Technical Specification Group Services and System Aspects TSGS#15(02)0132

Meeting #15, Jeju-do, Korea, 5-14 March 2002

Source: TSG SA WG2 Title: CRs on 23.107 rel99 (v.3.7.0), Rel-4 (v. 4.3.0), and Rel-5 (v. 5.3.0) 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 #15.

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.

Tdoc #	Title	Spec	CR #	c	Rel	WI
				a		
				t		
S2-020169	Clarification of the QoS mapping	23.107	083	F	R99	TEI
	on the MS					
S2-020170	Clarification of the QoS mapping on the MS	23.107	084	A	R4	TEI4
S2-020171	Clarification of the QoS mapping on the MS	23.107	085	A	R5	TEI5
S2-020649	QoS mapping rule for the R99 delivery order attribute	23.107	096	F	R99	TEI
S2-020652	QoS mapping rule for the R99 delivery order attribute	23.107	097	A	R4	TEI4
S2-020653	QoS mapping rule for the R99 delivery order attribute	23.107	098	A	R5	TEI5
S2-020723	Corrections on attribute values	23.107	093r1	F	R99	TEI
S2-020724	Corrections on attribute values	23.107	099	F	R4	TEI4
S2-020813	Corrections on attribute values	23.107	100r1	F	R5	TEI5
S2-020916	Determining the highest QoS	23.107	086r3	F	R99	TEI
S2-020917	Determining the highest QoS	23.107	087r3	A	R4	TEI4
S2-020918	Determining the highest QoS	23.107	088r3	A	R5	TEI5

CRs on 23.107 Release 99, with mirror CRs to Rel-4 and Rel-5:

3GPP TSG-SA2 Meeting #22 Phoenix, USA, 14.- 18. January 2002

Tdoc S2-020169

CHANGE REQUEST													
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Proposed change affects: # (U)SIM ME/UE X Radio Access Network Core Network X													
Title: #	Cla	rificati	on of t	he QoS I	mappin	<mark>g on tl</mark>	ne N	IS					
Source: ¥	Sier	mens	AG										
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Reason for change	: #	At th attrib class QoS	e morr outes a value attribu	pent it is pplies al the MS utes from	not spe so for t shall as the ap	cified he MS ssume plication	that 5. Fu 9 for 0n.	the m rthern the RS	nappir nore, 97/98	ng betwee it is oper attribute	en R9 whic s if it	9 - R97/9 h preced gets only	98 QoS ence the R99
Summary of chang	e: #	It is p prece	oropos edence	ed to de e value t	fine, tha o subso	at in th ribed.	e ab	ove n	nentio	oned case	e the	MS shall	set the
Consequences if not approved:	ж	Diffe	rent M	S impler	nentatio	ons.							
Clauses affected:	ж	2, 9.	1.2.2; s	9.1.2.3									
Other specs affected:	ж	Of Te Of	ther co est spe &M Sp	ore speci ecification pecification	fication ns ons	S	¥						
Other comments:	ж												

2 References

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

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- [1] 3GPP TS 23.110: "UMTS Access Stratum Services and Functions".
- [2] 3GPP TS 22.100: "Service aspects, Service principles".
- [3] 3GPP TS 23.121: "Evolution of the GSM platform towards UMTS".
- [4] (Void)
- [5] 3GPP TS 22.105: "Services & Service capabilities".
- [6]
 3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core Network Protocols –

 Stage 3"

9.1.2.2 Determining R99 attributes from R97/98 attributes

This mapping is applicable in the following cases:

- hand over of PDP Context from GPRS R97/98 SGSN to GPRS R99 or UMTS SGSN;
- PDP Context Activation in a serving R99 SGSN with a R97/98 GGSN. When GGSN respond to the PDP Context Activation, mapping of the changed R97/98 QoS attributes received from the GGSN to R99 QoS attributes is performed in the serving SGSN;

This mapping is also applicable if a R99 MS allows an application to request a PDP Context Activation with R97/98 QoS attributes, e.g. via AT command.

Resulting R99	Attribute	Deri	Derived from R97/98 Attribute				
Name	Value	Value	Name				
Traffic class	Interactive	1, 2, 3	Delay class				
	Background	4					
Traffic handling priority	1	1	Delay class				
	2	2					
	3	3					
SDU error ratio	10 ⁻⁶	1, 2	Reliability class				
	10 ⁻⁴	3					
	10 ⁻³	4, 5					
Residual bit error ratio	10 ⁻⁵	1, 2, 3, 4	Reliability class				
	4*10 ⁻³	5					
Delivery of erroneous SDUs	'no'	1, 2, 3, 4	Reliability class				
	'yes'	5					
Maximum bitrate [kbps]	8	1	Peak throughput class				
	16	2					
	32	3					
	64	4					
	128	5					
	256	6					
	512	7					
	1024	8					
	2048	9					
Allocation/Retention priority	1	1	Precedence class				
	2	2					
	3	3					
Delivery order	yes'	yes'	Reordering Required (Information				
	'no'	'no'	in the SGSN and the GGSN PDP Contexts)				
Maximum SDU size	1 500 octets	(Fixed value)					

Table 6: Rules for determining R99 attributes from R97/98 attributes

Note: As the allocation/retention priority attribute is not available in the MS(see 6.4.4.1) the mapping of the allocation/retention priority attribute is not relevant for the MS.

9.1.2.3 Determining R97/98 attributes from R99 attributes

This mapping is applicable in the following cases:

- PDP Context is handed over from GPRS R99 or UMTS to GPRS R97/98;
- when a R99 MS perform a PDP Context Activation in a serving R99 SGSN while the GGSN is of R97/98. In this case the SGSN shall perform mapping of the R99 QoS attributes to the R97/98 QoS attributes;
- a R99 HLR may need to map the stored subscribed QoS attributes in the HLR subscriber data to R97/98 QoS attributes that are going to be sent in the Insert Subscriber Data message from the R99 HLR to the R97/98 and R99 SGSN. It is an implementation issue if the R97/98 QoS attributes are stored in the HLR in addition to the R99 QoS attributes.

• <u>a R99 MS (except UMTS only MS) receives a request for a PDP Context Activation with R99 QoS attributes, e.g. via AT command.</u>

Resulting R97/98	Attribute	Derived from R99 Attribute					
Name	Value	Value	Name				
Delay class	1	Conversational	Traffic class				
	1	Streaming	Traffic class				
	1	Interactive	Traffic class				
		1	Traffic handling priority				
	2	Interactive	Traffic class				
		2	Traffic handling priority				
	3	Interactive	Traffic class				
		3	Traffic handling priority				
	4	Background	Traffic class				
Reliability class	2	<= 10 ⁻⁵	SDU error ratio				
	3	$10^{-5} < x <= 5^{*}10^{-4}$	SDU error ratio				
	4	> 5*10 ⁻⁴	SDU error ratio				
		<= 2*10 ⁻⁴	Residual bit error ratio				
	5	> 5*10 ⁻⁴	SDU error ratio				
		> 2*10 ⁻⁴	Residual bit error ratio				
Peak throughput class	1	< 16	Maximum bitrate [kbps]				
	2	16 <= x < 32					
	3	32 <= x < 64					
	4	64 <= x < 128					
	5	128 <= x < 25					
	6	256 <= x < 512					
	7	512 <= x < 1024					
	8	1024 <= x < 2048					
	9	>= 2048					
Precedence class	1	1	Allocation/retention priority				
	2	2					
	3	3					
Mean throughput class	Always set to 31	-					
Reordering Required	yes'	yes'	Delivery order				
(Information in the SGSN and		· · ·					
the GGSN PDP Contexts)	'noʻ	'no′					

Table 7: Rules for determining R97/98 attributes from R99 attributes

<u>As the allocation/retention priority attribute is not available in the MS(see 6.4.4.1) the MS shall set the R97/98</u> precedence class attribute to the value "subscribed" (see <u>3GPP TS 24.008)</u>.

3GPP TSG-SA2 Meeting #22 Phoenix, USA, 14.- 18. January 2002

Tdoc S2-020170

CHANGE REQUEST										
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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 Core Network X										
Title: ೫ (Clarificatio	on of the QoS	mapping or	the MS	5					
Source: ೫ <mark>S</mark>	Siemens /	AG								
Work item code: #	TEI					Date: ೫	2002-01-09	9		
Category: # U	A se <u>one</u> of t F (corr A (corr B (ada C (fund D (edit etailed exp e found in 3	the following cat ection) responds to a co lition of feature), ctional modification orial modification lanations of the 3GPP <u>TR 21.90</u>	tegories: prrection in a tion of feature n) above categ <u>0</u> .	n earlier ə) gories ca	<i>release</i> , n	Release: ₩ Use <u>one</u> of 2) R96 R97 R98 R99 REL-4 REL-5	Rel 4 the following r (GSM Phase (Release 199 (Release 199 (Release 199 (Release 4) (Release 5)	eleases: 2) 6) 7) 8) 9)		
Reason for change:	X At the attrib class QoS	e moment it is utes applies a value the MS attributes from	not specifie lso for the N shall assur the applica	ed that that that that that the second secon	he map hermoi he R97/	pping betwee re, it is open /98 attributes	n R99 - R97/ which preced if it gets only	98 QoS dence y the R99		
Summary of change:	۲ <mark>It is p</mark> prece	proposed to de edence value t	fine, that in o subscribe	the abo d.	ve mei	ntioned case	the MS shal	l set the		
Consequences if not approved:	# Diffe	rent MS implei	mentations.							
Clauses affected:	೫ <mark>2,9.</mark> ′	1.2.2; 9.1.2.3								
Other specs affected:	¥ Ot Te O≀	her core spec est specificatio &M Specificatio	ifications ns ons	ж						
Other comments:	ж									

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 Stage 3"

9.1.2.2 Determining R99 attributes from R97/98 attributes

This mapping is applicable in the following cases:

- hand over of PDP Context from GPRS R97/98 SGSN to GPRS R99 or UMTS SGSN;
- PDP Context Activation in a serving R99 SGSN with a R97/98 GGSN. When GGSN respond to the PDP Context Activation, mapping of the changed R97/98 QoS attributes received from the GGSN to R99 QoS attributes is performed in the serving SGSN.

This mapping is also applicable if a R99 MS allows an application to request a PDP Context Activation with R97/98 QoS attributes, e.g. via AT command.

Resulting R99	Attribute	Deri	Derived from R97/98 Attribute					
Name	Value	Value	Name					
Traffic class	Interactive	1, 2, 3	Delay class					
	Background	4						
Traffic handling priority	1	1	Delay class					
	2	2						
	3	3						
SDU error ratio	10 ⁻⁶	1, 2	Reliability class					
	10 ⁻⁴	3						
	10 ⁻³	4, 5						
Residual bit error ratio	10 ⁻⁵	1, 2, 3, 4	Reliability class					
	4*10 ⁻³	5						
Delivery of erroneous SDUs	'no'	1, 2, 3, 4	Reliability class					
,	'yes'	5						
Maximum bitrate [kbps]	8	1	Peak throughput class					
	16	2						
	32	3						
	64	4						
	128	5						
	256	6						
	512	7						
	1024	8						
	2048	9						
Allocation/Retention priority	1	1	Precedence class					
	2	2						
	3	3						
Delivery order	yes'	yes'	Reordering Required (Information					
	'no'	'no'	in the SGSN and the GGSN PDP Contexts)					
Maximum SDU size	1 500 octets	(Fixed value)						

Table 6: Rules for determining R99 attributes from R97/98 attributes

Note: As the allocation/retention priority attribute is not available in the MS(see 6.4.4.1) the mapping of the allocation/retention priority attribute is not relevant for the MS.

9.1.2.3 Determining R97/98 attributes from R99 attributes

This mapping is applicable in the following cases:

- PDP Context is handed over from GPRS R99 or UMTS to GPRS R97/98;
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- a R99 HLR may need to map the stored subscribed QoS attributes in the HLR subscriber data to R97/98 QoS attributes that are going to be sent in the Insert Subscriber Data message from the R99 HLR to the R97/98 and R99 SGSN. It is an implementation issue if the R97/98 QoS attributes are stored in the HLR in addition to the R99 QoS attributes.

• <u>a R99 MS (except UMTS only MS) receives a request for a PDP Context Activation with R99 QoS attributes, e.g. via AT command.</u>

Resulting R97/98	Attribute	Derived from R99 Attribute				
Name	Value	Value	Name			
Delay class	1	conversational	Traffic class			
-	1	streaming	Traffic class			
	1	Interactive	Traffic class			
		1	Traffic handling priority			
	2	Interactive	Traffic class			
		2	Traffic handling priority			
	3	Interactive	Traffic class			
		3	Traffic handling priority			
	4	Background	Traffic class			
Reliability class	2	<= 10 ⁻⁵	SDU error ratio			
	3	$10^{-5} < x <= 5^{*}10^{-4}$	SDU error ratio			
	4	> 5*10 ⁻⁴	SDU error ratio			
		<= 2*10 ⁻⁴	Residual bit error ratio			
	5	> 5*10 ⁻⁴	SDU error ratio			
		> 2*10 ⁻⁴	Residual bit error ratio			
Peak throughput class	1	< 16	Maximum bitrate [kbps]			
	2	16 <= x < 32				
	3	32 <= x < 64	-			
	4	64 <= x < 128				
	5	128 <= x < 25				
	6	256 <= x < 512				
	7	512 <= x < 1024				
	8	1024 <= x < 2048	-			
	9	>= 2048				
Precedence class	1	1	Allocation/retention priority			
	2	2				
	3	3				
Mean throughput class	Always set to 31	-				
Reordering Required	yes'	yes'	Delivery order			
(Information in the SGSN and	1					
the GGSN PDP Contexts)	îno ^r	'no'				

Table 7: Rules for determining R97/98 attributes from R99 attributes

<u>As the allocation/retention priority attribute is not available in the MS(see 6.4.4.1) the MS shall set the R97/98</u> precedence class attribute to the value "subscribed" (see <u>3GPP TS 24.008)</u>.

