Channel structures and access capabilities".

[17]   3GPP TS 44.004: "Layer 1; General requirements".

[18]   3GPP TS 44.005: "Data Link (DL) layer; General aspects".

[19]   3GPP TS 44.006: "Mobile Station - Base Station System (MS - BSS) interface; Data Link (DL) layer specification".

[19a]   3GPP TS 25.321: "Medium Access Control (MAC) protocol specification".

[19b]   3GPP TS 25.322: "Radio Link Control (RLC) protocol specification".

[19c]   3GPP TS 25.413: "UTRAN Iu interface RANAP signalling".

[20]   3GPP TS 24.007: "Mobile radio interface signalling layer 3; General aspects".

[21]   3GPP TS 24.010: "Mobile radio interface layer 3; Supplementary services specification; General aspects".

[22]   3GPP TS 24.011: "Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[23]   3GPP TS 24.012: "Short Message Service Cell Broadcast (SMSCB) support on the mobile radio interface".

[23a]   3GPP TS 44.071: "Location Services (LCS); Mobile radio interface layer 3 specification."

[23b]   3GPP TS 44.031 "Location Services LCS); Mobile Station (MS) - Serving Mobile Location Centre (SMLC); Radio Resource LCS Protocol (RRLP)".

[23c]   3GPP TS 25.331: "Radio Resource Control (RRC) protocol specification"

[24]   3GPP TS 24.080: "Mobile radio Layer 3 supplementary service specification; Formats and coding".

[25]   3GPP TS 24.081: "Line identification supplementary services; Stage 3".

[26]   3GPP TS 24.082: "Call Forwarding (CF) supplementary services; Stage 3".

[27]   3GPP TS 24.083: "Call Waiting (CW) and Call Hold (HOLD) supplementary services; Stage 3".

[28]   3GPP TS 24.084: "MultiParty (MPTY) supplementary services; Stage 3".

[29]   3GPP TS 24.085: "Closed User Group (CUG) supplementary services; Stage 3".

[30]   3GPP TS 24.086: "Advice of Charge (AoC) supplementary services; Stage 3".

[31]   3GPP TS 24.088: "Call Barring (CB) supplementary services; Stage 3".

[32]   3GPP TS 45.002: "Multiplexing and multiple access on the radio path".

[33]   3GPP TS 45.005: "Radio transmission and reception".

[34]   3GPP TS 45.008: "Radio subsystem link control".

[35]   3GPP TS 45.010: "Radio subsystem synchronization".

[36]   3GPP TS 27.001: "General on Terminal Adaptation Functions (TAF) for Mobile Stations (MS)".

[36a]   3GPP TS 27.060: "Mobile Station (MS) supporting Packet Switched Services ".

[37]   3GPP TS 29.002: "Mobile Application Part (MAP) specification".

[38]   3GPP TS 29.007: "General requirements on interworking between the Public Land Mobile Network (PLMN) and the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN)".

[39]   3GPP TS 51.010: "Mobile Station (MS) conformance specification".

[40]   3GPP TS 51.021: "GSM radio aspects base station system equipment specification".

[41]   ISO/IEC 646 (1991): "Information technology - ISO 7-bit coded character set for information interchange".

[42]   ISO/IEC 6429: "Information technology - Control functions for coded character sets".

[43]   ISO 8348 (1987): "Information technology -- Open Systems Interconnection -- Network Service Definition".

[44]   ITU-T Recommendation E.163: "Numbering plan for the international telephone service".

[45]   ITU-T Recommendation E.164: "The international public telecommunication numbering plan".

[46]   ITU-T Recommendation E.212: "The international identification plan for mobile terminals and mobile users".

[47]   ITU-T Recommendation F.69 (1993): "The international telex service - Service and operational provisions of telex destination codes and telex network identification codes".

[48]   ITU-T Recommendation I.330: "ISDN numbering and addressing principles".

[49]   ITU-T Recommendation I.440 (1989): "ISDN user-network interface data link layer - General aspects".

[50]   ITU-T Recommendation I.450 (1989): "ISDN user-network interface layer 3 General aspects".

[51]   ITU-T Recommendation I.500 (1993): "General structure of the ISDN interworking recommendations".

