Technical Specification Group Services and System Aspects *TSGS#10(00)0591*
Meeting #10, Bangkok, Thailand, 11-14 December 2000

Source: **TSG SA WG2**
Title: **CRs on 23.107 v.3.4.0**
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 #10.
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.

CRs on 23.107 v.3.4.0

Spec	*Rel*	*CR #*	*Cat*	*Title*	*Input*	*Output*	*S2 tdoc #*
23.107	R99	033	D	Scope of TS23.107	3.4.0	3.5.0	S2-002065
23.107	Rel-4	035	D	Scope of TS23.107	3.4.0	4.0.0	S2-002066
23.107	R99	036	D	Streaming Delay Attribute	3.4.0	3.5.0	S2-002067
23.107	Rel-4	039	F	Asymmetric Transfer Delay	3.4.0	4.0.0	S2-002069

3GPP TSG SA WG2 #15
Makuhari, Japan, 13-17 November, 2000

***Document* S2-002065**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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23.107	CR	033r1	Current Version:	3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to: SA#10	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑	for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio		Core Network	X

Source: QoS Drafting Group **Date:** 11.07.00

Subject: ~~Title and~~ Scope of TS23.107

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification	X		Release 99	
				Release 00	X

Reason for change: To clarify the scope ~~and title~~ of TS23.107 to reflect the focus of the document on the framework for QoS within UMTS. ~~'Release 99' is deleted from the title since TS23.107 will also be applicable to Release 4 and future releases.~~

Clauses affected: Updates to ~~Title and~~ Section 1 Scope

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

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<--------- double-click here for help and instructions on how to create a CR.

1 Scope

The present document provides the framework for Quality of Service within UMTS. The main purpose is to specify the list of attributes applicable to UMTS Bearer Service and Radio Access Bearer Service, as well as describe the Quality of Service architecture to be used in UMTS networks. ~~The document shall be used as a living document which will cover all issues related Quality of Service in UMTS.~~

3GPP TSG SA WG2 #15
Makuhari, Japan, 13-17 November, 2000

***Document* S2-002066**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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23.107	**CR**	**035**	Current Version:	3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	SA#10	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio		Core Network	X

Source: QoS Drafting Group **Date:** 11.07.00

Subject: Scope of TS23.107

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification	X		Release 99	X
				Release 00	

Reason for change: To clarify the scope of TS23.107 to reflect the focus of the document on the framework for QoS within UMTS.

Clauses affected: Updates to Section 1 Scope

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

Other comments:

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<--------- double-click here for help and instructions on how to create a CR.

1 Scope

The present document provides the framework for Quality of Service within UMTS. The main purpose is to specify the list of attributes applicable to UMTS Bearer Service and Radio Access Bearer Service, as well as describe the Quality of Service architecture to be used in UMTS networks. ~~The document shall be used as a living document which will cover all issues related Quality of Service in UMTS.~~

3GPP TSG SA WG2 #14
Sophia Antopolis, France, 09.-12.10.2000

Document S2-002067
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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23.107	CR	036	Current Version:	3.3.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	SA #10	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [X]

Source: QoS Drafting Group **Date:** 11.10.2000

Subject: Streaming Delay Attribute

Work item:

Category: *(only one category shall be marked with an X)*

F	Correction	
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	X

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: In the September SA2 QoS drafting meeting in Bristol contribution S2-001511 initiated a discussion on the Streaming delay attribute as specified in 3G TS 23.107. The delay values for Conversational and Streaming classes, as specified, may be misinterpreted. This CR proposes to clarify the delay attribute. Subsequent CRs may address the value ranges.

Clauses affected:

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other GSM core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:


help.doc

<--------- double-click here for help and instructions on how to create a CR.

6.4.3 UMTS Bearer Service Attributes

6.4.3.1 List of attributes

Traffic class ('conversational', 'streaming', 'interactive', 'background')

Definition: type of application for which the UMTS bearer service is optimised

[Purpose: By including the traffic class itself as an attribute, UMTS can make assumptions about the traffic source and optimise the transport for that traffic type.]

Maximum bitrate (kbps)

Definition: maximum number of bits delivered by UMTS and to UMTS at a SAP within a period of time, divided by the duration of the period. The traffic is conformant with Maximum bitrate as long as it follows a token bucket algorithm where token rate equals Maximum bitrate and bucket size equals Maximum SDU size.

