

Technical Specification Group Services and System Aspects **TSGS#16(02)0531**

Meeting #17, Biarritz, France, 9-12 September 2002

**Source:** TSG SA WG2  
**Title:** CRs on 23.107  
**Agenda Item:** 7.2.3

The following Change Requests (CRs) have been approved by TSG SA WG2 and are requested to be approved by TSG SA plenary #17.

Note: the source of all these CRs is now S2, even if the name of the originating company(ies) is still reflected on the cover page of all the attached CRs.

<b>Tdoc #</b>	<b>Title</b>	<b>Spec</b>	<b>CR #</b>	<b>c a t</b>	<b>Ver sion in</b>	<b>WI</b>	<b>S2 meetin g</b>
<a href="#">S2-022055</a>	Subscribed QoS	23.107	111 r3	F	3.8. 0	E2EQoS	25
<a href="#">S2-022056</a>	Subscribed QoS	23.107	112 r3	A	4.4. 0	E2EQoS	25
<a href="#">S2-022057</a>	Subscribed QoS	23.107	113 r3	A	5.5. 0	E2EQoS	25
<a href="#">S2-021992</a>	Modification of the minimum transfer delay value for traffic class Streaming	23.107	114 r1	F	3.8. 0	QoS	25
<a href="#">S2-021993</a>	Modification of the minimum transfer delay value for traffic class Streaming	23.107	115 r1	A	4.4. 0	QoS	25
<a href="#">S2-021994</a>	Modification of the minimum transfer delay value for traffic class Streaming	23.107	116 r1	A	5.5. 0	QoS	25
<a href="#">S2-022562</a>	Classes of service vs Traffic classes	23.107	125	F	3.8. 0	TEI	26
<a href="#">S2-022563</a>	Classes of service vs Traffic classes	23.107	126	A	4.4. 0	TEI4	26
<a href="#">S2-022564</a>	Classes of service vs Traffic classes	23.107	127	A	5.5. 0	TEI5	26

## CHANGE REQUEST

⌘ **23.107 CR 111** ⌘ rev **3** ⌘ Current version: **3.8.0** ⌘

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

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

<b>Title:</b>	⌘ Subscribed QoS				
<b>Source:</b>	⌘ Ericsson				
<b>Work item code:</b>	⌘ E2EQoS	<b>Date:</b>	⌘ 28/06/2002		
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ R99		
	<i>Use one of the following categories:</i> <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> .		<i>Use one of the following releases:</i> <b>2</b> (GSM Phase 2) <b>R96</b> (Release 1996) <b>R97</b> (Release 1997) <b>R98</b> (Release 1998) <b>R99</b> (Release 1999) <b>Rel-4</b> (Release 4) <b>Rel-5</b> (Release 5) <b>Rel-6</b> (Release 6)		

<b>Reason for change:</b>	⌘ If the UE requests QoS profile, the QoS profile in the UMTS subscription is interpreted as a maximum QoS profile against which the requested QoS profile is checked. On the other hand, if the UE does not specify one or more of the QoS attributes by setting the attributes to 'subscribed', the network assumes a request of values derived from the QoS profile in the UMTS subscription. This may however lead to problems:  If the UE request "subscribed" for traffic class and if HLR contains streaming or conversational traffic class, SGSN will (based on existing specifications) allocate a streaming or conversational traffic class. So simple UEs will always receive a real time traffic class even if they most of the time just have non real time applications (e.g. WAP). This will lead to charging problems (if operator charges based on real time price) and waste of radio resources (especially if these UE are always-on).  Also, if the UE requests only part of the QoS attributes and sets the values of the rest of the attributes as 'subscribed', there is a possibility that indiscriminate use of values derived from the QoS profile in the UMTS subscription may lead to an inconsistent QoS profile (e.g. guaranteed bit rate is not defined for the Interactive class), which may lead to unnecessary rejection of the PDP context by the network.
<b>Summary of change:</b>	⌘ If the UE requests or modifies a UMTS bearer and one or more of the QoS attributes are not specified by the UE by setting the attributes to 'subscribed', the network shall assume a request of values as specified in the QoS profile in the UMTS subscription. For the specific case of traffic class, the network shall assume a request for Interactive class if the UE requests this attribute as 'subscribed'. For the rest of the QoS attributes, the network shall ensure that the

negotiated QoS contains only values explicitly defined for the traffic class.

It is also clarified that when the application in the UE requires streaming or conversational QoS, then the UE shall at least explicitly request the traffic class and should explicitly request the guaranteed bit rate and the maximum bit rate. Note that in practice applications that have specific (high) QoS requirements would request explicitly what they need.

**Consequences if not approved:** ⌘ May cause an inefficient resource utilisation in the core network, PDP Contexts may be rejected by the network with higher probability.

**Clauses affected:** ⌘ 6.4.2

<b>Other specs affected:</b>	⌘	<table border="1"><tr><td>Y</td><td>N</td></tr><tr><td>X</td><td></td></tr><tr><td></td><td>X</td></tr><tr><td></td><td>X</td></tr></table>	Y	N	X			X		X	Other core specifications Test specifications O&M Specifications	⌘ 23.060, 27.060
		Y	N									
		X										
	X											
	X											

**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.

## 6.4.2 Sources of UMTS Bearer Service Attributes

UMTS bearer service attributes describe the service provided by the UMTS network to the user of the UMTS bearer service. A set of QoS attributes (QoS profile) specifies this service. At UMTS bearer service establishment or modification different QoS profiles have to be taken into account.