[52]   ITU-T Recommendation T.50: "International Reference Alphabet (IRA) (Formerly International Alphabet No. 5 or IA5) - Information technology - 7-bit coded character set for information interchange".

[53]   ITU Recommendation Q.931: ISDN user-network interface layer 3 specification for basic control".

[54]   ITU-T Recommendation V.21: "300 bits per second duplex modem standardized for use in the general switched telephone network".

[55]   ITU-T Recommendation V.22: "1200 bits per second duplex modem standardized for use in the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[56]   ITU-T Recommendation V.22bis: "2400 bits per second duplex modem using the frequency division technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[57]   Void.

[58]   ITU-T Recommendation V.26ter: "2400 bits per second duplex modem using the echo cancellation technique standardized for use on the general switched telephone network and on point-to-point 2-wire leased telephone-type circuits".

[59]   ITU-T Recommendation V.32: "A family of 2-wire, duplex modems operating at data signalling rates of up to 9600 bit/s for use on the general switched telephone network and on leased telephone-type circuits".

[60]   ITU-T Recommendation V.110: "Support by an ISDN of data terminal equipments with V-Series type interfaces".

[61]   ITU-T Recommendation V.120: "Support by an ISDN of data terminal equipment with V-Series type interfaces with provision for statistical multiplexing".

[62]   ITU-T Recommendation X.21: "Interface between Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) for synchronous operation on public data networks".

[63]   Void.

[64]   Void.

[65]   ITU-T Recommendation X.30: "Support of X.21, X.21 bis and X.20 bis based Data Terminal Equipments (DTEs) by an Integrated Services Digital Network (ISDN)".

[66]   ITU-T Recommendation X.31: "Support of packet mode terminal equipment by an ISDN".

[67]   Void.

[68]   Void.

[69]   ITU-T Recommendation X.121: "International numbering plan for public data networks".

[70]   ETSI ETS 300 102-1: "Integrated Services Digital Network (ISDN); User-network interface layer 3; Specifications for basic call control".

[71]   ETSI ETS 300 102-2: "Integrated Services Digital Network (ISDN); User-network interface layer 3; Specifications for basic call control; Specification Description Language (SDL) diagrams".

[72]   ISO/IEC 10646: "Information technology -- Universal Multiple-Octet Coded Character Set (UCS)".

[73]   3GPP TS 22.060: "General Packet Radio Service (GPRS); Service Description; Stage 1".

[74]   3GPP TS 23.060: "General Packet Radio Service (GPRS); Service Description; Stage 2".

[75]   3GPP TS 43.064: "General Packet Radio Service (GPRS); Overall description of the GPRS radio interface; Stage 2".

[76]   3GPP TS 44.060: "General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol".

[77]   IETF RFC 1034: "Domain names - concepts and facilities".

[78]   3GPP TS 44.065: "Mobile Station (MS) - Serving GPRS Support Node (SGSN); Subnetwork Dependent Convergence Protocol (SNDCP)".

[78a]   3GPP TS 44.064: "Mobile Station - Serving GPRS Support Node (MS-SGSN) Logical Link Control (LLC) Layer Specification".

[79]   ITU Recommendation I.460: "Multiplexing, rate adaption and support of existing interfaces".

[80]   3GPP TS 26.111: "Codec for Circuit Switched Multimedia Telephony Service; Modifications to H.324".

[81]   3GPP TS 23.107: "Quality of Service (QoS) concept and architecture".

[82]   3GPP TS 43.022: "Functions related to Mobile Station (MS) in idle mode and group receive mode".

[83]   3GPP TS 26.103: "Speech Codec List for GSM and UMTS".

[84]   3GPP TS 44.018: "Mobile radio interface layer 3 specification, Radio Resource Control Protocol".

[85]   3GPP TS 48.008: "Mobile-services Switching Centre – Base Station System (MSC – BSS) interface; layer 3 specification".

[86]   3GPP TS 48.018: "General Packet Radio Service (GPRS); Base Station System (BSS) - Serving GPRS Support Node (SGSN); BSS GPRS Protocol (BSSGP)".

[87]   3GPP TS 43.055: "Dual Transfer Mode (DTM); Stage 2".

[88]   3GPP TS 23.067: "enhanced Multi-Level Precedence and Pre-emption service (eMLPP); Stage 2".