The conformance definition should not be interpreted as a required implementation algorithm. The token bucket algorithm is described in annex B.

[Purpose: Maximum bitrate can be used to make code reservations in the downlink of the radio interface. Its purpose is 1) to limit the delivered bitrate to applications or external networks with such limitations 2) to allow maximum wanted user bitrate to be defined for applications able to operate with different rates (e.g. non transparent circuit switched data)]

Guaranteed bitrate (kbps)

Definition: guaranteed number of bits delivered by UMTS at a SAP within a period of time (provided that there is data to deliver), divided by the duration of the period. The traffic is conformant with the guaranteed bitrate as long as it follows a token bucket algorithm where token rate equals Guaranteed bitrate and bucket size equals k*Maximum SDU size. For release 1999, k=1. A value of k greater than one Maximum SDU size may be specified in future releases to capture burstiness of sources. Signalling to specify the value of k may be provided in future releases.

The conformance definition should not be interpreted as a required implementation algorithm. The token bucket algorithm is described in annex B.

[Purpose: Guaranteed bitrate may be used to facilitate admission control based on available resources, and for resource allocation within UMTS. Quality requirements expressed by e.g. delay and reliability attributes only apply to incoming traffic up to the guaranteed bitrate.]

Delivery order (y/n)

Definition: indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not.

[Purpose: the attribute is derived from the user protocol (PDP type) and specifies if out-of-sequence SDUs are acceptable or not. This information cannot be extracted from the traffic class. Whether out-of-sequence SDUs are dropped or re-ordered depends on the specified reliability]

Maximum SDU size (octets)

Definition: the maximum allowed SDU size

[Purpose: The maximum SDU size is used for admission control and policing.]

SDU format information (bits)

Definition: list of possible exact sizes of SDUs

[Purpose: UTRAN needs SDU size information to be able to operate in transparent RLC protocol mode, which is beneficial to spectral efficiency and delay when RLC re-transmission is not used. Thus, if the application can specify SDU sizes, the bearer is less expensive.]

SDU error ratio

Definition: Indicates the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic.

NOTE 1: By reserving resources, SDU error ratio performance is independent of the loading conditions, whereas without reserved resources, such as in Interactive and Background classes, SDU error ratio is used as target value.

[Purpose: Used to configure the protocols, algorithms and error detection schemes, primarily within UTRAN.]

Residual bit error ratio

Definition: Indicates the undetected bit error ratio in the delivered SDUs. If no error detection is requested, Residual bit error ratio indicates the bit error ratio in the delivered SDUs.

[Purpose: Used to configure radio interface protocols, algorithms and error detection coding.]

Delivery of erroneous SDUs (y/n/-)

Definition: Indicates whether SDUs detected as erroneous shall be delivered or discarded.

NOTE 2: 'yes' implies that error detection is employed and that erroneous SDUs are delivered together with an error indication, 'no' implies that error detection is employed and that erroneous SDUs are discarded, and '-' implies that SDUs are delivered without considering error detection.

[Purpose: Used to decide whether error detection is needed and whether frames with detected errors shall be forwarded or not.]

Transfer delay (ms)

Definition: Indicates maximum delay for 95th percentile of the distribution of delay for all delivered SDUs during the lifetime of a bearer service, where delay for an SDU is defined as the time from a request to transfer an SDU at one SAP to its delivery at the other SAP.

[Purpose: used to specify the delay tolerated by the application. It allows UTRAN to set transport formats and ARQ parameters.]

NOTE 3: Transfer delay of an arbitrary SDU is not meaningful for a bursty source, since the last SDUs of a burst may have long delay due to queuing, whereas the meaningful response delay perceived by the user is the delay of the first SDU of the burst.

Traffic handling priority

Definition: specifies the relative importance for handling of all SDUs belonging to the UMTS bearer compared to the SDUs of other bearers.

[Purpose: Within the interactive class, there is a definite need to differentiate between bearer qualities. This is handled by using the traffic handling priority attribute, to allow UMTS to schedule traffic accordingly. By definition, priority is an alternative to absolute guarantees, and thus these two attribute types cannot be used together for a single bearer.]

Allocation/Retention Priority

Definition: specifies the relative importance compared to other UMTS bearers for allocation and retention of the UMTS bearer. The Allocation/Retention Priority attribute is a subscription parameter which is not negotiated from the mobile terminal.

NOTE 4: The addition of a user-controlled Allocation/Retention Priority attribute is for further study in future releases.

