

**Source:** T3

**Title:** Change Requests on (U)SIM toolkit (TS 11.14 / 31.111)

**Document for:** Approval

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This document contains change requests to TS 11.14 and TS 31.111 as agreed by T3.

<b>T3 Doc</b>	<b>Spec</b>	<b>CR</b>	<b>Rel</b>	<b>Cat</b>	<b>Subject</b>
T3-010758	11.14	A208	R99	F	Corrections to the bearer independant protocol feature
T3-010756	31.111	059	Rel-4	F	Reservation of byte in terminal profile for TIA/EIA/IS-820
T3-010759	31.111	060	R99	F	Corrections to the bearer independant protocol feature
T3-010760	31.111	061	Rel-4	A	Corrections to the bearer independant protocol feature

CR-Form-v3

## CHANGE REQUEST

⌘ **11.14 CR A208** ⌘ rev **-** ⌘ Current version: **8.8.0** ⌘

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  Core Network

<b>Title:</b>	⌘ Miscellaneous corrections		
<b>Source:</b>	⌘ T3		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ 7/11/2001
<b>Category:</b>	⌘ F	<b>Release:</b>	⌘ R99
Use <u>one</u> of the following categories: <b>F</b> (essential correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (Addition of feature), <b>C</b> (Functional modification of feature) <b>D</b> (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)	

<b>Reason for change:</b>	⌘
<b>Summary of change:</b>	⌘
<b>Consequences if not approved:</b>	⌘

<b>Clauses affected:</b>	⌘ 6.4.29, 12.52.2, 12.53, 12.55, 12.58		
<b>Other specs affected:</b>	<input checked="" type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	31.111
<b>Other comments:</b>	⌘		

**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://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.

## 6.4.29 RECEIVE DATA

This subclause applies only if class "e" is supported.

This command requests the ME to return data from a dedicated Channel identifier according to the number of bytes specified by the SIM.

Upon receiving this command, the ME shall return the data available in the Rx buffer corresponding to the Channel identifier. Examples are given below, but the list is not exhaustive:

If the ME is unable to process the command:

- If the command is rejected because the requested channel is already closed the ME informs the SIM using TERMINAL RESPONSE (Bearer independent protocol error);
- If the user has indicated the need to end the proactive SIM session, the ME informs the SIM using TERMINAL RESPONSE (Proactive SIM session terminated by the user).

If the ME is able to process the command:

- If the requested number of bytes is available in the buffer, the ME shall inform the SIM that the command has been successfully executed, using TERMINAL RESPONSE and return the requested data and the number of bytes remaining in the channel buffer (or FF if more than the maximum bytes remains).
- If the requested number of bytes is available in the buffer but the whole requested data cannot be included in the TERMINAL RESPONSE because of APDU size limits, the ME shall return the maximum number of bytes possible according to the length of other TLVs. The ME shall inform the SIM that the command has been successfully executed, using TERMINAL RESPONSE and shall indicate the number of bytes remaining in the channel buffer (or FF if more than the maximum bytes remains).
- If the requested number of bytes is not yet available in the buffer, the ME shall NOT wait for the requested number of bytes to arrive. The ME shall inform the SIM, using TERMINAL RESPONSE (Command performed with missing information) and returns the data currently available in the channel buffer.
- In the case of packet/datagram transmission, the ME shall put in the Rx buffer a complete packet SDU and only one at one time. For example, if UDP datagrams are received by the ME, the latter shall insert only the SDU of each UDP packet received in the Rx buffer. After one SDU has been downloaded by the SIM (using one or several RECEIVE DATA commands), the ME shall insert the next SDU of UDP datagram, and so on.
- If the alpha identifier is provided by the SIM, the ME shall use it to inform the user. The ME may also use it to inform the user during data transfer. If an icon is provided by the SIM, the icon indicated in the command may be used by the ME to inform the user, in addition to, or instead of the alpha identifier, as indicated with the icon qualifier (see subclause 6.5.4).

## 12.52.2 Bearer parameters for GPRS / packet service

Contents : parameters describing the Quality of Service (QoS) and the type of PDP. This is an element of the PDP context.

The default values of the subparameters are manufacturer specific since they depend on the purpose of the device and data services provided by it. Not all combinations and values of these subparameters are supported by GSM (refer TS 22.002 [30]).

X (length of parameters) = ~~86~~.

Coding : The following values are as defined in TS 27.007 [27], for the quality of Service profile requested "+CGQREQ" extended command. They are coded in hexadecimal.

- Coding of Byte 4 - Precedence class: same as the "precedence" subparameter, defined in TS 27.007 [27].