- The UE capabilities form a QoS profile which may limit the UMTS bearer service which can be provided.
- The UE or the terminal equipment (TE) within the terminating network may request a QoS profile at UMTS bearer establishment or modification. The application using the UE may request the UE to provide a UMTS bearer service with a specific QoS profile. If the application requests no specific QoS the UE may use a QoS profile configured within the UE (e.g., by AT commands). How the TE derives a QoS profile is out of scope for UMTS.
- A QoS profile in the UMTS subscription describes the upper limits for the provided service if the service user requests specific values. ~~Otherwise, this QoS profile may describe a default QoS service profile requested by the user.~~
- If the UE requests or modifies a UMTS bearer and one or more of the QoS attributes are not specified by the UE by setting the attributes to 'subscribed', the SGSN shall assume a request of values as specified in the QoS profile in the UMTS subscription. If the UE sets the traffic class to 'subscribed', the SGSN shall assume a request for Interactive class. When the application in the UE requires streaming or conversational QoS, then the UE shall at least explicitly request the traffic class and should explicitly request the guaranteed bit rate and the maximum bit rate. For the rest of the QoS attributes, the network shall ensure that the negotiated QoS contains only values explicitly defined for the traffic class.
- ~~Default QoS profile(s) may be configured by the operator for the UMTS bearer services provided by the network.~~
- A Network specific QoS profile characterising for example the current resource availability or other network capabilities or limitations may limit the provided UMTS bearer service or initiate a modification of an established UMTS bearer service.

## CHANGE REQUEST

⌘ **23.107 CR 112** ⌘ rev **3** ⌘ Current version: **4.4.0** ⌘

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  Radio Access Network  Core Network

<b>Title:</b>	⌘ Subscribed QoS				
<b>Source:</b>	⌘ Ericsson				
<b>Work item code:</b>	⌘ E2EQoS	<b>Date:</b>	⌘ 28/06/2002		
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ Rel-4		
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:		
	<b>F</b> (correction)		2 (GSM Phase 2)		
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)		
	<b>B</b> (addition of feature),		R97 (Release 1997)		
	<b>C</b> (functional modification of feature)		R98 (Release 1998)		
	<b>D</b> (editorial modification)		R99 (Release 1999)		
	Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Rel-4 (Release 4)		
			Rel-5 (Release 5)		
			Rel-6 (Release 6)		

<b>Reason for change:</b>	⌘ If the UE requests QoS profile, the QoS profile in the UMTS subscription is interpreted as a maximum QoS profile against which the requested QoS profile is checked. On the other hand, if the UE does not specify one or more of the QoS attributes by setting the attributes to 'subscribed', the network assumes a request of values derived from the QoS profile in the UMTS subscription. This may however lead to problems:  If the UE request "subscribed" for traffic class and if HLR contains streaming or conversational traffic class, SGSN will (based on existing specifications) allocate a streaming or conversational traffic class. So simple UEs will always receive a real time traffic class even if they most of the time just have non real time applications (e.g. WAP). This will lead to charging problems (if operator charges based on real time price) and waste of radio resources (especially if these UE are always-on).  Also, if the UE requests only part of the QoS attributes and sets the values of the rest of the attributes as 'subscribed', there is a possibility that indiscriminate use of values derived from the QoS profile in the UMTS subscription may lead to an inconsistent QoS profile (e.g. guaranteed bit rate is not defined for the Interactive class), which may lead to unnecessary rejection of the PDP context by the network.
<b>Summary of change:</b>	⌘ If the UE requests or modifies a UMTS bearer and one or more of the QoS attributes are not specified by the UE by setting the attributes to 'subscribed', the network shall assume a request of values as specified in the QoS profile in the UMTS subscription. For the specific case of traffic class, the network shall assume a request for Interactive class if the UE requests this attribute as 'subscribed'. For the rest of the QoS attributes, the network shall ensure that the

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It is also clarified that when the application in the UE requires streaming or conversational QoS, then the UE shall at least explicitly request the traffic class and should explicitly request the guaranteed bit rate and the maximum bit rate. Note that in practice applications that have specific (high) QoS requirements would request explicitly what they need.

**Consequences if not approved:** ⌘ May cause an inefficient resource utilisation in the core network, PDP Contexts may be rejected by the network with higher probability.

**Clauses affected:** ⌘ 6.4.2

	Y	N		
<b>Other specs affected:</b>	X		Other core specifications	⌘ 23.060, 27.060
		X	Test specifications	
		X	O&M Specifications	

**Other comments:** ⌘

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CR-Form-v7	
<b>CHANGE REQUEST</b>	
⌘ <b>23.107 CR 113</b> ⌘ rev <b>3</b> ⌘	Current version: <b>5.5.0</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:** UICC apps ⌘  ME  Radio Access Network  Core Network

<b>Title:</b>	⌘ Subscribed QoS		
<b>Source:</b>	⌘ Ericsson		
<b>Work item code:</b>	⌘ E2EQoS	<b>Date:</b>	⌘ 28/06/2002
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ Rel-5
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)		2 (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)		R96 (Release 1996)
	<b>B</b> (addition of feature),		R97 (Release 1997)
	<b>C</b> (functional modification of feature)		R98 (Release 1998)
	<b>D</b> (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

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**Consequences if not approved:** ⌘ May cause an inefficient resource utilisation in the core network, PDP Contexts may be rejected by the network with higher probability.