3GPP TSG-SA2 Meeting #22 Phoenix, USA, 14.- 18. January 2002

Tdoc S2-020171

CR-Form-v4 CHANGE REQUEST										
¥	<mark>23.107</mark>	CR 085	ж	ev	жC	Current versi	ion: 5.	3.0	ж	
For <u>HELP</u> 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 Core Network X										
Title: ೫	Clarification	on of the QoS r	mapping on	the MS						
Source: ೫	Siemens .	AG								
Work item code: Ж	TEI					Date: ೫	2002-0	1-09		
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Summary of change	e: # It is p prece	proposed to def edence value to	fine, that in o subscribe	the abov d.	e ment	tioned case	the MS s	shall s	et the	
Consequences if not approved:	# Diffe	rent MS implen	nentations.							
Clauses affected:	₩ <mark>2,9.</mark>	1.2.2; 9.1.2.3								
Other specs affected:	ж О Те О	her core specifiest specification M Specification	fications ns ons	¥						
Other comments:	ж									

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 Stage 3"

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Resulting R99	Attribute	Deri	Derived from R97/98 Attribute				
Name	Value	Value	Name				
Traffic class	Interactive	1, 2, 3	Delay class				
	Background	4					
Traffic handling priority	1	1	Delay class				
	2	2					
	3	3					
SDU error ratio	10 ⁻⁶	1, 2	Reliability class				
	10 ⁻⁴	3					
	10 ⁻³	4, 5					
Residual bit error ratio	10 ⁻⁵	1, 2, 3, 4	Reliability class				
	4*10 ⁻³	5					
Delivery of erroneous SDUs	'no'	1, 2, 3, 4	Reliability class				
	'yes'	5					
Maximum bitrate [kbps]	8	1	Peak throughput class				
	16	2					
	32	3					
	64	4					
	128	5					
	256	6					
	512	7					
	1024	8					
	2048	9					
Allocation/Retention priority	1	1	Precedence class				
	2	2					
	3	3					
Delivery order	yes'	yes'	Reordering Required (Information				
	'no'	'no'	in the SGSN and the GGSN PDP Contexts)				
Maximum SDU size	1 500 octets	(Fixed value)	KK				

Table 6: Rules for determining R99 attributes from R97/98 attributes

Note: As the allocation/retention priority attribute is not available in the MS(see 6.4.4.1) the mapping of the allocation/retention priority attribute is not relevant for the MS.

9.1.2.3 Determining R97/98 attributes from R99 attributes

This mapping is applicable in the following cases:

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- a R99 HLR may need to map the stored subscribed QoS attributes in the HLR subscriber data to R97/98 QoS attributes that are going to be sent in the Insert Subscriber Data message from the R99 HLR to the R97/98 and R99 SGSN. It is an implementation issue if the R97/98 QoS attributes are stored in the HLR in addition to the R99 QoS attributes.

• <u>a R99 MS (except UMTS only MS) receives a request for a PDP Context Activation with R99 QoS attributes, e.g. via AT command.</u>

Resulting R97/98	Attribute	Derived from R99 Attribute				
Name	Value	Value	Name			
Delay class	1	conversational	Traffic class			
-	1	streaming	Traffic class			
	1	Interactive	Traffic class			
		1	Traffic handling priority			
	2	Interactive	Traffic class			
		2	Traffic handling priority			
	3	Interactive	Traffic class			
		3	Traffic handling priority			
	4	Background	Traffic class			
Reliability class	2	<= 10 ⁻⁵	SDU error ratio			
	3	$10^{-5} < x <= 5^{*}10^{-4}$	SDU error ratio			
	4	> 5*10 ⁻⁴	SDU error ratio			
		<= 2*10 ⁻⁴	Residual bit error ratio			
	5	> 5*10 ⁻⁴	SDU error ratio			
		> 2*10 ⁻⁴	Residual bit error ratio			
Peak throughput class	1	< 16	Maximum bitrate [kbps]			
	2	16 <= x < 32				
	3	32 <= x < 64	-			
	4	64 <= x < 128				
	5	128 <= x < 25				
	6	256 <= x < 512				
	7	512 <= x < 1024				
	8	1024 <= x < 2048	-			
	9	>= 2048				
Precedence class	1	1	Allocation/retention priority			
	2	2				
	3	3				
Mean throughput class	Always set to 31	-				
Reordering Required	yes'	yes'	Delivery order			
(Information in the SGSN and	1					
the GGSN PDP Contexts)	îno ^r	'no'				

Table 7: Rules for determining R97/98 attributes from R99 attributes

<u>As the allocation/retention priority attribute is not available in the MS(see 6.4.4.1) the MS shall set the R97/98</u> precedence class attribute to the value "subscribed" (see <u>3GPP TS 24.008)</u>.

3GPP TSG-SA2 Meeting #23 Sophia Antipolis, France, 18-22 February, 2002

Tdoc S2-020649

CHANGE REQUEST														
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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 Core Network X														
Title: %	Qos	<mark>S map</mark>	<mark>ping ru</mark>	ule for the	e R99 (deliver	y oro	der at	tribut	te				
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Work item code: Ж	TEI									Date: ೫	3 <mark>13</mark>	.02.2002	2	
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Reason for change	e: X	At th deliv appli	e morr ery orc cation	nent it is der attrib	not spe utes if i	ecified it gets	whic only	the F	ue th R97/9	e MS sha 98 QoS att	II assu ribute	ume for es from t	the R he	99
Summary of chang	је: Ж	lt is p deliv	oropos ery oro	ed to det der attrib	fine, tha ute to t	at in th he val	ne ab ue s	ove r ubscr	nenti ibed.	ioned case	e the	MS sha	l set t	he
Consequences if not approved:	ж	Diffe	rent M	S impler	nentati	ons.								
Clauses offersted	مە	0.4.0												
Clauses allected:	ተ	9.1.2	Z											
Other specs affected:	Ж	0 Te 0	ther co est spe &M Sp	ore speci ecification pecification	fication ns ons	IS	ж							
Other comments:	ж													

9.1.2.2 Determining R99 attributes from R97/98 attributes

This mapping is applicable in the following cases:

- hand over of PDP Context from GPRS R97/98 SGSN to GPRS R99 or UMTS SGSN;
- PDP Context Activation in a serving R99 SGSN with a R97/98 GGSN. When GGSN respond to the PDP Context Activation, mapping of the changed R97/98 QoS attributes received from the GGSN to R99 QoS attributes is performed in the serving SGSN.

This mapping is also applicable if a R99 MS allows an application to request a PDP Context Activation with R97/98 QoS attributes, e.g. via AT command.

Resulting R99	Attribute	Deri	Derived from R97/98 Attribute					
Name	Value	Value	Name					
Traffic class	Interactive	1, 2, 3	Delay class					
	Background	4						
Traffic handling priority	1	1	Delay class					
	2	2						
	3	3						
SDU error ratio	10 ⁻⁶	1, 2	Reliability class					
	10 ⁻⁴	3						
	10 ⁻³	4, 5						
Residual bit error ratio	10 ⁻⁵	1, 2, 3, 4	Reliability class					
	4*10 ⁻³	5						
Delivery of erroneous SDUs	'no'	1, 2, 3, 4	Reliability class					
	'yes'	5						
Maximum bitrate [kbps]	8	1	Peak throughput class					
	16	2	Ŭ.					
	32	3						
	64	4						
	128	5						
	256	6						
	512	7						
	1024	8						
	2048	9						
Allocation/Retention priority	1	1	Precedence class					
	2	2						
	3	3						
Delivery order	yes'	yes'	Reordering Required (Information					
	'no'	'no'	in the SGSN and the GGSN PDP Contexts)					
Maximum SDU size	1 500 octets	(Fixed value)						

Table 6: Rules for determining R99 attributes from R97/98 attributes

Note: As the allocation/retention priority attribute is not available in the MS (see 6.4.4.1) the mapping of the allocation/retention priority attribute is not relevant for the MS.

As the reordering required attribute is not available in the MS the MS shall set the R99 delivery order attribute to the value "subscribed" (see 3GPP TS 24.008).

*** following extract from 24.008 for information only! ***

10.5.6.5 Quality of service

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

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

The *quality of service* is a type 4 information element with a length of 13octets. The *quality of service* information element is coded as shown in figure 10.5.138/3GPP TS 24.008 and table 10.5.156/3GPP TS 24.008.

8	7	6	5	4	3	2	1		
Quality of service IEI								octet 1	
Length of quality of service IE							Octet 2		
0	0		Delay Reliability						
sp	are		class			class			
	Pe	ak		0	F	Precedenc	e	octet 4	
	throughput			spare		class			
0	0	0			Mean			octet 5	
	spare			throughput					
Т	raffic Clas	SS	Deliver	y order	Delive	ery of erro	neous	Octet 6	
						SDU			
	Maximum SDU size							Octet 7	
	Maximum bit rate for uplink							Octet 8	
	Maximum bit rate for downlink						Octet 9		
	Residual BER SDU error ratio							Octet 10	
		Transfe	er delay			Traffic H	landling	Octet 11	
						pric	ority		
							Octet 12		
Guaranteed bit rate for uplink									
Guaranteed bit rate for downlink						Octet 13			

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

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



In MS to network direction and in network to MS direction :

- 0 0 1 Delay class 1
- 0 1 0 Delay class 2
- 0 1 1 Delay class 3
- 1 0 0 Delay class 4 (best effort)
- 111 Reserved

All other values are interpreted as Delay class 4 (best effort) in this version of the protocol. Bit 7 and 8 of octet 3 are spare and shall be coded all 0. Precedence class, octet 4 (see 3GPP TS 23.107) Bits 321 In MS to network direction: Subscribed precedence 000 In network to MS direction: 000 Reserved In MS to network direction and in network to MS direction : 001 High priority 010 Normal priority 011 Low priority Reserved 111 All other values are interpreted as Normal priority in this version of the protocol. Bit 4 of octet 4 is spare and shall be coded as 0. Peak throughput, octet 4 (see 3GPP TS 23.107) Bits 8765 In MS to network direction: 0000 Subscribed peak throughput In network to MS direction: 0000 Reserved In MS to network direction and in network to MS direction : Up to 1 000 octet/s 0001 0010 Up to 2 000 octet/s 0011 Up to 4 000 octet/s Up to 8 000 octet/s 0100 Up to 16 000 octet/s 0101 0110 Up to 32 000 octet/s 0111 Up to 64 000 octet/s Up to 128 000 octet/s 1000 1001 Up to 256 000 octet/s 1111 Reserved All other values are interpreted as Up to 1 000 octet/s in this version of the protocol. Mean throughput, octet 5 (see 3GPP TS 23.107) Bits 54321