- Coding of Byte 5 - Delay class: same as the "delay" subparameter, defined in TS 27.007 [27].
- Coding of Byte 6 - Reliability class: same as the "reliability" subparameter, defined in TS 27.007 [27].
- Coding of Byte 7 - Peak throughput class: same as the "peak" subparameter, defined in TS 27.007 [27].
- Coding of Byte 8 - Mean throughput class: same as the "mean" subparameter, defined in TS 27.007 [27].
- Coding of Byte 9 - Packet data protocol type:
  - '02' = IP (Internet Protocol, IETF STD 5);
  - all other values are reserved.

## 12.53 Channel data

This subclause applies only if class "e" is supported.

Byte(s)	Description	Length
1	Channel data tag	1
<del>2 to Y+1</del>	Length (X)	<del>Y+1</del>
<del>(Y+2) to (Y+X+1)</del> <del>(3+X)-1</del>	Channel data string	X

Contents:

The Channel data object contains application data read from or written to a specific channel buffer in the ME.

Coding:

The Channel data string ~~must~~ shall be considered by the ME as binary coded on 8 bits.

[...]

## 12.55 Buffer size

This subclause applies only if class "e" is supported.

Byte(s)	Description	Length
1	Buffer size tag	1
<del>2 to (Y+1)</del>	Length (2)	<del>1</del>
<del>3 to 4(Y+2)</del> <del>to (Y+X+1)</del>	Buffer size	2

The Buffer size codes the number of bytes requested by the SIM in an OPEN CHANNEL command or what the ME can offer the SIM (placed in TERMINAL RESPONSE).

[...]

## 12.58 Other Address

Byte(s)	Description	Length
1	Other address tag	1
2	Length (X)	1
3	Type of address	1
4 to (4+X- +42)	Address	X-1

A null Local address shall be coded with Length = '00', and no Value part. In that case, the ME shall request a dynamic address.

Coding of Type of address: according to packet data protocol address in TS 04.08 [8].

'21' = IPv4 address

'597' = IPv6 address

'others' = reserved

Coding of address: according to packet data protocol address in TS 04.08 [8].

If type of address indicates IPv4, the Address information in octet 4 to octet 7 contains the IPv4 address. Bit 8 of octet 4 represents the most significant bit of the IP address and bit 1 of octet 7 the least significant bit .

If type of address indicates IPv6, the Address information in octet 4 to octet 19 contains the IPv6 address. Bit 8 of octet 4 represents the most significant bit of the IP address and bit 1 of octet 19 the least significant bit.

CR-Form-v4
<b>CHANGE REQUEST</b>
⌘ <b>31.111 CR 059</b> ⌘ ev <b>-</b> ⌘ Current version: <b>4.3.0</b> ⌘

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  Core Network

<b>Title:</b>	⌘ Reservation for TIA/EIA/IS-820 facilities		
<b>Source:</b>	⌘ T3		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ 07.11.01
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ REL-4
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		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)

<b>Reason for change:</b>	⌘ Alignment with the ETSI-SCP 102223 specification. See the LS from ETSI-SCP, in Tdoc T3-010628.		
<b>Summary of change:</b>	⌘ Reservation of the 20 <sup>th</sup> byte of the Terminal Profile for IS-820 purposes.		
<b>Consequences if not approved:</b>	⌘ Inconsistency of the specification with the CAT, leading to a risk of a future clash in the bit allocation.		

<b>Clauses affected:</b>	⌘ 2, 5.2		
<b>Other specs affected:</b>	⌘ <input type="checkbox"/> Other core specifications ⌘ <input type="checkbox"/> Test specifications ⌘ <input type="checkbox"/> O&M Specifications		
<b>Other comments:</b>	⌘		

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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.

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## 2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- 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 22.002: "Circuit Bearer Services (BS) supported by a Public Land Mobile Network (PLMN)".
- [2] 3GPP TS 22.030: "Man-Machine Interface (MMI) of the User Equipment (UE)".
- [3] 3GPP TS 22.042: "Network identity and timezone (NITZ); Service description; Stage 1".
- [...]
- [24] IETF RFC 1738: "Uniform Resource Locators (URL)"
- [25] IETF RFC 768 "User Datagram Protocol (UDP)"
- [26] IETF RFC 793 "Transmission Control Protocol (TCP)"
- [27] 3GPP TS 44.018: "Mobile Radio Interface Layer 3 Specification; Radio Resource Control Protocol"
- [28] "Specification of the Bluetooth system; Profiles part"  
<http://www.virelex.com/bluetooth/specification.asp>;
- [29] TIA/EIA-136-123: "Third Generation Wireless – Digital Control Channel Layer 3, April 23, 2001"
- [30] 3GPP TS 23.003: "Numbering, addressing and identification"
- [31] [TIA/EIA/IS-820: "Removable User Identity Module \(R-UIM\) for TIA/EIA Spread Spectrum Standards"](#).