**Clauses affected:** ⌘ 6.4.2

	Y	N		
<b>Other specs affected:</b>	X		Other core specifications	⌘ 23.060, 27.060
		X	Test specifications	
		X	O&M Specifications	

**Other comments:** ⌘

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- If the UE requests or modifies a UMTS bearer and one or more of the QoS attributes are not specified by the UE by setting the attributes to 'subscribed', the SGSN shall assume a request of values as specified in the QoS profile in the UMTS subscription. If the UE sets the traffic class to 'subscribed', the SGSN shall assume a request for Interactive class. When the application in the UE requires streaming or conversational QoS, then the UE shall at least explicitly request the traffic class and should explicitly request the guaranteed bit rate and the maximum bit rate. For the rest of the QoS attributes, the network shall ensure that the negotiated QoS contains only values explicitly defined for the traffic class.
- ~~Default QoS profile(s) may be configured by the operator for the UMTS bearer services provided by the network.~~
- A Network specific QoS profile characterising for example the current resource availability or other network capabilities or limitations may limit the provided UMTS bearer service or initiate a modification of an established UMTS bearer service.

## CHANGE REQUEST

⌘ **TS 23.107 CR 114** ⌘ rev **1** ⌘ Current version: **3.8.0** ⌘

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

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

<b>Title:</b>	⌘ Modification of the minimum transfer delay value for traffic class Streaming		
<b>Source:</b>	⌘ Siemens, T-Mobile Deutschland		
<b>Work item code:</b>	⌘ QoS	<b>Date:</b>	⌘ 27/06/2002
<b>Category:</b>	⌘ <b>F</b>	<b>Release:</b>	⌘ R99
	<i>Use one of the following categories:</i> <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> .		<i>Use one of the following releases:</i> <b>2</b> (GSM Phase 2) <b>R96</b> (Release 1996) <b>R97</b> (Release 1997) <b>R98</b> (Release 1998) <b>R99</b> (Release 1999) <b>Rel-4</b> (Release 4) <b>Rel-5</b> (Release 5) <b>Rel-6</b> (Release 6)

<b>Reason for change:</b>	⌘ The minimum value for the UMTS BS attribute transfer delay for traffic class Streaming is 250 ms, and the corresponding RAB service value is 250 ms, too. For this value, the resulting transfer delay for the core network would be 0 ms. This violates the mapping rules made in sub-clause 8.2. which state: "For example requested transfer delay for the UMTS bearer shall typically be larger than the requested transfer delay for the Radio Access Bearer, as the transport through the core network will use a part of the acceptable delay." and "Transfer delay for Radio Access Bearer service shall be reduced with the delay introduced in the core network, e.g. on transmission links or in a codec resident in the Core Network."  Since there is always a transfer delay in the core network for streaming services as well, the minimum value for the UMTS BS attribute transfer delay shall be 280 ms for traffic class Streaming. The corresponding RAB value remains unmodified. This CR follows the definition of the minimum UMTS and RAB transfer delay values for traffic class Conversational which are 100ms and 80 ms respectively
<b>Summary of change:</b>	⌘ This CR removes the inconsistent UMTS to RAB attribute mapping for transfer delay values for traffic class Streaming.
<b>Consequences if not approved:</b>	⌘ The TS 23.107 would remain contradicting itself and consequently a reasonable minimum value for the attribute transfer delay for traffic class Streaming is not considered during RAB establishment.

<b>Clauses affected:</b>	⌘ 6.5.1								
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <tr> <td style="width: 20px;">Y</td> <td style="width: 20px;">N</td> </tr> <tr> <td style="width: 20px;"> </td> <td style="width: 20px;">X</td> </tr> <tr> <td style="width: 20px;"> </td> <td style="width: 20px;">X</td> </tr> </table>	Y	N		X		X	Other core specifications	⌘
Y	N								
	X								
	X								
		Test specifications	⌘						

O&M Specifications

**Other comments:** ☹

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## 6.5.1 Ranges of UMTS Bearer Service Attributes

The following table lists the value ranges of the UMTS bearer service attributes. The value ranges reflect the capability of UMTS network.

**Table 4: Value ranges for UMTS Bearer Service Attributes**

Traffic class	Conversational class	Streaming class	Interactive class	Background class
Maximum bitrate (kbps)	< 2 048 (1) (2)	< 2 048 (1) (2)	< 2 048 - overhead (2) (3)	< 2 048 - overhead (2) (3)
Delivery order	Yes/No	Yes/No	Yes/No	Yes/No
Maximum SDU size (octets)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)
SDU format information	(5)	(5)		
Delivery of erroneous SDUs	Yes/No/- (6)	Yes/No/- (6)	Yes/No/- (6)	Yes/No/- (6)
Residual BER	$5 \cdot 10^{-2}, 10^{-2}, 5 \cdot 10^{-3}, 10^{-3}, 10^{-4}, 10^{-5}, 10^{-6}$	$5 \cdot 10^{-2}, 10^{-2}, 5 \cdot 10^{-3}, 10^{-3}, 10^{-4}, 10^{-5}, 10^{-6}$	$4 \cdot 10^{-3}, 10^{-5}, 6 \cdot 10^{-8}$ (7)	$4 \cdot 10^{-3}, 10^{-5}, 6 \cdot 10^{-8}$ (7)
SDU error ratio	$10^{-2}, 7 \cdot 10^{-3}, 10^{-3}, 10^{-4}, 10^{-5}$	$10^{-1}, 10^{-2}, 7 \cdot 10^{-3}, 10^{-3}, 10^{-4}, 10^{-5}$	$10^{-3}, 10^{-4}, 10^{-6}$	$10^{-3}, 10^{-4}, 10^{-6}$
Transfer delay (ms)	100 up to <i>FFS</i> (8)	<del>250</del> 280 (9) up to <i>FFS</i> (8)		
Guaranteed bit rate (kbps)	< 2 048 (1) (2)	< 2 048 (1) (2)		
Traffic handling priority			1,2,3	
Allocation/Retention priority	1,2,3	1,2,3	1,2,3	1,2,3