[Purpose: Priority is used for differentiating between bearers when performing allocation and retention of a bearer. In situations where resources are scarce, the relevant network elements can use the Allocation/Retention Priority to prioritize bearers with a high Allocation/Retention Priority over bearers with a low Allocation/Retention Priority when performing admission control.]

[SKIPPED TEXT]

6.4.4 Radio Access Bearer Service Attributes

Radio Access Bearer Service Attributes shall be applied to both CS and PS domains.

6.4.4.1 List of attributes

Traffic class ('conversational', 'streaming', 'interactive', 'background')

Definition: type of application for which the Radio Access Bearer service is optimised.

[Purpose: By including the traffic class itself as an attribute, UTRAN can make assumptions about the traffic source and optimise the transport for that traffic type. In particular, buffer allocation may be based on traffic class.]

Maximum bitrate (kbps)

Definition: maximum number of bits delivered by UTRAN and to UTRAN at a SAP within a period of time, divided by the duration of the period. The traffic is conformant with the Maximum bitrate as long as it follows a token bucket algorithm where token rate equals Maximum bitrate and bucket size equals Maximum SDU size.

The conformance definition should not be interpreted as a required implementation algorithm. The token bucket algorithm is described in annex B.

[Purpose: 1) to limit the delivered bitrate to applications or external networks with such limitations, 2) to allow maximum wanted RAB bitrate to be defined for applications able to operate with different rates (e.g. non transparent circuit switched data)]

Guaranteed bitrate (kbps)

Definition: guaranteed number of bits delivered at a SAP within a period of time (provided that there is data to deliver), divided by the duration of the period. The traffic is conformant with the Guaranteed bitrate as long as it follows a token bucket algorithm where token rate equals Guaranteed bitrate and bucket size equals k Maximum SDU size. For Release 1999, k = 1. A value of k greater than one Maximum SDU size may be specified in future releases to capture burstiness of sources. Signalling to specify the value of k may be provided in future releases.

The conformance definition should not be interpreted as a required implementation algorithm. The token bucket algorithm is described in annex B.

[Purpose: Guaranteed bitrate may be used to facilitate admission control based on available resources, and for resource allocation within UTRAN. Quality requirements expressed by e.g. delay and reliability attributes only apply to incoming traffic up to the guaranteed bitrate. The guaranteed bitrate at the RAB level may be different from that on UMTS bearer level, for example due to header compression.]

Delivery order (y/n)

Definition: indicates whether the UMTS bearer shall provide in-sequence SDU delivery or not.

[Purpose: specifies if out-of-sequence SDUs are acceptable or not. This information cannot be extracted from the traffic class. Whether out-of-sequence SDUs are dropped or re-ordered depends on the specified reliability.]

Maximum SDU size (octets)

Definition: the maximum allowed SDU size.

[Purpose: The maximum SDU size is used for admission control and policing.]

SDU format information (bits)

Definition: list of possible exact sizes of SDUs. If unequal error protection shall be used by a Radio Access Bearer service, SDU format information defines the exact subflow format of the SDU payload. SDU format information also supports definition of allowed subflow bitrates.

NOTE 1: SDU format information is used by UTRAN to define which bits of the payload that belongs to each subflow. Exact syntax of SDU format information attribute is the task of RAN WG3.

[Purpose: UTRAN needs SDU format information to be able to operate in transparent RLC protocol mode, which is beneficial to spectral efficiency and delay when RLC re-transmission is not used. Thus, if the application can specify SDU sizes, the bearer is less expensive. Moreover, in case of unequal error protection, UTRAN needs to know the exact format of SDU payload to be able to demultiplex the SDU onto different radio bearer services. When rate control is applied to services having a constant SDU size, e.g. CS data, the subflow bitrate is used to calculate the allowed inter PDU transmission interval (IPTI).]

SDU error ratio

Definition: Indicates the fraction of SDUs lost or detected as erroneous. SDU error ratio is defined only for conforming traffic. In case of unequal error protection., SDU error ratio is set per subflow and represents the error ratio in each subflow. SDU error ratio is only set for subflows for which error detection is requested.

NOTE 2: By reserving resources, SDU error ratio performance is independent of the loading conditions, whereas without reserved resources, such as in Interactive and Background classes, SDU error ratio is used as target value.

[Purpose: Used to configure protocols, algorithms and error detection schemes, primarily within UTRAN.]