	< direction:					
00000	Subscribed mean throughput					
In network to MS direction:						
00000	Reserved					
In MS to network	A direction and in network to MS direction :					
00001	100 octevn					
00010						
00011	1 000 octot/b					
00100	2 000 octet/h					
00101	5 000 octet/h					
00110	10 000 octet/h					
01000	20 000 octet/h					
01001	50 000 octet/h					
01010	100 000 octet/h					
01011	200 000 octet/h					
01100	500 000 octet/h					
01101	1 000 000 octet/h					
01110	2 000 000 octet/h					
01111	5 000 000 octet/h					
10000	10 000 000 octet/h					
10001	20 000 000 octet/h					
10010	50 000 000 octet/h					
11110	Reserved					
11111	Best effort					
The value Best	effort indicates that throughput shall be made available to the MS on a per need and availability					
basis.						
All other values	are interpreted as Best effort in this					
version of the pr	otocol.					
Bits 8 to 6 of oct	et 5 are spare and shall be coded all 0.					
Delivery of error Bits 3 2 1	eous SDUs, octet 6 (see 3GPP TS 23.107)					
Delivery of error Bits 3 2 1 In MS to networl	eous SDUs, octet 6 (see 3GPP TS 23.107)					
Delivery of error Bits 3 2 1 In MS to networl 0 0 0	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs					
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs 6 direction:					
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0	eous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved					
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0 In MS to networl	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs 6 direction: Reserved < direction and in network to MS direction :					
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0 In MS to networl 0 0 1	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs 6 direction: Reserved < direction and in network to MS direction : No detect ('-')					
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0 In MS to networl 0 0 1 0 1 0	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs 6 direction: Reserved < direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes')					
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0 In MS to networl 0 0 1 0 1 0 0 1 1	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs 6 direction: Reserved < direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no')					
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0 In MS to networl 0 0 1 0 1 0 0 1 1 1 1 1	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs 6 direction: Reserved < direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved					
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0 In MS to networl 0 0 1 0 1 0 0 1 1 1 1 1	direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved					
Delivery of error Bits 3 2 1 In MS to networl 0 0 In network to MS 0 0 0 In MS to networl 0 1 0 0 1 1 1 1 1	direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved					
Delivery of error Bits 3 2 1 In MS to network 0 0 In network to MS 0 0 0 In MS to network 0 1 0 0 1 1 1 1 1 The network sha	direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved di map all other values not explicitly defined onto one of the values defined in this version of the					
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 1 0 0 1 1 1 1 1 The network sha protocol. The network	direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved difference and the values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol.					
Delivery of error Bits 3 2 1 In MS to networf 0 0 0 In network to MS 0 0 0 In MS to networf 0 1 0 0 1 1 1 1 1 The network sha protocol. The network	direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved di map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved.					
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 0 1 0 1 0 0 1 1 1 1 1 The network sha protocol. The network sha protocol. The network shall co Delivery order, co	A direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved All map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Autoret 6 (see 3GPP TS 23.107)					
Delivery of error Bits 3 2 1 In MS to networt 0 0 0 In network to MS 0 0 0 In MS to networt 0 0 1 0 1 0 0 1 1 1 1 1 The network sha protocol. The ne	eeous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved all map all other values not explicitly defined onto one of the values defined in this version of the tetwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Ercet 6 (see 3GPP TS 23.107)					
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 0 1 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap protocol. The network shap protocol. The network shap pelivery order, of Bits 5 4 3	A direction: Subscribed delivery of erroneous SDUs 3 direction: Reserved 4 direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved All map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Extert 6 (see 3GPP TS 23.107)					
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 1 0 0 1 1 1 1 1 The network sha protocol. The network sha protocol. The network sha protocol. The network The MS shall co Delivery order, co Bits 5 4 3 In MS to network	eeous SDUs, octet 6 (see 3GPP TS 23.107) (direction: Subscribed delivery of erroneous SDUs 6 direction: Reserved (direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved III map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Actet 6 (see 3GPP TS 23.107)					
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap protocol. The network shap protocol. The network Delivery order, construction Bits 5 4 3 In MS to network 0 0	eeous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved all map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Actet 6 (see 3GPP TS 23.107) direction: Subscribed delivery order					
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap Delivery order, constant Bits 5 4 3 In MS to network to MS	eeous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved dil map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Incetet 6 (see 3GPP TS 23.107) difference: Subscribed delivery order direction: Subscribed delivery order direction:					
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 0 1 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap on the MS to network 0 0 In network to MS 0 0	eous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved all map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Acte t 6 (see 3GPP TS 23.107) direction: Subscribed delivery order direction: Reserved					
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap protocol. The network shap protocol. The network Delivery order, construction Bits 5 4 3 In MS to network 0 0 In network to MS 0 0 In MS to network	eous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved all map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Intert of (see 3GPP TS 23.107) direction: Subscribed delivery order Girection: Reserved direction: Reserved direction: Subscribed delivery order Girection: Reserved direction: Reserved direction: Reserved direction: Reserved direction and in network to MS direction :					
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 0 1 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap of the MS shall co Delivery order, co Bits 5 4 3 In MS to network 0 0 In network to MS 0 0 In MS to network 0 1	eous SDUs, octet 6 (see 3GPP TS 23.107)					
Delivery of error Bits 3 2 1 In MS to networf 0 0 0 In network to MS 0 0 0 In MS to networf 0 0 1 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap o Delivery order, c Bits 5 4 3 In MS to networf 0 0 In network to MS 0 0 In MS to networf 0 1 1 0	eous SDUs, octet 6 (see 3GPP TS 23.107)					
Delivery of error Bits 3 2 1 In MS to networf 0 0 0 In network to MS 0 0 0 In MS to networf 0 0 1 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap on the MS shall control Delivery order, control Bits 5 4 3 In MS to networf 0 0 In network to MS 0 0 In MS to networf 0 1 1 0 1 1	eeous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved III map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. ctet 6 (see 3GPP TS 23.107) diffection: Subscribed delivery order direction: Reserved direction: With delivery order ('yes') Without delivery order ('no') Reserved					

Traine class, ocle	10 (See 3GPP 15 23.107)
Bits	
876	
In MS to network	direction:
000	Subscribed traffic class
In network to MS	direction:
000	Reserved
In MS to network	direction and in network to MS direction :
001	Conversational class
010	Streaming class
011	Interactive class
100	Background class
111	Reserved

Traffic alass satet C (ass 2000 TC 02 407)

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

The MS shall consider all other values as reserved.

Maximum SDU size, octet 7 (see 3GPP TS 23.107)In MS to network direction:0 0 0 0 0 0 0 01 1 1 1 1 1 1ReservedIn network to MS direction:0 0 0 0 0 0 0 00 0 0 0 0 0 0 0Reserved1 1 1 1 1 1 1ReservedI n 1 1 1 1 1 1ReservedI n MS to network direction and in network to MS direction :

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

10010111	1502 octets
10011000	1510 octets
10011001	1520 octets

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

The MS shall consider all other values as reserved.

Maximum bit rate for uplink, octet 8 Bits 87654321 In MS to network direction: 0000000 Subscribed maximum bit rate for uplink In network to MS direction: 0000000 Reserved In MS to network direction and in network to MS direction : 0 0 0 0 0 0 0 1 The maximum bit rate is binary coded in 8 bits, using a granularity of 1 kbps 00111111 giving a range of values from 1 kbps to 63 kbps in 1 kbps increments. The maximum bit rate is 64 kbps + ((the binary coded value in 8 bits -01000000) * 8 kbps) 01000000 giving a range of values from 64 kbps to 568 kbps in 8 kbps increments. 01111111 1000000 The maximum bit rate is 576 kbps + ((the binary coded value in 8 bits -10000000) * 64 kbps) 11111110 giving a range of values from 576 kbps to 8640 kbps in 64 kbps increments. 11111111 0kbps Maximum bit rate for downlink, octet 9 (see 3GPP TS 23.107)

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

Residual Bit Error Rate (BER), octet 10 (see 3GPP TS 23.107) Bits 8765 In MS to network direction: Subscribed residual BER 0000 In network to MS direction: 0000 Reserved In MS to network direction and in network to MS direction : The Residual BER value consists of 4 bits. The range is from $5^{*}10^{-2}$ to $6^{*}10^{-8}$. 5*10⁻² 0001 1*10⁻² 0010 5*10⁻³ 0011 4*10⁻³ 0100 1*10⁻³ 0101 1*10⁻⁴ 0110 1*10⁻⁵ 0111 1*10⁻⁶ 1000 6*10⁻⁸ 1001 1111 Reserved The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol. The network shall return a negotiated value which is explicitly defined in this version of the protocol. The MS shall consider all other values as reserved. SDU error ratio, octet 10 (see 3GPP TS 23.107) Bits 4321 In MS to network direction: Subscribed SDU error ratio 0000 In network to MS direction: 0000 Reserved In MS to network direction and in network to MS direction : The SDU error ratio value consists of 4 bits. The range is is from $1*10^{-1}$ to $1*10^{-6}$. 0001 1*10⁻² 7*10⁻³ 0010 1*10⁻³ 0011 1*10⁻⁴ 0100 1*10⁻⁵ 0101 1*10⁻⁶ 0110 1*10⁻¹ 0111 1111 Reserved The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol. The network shall return a negotiated value which is explicitly defined in this version of the protocol. The MS shall consider all other values as reserved. Traffic handling priority, octet 11 (see 3GPP TS 23.107) Bits 21 In MS to network direction: Subscribed traffic handling priority 0.0 In network to MS direction: 00 Reserved In MS to network direction and in network to MS direction : 01 Priority level 1 10 Priority level 2 11 Priority level 3 The Traffic handling priority value is ignored if the Traffic Class is Conversation class, Streaming class or Background class. Transfer delay, octet 11 (See 3GPP TS 23.107) Bits 876543

In MS to network direction:							
0 0 0 0 0 0 Subscribed transfer delay							
In network to MS direction:							
00000 Reserved							
In MS to network direction and in network to MS direction :							
000001	The Transfer delay is binary coded in 6 bits, using a granularity of 10 ms						
001111	giving a range of values from 10 ms to 150 ms in 10 ms increments						
010000	The transfer delay is 200 ms + ((the binary coded value in 6 bits – 010000) ^ 50 ms)						
011111	giving a range of values from 200 ms to 950 ms in 50ms increments						
100000	The transfer delay is $1000 \text{ ms} + ((\text{the binary coded value in 6 bits} - 100000) * 100 \text{ ms})$						
111110	aiving a range of value from 1000 ms to 1000 ms in 100ms increments						
111111	Reserved						
The Transfer de	lav value is ignored if the Traffic Class is Interactive class or Background class.						
Guaranteed bit r	Guaranteed bit rate for uplink octet 12 (See 3GPP TS 23 107)						
Coding is identical to that of Maximum bit rate for uplink.							
.							
The Guaranteed	bit rate for uplink value is ignored if the Traffic Class is Interactive class or Background class, or						
Maximum bit rate	e for uplink is set to 0 kbps.						
Guaranteed bit r	ate for downlink, octet 13(See 3GPP TS 23.107)						
Coding is identic	cal to that of Maximum bit rate for uplink.						

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

3GPP TSG-SA2 Meeting #23 Sophia Antipolis, France, 18-22 February, 2002

Tdoc S2-020652

CHANGE REQUEST													
ж	23.	<mark>107</mark>	CR ()97	ж	s rev	-	Ħ	Cur	rent vers	sion:	<mark>.3.0</mark>	Ħ
For <mark>HELP</mark> on u	sing ti	his for	m, see l	bottom	of this p	age c	r look	at th	ie pop	o-up text	over th	е ж sy	mbols.
Proposed change	affect	s: #	(U)S	IM	ME/U	EX	Ra	dio Ac	ccess	Networ	k	Core No	etwork X
Title: %	Qos	<mark>S map</mark>	<mark>ping rul</mark> e	e for the	R99 de	elivery	orde	r attri	ibute				
Source: ೫	Sier	nens .	AG										
Work item code: ೫	TEI	4								Date: ೫	13.02	2.2002	
Category: ₩	A Use <u>c</u> I Detai be for	one of a F (corr A (corr B (adc C (fund D (edia led exp und in	the follov rection) responds lition of fo ctional mo torial mo blanation 3GPP <u>TF</u>	ving cate s to a col eature), nodification dification s of the a R 21.900	egories: rrection i on of fea) above ca	n an e ture) ategori	arlier i es car	releas	Rel Us e)	ease: # se <u>one</u> of 2 R96 R97 R98 R99 REL-4 REL-5	REL- the follo (GSM F (Releas (Releas (Releas (Releas (Releas	4 wing rel Phase 2) se 1996) se 1997) se 1998) se 1999) se 4) se 5)	eases:
Reason for change	e: X	At the deliver	e mome ery orde cation.	ent it is r er attribu	not spec utes if it	gets o	which only th	value ne R9	e the 97/98	MS shal QoS att	l assum ributes	ne for th from the	e R99 e
Summary of chang	1 e: #	lt is p deliv	oropose ery orde	d to def er attribu	ine, that ute to th	t in the e valu	e abo le sub	ve me oscrib	entior ed.	ned case	the MS	S shall s	set the
Consequences if not approved:	ж	Diffe	rent MS	implem	nentatio	ns.							
	0.0	0.4.0	0										
Clauses affected:	ж	9.1.2	.2										
Other specs affected:	Ж	01 Te	her core st spec &M Spe	e specif ification cificatio	ications s ns	:	¥						
Other comments:	ж												

9.1.2.2 Determining R99 attributes from R97/98 attributes

This mapping is applicable in the following cases:

- hand over of PDP Context from GPRS R97/98 SGSN to GPRS R99 or UMTS SGSN;
- PDP Context Activation in a serving R99 SGSN with a R97/98 GGSN. When GGSN respond to the PDP Context Activation, mapping of the changed R97/98 QoS attributes received from the GGSN to R99 QoS attributes is performed in the serving SGSN.

This mapping is also applicable if a R99 MS allows an application to request a PDP Context Activation with R97/98 QoS attributes, e.g. via AT command.

Resulting R99	Attribute	Deri	Derived from R97/98 Attribute					
Name	Value	Value	Name					
Traffic class	Interactive	1, 2, 3	Delay class					
	Background	4	·					
Traffic handling priority	1	1	Delay class					
	2	2						
	3	3						
SDU error ratio	10 ⁻⁶	1, 2	Reliability class					
	10 ⁻⁴	3						
	10 ⁻³	4, 5						
Residual bit error ratio	10 ⁻⁵	1, 2, 3, 4	Reliability class					
	4*10 ⁻³	5						
Delivery of erroneous SDUs	'no'	1, 2, 3, 4	Reliability class					
	'yes'	5						
Maximum bitrate [kbps]	8	1	Peak throughput class					
	16	2	Ŭ.					
	32	3						
	64	4						
	128	5						
	256	6						
	512	7						
	1024	8						
	2048	9						
Allocation/Retention priority	1	1	Precedence class					
	2	2						
	3	3						
Delivery order	yes'	yes'	Reordering Required (Information					
	'no'	'no'	in the SGSN and the GGSN PDP Contexts)					
Maximum SDU size	1 500 octets	(Fixed value)						

Table 6: Rules for determining R99 attributes from R97/98 attributes

Note: As the allocation/retention priority attribute is not available in the MS (see 6.4.4.1) the mapping of the allocation/retention priority attribute is not relevant for the MS.

As the reordering required attribute is not available in the MS the MS shall set the R99 delivery order attribute to the value "subscribed" (see 3GPP TS 24.008).

*** following extract from 24.008 for information only! ***

10.5.6.5 Quality of service

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

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

The *quality of service* is a type 4 information element with a length of 13octets. The *quality of service* information element is coded as shown in figure 10.5.138/3GPP TS 24.008 and table 10.5.156/3GPP TS 24.008.