- 1) Bitrate of 2 048 kbps requires that UTRAN operates in transparent RLC protocol mode, in this case the overhead from layer 2 protocols is negligible.
- 2) The granularity of the bit rate attributes shall be studied. Although the UMTS network has capability to support a large number of different bitrate values, the number of possible values shall be limited not to unnecessarily increase the complexity of for example terminals, charging and interworking functions. Exact list of supported values shall be defined together with S1, N1, N3 and R2.
- 3) Impact from layer 2 protocols on maximum bitrate in non-transparent RLC protocol mode shall be estimated.
- 4) In case of PDP type = PPP, maximum SDU size is 1502 octets. In other cases, maximum SDU size is 1 500 octets.
- 5) Definition of possible values of exact SDU sizes for which UTRAN can support transparent RLC protocol mode, is the task of RAN WG3.
- 6) If *Delivery of erroneous SDUs* is set to 'Yes' error indications can only be provided on the MT/TE side of the UMTS bearer. On the CN Gateway side error indications can not be signalled outside of UMTS network in release 1999.
- 7) Values are derived from CRC lengths of 8, 16 and 24 bits on layer 1.
- 8) The upper bound is *FFS* (For Further Study).
- 9) If the UE requests a transfer delay value lower than the minimum value, this shall not cause the network (SGSN and GGSN) to reject the request from the UE. The network may negotiate the value for the transfer delay.

## CHANGE REQUEST

⌘ **TS 23.107 CR 115** ⌘ rev **1** ⌘ Current version: **4.4.0** ⌘

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  Radio Access Network  Core Network

<b>Title:</b>	⌘ Modification of the minimum transfer delay value for traffic class Streaming		
<b>Source:</b>	⌘ Siemens, T-Mobile Deutschland		
<b>Work item code:</b>	⌘ QoS	<b>Date:</b>	⌘ 27/06/2002
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ Rel-4
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<i>F</i> (correction)		2 (GSM Phase 2)
	<i>A</i> (corresponds to a correction in an earlier release)		R96 (Release 1996)
	<i>B</i> (addition of feature),		R97 (Release 1997)
	<i>C</i> (functional modification of feature)		R98 (Release 1998)
	<i>D</i> (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

<b>Reason for change:</b>	⌘ The minimum value for the UMTS BS attribute transfer delay for traffic class Streaming is 250 ms, and the corresponding RAB service value is 250 ms, too. For this value, the resulting transfer delay for the core network would be 0 ms. This violates the mapping rules made in sub-clause 8.2. which state: "For example requested transfer delay for the UMTS bearer shall typically be larger than the requested transfer delay for the Radio Access Bearer, as the transport through the core network will use a part of the acceptable delay." and "Transfer delay for Radio Access Bearer service shall be reduced with the delay introduced in the core network, e.g. on transmission links or in a codec resident in the Core Network."  Since there is always a transfer delay in the core network for streaming services as well, the minimum value for the UMTS BS attribute transfer delay shall be 280 ms for traffic class Streaming. The corresponding RAB value remains unmodified. This CR follows the definition of the minimum UMTS and RAB transfer delay values for traffic class Conversational which are 100ms and 80 ms respectively
<b>Summary of change:</b>	⌘ This CR removes the inconsistent UMTS to RAB attribute mapping for transfer delay values for traffic class Streaming.
<b>Consequences if not approved:</b>	⌘ The TS 23.107 would remain contradicting itself and consequently a reasonable minimum value for the attribute transfer delay for traffic class Streaming is not considered during RAB establishment.

<b>Clauses affected:</b>	⌘ 6.5.1								
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">N</td> </tr> <tr> <td style="padding: 2px;"> </td> <td style="padding: 2px;">X</td> </tr> <tr> <td style="padding: 2px;"> </td> <td style="padding: 2px;">X</td> </tr> </table>	Y	N		X		X	Other core specifications	⌘
	Y	N							
	X								
	X								
		Test specifications	⌘						

O&M Specifications

**Other comments:** ☹

**How to create CRs using this form:**

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/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.

## 6.5.1 Ranges of UMTS Bearer Service Attributes

The following table lists the value ranges of the UMTS bearer service attributes. The value ranges reflect the capability of UMTS network.