Residual bit error ratio

Definition: Indicates the undetected bit error ratio for each subflow in the delivered SDUs. For equal error protection, only one value is needed. If no error detection is requested for a subflow, Residual bit error ratio indicates the bit error ratio in that subflow of the delivered SDUs.

[Purpose: Used to configure radio interface protocols, algorithms and error detection coding. For services requiring unequal error protection, residual bit error ratio is given for each subflow.]

Delivery of erroneous SDUs (y/n/-)

Definition: Indicates whether SDUs with detected errors shall be delivered or not. In case of unequal error protection, the attribute is set per subflow.

NOTE 3: 'yes' implies that error detection is employed and that erroneous SDUs are delivered together with an error indication, 'no' implies that error detection is employed and that erroneous SDUs are discarded, and '-' implies that SDUs are delivered without considering error detection.

In case of unequal protection, different subflows may have different settings. Whenever there is a detected error in a subflow with 'no', the SDU is discarded, irrespective of settings in other subflows. For an SDU with multiple subflows with a 'yes' setting, there may be one error indication per subflow, or, if there is only one error indication per SDU, it indicates that an error was detected in at least one of these subflows. Exact definitions are the task of RAN3.

[Purpose: Used to decide whether error detection is needed and whether frames with detected errors shall be forwarded or discarded.]

Transfer delay (ms)

Definition: Indicates maximum delay for 95th percentile of the distribution of delay for all delivered SDUs during the lifetime of a bearer service, where delay for an SDU is defined as the time from a request to transfer an SDU at one SAP to its delivery at the other SAP.

[Purpose: specifies the UTRAN part of the total transfer delay for the UMTS bearer. It allows UTRAN to set transport formats and ARQ parameters.]

Traffic handling priority

Definition: specifies the relative importance for handling of all SDUs belonging to the radio access bearer compared to the SDUs of other bearers.

[Purpose: Within the interactive class, there is a definite need to differentiate between bearer qualities. This is handled by using the traffic handling priority attribute, to allow UTRAN to schedule traffic accordingly. By definition, priority is an alternative to absolute guarantees, and thus these two attribute types cannot be used together for a single bearer.]

Allocation/Retention Priority

Definition: specifies the relative importance compared to other Radio access bearers for allocation and retention of the Radio access bearer. The Allocation/Retention Priority attribute is a subscription parameter which is not negotiated from the mobile terminal.

NOTE 4: The addition of a user-controlled Allocation/Retention Priority attribute is for further study in future releases.

[Purpose: Priority is used for differentiating between bearers when performing allocation and retention of a bearer. In situations where resources are scarce, the relevant network elements can use the Allocation/Retention Priority to prioritize bearers with a high Allocation/Retention Priority over bearers with a low Allocation/Retention Priority when performing admission control.]

Source statistics descriptor ('speech'/'unknown')

Definition: specifies characteristics of the source of submitted SDUs.

[Purpose: Conversational speech has a well-known statistical behaviour (or the discontinuous transmission (DTX) factor). By being informed that the SDUs for a RAB are generated by a speech source, UTRAN may, based on experience, calculate a statistical multiplex gain for use in admission control on the radio and Iu interfaces.]

[SKIPPED TEXT]

6.5 Parameter Value Ranges

For UMTS Bearer service and Radio Access Bearer services a list of finite attribute values or the allowed value range is defined for each attribute. The value list/value range define the values that are possible to be used for an attribute considering every possible service condition for release 1999. When a service is defined as a combination of attributes, further limitations may apply; for example the shortest possible delay may not be possible to use together with the lowest possible SDU error ratio. Service requirements, i.e. required QoS and performance for a given UMTS service is defined in the service requirement specifications (22.1xx). The aspect of future proof coding (beyond release 1999) of attributes in protocol specifications is not considered in the defined value list/value range tables.