8	7	6	5	4	3	2	1		
Quality of service IEI								octet 1	
Length of quality of service IE							Octet 2		
0	0		Delay Reliability						
sp	are		class			class			
	Pe	ak		0	F	Precedenc	e	octet 4	
	throughput			spare		class			
0	0	0			Mean			octet 5	
	spare			throughput					
Т	raffic Clas	SS	Deliver	y order	Delive	ery of erro	neous	Octet 6	
						SDU			
	Maximum SDU size							Octet 7	
	Maximum bit rate for uplink							Octet 8	
	Maximum bit rate for downlink						Octet 9		
	Residual BER SDU error ratio							Octet 10	
		Transfe	er delay			Traffic H	landling	Octet 11	
						pric	ority		
							Octet 12		
Guaranteed bit rate for uplink									
Guaranteed bit rate for downlink						Octet 13			

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

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



In MS to network direction and in network to MS direction :

- 0 0 1 Delay class 1
- 0 1 0 Delay class 2
- 0 1 1 Delay class 3
- 1 0 0 Delay class 4 (best effort)
- 111 Reserved

All other values are interpreted as Delay class 4 (best effort) in this version of the protocol. Bit 7 and 8 of octet 3 are spare and shall be coded all 0. Precedence class, octet 4 (see 3GPP TS 23.107) Bits 321 In MS to network direction: Subscribed precedence 000 In network to MS direction: 000 Reserved In MS to network direction and in network to MS direction : 001 High priority 010 Normal priority 011 Low priority Reserved 111 All other values are interpreted as Normal priority in this version of the protocol. Bit 4 of octet 4 is spare and shall be coded as 0. Peak throughput, octet 4 (see 3GPP TS 23.107) Bits 8765 In MS to network direction: 0000 Subscribed peak throughput In network to MS direction: 0000 Reserved In MS to network direction and in network to MS direction : Up to 1 000 octet/s 0001 0010 Up to 2 000 octet/s 0011 Up to 4 000 octet/s Up to 8 000 octet/s 0100 Up to 16 000 octet/s 0101 0110 Up to 32 000 octet/s 0111 Up to 64 000 octet/s Up to 128 000 octet/s 1000 1001 Up to 256 000 octet/s 1111 Reserved All other values are interpreted as Up to 1 000 octet/s in this version of the protocol. Mean throughput, octet 5 (see 3GPP TS 23.107) Bits 54321

	< direction:					
00000	Subscribed mean throughput					
In network to MS direction:						
00000	Reserved					
In MS to network	A direction and in network to MS direction :					
00001	100 octevn					
00010						
00011	1 000 octot/b					
00100	2 000 octet/h					
00101	5 000 octet/h					
00110	10 000 octet/h					
01000	20 000 octet/h					
01001	50 000 octet/h					
01010	100 000 octet/h					
01011	200 000 octet/h					
01100	500 000 octet/h					
01101	1 000 000 octet/h					
01110	2 000 000 octet/h					
01111	5 000 000 octet/h					
10000	10 000 000 octet/h					
10001	20 000 000 octet/h					
10010	50 000 000 octet/h					
11110	Reserved					
11111	Best effort					
The value Best	effort indicates that throughput shall be made available to the MS on a per need and availability					
basis.						
All other values	are interpreted as Best effort in this					
version of the pr	otocol.					
Bits 8 to 6 of oct	et 5 are spare and shall be coded all 0.					
Delivery of error Bits 3 2 1	eous SDUs, octet 6 (see 3GPP TS 23.107)					
Delivery of error Bits 3 2 1 In MS to networl	eous SDUs, octet 6 (see 3GPP TS 23.107)					
Delivery of error Bits 3 2 1 In MS to networl 0 0 0	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs					
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs 6 direction:					
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0	eous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved					
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0 In MS to networl	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs 6 direction: Reserved < direction and in network to MS direction :					
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0 In MS to networl 0 0 1	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs 6 direction: Reserved < direction and in network to MS direction : No detect ('-')					
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0 In MS to networl 0 0 1 0 1 0	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs 6 direction: Reserved < direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes')					
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0 In MS to networl 0 0 1 0 1 0 0 1 1	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs 6 direction: Reserved < direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no')					
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0 In MS to networl 0 0 1 0 1 0 0 1 1 1 1 1	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs 6 direction: Reserved < direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved					
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0 In MS to networl 0 0 1 0 1 0 0 1 1 1 1 1	direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved					
Delivery of error Bits 3 2 1 In MS to networl 0 0 In network to MS 0 0 0 In MS to networl 0 1 0 0 1 1 1 1 1	direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved					
Delivery of error Bits 3 2 1 In MS to network 0 0 In network to MS 0 0 0 In MS to network 0 1 0 0 1 1 1 1 1 The network sha	direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved di map all other values not explicitly defined onto one of the values defined in this version of the					
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 1 0 0 1 1 1 1 1 The network sha protocol. The network	direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved difference and the values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol.					
Delivery of error Bits 3 2 1 In MS to networf 0 0 0 In network to MS 0 0 0 In MS to networf 0 1 0 0 1 1 1 1 1 The network sha protocol. The network	direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved di map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved.					
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 0 1 0 1 0 0 1 1 1 1 1 The network sha protocol. The network sha protocol. The network shall co Delivery order, co	A direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved All map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Autoret 6 (see 3GPP TS 23.107)					
Delivery of error Bits 3 2 1 In MS to networt 0 0 0 In network to MS 0 0 0 In MS to networt 0 0 1 0 1 0 0 1 1 1 1 1 The network sha protocol. The ne	eeous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved all map all other values not explicitly defined onto one of the values defined in this version of the tetwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Ercet 6 (see 3GPP TS 23.107)					
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 0 1 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap protocol. The network shap protocol. The network shap pelivery order, of Bits 5 4 3	A direction: Subscribed delivery of erroneous SDUs 3 direction: Reserved 4 direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved All map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Extert 6 (see 3GPP TS 23.107)					
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 1 0 0 1 1 1 1 1 The network sha protocol. The network sha protocol. The network sha protocol. The network The MS shall co Delivery order, co Bits 5 4 3 In MS to network	eeous SDUs, octet 6 (see 3GPP TS 23.107) (direction: Subscribed delivery of erroneous SDUs 6 direction: Reserved (direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved III map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Actet 6 (see 3GPP TS 23.107)					
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap protocol. The network shap protocol. The network Delivery order, construction Bits 5 4 3 In MS to network 0 0	eeous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved all map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Actet 6 (see 3GPP TS 23.107) direction: Subscribed delivery order					
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap Delivery order, constant Bits 5 4 3 In MS to network to MS	eeous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved dil map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Incetet 6 (see 3GPP TS 23.107) difference: Subscribed delivery order direction: Subscribed delivery order direction:					
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 0 1 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap Delivery order, constant Bits 5 4 3 In MS to network to MS 0 0	eous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved all map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Acte t 6 (see 3GPP TS 23.107) direction: Subscribed delivery order direction: Reserved					
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap protocol. The network shap protocol. The network Delivery order, of Bits 5 4 3 In MS to network 0 0 In network to MS 0 0 In MS to network	eous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved all map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Intert of (see 3GPP TS 23.107) direction: Subscribed delivery order Girection: Reserved direction: Reserved direction: Subscribed delivery order Girection: Reserved direction: Reserved direction: Reserved direction: Reserved direction and in network to MS direction :					
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 0 1 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap on the MS shall control Delivery order, control Bits 5 4 3 In MS to network to MS 0 0 In network to MS 0 0 In MS to network 0 1	eous SDUs, octet 6 (see 3GPP TS 23.107)					
Delivery of error Bits 3 2 1 In MS to networf 0 0 0 In network to MS 0 0 0 In MS to networf 0 0 1 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap o Delivery order, c Bits 5 4 3 In MS to networf 0 0 In network to MS 0 0 In MS to networf 0 1 1 0	eous SDUs, octet 6 (see 3GPP TS 23.107)					
Delivery of error Bits 3 2 1 In MS to networf 0 0 0 In network to MS 0 0 0 In MS to networf 0 0 1 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap on the MS shall control Delivery order, control Bits 5 4 3 In MS to networf 0 0 In network to MS 0 0 In MS to networf 0 1 1 0 1 1	eeous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved III map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. ctet 6 (see 3GPP TS 23.107) diffection: Subscribed delivery order direction: Reserved direction: With delivery order ('yes') Without delivery order ('no') Reserved					

Traine class, ocle	10 (See 3GPP 15 23.107)
Bits	
876	
In MS to network	direction:
000	Subscribed traffic class
In network to MS	direction:
000	Reserved
In MS to network	direction and in network to MS direction :
001	Conversational class
010	Streaming class
011	Interactive class
100	Background class
111	Reserved

Traffic alass satet C (ass 2000 TC 02 407)

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

The MS shall consider all other values as reserved.

Maximum SDU size, octet 7 (see 3GPP TS 23.107)In MS to network direction:0 0 0 0 0 0 0 01 1 1 1 1 1 1ReservedIn network to MS direction:0 0 0 0 0 0 0 00 0 0 0 0 0 0 0Reserved1 1 1 1 1 1 1ReservedI network to MS direction:0 0 0 0 0 0 0 0Reserved1 1 1 1 1 1 1ReservedIn MS to network direction and in network to MS direction :

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

10010111	1502 octets
10011000	1510 octets
10011001	1520 octets

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

The MS shall consider all other values as reserved.

Maximum bit rate for uplink, octet 8 Bits 87654321 In MS to network direction: 0000000 Subscribed maximum bit rate for uplink In network to MS direction: 0000000 Reserved In MS to network direction and in network to MS direction : 0 0 0 0 0 0 0 1 The maximum bit rate is binary coded in 8 bits, using a granularity of 1 kbps 00111111 giving a range of values from 1 kbps to 63 kbps in 1 kbps increments. The maximum bit rate is 64 kbps + ((the binary coded value in 8 bits -01000000) * 8 kbps) 01000000 giving a range of values from 64 kbps to 568 kbps in 8 kbps increments. 01111111 1000000 The maximum bit rate is 576 kbps + ((the binary coded value in 8 bits -10000000) * 64 kbps) 11111110 giving a range of values from 576 kbps to 8640 kbps in 64 kbps increments. 11111111 0kbps Maximum bit rate for downlink, octet 9 (see 3GPP TS 23.107)

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

Residual Bit Error Rate (BER), octet 10 (see 3GPP TS 23.107) Bits 8765 In MS to network direction: Subscribed residual BER 0000 In network to MS direction: 0000 Reserved In MS to network direction and in network to MS direction : The Residual BER value consists of 4 bits. The range is from $5^{*}10^{-2}$ to $6^{*}10^{-8}$. 5*10⁻² 0001 1*10⁻² 0010 5*10⁻³ 0011 4*10⁻³ 0100 1*10⁻³ 0101 1*10⁻⁴ 0110 1*10⁻⁵ 0111 1*10⁻⁶ 1000 6*10⁻⁸ 1001 1111 Reserved The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol. The network shall return a negotiated value which is explicitly defined in this version of the protocol. The MS shall consider all other values as reserved. SDU error ratio, octet 10 (see 3GPP TS 23.107) Bits 4321 In MS to network direction: Subscribed SDU error ratio 0000 In network to MS direction: 0000 Reserved In MS to network direction and in network to MS direction : The SDU error ratio value consists of 4 bits. The range is is from $1*10^{-1}$ to $1*10^{-6}$. 0001 1*10⁻² 7*10⁻³ 0010 1*10⁻³ 0011 1*10⁻⁴ 0100 1*10⁻⁵ 0101 1*10⁻⁶ 0110 1*10⁻¹ 0111 1111 Reserved The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol. The network shall return a negotiated value which is explicitly defined in this version of the protocol. The MS shall consider all other values as reserved. Traffic handling priority, octet 11 (see 3GPP TS 23.107) Bits 21 In MS to network direction: Subscribed traffic handling priority 0.0 In network to MS direction: 00 Reserved In MS to network direction and in network to MS direction : 01 Priority level 1 10 Priority level 2 11 Priority level 3 The Traffic handling priority value is ignored if the Traffic Class is Conversation class, Streaming class or Background class. Transfer delay, octet 11 (See 3GPP TS 23.107) Bits 876543

In MS to network direction:							
0 0 0 0 0 0 Subscribed transfer delay							
In network to MS direction:							
00000 Reserved							
In MS to network direction and in network to MS direction :							
000001	The Transfer delay is binary coded in 6 bits, using a granularity of 10 ms						
001111	giving a range of values from 10 ms to 150 ms in 10 ms increments						
010000	The transfer delay is 200 ms + ((the binary coded value in 6 bits – 010000) ^ 50 ms)						
011111	giving a range of values from 200 ms to 950 ms in 50ms increments						
100000	The transfer delay is $1000 \text{ ms} + ((\text{the binary coded value in 6 bits} - 100000) * 100 \text{ ms})$						
111110	aiving a range of value from 1000 ms to 1000 ms in 100ms increments						
111111	Reserved						
The Transfer de	lav value is ignored if the Traffic Class is Interactive class or Background class.						
Guaranteed bit r	Guaranteed bit rate for uplink octet 12 (See 3GPP TS 23 107)						
Coding is identical to that of Maximum bit rate for uplink.							
.							
The Guaranteed	bit rate for uplink value is ignored if the Traffic Class is Interactive class or Background class, or						
Maximum bit rate	e for uplink is set to 0 kbps.						
Guaranteed bit r	ate for downlink, octet 13(See 3GPP TS 23.107)						
Coding is identic	cal to that of Maximum bit rate for uplink.						