**Table 4: Value ranges for UMTS Bearer Service Attributes**

Traffic class	Conversational class	Streaming class	Interactive class	Background class
Maximum bitrate (kbps)	< 2 048 (1) (2)	< 2 048 (1) (2)	< 2 048 - overhead (2) (3)	< 2 048 - overhead (2) (3)
Delivery order	Yes/No	Yes/No	Yes/No	Yes/No
Maximum SDU size (octets)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)
SDU format information	(5)	(5)		
Delivery of erroneous SDUs	Yes/No/- (6)	Yes/No/- (6)	Yes/No/- (6)	Yes/No/- (6)
Residual BER	$5 \cdot 10^{-2}$ , $10^{-2}$ , $5 \cdot 10^{-3}$ , $10^{-3}$ , $10^{-4}$ , $10^{-5}$ , $10^{-6}$	$5 \cdot 10^{-2}$ , $10^{-2}$ , $5 \cdot 10^{-3}$ , $10^{-3}$ , $10^{-4}$ , $10^{-5}$ , $10^{-6}$	$4 \cdot 10^{-3}$ , $10^{-5}$ , $6 \cdot 10^{-8}$ (7)	$4 \cdot 10^{-3}$ , $10^{-5}$ , $6 \cdot 10^{-8}$ (7)
SDU error ratio	$10^{-2}$ , $7 \cdot 10^{-3}$ , $10^{-3}$ , $10^{-4}$ , $10^{-5}$	$10^{-1}$ , $10^{-2}$ , $7 \cdot 10^{-3}$ , $10^{-3}$ , $10^{-4}$ , $10^{-5}$	$10^{-3}$ , $10^{-4}$ , $10^{-6}$	$10^{-3}$ , $10^{-4}$ , $10^{-6}$
Transfer delay (ms)	100 – maximum value	<del>250</del> <u>280 (8)</u> – maximum value		
Guaranteed bit rate (kbps)	< 2 048 (1) (2)	< 2 048 (1) (2)		
Traffic handling priority			1,2,3	
Allocation/Retention priority	1,2,3	1,2,3	1,2,3	1,2,3

- 1) Bitrate of 2 048 kbps requires that UTRAN operates in transparent RLC protocol mode, in this case the overhead from layer 2 protocols is negligible.
- 2) The granularity of the bit rate attributes shall be studied. Although the UMTS network has capability to support a large number of different bitrate values, the number of possible values shall be limited not to unnecessarily increase the complexity of for example terminals, charging and interworking functions. Exact list of supported values shall be defined together with S1, N1, N3 and R2.
- 3) Impact from layer 2 protocols on maximum bitrate in non-transparent RLC protocol mode shall be estimated.
- 4) In case of PDP type = PPP, maximum SDU size is 1502 octets. In other cases, maximum SDU size is 1 500 octets.
- 5) Definition of possible values of exact SDU sizes for which UTRAN can support transparent RLC protocol mode, is the task of RAN WG3.
- 6) If *Delivery of erroneous SDUs* is set to 'Yes' error indications can only be provided on the MT/TE side of the UMTS bearer. On the CN Gateway side error indications can not be signalled outside of UMTS network in release 1999.
- 7) ~~7)~~ Values are derived from CRC lengths of 8, 16 and 24 bits on layer 1.
- 8) If the UE requests a transfer delay value lower than the minimum value, this shall not cause the network (SGSN and GGSN) to reject the request from the UE. The network may negotiate the value for the transfer delay.



## CHANGE REQUEST

⌘ **TS 23.107 CR 116** ⌘ rev **1** ⌘ Current version: **5.5.0** ⌘

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  Radio Access Network  Core Network

<b>Title:</b>	⌘ Modification of the minimum transfer delay value for traffic class Streaming		
<b>Source:</b>	⌘ Siemens, T-Mobile Deutschland		
<b>Work item code:</b>	⌘ QoS	<b>Date:</b>	⌘ 27/06/2002
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ Rel-5
	<i>Use one of the following categories:</i> <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> .		<i>Use one of the following releases:</i> <b>2</b> (GSM Phase 2) <b>R96</b> (Release 1996) <b>R97</b> (Release 1997) <b>R98</b> (Release 1998) <b>R99</b> (Release 1999) <b>Rel-4</b> (Release 4) <b>Rel-5</b> (Release 5) <b>Rel-6</b> (Release 6)

<b>Reason for change:</b>	⌘ The minimum value for the UMTS BS attribute transfer delay for traffic class Streaming is 250 ms, and the corresponding RAB service value is 250 ms, too. For this value, the resulting transfer delay for the core network would be 0 ms. This violates the mapping rules made in sub-clause 8.2. which state: "For example requested transfer delay for the UMTS bearer shall typically be larger than the requested transfer delay for the Radio Access Bearer, as the transport through the core network will use a part of the acceptable delay." and "Transfer delay for Radio Access Bearer service shall be reduced with the delay introduced in the core network, e.g. on transmission links or in a codec resident in the Core Network."  Since there is always a transfer delay in the core network for streaming services as well, the minimum value for the UMTS BS attribute transfer delay shall be 280 ms for traffic class Streaming. The corresponding RAB value remains unmodified. This CR follows the definition of the minimum UMTS and RAB transfer delay values for traffic class Conversational which are 100ms and 80 ms respectively
<b>Summary of change:</b>	⌘ This CR removes the inconsistent UMTS to RAB attribute mapping for transfer delay values for traffic class Streaming.
<b>Consequences if not approved:</b>	⌘ The TS 23.107 would remain contradicting itself and consequently a reasonable minimum value for the attribute transfer delay for traffic class Streaming is not considered during RAB establishment.