## 5.2 Structure and coding of TERMINAL PROFILE

Direction: ME to UICC.

The command header is specified in TS 31.101 [13].

Command parameters/data:

Description	Clause	M/O/C	Length
Profile	-	M	lgth

- Profile:

Contents: The list of USAT facilities that are supported by the ME.

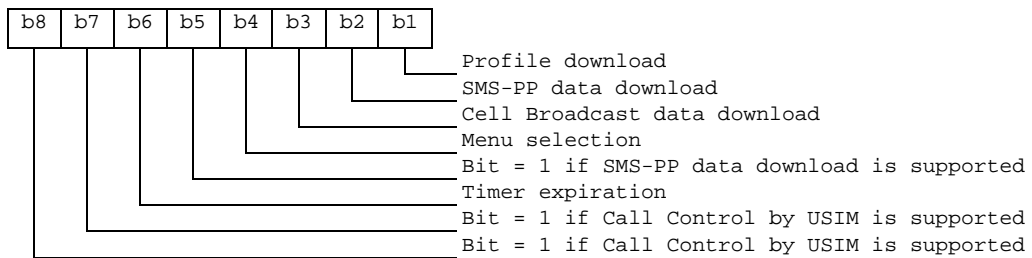
Coding:

1 bit is used to code each facility:

bit = 1: facility supported by ME

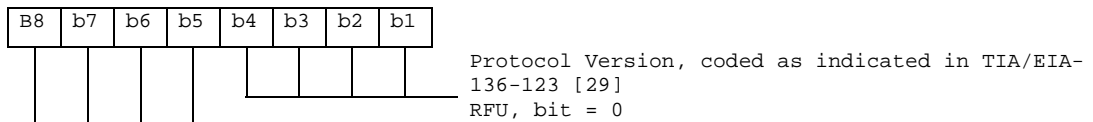
bit = 0: facility not supported by ME

First byte (Download):

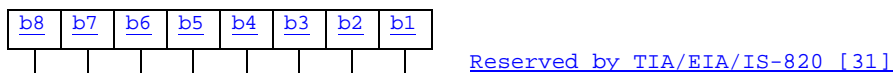


[...]

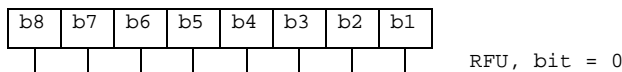
Nineteenth byte: (reserved for TIA/EIA-136 facilities):



Twentieth byte: (reserved for TIA/EIA/IS-820 facilities):



Subsequent bytes:



RFU bits, and all bits of subsequent bytes, are reserved to indicate future facilities. A SIM supporting only the features of SIM Application Toolkit defined here shall not check the value of RFU bits.

Response parameters/data: None.



CR-Form-v3
<b>CHANGE REQUEST</b>
⌘ <b>31.111 CR 60</b> ⌘ rev <b>-</b> ⌘ Current version: <b>3.6.0</b> ⌘

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  Core Network

<b>Title:</b>	⌘ Miscellaneous corrections		
<b>Source:</b>	⌘ T3		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ 7/11/2001
<b>Category:</b>	⌘ F	<b>Release:</b>	⌘ R99
	Use <u>one</u> of the following categories: <b>F</b> (essential correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (Addition of feature), <b>C</b> (Functional modification of feature) <b>D</b> (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)

<b>Reason for change:</b>	⌘
<b>Summary of change:</b>	⌘
<b>Consequences if not approved:</b>	⌘

<b>Clauses affected:</b>	⌘ 6.4.29, 8.52.2, 8.53, 8.55, 8.59		
<b>Other specs affected:</b>	<input checked="" type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	11.14 R99 (T3-010758)
<b>Other comments:</b>	⌘		

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## 6.4.29 RECEIVE DATA

This clause applies only if class "e" is supported.

This command requests the ME to return data from a dedicated Channel identifier according to the number of bytes specified by the UICC.

Upon receiving this command, the ME shall return the data available in the Rx buffer corresponding to the Channel identifier. Examples are given below, but the list is not exhaustive.

If the ME is unable to process the command:

- if the command is rejected because the requested channel is already closed the ME informs the UICC using TERMINAL RESPONSE (Bearer independent protocol error);
- if the user has indicated the need to end the proactive UICC session, the ME informs the UICC using TERMINAL RESPONSE (Proactive UICC session terminated by the user).