[88a]   3GPP TS 23.093: "Technical realization of Completion of Calls to Busy Subscriber (CCBS); Stage 2".

[89]   3GPP TS 22.042: "Network Identity and Time Zone (NITZ), Stage 1".

[90]   3GPP TS 23.040: "Technical realization of Short Message Service (SMS)".

[91]   3GPP TS 44.056: "GSM Cordless Telephony System (CTS), (Phase 1) CTS Radio Interface Layer 3 Specification".

[92]   3GPP TS 23.226: "Global Text Telephony; Stage 2 "

[93]   3GPP TS 26.226: "Cellular Text Telephone Modem (CTM), General Description "

[94]   3GPP TS 23.236: "Intra Domain Connection of RAN Nodes to Multiple CN Nodes"

[95]   3GPP TS 24.229: "IP Multimedia Call Control Protocol based on SIP and SDP"

[96]   3GPP TS 23.205: "Bearer-independent circuit-switched core network; Stage 2".

[97]   3GPP TS 23.172: "UDI/RDI Fallback and Service Modification; Stage 2".

[98]   3GPP TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode"

[99]   RFC 3513 (April 2003): "Internet Protocol Version 6 (IPv6) Addressing Architecture".RFC 2373 (July 1998): "IP Version 6 Addressing Architecture".

[100]   3GPP TS 29.207: "Policy control over Go interface".

[101]   3GPP TS 21.111: "USIM and IC card requirements".

[102]   RFC 1661 (July 1994): "The Point-to-Point Protocol (PPP)".

[103]   RFC 3232 (January 2002): "Assigned Numbers: RFC 1700 is Replaced by an On-line Database".

****   2ⁿᵈ change   ****

10.5.6.3   Protocol configuration options

The purpose of the *protocol configuration options* information element is to:

-    transfer external network protocol options associated with a PDP context activation, and

-    transfer additional (protocol) data (e.g. configuration parameters, error codes or messages/events) associated with an external protocol or an application.

The *protocol configuration options* is a type 4 information element with a minimum length of 32 octets and a maximum length of 253 octets.