<b>Clauses affected:</b>	⌘ 6.5.1								
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">N</td> </tr> <tr> <td style="padding: 2px;"> </td> <td style="padding: 2px;">X</td> </tr> <tr> <td style="padding: 2px;"> </td> <td style="padding: 2px;">X</td> </tr> </table>	Y	N		X		X	Other core specifications	⌘
	Y	N							
	X								
	X								
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;"> </td> <td style="padding: 2px;"> </td> </tr> <tr> <td style="padding: 2px;"> </td> <td style="padding: 2px;">X</td> </tr> </table>				X	Test specifications	⌘		
	X								

O&M Specifications

**Other comments:** ☹

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

### 6.5.1 Ranges of UMTS Bearer Service Attributes

The following table lists the value ranges of the UMTS bearer service attributes. The value ranges reflect the capability of UMTS network.

**Table 4: Value ranges for UMTS Bearer Service Attributes**

Traffic class	Conversational class	Streaming class	Interactive class	Background class
Maximum bitrate (kbps)	< 2 048 (1) (2)	< 2 048 (1) (2)	< 2 048 - overhead (2) (3)	< 2 048 - overhead (2) (3)
Delivery order	Yes/No	Yes/No	Yes/No	Yes/No
Maximum SDU size (octets)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)
SDU format information	(5)	(5)		
Delivery of erroneous SDUs	Yes/No/- (6)	Yes/No/- (6)	Yes/No/- (6)	Yes/No/- (6)
Residual BER	$5 \cdot 10^{-2}, 10^{-2}, 5 \cdot 10^{-3}, 10^{-3}, 10^{-4}, 10^{-5}, 10^{-6}$	$5 \cdot 10^{-2}, 10^{-2}, 5 \cdot 10^{-3}, 10^{-3}, 10^{-4}, 10^{-5}, 10^{-6}$	$4 \cdot 10^{-3}, 10^{-5}, 6 \cdot 10^{-8}$ (7)	$4 \cdot 10^{-3}, 10^{-5}, 6 \cdot 10^{-8}$ (7)
SDU error ratio	$10^{-2}, 7 \cdot 10^{-3}, 10^{-3}, 10^{-4}, 10^{-5}$	$10^{-1}, 10^{-2}, 7 \cdot 10^{-3}, 10^{-3}, 10^{-4}, 10^{-5}$	$10^{-3}, 10^{-4}, 10^{-6}$	$10^{-3}, 10^{-4}, 10^{-6}$
Transfer delay (ms)	100 – maximum value	<del>250</del> <u>280</u> (8) – maximum value		
Guaranteed bit rate (kbps)	< 2 048 (1) (2)	< 2 048 (1) (2)		
Traffic handling priority			1,2,3	
Allocation/Retention priority	1,2,3	1,2,3	1,2,3	1,2,3
Source statistic descriptor	Speech/unknown	Speech/unknown		

- 1) Bitrate of 2 048 kbps requires that UTRAN operates in transparent RLC protocol mode, in this case the overhead from layer 2 protocols is negligible.
- 2) The granularity of the bit rate attributes shall be studied. Although the UMTS network has capability to support a large number of different bitrate values, the number of possible values shall be limited not to unnecessarily increase the complexity of for example terminals, charging and interworking functions. Exact list of supported values shall be defined together with S1, N1, N3 and R2.
- 3) Impact from layer 2 protocols on maximum bitrate in non-transparent RLC protocol mode shall be estimated.
- 4) In case of PDP type = PPP, maximum SDU size is 1502 octets. In other cases, maximum SDU size is 1 500 octets.
- 5) Definition of possible values of exact SDU sizes for which UTRAN can support transparent RLC protocol mode, is the task of RAN WG3.
- 6) If *Delivery of erroneous SDUs* is set to 'Yes' error indications can only be provided on the MT/TE side of the UMTS bearer. On the CN Gateway side error indications can not be signalled outside of UMTS network in release 1999.

7) ~~7)~~ Values are derived from CRC lengths of 8, 16 and 24 bits on layer 1.

8) If the UE requests a transfer delay value lower than the minimum value, this shall not cause the network (SGSN and GGSN) to reject the request from the UE. The network may negotiate the value for the transfer delay.

3GPP TSG-SA2 Meeting #26  
 Toronto, Canada, 19-23 August 2002

Tdoc S2-022562

CR-Form-v7
<b>CHANGE REQUEST</b>
⌘ <b>23.107 CR 125</b> ⌘ rev <b>-</b> ⌘ Current version: <b>3.8.0</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:** UICC apps  ME  Radio Access Network  Core Network

<b>Title:</b>	⌘	Classes of service vs. traffic classes
<b>Source:</b>	⌘	Ericsson
<b>Work item code:</b>	⌘	TEI
		<b>Date:</b> ⌘ 22/08/2002
<b>Category:</b>	⌘	<b>F</b>
		<b>Release:</b> ⌘ R99
		Use <u>one</u> of the following categories: <ul style="list-style-type: none"> <li><b>F</b> (correction)</li> <li><b>A</b> (corresponds to a correction in an earlier release)</li> <li><b>B</b> (addition of feature),</li> <li><b>C</b> (functional modification of feature)</li> <li><b>D</b> (editorial modification)</li> </ul> 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: <ul style="list-style-type: none"> <li>2 (GSM Phase 2)</li> <li>R96 (Release 1996)</li> <li>R97 (Release 1997)</li> <li>R98 (Release 1998)</li> <li>R99 (Release 1999)</li> <li>Rel-4 (Release 4)</li> <li>Rel-5 (Release 5)</li> <li>Rel-6 (Release 6)</li> </ul>