If the ME is able to process the command:

- ~~if~~ if the requested number of bytes is available in the buffer, the ME shall inform the UICC that the command has been successfully executed, using TERMINAL RESPONSE and return the requested data and the number of bytes remaining in the channel buffer (or FF if more than the maximum bytes remains);
- If the requested number of bytes is available in the buffer but the whole requested data cannot be included in the TERMINAL RESPONSE because of APDU size limits, the ME shall return the maximum number of bytes possible according to the length of other TLVs. The ME shall inform the SIM that the command has been successfully executed, using TERMINAL RESPONSE and shall indicate the number of bytes remaining in the channel buffer (or FF if more than the maximum bytes remains).
- if the requested number of bytes is not yet available in the buffer, the ME shall NOT wait for the requested number of bytes to arrive. The ME shall inform the UICC, using TERMINAL RESPONSE (Command performed with missing information) and returns the data currently available in the channel buffer;
- in the case of packet/datagram transmission, the ME shall put in the Rx buffer a complete packet SDU and only one at one time. For example, if UDP datagrams are received by the ME, the latter shall insert only the SDU of each UDP packet received in the Rx buffer. After one SDU has been downloaded by the UICC (using one or several RECEIVE DATA commands), the ME shall insert the next SDU of UDP datagram, and so on;
- if the alpha identifier is provided by the UICC, the ME shall use it to inform the user. The ME may also use it to inform the user during data transfer. If an icon is provided by the UICC, the icon indicated in the command may be used by the ME to inform the user, in addition to, or instead of the alpha identifier, as indicated with the icon qualifier (see clause 6.5.4).

## 8.52.2 Bearer parameters for GPRS/Packet Service

Contents: parameters describing the Quality of Service (QoS) and the type of PDP. This is an element of the PDP context.

In this case X=~~6~~8.

Coding : The following values are as defined in the TS 27.007 [12], for the "+CGQREQ" extended command. They are coded in hexadecimal.

- Coding of Byte 4 - Precedence class: same as the "precedence" subparameter, defined in [12].
- Coding of Byte 5 - Delay class: same as the "delay" subparameter, defined in [12].
- Coding of Byte 6 - Reliability class: same as the "reliability" subparameter, defined in [12].
- Coding of Byte 7 - Peak throughput class: same as the "peak" subparameter, defined in [12].
- Coding of Byte 8 - Mean throughput class: same as the "mean" subparameter, defined in [12].
- Coding of Byte 9 - Packet data protocol type:

- '02' = IP (Internet Protocol, IETF STD 5);
- all other values are reserved.

## 8.53 Channel data

Byte(s)	Description	Length
1	Channel data tag	1
2 to Y+1	Length (X)	<del>Y+1</del>
(Y+2) to (Y+X+1) <del>3 to</del> <del>(3+X)-1</del>	Channel data string	X

- Contents:
  - the Channel data object contains application data read from or written to a specific channel buffer in the ME.
- Coding:
  - the Channel data string shall~~must~~ be considered by the ME as binary coded on 8 bits.

## 8.55 Buffer size

Byte(s)	Description	Length
1	Buffer size tag	1
2 <del>to (Y+1)</del>	Length (2)	<del>1</del> <del>Y</del>
3 to 4 <del>(Y+2)</del> <del>to (Y+X+1)</del>	Buffer size	2

The Buffer size codes the number of bytes requested by the UICC in an OPEN CHANNEL command or what the ME can offer the UICC (placed in TERMINAL RESPONSE).

## 8.58 Other Address

Byte(s)	Description	Length
1	Other address tag	1
2	Length (X)	1
3	Type of address	1
4 to (4+ X) <del>2-4</del>	Address	X-1

A null Local address shall be coded with Length = '00', and no Value part. In that case, the ME shall request a dynamic address.

Coding of Type of address: according to packet data protocol address in 24.008 [9]

- '21' = IPv4 address
- ~~'597'~~ = IPv6 address
- 'others' = reserved

Coding of address: according to packet data protocol address in 24.008 [9]

If type of address indicates IPv4, the Address information in octet 4 to octet 7 contains the IPv4 address. Bit 8 of octet 4 represents the most significant bit of the IP address and bit 1 of octet 7 the least significant bit .

If type of address indicates IPv6, the Address information in octet 4 to octet 19 contains the IPv6 address. Bit 8 of octet 4 represents the most significant bit of the IP address and bit 1 of octet 19 the least significant bit.