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

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ж	23.	<mark>107</mark>	CR	098		ж r∈	ev	_	ж	Curr	ent vers	sion:	<mark>5.3.</mark> () [#]	
For <u>HELP</u> on u	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 Core Network X															
Title: ¥	QoS	<mark>S map</mark>	<mark>ping ru</mark> l	le for the	e R99 (<mark>delive</mark>	ry or	der a	attrib	oute					
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Work item code: ¥	TEI	5								L	Date: ೫	13.0	2.2002	2	
Category: % A Release: % REL-5 Use one of the following categories: Use one of the following releases: F (correction) 2 (GSM Phase 2) A (corresponds to a correction in an earlier release) R96 (Release 1996) B (addition of feature), R97 (Release 1997) C (functional modification of feature) R98 (Release 1998) D (editorial modification) R99 (Release 1999) Detailed explanations of the above categories can be found in 3GPP TR 21.900. REL-5 (Release 5)							:								
Reason for change	e: X	At the deliver	e mom ery ord cation.	ent it is er attrib	not spe utes if	ecified it gets	l whi s only	ch va v the	alue R97	the N 7/98 (MS shal QoS att	l assur ributes	ne for from t	the R99 he	9
Summary of chang	/e:	lt is p deliv	oropose ery ord	ed to de er attrib	fine, th ute to t	at in t the va	he al lue s	oove ubsc	me cribe	ntion ed.	ed case	the M	S shal	l set the	Э
Consequences if not approved:	ж	Diffe	rent MS	6 impler	nentati	ons.									
Clauses affected:	ж	9.1.2	.2												
Other specs affected:	ж	Ot Te Od	ther cor est spec &M Spe	re speci cification ecificatio	ficatior ns ons	IS	ж								
Other comments:	ж														

9.1.2.2 Determining R99 attributes from R97/98 attributes

This mapping is applicable in the following cases:

- hand over of PDP Context from GPRS R97/98 SGSN to GPRS R99 or UMTS SGSN;
- PDP Context Activation in a serving R99 SGSN with a R97/98 GGSN. When GGSN respond to the PDP Context Activation, mapping of the changed R97/98 QoS attributes received from the GGSN to R99 QoS attributes is performed in the serving SGSN.

This mapping is also applicable if a R99 MS allows an application to request a PDP Context Activation with R97/98 QoS attributes, e.g. via AT command.

Resulting R99	Attribute	Deri	Derived from R97/98 Attribute					
Name	Value	Value	Name					
Traffic class	Interactive	1, 2, 3	Delay class					
	Background	4						
Traffic handling priority	1	1	Delay class					
	2	2						
	3	3						
SDU error ratio	10 ⁻⁶	1, 2	Reliability class					
	10 ⁻⁴	3						
	10 ⁻³	4, 5						
Residual bit error ratio	10 ⁻⁵	1, 2, 3, 4	Reliability class					
	4*10 ⁻³	5						
Delivery of erroneous SDUs	'no'	1, 2, 3, 4	Reliability class					
	'yes'	5						
Maximum bitrate [kbps]	8	1	Peak throughput class					
	16	2	Ŭ.					
	32	3						
	64	4						
	128	5						
	256	6						
	512	7						
	1024	8						
	2048	9						
Allocation/Retention priority	1	1	Precedence class					
	2	2						
	3	3						
Delivery order	yes'	yes'	Reordering Required (Information					
	'no'	'no'	in the SGSN and the GGSN PDP Contexts)					
Maximum SDU size	1 500 octets	(Fixed value)						

Table 6: Rules for determining R99 attributes from R97/98 attributes

Note: As the allocation/retention priority attribute is not available in the MS (see 6.4.4.1) the mapping of the allocation/retention priority attribute is not relevant for the MS.

As the reordering required attribute is not available in the MS the MS shall set the R99 delivery order attribute to the value "subscribed" (see 3GPP TS 24.008).

*** following extract from 24.008 for information only! ***

10.5.6.5 Quality of service

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

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

The *quality of service* is a type 4 information element with a length of 13octets. The *quality of service* information element is coded as shown in figure 10.5.138/3GPP TS 24.008 and table 10.5.156/3GPP TS 24.008.

8	7	6	5	4	3	2	1		
Quality of service IEI									
	Length of quality of service IE								
0 0 Delay Reliability							octet 3		
sp	spare class class								
	Pe	ak		0	F	Precedenc	e	octet 4	
	throu	ghput		spare		class			
0	0	0			Mean			octet 5	
	spare			t	hroughp	ut			
Т	raffic Clas	SS	Deliver	y order	Delivery of erroneous			Octet 6	
						SDU			
		Ν	/laximum	SDU siz	е			Octet 7	
		Max	mum bit	rate for u	plink			Octet 8	
		Maxin	num bit ra	ate for do	wnlink			Octet 9	
	Residu	al BER			SDU e	rror ratio		Octet 10	
	Transfer delay Traffic Handling							Octet 11	
						pric	ority		
								Octet 12	
Guaranteed bit rate for uplink									
Guaranteed bit rate for downlink								Octet 13	

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

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



In MS to network direction and in network to MS direction :

- 0 0 1 Delay class 1
- 0 1 0 Delay class 2
- 0 1 1 Delay class 3
- 1 0 0 Delay class 4 (best effort)
- 111 Reserved

All other values are interpreted as Delay class 4 (best effort) in this version of the protocol. Bit 7 and 8 of octet 3 are spare and shall be coded all 0. Precedence class, octet 4 (see 3GPP TS 23.107) Bits 321 In MS to network direction: Subscribed precedence 000 In network to MS direction: 000 Reserved In MS to network direction and in network to MS direction : 001 High priority 010 Normal priority 011 Low priority Reserved 111 All other values are interpreted as Normal priority in this version of the protocol. Bit 4 of octet 4 is spare and shall be coded as 0. Peak throughput, octet 4 (see 3GPP TS 23.107) Bits 8765 In MS to network direction: 0000 Subscribed peak throughput In network to MS direction: 0000 Reserved In MS to network direction and in network to MS direction : Up to 1 000 octet/s 0001 0010 Up to 2 000 octet/s 0011 Up to 4 000 octet/s Up to 8 000 octet/s 0100 Up to 16 000 octet/s 0101 0110 Up to 32 000 octet/s 0111 Up to 64 000 octet/s Up to 128 000 octet/s 1000 1001 Up to 256 000 octet/s 1111 Reserved All other values are interpreted as Up to 1 000 octet/s in this version of the protocol. Mean throughput, octet 5 (see 3GPP TS 23.107) Bits 54321

	< direction:
00000	Subscribed mean throughput
In network to MS	S direction:
00000	Reserved
In MS to network	A direction and in network to MS direction :
00001	100 octevn
00010	
00011	1 000 octot/b
00100	2 000 octet/h
00101	5 000 octet/h
00110	10 000 octet/h
01000	20 000 octet/h
01001	50 000 octet/h
01010	100 000 octet/h
01011	200 000 octet/h
01100	500 000 octet/h
01101	1 000 000 octet/h
01110	2 000 000 octet/h
01111	5 000 000 octet/h
10000	10 000 000 octet/h
10001	20 000 000 octet/h
10010	50 000 000 octet/h
11110	Reserved
11111	Best effort
The value Best	effort indicates that throughput shall be made available to the MS on a per need and availability
basis.	
All other values	are interpreted as Best effort in this
version of the pr	otocol.
Bits 8 to 6 of oct	et 5 are spare and shall be coded all 0.
Delivery of error Bits 3 2 1	eous SDUs, octet 6 (see 3GPP TS 23.107)
Delivery of error Bits 3 2 1 In MS to networl	eous SDUs, octet 6 (see 3GPP TS 23.107)
Delivery of error Bits 3 2 1 In MS to networl 0 0 0	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs 6 direction:
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0	eous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0 In MS to networl	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs 6 direction: Reserved < direction and in network to MS direction :
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0 In MS to networl 0 0 1	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs 6 direction: Reserved < direction and in network to MS direction : No detect ('-')
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0 In MS to networl 0 0 1 0 1 0	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs 6 direction: Reserved < direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes')
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0 In MS to networl 0 0 1 0 1 0 0 1 1	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs 6 direction: Reserved < direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no')
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0 In MS to networl 0 0 1 0 1 0 0 1 1 1 1 1	eous SDUs, octet 6 (see 3GPP TS 23.107) < direction: Subscribed delivery of erroneous SDUs 6 direction: Reserved < direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved
Delivery of error Bits 3 2 1 In MS to networl 0 0 0 In network to MS 0 0 0 In MS to networl 0 0 1 0 1 0 0 1 1 1 1 1	direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved
Delivery of error Bits 3 2 1 In MS to networl 0 0 In network to MS 0 0 0 In MS to networl 0 1 0 0 1 1 1 1 1	direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved
Delivery of error Bits 3 2 1 In MS to network 0 0 In network to MS 0 0 0 In MS to network 0 1 0 0 1 1 1 1 1 The network sha	direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved di map all other values not explicitly defined onto one of the values defined in this version of the
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 1 0 0 1 1 1 1 1 The network sha protocol. The network	direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved difference and the values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol.
Delivery of error Bits 3 2 1 In MS to networf 0 0 0 In network to MS 0 0 0 In MS to networf 0 1 0 0 1 1 1 1 1 The network sha protocol. The network	direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved di map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved.
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 0 1 0 1 0 0 1 1 1 1 1 The network sha protocol. The network sha protocol. The network shall co Delivery order, co	A direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved All map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Autoret 6 (see 3GPP TS 23.107)
Delivery of error Bits 3 2 1 In MS to networt 0 0 0 In network to MS 0 0 0 In MS to networt 0 0 1 0 1 0 0 1 1 1 1 1 The network sha protocol. The ne	eeous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved all map all other values not explicitly defined onto one of the values defined in this version of the tetwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Ercet 6 (see 3GPP TS 23.107)
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 0 1 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap protocol. The network shap protocol. The network shap pelivery order, of Bits 5 4 3	A direction: Subscribed delivery of erroneous SDUs 3 direction: Reserved 4 direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved All map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Extert 6 (see 3GPP TS 23.107)
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 1 0 0 1 1 1 1 1 The network sha protocol. The network sha protocol. The network sha protocol. The network The MS shall co Delivery order, co Bits 5 4 3 In MS to network	eeous SDUs, octet 6 (see 3GPP TS 23.107) (direction: Subscribed delivery of erroneous SDUs 6 direction: Reserved (direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved III map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Actet 6 (see 3GPP TS 23.107)
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap protocol. The network shap protocol. The network Delivery order, construction Bits 5 4 3 In MS to network 0 0	eeous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved all map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Actet 6 (see 3GPP TS 23.107) direction: Subscribed delivery order
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap Delivery order, constant Bits 5 4 3 In MS to network to MS	eeous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved dil map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Incetet 6 (see 3GPP TS 23.107) difference: Subscribed delivery order direction: Subscribed delivery order direction:
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 0 1 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap Delivery order, constant Bits 5 4 3 In MS to network to MS 0 0	eous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved all map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Acte t 6 (see 3GPP TS 23.107) direction: Subscribed delivery order direction: Reserved
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap protocol. The network shap protocol. The network Delivery order, of Bits 5 4 3 In MS to network 0 0 In network to MS 0 0 In MS to network	eous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved all map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. Intert of (see 3GPP TS 23.107) direction: Subscribed delivery order Girection: Reserved direction: Reserved direction: Subscribed delivery order Girection: Reserved direction: Reserved direction: Reserved direction: Reserved direction and in network to MS direction :
Delivery of error Bits 3 2 1 In MS to network 0 0 0 In network to MS 0 0 0 In MS to network 0 0 1 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap on the MS shall control Delivery order, control Bits 5 4 3 In MS to network to MS 0 0 In network to MS 0 0 In MS to network 0 1	eous SDUs, octet 6 (see 3GPP TS 23.107)
Delivery of error Bits 3 2 1 In MS to networf 0 0 0 In network to MS 0 0 0 In MS to networf 0 0 1 0 1 0 0 1 1 1 1 1 The network sha protocol. The net The MS shall co Delivery order, c Bits 5 4 3 In MS to networf 0 0 In network to MS 0 0 In network to MS 0 0 In MS to networf 0 1 1 0	eous SDUs, octet 6 (see 3GPP TS 23.107)
Delivery of error Bits 3 2 1 In MS to networf 0 0 0 In network to MS 0 0 0 In MS to networf 0 0 1 0 1 0 0 1 1 1 1 1 The network shap protocol. The network shap on the MS shall control Delivery order, control Bits 5 4 3 In MS to networf 0 0 In network to MS 0 0 In MS to networf 0 1 1 0 1 1	eeous SDUs, octet 6 (see 3GPP TS 23.107) direction: Subscribed delivery of erroneous SDUs direction: Reserved direction and in network to MS direction : No detect ('-') Erroneous SDUs are delivered ('yes') Erroneous SDUs are not delivered ('no') Reserved III map all other values not explicitly defined onto one of the values defined in this version of the etwork shall return a negotiated value which is explicitly defined in this version of this protocol. Insider all other values as reserved. ctet 6 (see 3GPP TS 23.107) diffection: Subscribed delivery order direction: Reserved direction: With delivery order ('yes') Without delivery order ('no') Reserved

Traine class, ocle	10 (See 3GPP 15 23.107)
Bits	
876	
In MS to network	direction:
000	Subscribed traffic class
In network to MS	direction:
000	Reserved
In MS to network	direction and in network to MS direction :
001	Conversational class
010	Streaming class
011	Interactive class
100	Background class
111	Reserved

Traffic alass satet C (ass 2000 TC 02 407)

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

The MS shall consider all other values as reserved.