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	$5*10^{-2}$, 10^{-2}, $5*10^{-3}$, 10^{-3}, 10^{-4}, 10^{-6}	$5*10^{-2}$, 10^{-2}, $5*10^{-3}$, 10^{-3}, 10^{-4}, 10^{-5}, 10^{-6}	$4*10^{-3}$, 10^{-5}, $6*10^{-8}$ (7)	$4*10^{-3}$, 10^{-5}, $6*10^{-8}$ (7)
SDU error ratio	10^{-2}, $7*10^{-3}$, 10^{-3}, 10^{-4}, 10^{-5}	10^{-1}, 10^{-2}, $7*10^{-3}$, 10^{-3}, 10^{-4}, 10^{-5}	10^{-3}, 10^{-4}, 10^{-6}	10^{-3}, 10^{-4}, 10^{-6}
Transfer delay (ms)	~~100 maximum value~~ 100 up to ***FFS*** (9)	~~250 maximum value~~ 250 up to ***FFS*** (9)		
Guaranteed bit rate (kbps)	< 2 048 (1) (2)	< 2 048 (1) (2)		
Traffic handling priority			1,2,3 (8)	
Allocation/Retention priority	1,2,3 (8)	1,2,3 (8)	1,2,3 (8)	1,2,3 (8)

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 parameters 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) ~~8)~~ Number of priority levels shall be further analysed by S1, N1 and N3.

9) The upper bound is FFS (For Further Study).

6.5.2 Ranges of Radio Access Bearer Service Attributes

The following table lists the value ranges of the radio access bearer service attributes. The value ranges reflect the capability of UTRAN.

Table 5: Value ranges for Radio Access 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/-	Yes/No/-	Yes/No/-	Yes/No/-
Residual BER	$5*10^{-2}$, 10^{-2}, $5*10^{-3}$, 10^{-3}, 10^{-4}, 10^{-6}	$5*10^{-2}$, 10^{-2}, $5*10^{-3}$, 10^{-3}, 10^{-4}, 10^{-5}, 10^{-6}	$4*10^{-3}$, 10^{-5}, $6*10^{-8}$ (6)	$4*10^{-3}$, 10^{-5}, $6*10^{-8}$ (6)
SDU error ratio	10^{-2}, $7*10^{-3}$, 10^{-3}, 10^{-4}, 10^{-5}	10^{-1}, 10^{-2}, $7*10^{-3}$, 10^{-3}, 10^{-4}, 10^{-5}	10^{-3}, 10^{-4}, 10^{-6}	10^{-3}, 10^{-4}, 10^{-6}
Transfer delay (ms)	~~80 – maximum value~~ 80 up to ***FFS*** (8)	~~250 – maximum value~~ 250 up to ***FFS*** (8)		
Guaranteed bit rate (kbps)	< 2 048 (1) (2)	< 2 048 (1) (2)		
Traffic handling priority			1,2,3 (7)	
Allocation/Retention priority	1,2,3 (7)	1,2,3 (7)	1,2,3 (7)	1,2,3 (7)
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 parameters 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) Values are derived from CRC lengths of 8, 16 and 24 bits on layer 1.

7) ~~7)~~ Number of priority levels shall be further analysed by S1, N1 and N3.

8) The upper bound is FFS (For Further Study).

3GPP TSG-SA2 Meeting #15 ***Tdoc S2-002069***
Makuhari, Japan, 13th-17th of November 2000

CR-Form-v3

CHANGE REQUEST

⌘ **23.107** **CR** 039 ⌘ rev **-** ⌘ Current version: **3.4.0** ⌘

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

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

Title:	⌘	Asymmetric Transfer Delay
Source:	⌘	QoS Drafting Group
Work item code:	⌘	QoS ***Date:*** ⌘ 2000-11-15~~14~~
Category:	⌘	**F** ***Release:*** ⌘ ~~R99~~REL-4

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

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	This CR clarifies the use of values for the Transfer Delay attribute. Asymmetrical transfer delays shall be specified separately. The following case is one example: When the conversational traffic class is used for voice, transcoding delay and node B processing delay for uplink and downlink may be significantly different.
Summary of change:	⌘	Text is added to indicate that the transfer delay is also an asymmetrical attribute.
Consequences if not approved:	⌘	

Clauses affected:	⌘	6.4.1
Other specs affected:	⌘	[X] Other core specifications ⌘ 24.008 [ ] Test specifications [ ] O&M Specifications
Other comments:	⌘	See also TSG-RAN3: R3-00393 March 2000, identifies the UTRAN delay splitting. See also 3G TS 25.413 – Asymmetrical Indicator in section 9.2.1.3.

6.4.1 Asymmetric Bearers

Uni-directional and bi-directional bearer services shall be supported. For bi-directional bearer services, the attributes Maximum bitrate, ~~and~~ Guaranteed bitrate, and ~~t~~Transfer delay should be possible to set separately for uplink/downlink in order to support asymmetric bearers.