CR-Form-v3
<b>CHANGE REQUEST</b>
⌘ <b>31.111 CR 61</b> ⌘ rev <b>-</b> ⌘ Current version: <b>4.4.0</b> ⌘

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  Core Network

<b>Title:</b>	⌘ Miscellaneous corrections		
<b>Source:</b>	⌘ T3		
<b>Work item code:</b>	⌘ TEI	<b>Date:</b>	⌘ 7/11/2001
<b>Category:</b>	⌘ A	<b>Release:</b>	⌘ REL-4
	Use <u>one</u> of the following categories: <b>F</b> (essential correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (Addition of feature), <b>C</b> (Functional modification of feature) <b>D</b> (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)

<b>Reason for change:</b>	⌘
<b>Summary of change:</b>	⌘
<b>Consequences if not approved:</b>	⌘

<b>Clauses affected:</b>	⌘ 6.4.29, 8.52.2, 8.53, 8.55, 8.59		
<b>Other specs affected:</b>	<input type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	⌘	
<b>Other comments:</b>	⌘		

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- if the requested number of bytes is not yet available in the buffer, the ME shall NOT wait for the requested number of bytes to arrive. The ME shall inform the UICC, using TERMINAL RESPONSE (Command performed with missing information) and returns the data currently available in the channel buffer;
- in the case of packet/datagram transmission, the ME shall put in the Rx buffer a complete packet SDU and only one at one time. For example, if UDP datagrams are received by the ME, the latter shall insert only the SDU of each UDP packet received in the Rx buffer. After one SDU has been downloaded by the UICC (using one or several RECEIVE DATA commands), the ME shall insert the next SDU of UDP datagram, and so on;
- if the alpha identifier is provided by the UICC, the ME shall use it to inform the user. The ME may also use it to inform the user during data transfer. If an icon is provided by the UICC, the icon indicated in the command may be used by the ME to inform the user, in addition to, or instead of the alpha identifier, as indicated with the icon qualifier (see clause 6.5.4).

## 8.52.2 Bearer parameters for GPRS/Packet Service

Contents: parameters describing the Quality of Service (QoS) and the type of PDP. This is an element of the PDP context.

In this case X=~~6~~8.

Coding : The following values are as defined in the TS 27.007 [12], for the "+CGQREQ" extended command. They are coded in hexadecimal.

- Coding of Byte 4 - Precedence class: same as the "precedence" subparameter, defined in [12].
- Coding of Byte 5 - Delay class: same as the "delay" subparameter, defined in [12].
- Coding of Byte 6 - Reliability class: same as the "reliability" subparameter, defined in [12].
- Coding of Byte 7 - Peak throughput class: same as the "peak" subparameter, defined in [12].
- Coding of Byte 8 - Mean throughput class: same as the "mean" subparameter, defined in [12].
- Coding of Byte 9 - Packet data protocol type:

- '02' = IP (Internet Protocol, IETF STD 5);
- all other values are reserved.

## 8.53 Channel data

Byte(s)	Description	Length
1	Channel data tag	1
2 to Y+1	Length (X)	<del>Y+1</del>
(Y+2) to (Y+X+1) <del>3 to</del> <del>(3+X)-1</del>	Channel data string	X

- Contents:
  - the Channel data object contains application data read from or written to a specific channel buffer in the ME.
- Coding:
  - the Channel data string shall~~must~~ be considered by the ME as binary coded on 8 bits.

## 8.55 Buffer size

Byte(s)	Description	Length
1	Buffer size tag	1
2 <del>to (Y+1)</del>	Length (2)	<del>1</del> <del>Y</del>
3 to 4 <del>(Y+2)</del> <del>to (Y+X+1)</del>	Buffer size	2

The Buffer size codes the number of bytes requested by the UICC in an OPEN CHANNEL command or what the ME can offer the UICC (placed in TERMINAL RESPONSE).

## 8.58 Other Address

Byte(s)	Description	Length
1	Other address tag	1
2	Length (X)	1
3	Type of address	1
4 to <del>(4+</del> <del>X+2-4)</del>	Address	<del>X-1</del>

A null Local address shall be coded with Length = '00', and no Value part. In that case, the ME shall request a dynamic address.

Coding of Type of address: according to packet data protocol address in 24.008 [9]

'21' = IPv4 address

~~'597'~~ = IPv6 address

'others' = reserved

Coding of address: according to packet data protocol address in 24.008 [9]

If type of address indicates IPv4, the Address information in octet 4 to octet 7 contains the IPv4 address. Bit 8 of octet 4 represents the most significant bit of the IP address and bit 1 of octet 7 the least significant bit .

If type of address indicates IPv6, the Address information in octet 4 to octet 19 contains the IPv6 address. Bit 8 of octet 4 represents the most significant bit of the IP address and bit 1 of octet 19 the least significant bit.