<b>Reason for change:</b>	⌘	There is a regular confusion between the name of the values that the traffic classe QoS attribute can take (conversational, streaming, interactive and background) and the different classes of service referred to in 22.105.
		The names chosen for the traffic class QoS attribute were intended to provide an intuitive understanding of the main characteristics of each traffic class, but it was not intended to have a strict one-to-one mapping between traffic classes and classes of service. E.g. an interactive service does not necessarily have to be mapped to the Interactive traffic class; the Conversational traffic class could for instance very well be used if the application or the user has tight requirements on delay for an interactive service.
<b>Summary of change:</b>	⌘	A clarification that there is no strict one-to-one mapping between classes of service (as defined in 3GPP TS 22.105) and traffic classes is added at the end of section 6.3 which describes typical usages of the traffic classes.
<b>Consequences if not approved:</b>	⌘	The recurrent misunderstandng that there is a one-to-one mapping between the stage 1 requirements on the different classes of service defined in 22.105 and the stage 2 requirements for the traffic classes defined in 23.107 will remain.

<b>Clauses affected:</b>	⌘	6.3				
<b>Other specs affected:</b>	⌘	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">N</td> </tr> <tr> <td style="padding: 2px;"><input type="checkbox"/></td> <td style="padding: 2px;"><input checked="" type="checkbox"/></td> </tr> </table> Other core specifications	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Y	N					
<input type="checkbox"/>	<input checked="" type="checkbox"/>					
		<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;"><input type="checkbox"/></td> <td style="padding: 2px;"><input checked="" type="checkbox"/></td> </tr> </table> Test specifications	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<input type="checkbox"/>	<input checked="" type="checkbox"/>					
		<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;"><input type="checkbox"/></td> <td style="padding: 2px;"><input checked="" type="checkbox"/></td> </tr> </table> O&M Specifications	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
<input type="checkbox"/>	<input checked="" type="checkbox"/>					
<b>Other comments:</b>	⌘					

## 6.3 UMTS QoS Classes

When defining the UMTS QoS classes, also referred to as traffic classes, the restrictions and limitations of the air interface have to be taken into account. It is not reasonable to define complex mechanisms as have been in fixed networks due to different error characteristics of the air interface. The QoS mechanisms provided in the cellular network have to be robust and capable of providing reasonable QoS resolution. Table 1 illustrates the QoS classes for UMTS.

There are four different QoS classes:

- conversational class;
- streaming class;
- interactive class; and
- background class.

The main distinguishing factor between these QoS classes is how delay sensitive the traffic is: Conversational class is meant for traffic which is very delay sensitive while Background class is the most delay insensitive traffic class.

Conversational and Streaming classes are mainly intended to be used to carry real-time traffic flows. The main divider between them is how delay sensitive the traffic is. Conversational real-time services, like video telephony, are the most delay sensitive applications and those data streams should be carried in Conversational class.

Interactive class and Background are mainly meant to be used by traditional Internet applications like WWW, Email, Telnet, FTP and News. Due to looser delay requirements, compare to conversational and streaming classes, both provide better error rate by means of channel coding and retransmission. The main difference between Interactive and Background class is that Interactive class is mainly used by interactive applications, e.g. interactive Email or interactive Web browsing, while Background class is meant for background traffic, e.g. background download of Emails or background file downloading. Responsiveness of the interactive applications is ensured by separating interactive and background applications. Traffic in the Interactive class has higher priority in scheduling than Background class traffic, so background applications use transmission resources only when interactive applications do not need them. This is very important in wireless environment where the bandwidth is low compared to fixed networks.

However, these are only typical examples of usage of the traffic classes. There is in particular no strict one-to-one mapping between classes of service (as defined in 3GPP TS 22.105) and the traffic classes defined in this TS. For instance, a service interactive by nature can very well use the Conversational traffic class if the application or the user has tight requirements on delay.

3GPP TSG-SA2 Meeting #26  
 Toronto, Canada, 19-23 August 2002

Tdoc S2-022563

CR-Form-v7	
<b>CHANGE REQUEST</b>	
⌘ <b>23.107 CR 126</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:** UICC apps  ME  Radio Access Network  Core Network

<b>Title:</b>	⌘ Classes of service vs. traffic classes		
<b>Source:</b>	⌘ Ericsson		
<b>Work item code:</b>	⌘ TE14	<b>Date:</b>	⌘ 22/08/2002
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ Rel-4
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	<b>F</b> (correction)		2 (GSM Phase 2)
	<b>A</b> (corresponds to a correction in an earlier release)	R96 (Release 1996)	
	<b>B</b> (addition of feature),	R97 (Release 1997)	
	<b>C</b> (functional modification of feature)	R98 (Release 1998)	
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<b>Reason for change:</b>	⌘ There is a regular confusion between the name of the values that the traffic classe QoS attribute can take (conversational, streaming, interactive and background) and the different classes of service referred to in 22.105.  The names chosen for the traffic class QoS attribute were intended to provide an intuitive understanding of the main characteristics of each traffic class, but it was not intended to have a strict one-to-one mapping between traffic classes and classes of service. E.g. an interactive service does not necessarily have to be mapped to the Interactive traffic class; the Conversational traffic class could for instance very well be used if the application or the user has tight requirements on delay for an interactive service.
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<b>Clauses affected:</b>	⌘ 6.3										
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center; font-size: x-small;">Y</td> <td style="text-align: center; font-size: x-small;">N</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;">⌘</td> <td style="text-align: center;">X</td> </tr> </table>	Y	N	⌘	X	⌘	X	⌘	X	Other core specifications	⌘
Y	N										
⌘	X										
⌘	X										
⌘	X										
		Test specifications									
		O&M Specifications									
<b>Other comments:</b>	⌘										