Maximum SDU size, octet 7 (see 3GPP TS 23.107)In MS to network direction:0 0 0 0 0 0 0 01 1 1 1 1 1 1ReservedIn network to MS direction:0 0 0 0 0 0 0 00 0 0 0 0 0 0 0Reserved1 1 1 1 1 1 1ReservedI network to MS direction:0 0 0 0 0 0 0 0Reserved1 1 1 1 1 1 1ReservedIn MS to network direction and in network to MS direction :

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

10010111	1502 octets
10011000	1510 octets
10011001	1520 octets

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

The MS shall consider all other values as reserved.

Maximum bit rate for uplink, octet 8 Bits 87654321 In MS to network direction: 0000000 Subscribed maximum bit rate for uplink In network to MS direction: 0000000 Reserved In MS to network direction and in network to MS direction : 0 0 0 0 0 0 0 1 The maximum bit rate is binary coded in 8 bits, using a granularity of 1 kbps 00111111 giving a range of values from 1 kbps to 63 kbps in 1 kbps increments. The maximum bit rate is 64 kbps + ((the binary coded value in 8 bits -01000000) * 8 kbps) 01000000 giving a range of values from 64 kbps to 568 kbps in 8 kbps increments. 01111111 1000000 The maximum bit rate is 576 kbps + ((the binary coded value in 8 bits -10000000) * 64 kbps) 11111110 giving a range of values from 576 kbps to 8640 kbps in 64 kbps increments. 11111111 0kbps Maximum bit rate for downlink, octet 9 (see 3GPP TS 23.107)

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

Residual Bit Error Rate (BER), octet 10 (see 3GPP TS 23.107) Bits 8765 In MS to network direction: Subscribed residual BER 0000 In network to MS direction: 0000 Reserved In MS to network direction and in network to MS direction : The Residual BER value consists of 4 bits. The range is from $5^{*}10^{-2}$ to $6^{*}10^{-8}$. 5*10⁻² 0001 1*10⁻² 0010 5*10⁻³ 0011 4*10⁻³ 0100 1*10⁻³ 0101 1*10⁻⁴ 0110 1*10⁻⁵ 0111 1*10⁻⁶ 1000 6*10⁻⁸ 1001 1111 Reserved The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol. The network shall return a negotiated value which is explicitly defined in this version of the protocol. The MS shall consider all other values as reserved. SDU error ratio, octet 10 (see 3GPP TS 23.107) Bits 4321 In MS to network direction: Subscribed SDU error ratio 0000 In network to MS direction: 0000 Reserved In MS to network direction and in network to MS direction : The SDU error ratio value consists of 4 bits. The range is is from $1*10^{-1}$ to $1*10^{-6}$. 0001 1*10⁻² 7*10⁻³ 0010 1*10⁻³ 0011 1*10⁻⁴ 0100 1*10⁻⁵ 0101 1*10⁻⁶ 0110 1*10⁻¹ 0111 1111 Reserved The network shall map all other values not explicitly defined onto one of the values defined in this version of the protocol. The network shall return a negotiated value which is explicitly defined in this version of the protocol. The MS shall consider all other values as reserved. Traffic handling priority, octet 11 (see 3GPP TS 23.107) Bits 21 In MS to network direction: Subscribed traffic handling priority 0.0 In network to MS direction: 00 Reserved In MS to network direction and in network to MS direction : 01 Priority level 1 10 Priority level 2 11 Priority level 3 The Traffic handling priority value is ignored if the Traffic Class is Conversation class, Streaming class or Background class. Transfer delay, octet 11 (See 3GPP TS 23.107) Bits 876543

In MS to network direction:									
000000	Subscribed transfer delay								
In network to MS	S direction:								
000000	Reserved								
In MS to network	K direction and in network to MS direction :								
000001	The Transfer delay is binary coded in 6 bits, using a granularity of 10 ms								
001111	giving a range of values from 10 ms to 150 ms in 10 ms increments								
010000	The transfer delay is 200 ms + ((the binary coded value in 6 bits – 010000) * 50 ms)								
011111	giving a range of values from 200 ms to 950 ms in 50ms increments								
100000	The transfer delay is $1000 \text{ ms} + ((\text{the binary coded value in 6 bits} - 100000) * 100 \text{ ms})$								
111110	aiving a range of value from 1000 ms to 1000 ms in 100ms increments								
111111	Reserved								
The Transfer de	lav value is ignored if the Traffic Class is Interactive class or Background class.								
Guaranteed bit r	ate for uplink, octet 12 (See 3GPP TS 23,107)								
Coding is identic	al to that of Maximum bit rate for uplink.								
The Guaranteed	bit rate for uplink value is ignored if the Traffic Class is Interactive class or Background class, or								
Maximum bit rate	Maximum bit rate for uplink is set to 0 kbps.								
Guaranteed bit r	ate for downlink, octet 13(See 3GPP TS 23.107)								
Coding is identic	cal to that of Maximum bit rate for uplink.								

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

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Proposed change	affects	s: X	(U)	SIM	ME	/UE	X	Radi	o Ac	cess l	Vetwoi	rk <mark>X</mark>	Core N	letwork X
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Reason for change	<u>∽ ⊮ (</u>	23 10	7 cont	ains som		lated	text	and	obvid	ous m	istake	2		
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Consequences if not approved:	¥ (Confu /endo	sion in rs.	the spe	ecs ma	y cre	ate ii	ntero	pera	bility p	orobler	ns be	tween va	nious
Clauses affected:	Ж	<u>6.5.1</u>	, 6.5.2											
Other specs affected:	¥	Ot Te Ot	ther co est spe &M Sp	re speci cificatio ecificatio	ificatio ns ons	ns	ж							
Other comments:	ж													

6.5 Attribute 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.

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	Yes/No/- (6)	Yes/No/- (6)	Yes/No/- (6)	Yes/No/- (6)
SDUs				
Residual BER	5*10 ⁻² , 10 ⁻² , 5*10 ⁻³ , 10 ⁻³ , 10 ⁻⁴ , <u>10⁻⁵, 10⁻⁶</u>	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 up to FFS (<mark>98</mark>)	250 up to FFS (<mark>98</mark>)		
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 <mark>(8)</mark>	1,2,3 (8)	1,2,3 (8)

Table 4: Value ranges for UMTS Bearer Service Attributes

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

8) 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.

Traffic class	Conversational class	Streaming class	Interactive class	Background class
Maximum bitrate (kbps)	< 2 048 (1) (2)	2 048 (1) (2) < 2 048 (1) (2)		< 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 ⁻⁵ , 10 ⁻⁶	5*10 ⁻² , 10 ⁻² , 5*10 ⁻³ , 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 up to FFS (<u>7</u> 8)	250 up to FFS (8 <u>7</u>)		
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		

Table 5: Value ranges for R	Radio Access Bearer	Service Attributes
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- 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) Values are derived from CRC lengths of 8, 16 and 24 bits on layer 1.
- 7) Number of priority levels shall be further analysed by S1, N1 and N3.

The upper bound is FFS (For Further Study).

3GPP TSG-SA WG2 #23 18 – 22 February 2002

S2-020724

		CHANGE REQUEST		CR-Form-v3				
¥		23.107 CR 099 * rev - * Curre	ent vers	^{ion:} 4.3.0 [#]				
For HELP on using this form, see bottom of this page or look at the pop-up text over the # symbols.								
Proposed chang	Proposed change affects: # (U)SIM ME/UE X Radio Access Network X Core Network X							
Title:	ж	Corrections on attribute values						
Source:	ж	Nokia						
Work item code	: X	E2EQoS E	Date:	18.02.2002				
Category:	ж	F Rele	ase: #	R4				
		Use <u>one</u> of the following categories: Use 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.	e <u>one</u> of 2 R96 R97 R98 R99 REL-4 REL-5	the following releases: (GSM Phase 2) (Release 1996) (Release 1997) (Release 1998) (Release 1999) (Release 4) (Release 5)				

Reason for change: ೫	23.107 contains some outdated text and obvious mistakes.
Summary of change: ₩	The outdated text is the note that: "Number of priority levels shall be further analysed by S1, N1 and N3". According to 24.008 there are only 3 values, so the note can be erased The obvious mistake is that the value 10-5 is lacking from BER for conversational traffic class. It is added.
Consequences if # not approved:	Confusion in the specs may create interoperability problems between various vendors.
Clauses affected: # Other specs # affected:	6.5.1, 6.5.2 Other core specifications # Test specifications # O&M Specifications •
Other comments: #	

6.5 Attribute 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.

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	Yes/No/- (6)	Yes/No/- (6)	Yes/No/- (6)	Yes/No/- (6)
SDUs				
Residual BER	5*10 ⁻² , 10 ⁻² , 5*10 ⁻³ , 10 ⁻³ , 10 ⁻⁴ , <u>10⁻⁵, 10⁻⁶</u>	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 up to FFS (<mark>98</mark>)	250 up to FFS (<mark>98</mark>)		
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 <mark>(8)</mark>	1,2,3 (8)	1,2,3 (8)

Table 4: Value ranges for UMTS Bearer Service Attributes

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

8) 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.

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 ⁻⁵ , 10 ⁻⁶	5*10 ⁻² , 10 ⁻² , 5*10 ⁻³ , 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 up to FFS (<u>7</u> 8)	250 up to FFS (8 <u>7</u>)		
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		

Table 5: Value ranges for R	Radio Access Bearer	Service Attributes
-----------------------------	---------------------	---------------------------

- 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) Values are derived from CRC lengths of 8, 16 and 24 bits on layer 1.
- 7) Number of priority levels shall be further analysed by S1, N1 and N3.

The upper bound is FFS (For Further Study).

S2-020<u>813</u>725

3GPP TSG-SA WG2 #23 18 – 22 February 2002

CHANGE REQUEST											
H	23	<mark>.107</mark> (CR <mark>100</mark>	ж	rev	<u>1</u> -	Ħ	Current vers	sion:	5.3.0	ж
For <u>HELP</u> on	using	this form	, see bottor	n of this pa	age or	look a	at the	e pop-up text	over	the X syr	nbols.
Proposed change	e affec	<i>ts:</i>	(U)SIM	ME/UE	X	Radi	o Ac	cess Networ	k <mark>X</mark>	Core Ne	etwork X
Title:	ж <mark>Со</mark>	rrections	on attribute	e values							
Source:	₩ <mark>No</mark>	kia									
Work item code:	₩ <mark>E2</mark>	EQoS						<i>Date:</i>	18.	02.2002	
Category:	ж <mark>F</mark>							Release: ೫	R5		
	Deta be fo	F (esser A (corre B (Addit C (Func D (Edito iled expla- bund in 30	ntial correction sponds to a construction tion of feature tional modificat rial modificat anations of the GPP TR 21.9	n) correction in a), ation of feat ion) le above cat 00.	an ea ture) egorie	rlier re s can	lease	2 8) R96 R97 R98 R99 REL-4 REL-5	(GSN (Rele (Rele (Rele (Rele (Rele	/ Phase 2) pase 1996) pase 1997) pase 1998) pase 1999) pase 4) pase 5)	
Reason for chan	ge: Ж	23.107	contains so	me outdate	ed tex	and	obvid	ous mistakes	•		
Summary of chai	nge: X	The out "Number Accordin	dated text is r of priority ng to 24.008	s the note t levels shall there are on	that: be furt ily 3 va	her an dues, s	alyse so the	d by S1, N1 a e note can be e	nd N3 erased	".	
		The obv class. It <u>Source S</u>	ious mistake is added. Statistics Des	is that the v	value 1 added	0-5 is	lacki <u>Tabl</u>	ng from BER <u>e 4.</u>	for co	nversation	al traffic
Consequences if not approved:	× X	Confusi vendors	on in the sp s.	ecs may c	reate	intero	pera	bility problem	ns bet	ween var	ious
Clauses affected	: ж	6.5.1,	6.5.2								
Other specs affected:	ж	Oth Tes O&l	er core spe t specificati M Specifica	cifications ons tions	Ħ						
Other comments	: ж										

6.5 Attribute 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.

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 , <u>10⁻⁵,</u> 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 up to FFS (<mark>98</mark>)	250 up to FFS (<mark>98</mark>)		
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 <mark>(8)</mark>	1,2,3 <mark>(8)</mark>	1,2,3 <mark>(8)</mark>
Source statistic descriptor	Speech/unknown	Speech/unknown		

Table 4: Value ranges for UMTS Bearer Service Attributes

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

8) 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.

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 , <u>10⁻⁵,</u> 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 up to FFS (<u>7</u> 8)	250 up to FFS (8 <u>7</u>)		
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		

Table 5: Value ranges for Radio Access Bearer Service Attributes

- 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) Values are derived from CRC lengths of 8, 16 and 24 bits on layer 1.
- 7) Number of priority levels shall be further analysed by S1, N1 and N3.

The upper bound is FFS (For Further Study).