The *protocol configuration options* information element is coded as shown in figure 10.5.136/3GPP TS 24.008 and table 10.5.154/3GPP TS 24.008.
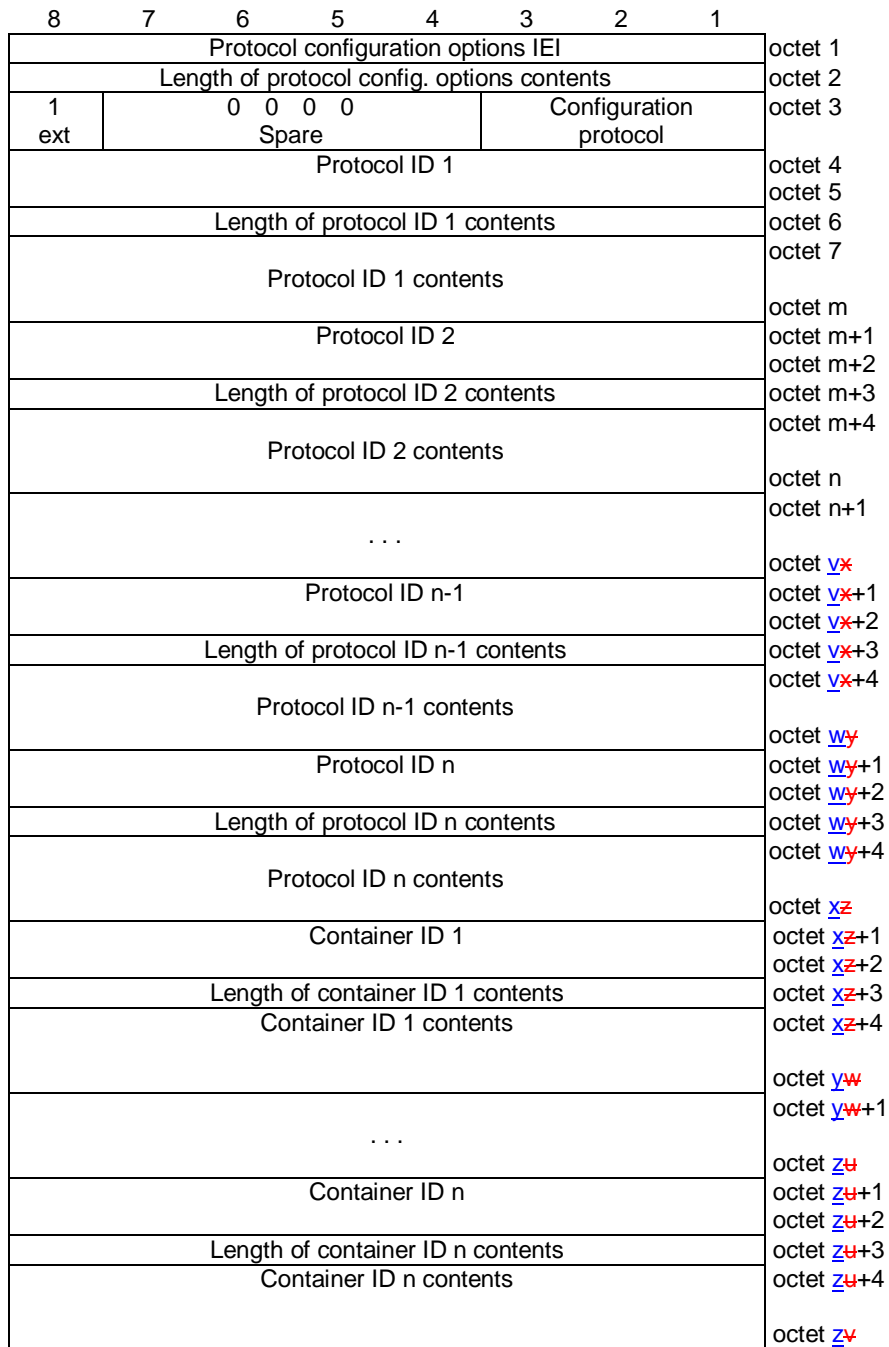
8	7	6	5	4	3	2	1	
Protocol configuration options IEI								octet 1
Length of protocol config. options contents								octet 2
1 ext	0 0 0 0 Spare				Configuration protocol			octet 3
Protocol ID 1								octet 4 octet 5
Length of protocol ID 1 contents								octet 6
Protocol ID 1 contents								octet 7 octet m
Protocol ID 2								octet m+1 octet m+2
Length of protocol ID 2 contents								octet m+3
Protocol ID 2 contents								octet m+4 octet n
. . .								octet n+1 octet v
Protocol ID n-1								octet v+1 octet v+2
Length of protocol ID n-1 contents								octet v+3
Protocol ID n-1 contents								octet v+4 octet w
Protocol ID n								octet w+1 octet w+2
Length of protocol ID n contents								octet w+3
Protocol ID n contents								octet w+4 octet x
Container ID 1								octet x+1 octet x+2
Length of container ID 1 contents								octet x+3
Container ID 1 contents								octet x+4 octet y
. . .								octet y+1 octet z
Container ID n								octet z+1 octet z+2
Length of container ID n contents								octet z+3
Container ID n contents								octet z+4 octet z

Figure 10.5.136/3GPP TS 24.008: *Protocol configuration options* **information element**

Table 10.5.154/3GPP TS 24.008: *Protocol configuration options* **information element**

Configuration protocol (octet 3)
Bits
3 2 1
0 0 0   PPP for use with IP PDP type

All other values are interpreted as PPP in this version of the protocol.

After octet 3, i.e. from octet 4 to octet z~~v~~, two logical lists are defined:

-    the Configuration protocol options list (octets 4 to x~~z~~), and

-    the Additional parameters list (octets x~~z~~+1 to z~~v~~).

Configuration protocol options list (octets 4 to x~~z~~)

The *configuration protocol options list* contains a variable number of logical units, the<u>y</u> may occur in an arbitrary order within the *configuration protocol options list*.

Each unit is of variable length and consists of a:

-    protocol identifier (2 octets);
-    the length of the protocol identifier contents of the unit (1 octet); and
-    the protocol identifier contents itself (n octets).

The *protocol identifier* field contains the hexadecimal coding of the configuration protocol identifier. Bit 8 of the first octet of the *protocol identifier* field contains the most significant bit and bit 1 of the second octet of the *protocol identifier* field contains the least significant bit.