## 6.3 UMTS QoS Classes

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However, these are only typical examples of usage of the traffic classes. There is in particular no strict one-to-one mapping between classes of service (as defined in 3GPP TS 22.105) and the traffic classes defined in this TS. For instance, a service interactive by nature can very well use the Conversational traffic class if the application or the user has tight requirements on delay.

3GPP TSG-SA2 Meeting #26  
 Toronto, Canada, 19-23 August 2002

Tdoc S2-022564

CR-Form-v7	
<b>CHANGE REQUEST</b>	
⌘ <b>23.107 CR 127</b> ⌘ rev <b>-</b> ⌘ Current version: <b>5.5.0</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:** UICC apps  ME  Radio Access Network  Core Network

<b>Title:</b>	⌘ Classes of service vs. traffic classes		
<b>Source:</b>	⌘ Ericsson		
<b>Work item code:</b>	⌘ TE15	<b>Date:</b>	⌘ 22/08/2002
<b>Category:</b>	⌘ <b>A</b>	<b>Release:</b>	⌘ Rel-5
	<i>Use one of the following categories:</i> <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> .		<i>Use one of the following releases:</i> <b>2</b> (GSM Phase 2) <b>R96</b> (Release 1996) <b>R97</b> (Release 1997) <b>R98</b> (Release 1998) <b>R99</b> (Release 1999) <b>Rel-4</b> (Release 4) <b>Rel-5</b> (Release 5) <b>Rel-6</b> (Release 6)

<b>Reason for change:</b>	⌘ There is a regular confusion between the name of the values that the traffic classe QoS attribute can take (conversational, streaming, interactive and background) and the different classes of service referred to in 22.105.  The names chosen for the traffic class QoS attribute were intended to provide an intuitive understanding of the main characteristics of each traffic class, but it was not intended to have a strict one-to-one mapping between traffic classes and classes of service. E.g. an interactive service does not necessarily have to be mapped to the Interactive traffic class; the Conversational traffic class could for instance very well be used if the application or the user has tight requirements on delay for an interactive service.
<b>Summary of change:</b>	⌘ A clarification that there is no strict one-to-one mapping between classes of service (as defined in 3GPP TS 22.105) and traffic classes is added at the end of section 6.3 which describes typical usages of the traffic classes.
<b>Consequences if not approved:</b>	⌘ The recurrent misunderstandng that there is a one-to-one mapping between the stage 1 requirements on the different classes of service defined in 22.105 and the stage 2 requirements for the traffic classes defined in 23.107 will remain.

<b>Clauses affected:</b>	⌘ 6.3						
<b>Other specs affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;">Y</td> <td style="text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> Other core specifications	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	⌘	
Y	N						
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	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> Test specifications	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> O&M Specifications	<input type="checkbox"/>	<input checked="" type="checkbox"/>				
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
<b>Other comments:</b>	⌘						



## 6.3 UMTS QoS Classes

When defining the UMTS QoS classes, also referred to as traffic classes, the restrictions and limitations of the air interface have to be taken into account. It is not reasonable to define complex mechanisms as have been in fixed networks due to different error characteristics of the air interface. The QoS mechanisms provided in the cellular network have to be robust and capable of providing reasonable QoS resolution. Table 1 illustrates the QoS classes for UMTS.

There are four different QoS classes:

- conversational class;
- streaming class;
- interactive class; and
- background class.

The main distinguishing factor between these QoS classes is how delay sensitive the traffic is: Conversational class is meant for traffic which is very delay sensitive while Background class is the most delay insensitive traffic class.

Conversational and Streaming classes are mainly intended to be used to carry real-time traffic flows. The main divider between them is how delay sensitive the traffic is. Conversational real-time services, like video telephony, are the most delay sensitive applications and those data streams should be carried in Conversational class.

Interactive class and Background are mainly meant to be used by traditional Internet applications like WWW, Email, Telnet, FTP and News. Due to looser delay requirements, compare to conversational and streaming classes, both provide better error rate by means of channel coding and retransmission. The main difference between Interactive and Background class is that Interactive class is mainly used by interactive applications, e.g. interactive Email or interactive Web browsing, while Background class is meant for background traffic, e.g. background download of Emails or background file downloading. Responsiveness of the interactive applications is ensured by separating interactive and background applications. Traffic in the Interactive class has higher priority in scheduling than Background class traffic, so background applications use transmission resources only when interactive applications do not need them. This is very important in wireless environment where the bandwidth is low compared to fixed networks.

However, these are only typical examples of usage of the traffic classes. There is in particular no strict one-to-one mapping between classes of service (as defined in 3GPP TS 22.105) and the traffic classes defined in this TS. For instance, a service interactive by nature can very well use the Conversational traffic class if the application or the user has tight requirements on delay.