3GPP TSG-SA2 Meeting #23 Sophia Antipolis, France, 18-22 February

S2-020916

CR-Form-v5							
ж	23.107 CR 86 # rev 3 [#] Current version: 3.7.0 [#]						
For <mark>HELP</mark> on ι	sing 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 Core Network X						
Title: #	Asymmetric Bearers – Mapping and Determining Highest QoS						
Source: ೫	Ericsson, Siemens						
Work item code: भ	GPRS Date: 米 18.02.2002						
Category: #	FRelease: %R99Use one of the following categories:Use one of the following releases:F (correction)2A (corresponds to a correction in an earlier release)R96B (addition of feature),R97C (functional modification of feature)R98D (editorial modification)R99D (editorial modification)R99D tailed explanations of the above categories canREL-4be found in 3GPP TR 21.900.REL-5						
	 to do with mapping from R99 to R97/98 when values are different for uplink and downlink. The bearers in R97/98 are symmetric. This is not yet detailed in TS23.107. Also, it is not specified whether the maximum bitrate for downlink or the maximum bitrate for uplink shall be used to determine which QoS profile is of the highest QoS. It is proposed that the issues of mapping with asymmetric bearers and determining the highest QoS are treated in a consistent manner. Regarding the 						
	mapping from R99 to R97/98 parameters, as stated in 23.107, the overall principle for the mapping between two profiles is that the two profiles, applied in their respective network releases, give the same or at least similar QoS. The thinking is that the best possible QoS shall be provided. The issue of determining the highest QoS is to address the issue of handovers from R99 to R97/98 networks, since all except one PDP context will be deactivated, and the one PDP context left shall have the highest QoS profile. The underlying thinking behind this is also consistent with that the best possible QoS shall be left, as much as possible to lessen the damage. After the selection of the PDP context, a mapping from R99 to R97/98 parameters is carried out.						
	It is proposed that the higher QoS of the uplink/downlink should be used for both mappings with asymmetric bearers and determining the highest QoS, i.e., the higher of uplink/downlink maximum bitrates should be chosen. The solution is simple, and straightforward. It wouldn't harm the bearer in the opposite direction with lower QoS needs, if a higher QoS was eventually assigned to the symmetric bearer.						
	Also, the editor of TS23.107 has been requested by S2 to editorially change 'MS'						

	to 'UE' in the TS.					
Summary of change: ೫	The higher of the uplink/downlink maximum bitrates is used for both mapping of					
	asymmetric bearers and determining the highest QoS. Also 'MS' to 'UE' editorial global change.					
Consequences if % not approved:	As it is not specified which maximum bitrate QoS attribute shall be used in the mapping of asymmetric bearers and determining highest QoS, there is the risk of different UE and SGSN implementations. In consequence mappings will be inconsistent and different PDP contexts would be released locally.					
Clauses affected: #	9.1.2.3, Annex C					
Other specs % affected:	Other core specifications # Test specifications # O&M Specifications *					
Other comments: #						

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: <u>http://www.3gpp.org/3G_Specs/CRs.htm</u>. 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 <u>ftp://ftp.3gpp.org/specs/</u> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

9.1.2 UMTS-GPRS

This section covers primarily the mapping of QoS attributes that are necessary across standardised interfaces. In addition to these, there are cases when mapping of QoS attributes are needed internal to a node.

GPRS Release 99 (R99) QoS attributes shall be equivalent to the UMTS QoS Attributes. For interworking purposes between different releases, mapping rules between GPRS Release 97/98 (R97/98) and GPRS Release 99 (R99) as well as UMTS are defined. Mapping shall occur whenever the <u>MSUE</u>, the SGSN, the GGSN and the HLR nodes are of different releases R97/98 or R99. The mapping is required in PDP context activation and modification procedures and when a R99 HLR Insert Subscriber Data towards a R97/98 SGSN.

It is not within the scope of the present document to determine if any value combinations of attribute values can not be supported. This means that complete mapping rules are defined here, and if the user requests a QoS profile which the network is not able to support (e.g. a low delay and a high reliability), the decision if such a attribute combination can be supported is left to admission control functionality within the PDP context activation procedure, and the QoS for such a profile may be renegotiated by the network based on the available resources.

The overall principle for the mapping between two profiles is that the two profiles, applied in their respective network releases, give the same or at least similar QoS. The GPRS R97/98 equipment will not be able to provide realtime service corresponding to the R99 conversational and streaming traffic classes. Therefore, the mapping is always to the non-realtime interactive and background traffic classes.

9.1.2.1 General rules

Air interface Session Management and GTP messages of R99 shall contain the R99 attributes as an extension of the R97/98 QoS Information Element thus unnecessary mapping can be avoided. When a R97/98 MS is visiting a GPRS

R99 or UMTS SGSN and the GGSN is of R97/98 or R99, the visited SGSN shall not perform any mapping of QoS attributes. In case of GGSN R99, the GTP version 1 (R99) QoS profile only contains the R97/98 QoS attributes. It can be noted that for this PDP Context a Traffic Flow Template (TFT) can not be requested.

When a R99 <u>MSUE</u> is visiting a GPRS R99 or UMTS SGSN (or serving PLMN) and the GGSN (or home PLMN) is of R97/98, the visited SGSN (or visited PLMN) shall be capable of providing bearers having QoS support according to R99. When a PDP Context is activated (mobile or network initiated) mapping takes place in the serving SGSN.

For MS initiated PDP Context Activations as well as network initiated PDP Context Activations, the home R97/98 GGSN will respond to the activation request by returning a the QoS Negotiated Profile, which contain the accepted and changed R97/98 attributes. A mapping of the changed attributes into R99 attributes will be done in serving SGSN and signalled to the mobile stationUE in the Activate PDP Context Accept message.

It is a general mapping rule that returned and unchanged attributes during negotiation procedures shall not be mapped a second time by serving SGSN, i.e. the unchanged R99 attributes received in the Create PDP Context Response message will be sent to <u>MSUE</u> in QoS Negotiated Profile of the Activate PDP Context Accept message.

MAP message of R99 shall also contain the R99 attributes as an extension of the R97/98 QoS Information Element when Insert Subscriber Data message is sent to a R99 SGSN. In the case when a R99 HLR send a Insert Subscriber Data message to a R97/98 SGSN, the message shall contain the R97/98 QoS attributes. A R99 SGSN shall use the R99 attributes of subscribed QoS profile when a R99 MSUE requests to use subscription data in the PDP Context Activation. The R99 SGSN shall use the R97/98 attributes of subscribed QoS profile when a R97/98 attributes of subscribed QoS profile when a R97/98 MS requests to use subscription data in the PDP Context Activation.

9.1.2.2 Determining R99 attributes from R97/98 attributes

This mapping is applicable in the following cases:

- hand over of PDP Context from GPRS R97/98 SGSN to GPRS R99 or UMTS SGSN;
- PDP Context Activation in a serving R99 SGSN with a R97/98 GGSN. When GGSN respond to the PDP Context Activation, mapping of the changed R97/98 QoS attributes received from the GGSN to R99 QoS attributes is performed in the serving SGSN.

This mapping is also applicable if a R99 <u>MSUE</u> allows an application to request a PDP Context Activation with R97/98 QoS attributes, e.g. via AT command.

Resulting R99	Attribute	Deri	ved from R97/98 Attribute	
Name	Value	Value	Name	
Traffic class	Interactive	1, 2, 3	Delay class	
	Background	4		
Traffic handling priority	1	1	Delay class	
	2	2		
	3	3		
SDU error ratio	10 ⁻⁶	1, 2	Reliability class	
	10 ⁻⁴	3		
	10 ⁻³	4, 5		
Residual bit error ratio	10 ⁻⁵	1, 2, 3, 4	Reliability class	
	4*10 ⁻³	5		
Delivery of erroneous SDUs	'no'	1, 2, 3, 4	Reliability class	
	'yes'	5		
Maximum bitrate [kbps]	8	1	Peak throughput class	
	16	2		
	32	3		
	64	4		
	128	5		
	256	6		
	512	7		
	1024	8		
	2048	9		
Allocation/Retention priority	1	1	Precedence class	
	2	2		
	3	3		
Delivery order	yes'	yes'	Reordering Required (Information	
	'no'	'no'	in the SGSN and the GGSN PDP Contexts)	
Maximum SDU size	1 500 octets	(Fixed value)		

Table 6: Rules for determining R99 attributes from R97/98 attributes

Note: As the allocation/retention priority attribute is not available in the <u>MSUE</u> (see 6.4.4.1) the mapping of the allocation/retention priority attribute is not relevant for the <u>MSUE</u>.

9.1.2.3 Determining R97/98 attributes from R99 attributes

This mapping is applicable in the following cases:

- PDP Context is handed over from GPRS R99 or UMTS to GPRS R97/98;
- when a R99 MSUE perform a PDP Context Activation in a serving R99 SGSN while the GGSN is of R97/98. In this case the SGSN shall perform mapping of the R99 QoS attributes to the R97/98 QoS attributes;
- a R99 HLR may need to map the stored subscribed QoS attributes in the HLR subscriber data to R97/98 QoS attributes that are going to be sent in the Insert Subscriber Data message from the R99 HLR to the R97/98 and R99 SGSN. It is an implementation issue if the R97/98 QoS attributes are stored in the HLR in addition to the R99 QoS attributes;
- a R99 <u>MSUE</u> (except UMTS only <u>MSUE</u>) receives a request for a PDP Context Activation with R99 QoS attributes, e.g. via AT command.

Resulting R97/98	Attribute	Derived from R99 Attribute		
Name	Value	Value	Name	
Delay class	1	conversational	Traffic class	
	1	streaming	Traffic class	
	1	Interactive	Traffic class	
		1	Traffic handling priority	
	2	Interactive	Traffic class	
		2	Traffic handling priority	
	3	Interactive	Traffic class	
		3	Traffic handling priority	
	4	Background	Traffic class	
Reliability class	2	<= 10 ⁻⁵	SDU error ratio	
	3	$10^{-5} < x <= 5^{*}10^{-4}$	SDU error ratio	
	4	> 5*10 ⁻⁴	SDU error ratio	
		<= 2*10 ⁻⁴	Residual bit error ratio	
	5	> 5*10 ⁻⁴	SDU error ratio	
		> 2*10 ⁻⁴	Residual bit error ratio	
Peak throughput class	1	< 16	Maximum bitrate [kbps]	
	2	16 <= x < 32		
	3	32 <= x < 64		
	4	64 <= x < 128		
	5	128 <= x < 25 <u>6</u>		
	6	256 <= x < 512		
	7	512 <= x < 1024		
	8	1024 <= x < 2048		
	9	>= 2048		
Precedence class	1	1	Allocation/retention priority	
	2	2		
	3	3		
Mean throughput class	Always set to 31	-		
Reordering Required	yes'	yes'	Delivery order	
(Information in the SGSN and the GGSN PDP Contexts)	'no'	'no'		

Table 7: Rules for determining R97/98 attributes from R99 attributes

As the allocation/retention priority attribute is not available in the <u>MSUE</u>(see 6.4.4.1) the <u>MSUE</u> shall set the R97/98 precedence class attribute to the value "subscribed" (see 3GPP TS 24.008).

Note: In the case of asymmetric bearers, the higher value of the maximum bitrate attributes for downlink and uplink is selected and used for the maximum bitrate value.

Annex C (normative): Determine which QoS profile is of highest QoS

In handovers from Release 1999 to GPRS Release 97/98 networks, it will be necessary to determine which PDP context of a set of PDP contexts provides the highest QoS, since, of a set of PDP contexts with the same APN and PDP address, all PDP contexts except the one with the highest QoS profile will be deactivated.

To determine which PDP context that has the highest QoS table C.1 is used. Only the PDP context(s) with the highest QoS ranking will be maintained and the rest will be deactivated. In a second step, if more than one PDP context remain, the PDP context with the highest value forof the Mmaximum bitrate attributes for downlink or uplink is selected-and is compared. All PDP contexts except the PDP context(s) with the highest Maximum bitrate selected will be deactivated.

If more than one PDP context remain after the second step, all PDP contexts except that with the lowest NSAPI are deactivated.

Table C.1

QoS ranking	2	conversational	Traffic class
_	3	streaming	Traffic class
	1	Interactive	Traffic class
		4	Traffic handling priority
	4	Interactive	Traffic class
		2	Traffic handling priority
	5	Interactive	Traffic class
		3	Traffic handling priority
	6	Background	Traffic class

QoS ranking	Traffic class	Traffic handling priority
1	Interactive	<u>1</u>
2	conversational	Not applicable
3	streaming	Not applicable
<u>4</u>	Interactive	2
<u>5</u>	Interactive	3
<u>6</u>	Background	Not applicable

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	to 'UE' in the TS.			
Summary of change: ೫	The higher of the uplink/downlink maximum bitrates is used for both mapping of			
	asymmetric bearers and determining the highest QoS. Also 'MS' to 'UE' editorial global change.			
Consequences if % not approved:	As it is not specified which maximum bitrate QoS attribute shall be used in the mapping of asymmetric bearers and determining highest QoS, there is the risk of different UE and SGSN implementations. In consequence mappings will be inconsistent and different PDP contexts would be released locally.			
Clauses affected: #	9.1.2.3, Annex C			
Other specs % affected:	Other core specifications # Test specifications # O&M Specifications *			
Other comments: #				

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: <u>http://www.3gpp.org/3G_Specs/CRs.htm</u>. 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 <u>ftp://ftp.3gpp.org/specs/</u> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

9.1.2 UMTS-GPRS

This section covers primarily the mapping of QoS attributes that are necessary across standardised interfaces. In addition to these, there are cases when mapping of QoS attributes are needed internal to a node.

GPRS Release 99 (R99) QoS attributes shall be equivalent to the UMTS QoS Attributes. For interworking purposes between different releases, mapping rules between GPRS Release 97/98 (R97/98) and GPRS Release 99 (R99) as well as UMTS are defined. Mapping shall occur whenever the <u>MSUE</u>, the SGSN, the GGSN and the HLR nodes are of different releases R97/98 or R99. The mapping is required in PDP context activation and modification procedures and when a R99 HLR Insert Subscriber Data towards a R97/98 SGSN.