If the *configuration protocol options list* contains a protocol identifier that is not supported by the receiving entity the corresponding unit shall be discarded.

The *length of the protocol identifier contents* field contains the binary coded representation of the length of the *protocol identifier contents* field of a unit. The first bit in transmission order is the most significant bit.

The *protocol identifier contents* field of each unit contains information specific to the configuration protocol specified by the *protocol identifier.*

PPP

At least the following protocol identifiers (as defined in RFC 3232<u>1700</u> [103]) shall be supported in this version of the protocol:

-    C021H (LCP;
-    C023H (PAP);
-    C223H (CHAP);and
-    8021H (IPCP).

The support of other protocol identifiers is implementation dependent and outside the scope of the present document.

The *protocol identifier contents* field of each unit corresponds to a "Packet" as defined in RFC 1661 <u>[102]</u> that is stripped off the "Protocol" and the "Padding" octets.

The detailed coding of the *protocol identifier contents* field is specified in the RFC that is associated with the protocol identifier of that unit.

Additional parameters list (octets x~~z~~+1 to z~~v~~)

The *additional parameters list* is included when special parameters and/or requests (associated with a PDP context) need to be transferred between the MS and the network. These parameters and/or requests are not related to a specific configuration protocol (e.g. PPP), and therefore are not encoded as the "Packets" contained in the *configuration protocol options list*.

The *additional parameters list* contains a list of special parameters, each one in a

separate container. The type of the parameter carried in a container is identified by a specific *container identifier*. In this version of the protocol, the following container identifiers are specified:

MS to network direction:

- 0001H (P-CSCF Address Request);

- 0002H (IM CN Subsystem Signaling Flag); and

- 0003H (DNS Server Address Request); and.

- 0004H (Not Supported).

Network to MS direction:

- 0001H (P-CSCF Address);

- 0002H (IM CN Subsystem Signaling Flag);

- 0003H (DNS Server Address); and

- 0004H (Policy Control rejection code).

If the *additional parameters list* contains a container identifier that is not supported by the receiving entity the corresponding unit shall be discarded.

The *container identifier* field is encoded as the *protocol identifier* field and the *length of container identifier contents* field is encoded as the *length of the protocol identifier contents* field.

When the *container identifier* indicates P-CSCF Address Request or DNS Server Address Request, the *container identifi*er contents field is empty and the *length of container identifier contents* indicates a length equal to zero. If the *container identifier contents* field is not empty, it shall be ignored.

When the *container identifier* indicates IM CN Subsystem Signaling Flag (see 3GPP TS 24.229 [95]), the *container identifier contents* field is empty and the *length of container identifier contents* indicates a length equal to zero. If the *container identifier contents* field is not empty, it shall be ignored. In Network to MS direction this information may be used by the MS to indicate to the user whether the requested dedicated signalling PDP context was successfully established.

When the *container identifier* indicates P-CSCF Address, the *container identifier contents* field contains one IPv6 address corresponding to a P-CSCF address (see 3GPP TS 24.229 [95]). This IPv6 address is encoded as an 128-bit address according to RFC 2373 [99]. When there is need to include more than one P-CSCF address, then more logical units with *container identifier* indicating P-CSCF Address are used.

When the *container identifier* indicates DNS Server Address, the *container identifier contents* field contains one IPv6 DNS server address (see 3GPP TS 27.060 [36a]). This IPv6 address is encoded as an 128-bit address according to RFC 2373 [99]. When there is need to include more than one DNS server address, then more logical units with *container identifier* indicating DNS Server Address are used.

When the *container identifier* indicates Policy Control rejection code, the *container identifier contents* field contains a Go interface related cause code from the GGSN to the UE (see 3GPP TS 29.207 [100]). The *length of container identifier contents* indicates a length equal to one. If the *container identifier contents* field is empty or its actual length is greater than one octect, then it shall be ignored by the receiver.

NOTE 1: The *additional parameters list* and the *configuration protocol options list* are logically separated since they carry different type of information. The beginning of the *additional parameters list* is marked by a logical unit, which has an identifier (i.e. the first two octets) equal to a *container identifier* (i.e. it is not a *protocol identifier*).

NOTE 2: The *additional parameters list* is discarded by a receiver, which does not

support this list (e.g. a R99 GGSN).