It is not within the scope of the present document to determine if any value combinations of attribute values can not be supported. This means that complete mapping rules are defined here, and if the user requests a QoS profile which the network is not able to support (e.g. a low delay and a high reliability), the decision if such a attribute combination can be supported is left to admission control functionality within the PDP context activation procedure, and the QoS for such a profile may be renegotiated by the network based on the available resources.

The overall principle for the mapping between two profiles is that the two profiles, applied in their respective network releases, give the same or at least similar QoS. The GPRS R97/98 equipment will not be able to provide realtime service corresponding to the R99 conversational and streaming traffic classes. Therefore, the mapping is always to the non-realtime interactive and background traffic classes.

9.1.2.1 General rules

Air interface Session Management and GTP messages of R99 shall contain the R99 attributes as an extension of the R97/98 QoS Information Element thus unnecessary mapping can be avoided. When a R97/98 MS is visiting a GPRS

R99 or UMTS SGSN and the GGSN is of R97/98 or R99, the visited SGSN shall not perform any mapping of QoS attributes. In case of GGSN R99, the GTP version 1 (R99) QoS profile only contains the R97/98 QoS attributes. It can be noted that for this PDP Context a Traffic Flow Template (TFT) can not be requested.

When a R99 <u>MSUE</u> is visiting a GPRS R99 or UMTS SGSN (or serving PLMN) and the GGSN (or home PLMN) is of R97/98, the visited SGSN (or visited PLMN) shall be capable of providing bearers having QoS support according to R99. When a PDP Context is activated (mobile or network initiated) mapping takes place in the serving SGSN.

For MS initiated PDP Context Activations as well as network initiated PDP Context Activations, the home R97/98 GGSN will respond to the activation request by returning a the QoS Negotiated Profile, which contain the accepted and changed R97/98 attributes. A mapping of the changed attributes into R99 attributes will be done in serving SGSN and signalled to the mobile stationUE in the Activate PDP Context Accept message.

It is a general mapping rule that returned and unchanged attributes during negotiation procedures shall not be mapped a second time by serving SGSN, i.e. the unchanged R99 attributes received in the Create PDP Context Response message will be sent to <u>MSUE</u> in QoS Negotiated Profile of the Activate PDP Context Accept message.

MAP message of R99 shall also contain the R99 attributes as an extension of the R97/98 QoS Information Element when Insert Subscriber Data message is sent to a R99 SGSN. In the case when a R99 HLR send a Insert Subscriber Data message to a R97/98 SGSN, the message shall contain the R97/98 QoS attributes. A R99 SGSN shall use the R99 attributes of subscribed QoS profile when a R99 MSUE requests to use subscription data in the PDP Context Activation. The R99 SGSN shall use the R97/98 attributes of subscribed QoS profile when a R97/98 attributes of subscribed QoS profile when a R97/98 MS requests to use subscription data in the PDP Context Activation.

9.1.2.2 Determining R99 attributes from R97/98 attributes

This mapping is applicable in the following cases:

- hand over of PDP Context from GPRS R97/98 SGSN to GPRS R99 or UMTS SGSN;
- PDP Context Activation in a serving R99 SGSN with a R97/98 GGSN. When GGSN respond to the PDP Context Activation, mapping of the changed R97/98 QoS attributes received from the GGSN to R99 QoS attributes is performed in the serving SGSN.

This mapping is also applicable if a R99 <u>MSUE</u> allows an application to request a PDP Context Activation with R97/98 QoS attributes, e.g. via AT command.

Resulting R99 Attribute		Deri	Derived from R97/98 Attribute		
Name	Value	Value	Name		
Traffic class	Interactive	1, 2, 3	Delay class		
	Background	4			
Traffic handling priority	1	1	Delay class		
	2	2			
	3	3			
SDU error ratio	10 ⁻⁶	1, 2	Reliability class		
	10 ⁻⁴	3			
	10 ⁻³	4, 5			
Residual bit error ratio	10 ⁻⁵	1, 2, 3, 4	Reliability class		
	4*10 ⁻³	5			
Delivery of erroneous SDUs	'no'	1, 2, 3, 4	Reliability class		
	'yes'	5			
Maximum bitrate [kbps]	8	1	Peak throughput class		
	16	2			
	32	3			
	64	4			
	128	5			
	256	6			
	512	7			
	1024	8			
	2048	9			
Allocation/Retention priority	1	1	Precedence class		
	2	2			
	3	3			
Delivery order	yes'	yes'	Reordering Required (Information		
	'no'	'no'	in the SGSN and the GGSN PDP Contexts)		
Maximum SDU size	1 500 octets	(Fixed value)			

Table 6: Rules for determining R99 attributes from R97/98 attributes

Note: As the allocation/retention priority attribute is not available in the <u>MSUE</u> (see 6.4.4.1) the mapping of the allocation/retention priority attribute is not relevant for the <u>MSUE</u>.

9.1.2.3 Determining R97/98 attributes from R99 attributes

This mapping is applicable in the following cases:

- PDP Context is handed over from GPRS R99 or UMTS to GPRS R97/98;
- when a R99 MSUE perform a PDP Context Activation in a serving R99 SGSN while the GGSN is of R97/98. In this case the SGSN shall perform mapping of the R99 QoS attributes to the R97/98 QoS attributes;
- a R99 HLR may need to map the stored subscribed QoS attributes in the HLR subscriber data to R97/98 QoS attributes that are going to be sent in the Insert Subscriber Data message from the R99 HLR to the R97/98 and R99 SGSN. It is an implementation issue if the R97/98 QoS attributes are stored in the HLR in addition to the R99 QoS attributes;
- a R99 <u>MSUE</u> (except UMTS only <u>MSUE</u>) receives a request for a PDP Context Activation with R99 QoS attributes, e.g. via AT command.

Resulting R97/98 Attribute		Derived from R99 Attribute		
Name	Value	Value	Name	
Delay class	1	conversational	Traffic class	
	1	streaming	Traffic class	
	1	Interactive	Traffic class	
		1	Traffic handling priority	
	2	Interactive	Traffic class	
		2	Traffic handling priority	
	3	Interactive	Traffic class	
		3	Traffic handling priority	
	4	Background	Traffic class	
Reliability class	2	<= 10 ⁻⁵	SDU error ratio	
	3	$10^{-5} < x <= 5^{*}10^{-4}$	SDU error ratio	
	4	> 5*10 ⁻⁴	SDU error ratio	
		<= 2*10 ⁻⁴	Residual bit error ratio	
	5	> 5*10 ⁻⁴	SDU error ratio	
		> 2*10 ⁻⁴	Residual bit error ratio	
Peak throughput class	1	< 16	Maximum bitrate [kbps]	
	2	16 <= x < 32		
	3	32 <= x < 64		
	4	64 <= x < 128		
	5	128 <= x < 25 <u>6</u>		
	6	256 <= x < 512		
	7	512 <= x < 1024		
	8	1024 <= x < 2048		
	9	>= 2048		
Precedence class	1	1	Allocation/retention priority	
	2	2		
	3	3		
Mean throughput class	Always set to 31	-		
Reordering Required	yes'	yes'	Delivery order	
(Information in the SGSN and the GGSN PDP Contexts)	'no'	'no'		

Table 7: Rules for determining R97/98 attributes from R99 attributes

As the allocation/retention priority attribute is not available in the <u>MSUE</u>(see 6.4.4.1) the <u>MSUE</u> shall set the R97/98 precedence class attribute to the value "subscribed" (see 3GPP TS 24.008).

Note: In the case of asymmetric bearers, the higher value of the maximum bitrate attributes for downlink and uplink is selected and used for the maximum bitrate value.

Annex C (normative): Determine which QoS profile is of highest QoS

In handovers from Release 1999 to GPRS Release 97/98 networks, it will be necessary to determine which PDP context of a set of PDP contexts provides the highest QoS, since, of a set of PDP contexts with the same APN and PDP address, all PDP contexts except the one with the highest QoS profile will be deactivated.

To determine which PDP context that has the highest QoS table C.1 is used. Only the PDP context(s) with the highest QoS ranking will be maintained and the rest will be deactivated. In a second step, if more than one PDP context remain, the PDP context with the highest value forof the Mmaximum bitrate attributes for downlink or uplink is selected-and is compared. All PDP contexts except the PDP context(s) with the highest Maximum bitrate selected will be deactivated.

If more than one PDP context remain after the second step, all PDP contexts except that with the lowest NSAPI are deactivated.

Table C.1

QoS ranking	2	conversational	Traffic class
	3	streaming	Traffic class
	1	Interactive	Traffic class
		4	Traffic handling priority
	4	Interactive	Traffic class
		2	Traffic handling priority
	5	Interactive	Traffic class
		3	Traffic handling priority
	6	Background	Traffic class

QoS ranking	Traffic class	Traffic handling priority
1	Interactive	<u>1</u>
2	conversational	Not applicable
3	streaming	Not applicable
<u>4</u>	Interactive	2
<u>5</u>	Interactive	3
<u>6</u>	Background	Not applicable

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	It is proposed that the determining the highe mapping from R99 to for the mapping betwe respective network re is that the best possib highest QoS is to add since all except one F shall have the highest consistent with that th lessen the damage. A to R97/98 parameters	issues of map est QoS are tre R97/98 param een two profile leases, give th ole QoS shall b ress the issue PDP context wi t QoS profile. e best possible After the select is is carried out	pping with ated in a seters, as s is that t e same o be provide of hando Il be dead The unde e QoS sh tion of the	a asymmetric to consistent ma stated in 23.1 he two profiles or at least similed. The issue of vers from R99 ctivated, and to rlying thinking all be left, as no PDP context	bearers and anner. Regardi 07, the overall s, applied in the lar QoS. The t of determining to R97/98 net he one PDP co behind this is much as possil , a mapping fro	ng the principle eir hinking the works, ontext left also ole to om R99
	It is proposed that the mappings with asymn higher of uplink/down simple, and straightfo with lower QoS needs bearer.	higher QoS o netric bearers link maximum rward. It woul s, if a higher Q	f the uplir and deter bitrates s dn't harm oS was er	nk/downlink sh mining the hig hould be chos the bearer in ventually assigned ted by S2 to c	nould be used f ghest QoS, i.e. sen. The soluti the opposite d gned to the syr	or both , the on is irection nmetric

	to 'UE' in the TS.			
Summary of change: ೫	The higher of the uplink/downlink maximum bitrates is used for both mapping of			
	asymmetric bearers and determining the highest QoS. Also 'MS' to 'UE' editorial global change.			
Consequences if % not approved:	As it is not specified which maximum bitrate QoS attribute shall be used in the mapping of asymmetric bearers and determining highest QoS, there is the risk of different UE and SGSN implementations. In consequence mappings will be inconsistent and different PDP contexts would be released locally.			
Clauses affected: #	9.1.2.3, Annex C			
Other specs % affected:	Other core specifications # Test specifications # O&M Specifications *			
Other comments: #				

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9.1.2 UMTS-GPRS

This section covers primarily the mapping of QoS attributes that are necessary across standardised interfaces. In addition to these, there are cases when mapping of QoS attributes are needed internal to a node.

GPRS Release 99 (R99) QoS attributes shall be equivalent to the UMTS QoS Attributes. For interworking purposes between different releases, mapping rules between GPRS Release 97/98 (R97/98) and GPRS Release 99 (R99) as well as UMTS are defined. Mapping shall occur whenever the <u>MSUE</u>, the SGSN, the GGSN and the HLR nodes are of different releases R97/98 or R99. The mapping is required in PDP context activation and modification procedures and when a R99 HLR Insert Subscriber Data towards a R97/98 SGSN.

It is not within the scope of the present document to determine if any value combinations of attribute values can not be supported. This means that complete mapping rules are defined here, and if the user requests a QoS profile which the network is not able to support (e.g. a low delay and a high reliability), the decision if such a attribute combination can be supported is left to admission control functionality within the PDP context activation procedure, and the QoS for such a profile may be renegotiated by the network based on the available resources.

The overall principle for the mapping between two profiles is that the two profiles, applied in their respective network releases, give the same or at least similar QoS. The GPRS R97/98 equipment will not be able to provide realtime service corresponding to the R99 conversational and streaming traffic classes. Therefore, the mapping is always to the non-realtime interactive and background traffic classes.

9.1.2.1 General rules

Air interface Session Management and GTP messages of R99 shall contain the R99 attributes as an extension of the R97/98 QoS Information Element thus unnecessary mapping can be avoided. When a R97/98 MS is visiting a GPRS

R99 or UMTS SGSN and the GGSN is of R97/98 or R99, the visited SGSN shall not perform any mapping of QoS attributes. In case of GGSN R99, the GTP version 1 (R99) QoS profile only contains the R97/98 QoS attributes. It can be noted that for this PDP Context a Traffic Flow Template (TFT) can not be requested.

When a R99 <u>MSUE</u> is visiting a GPRS R99 or UMTS SGSN (or serving PLMN) and the GGSN (or home PLMN) is of R97/98, the visited SGSN (or visited PLMN) shall be capable of providing bearers having QoS support according to R99. When a PDP Context is activated (mobile or network initiated) mapping takes place in the serving SGSN.

For MS initiated PDP Context Activations as well as network initiated PDP Context Activations, the home R97/98 GGSN will respond to the activation request by returning a the QoS Negotiated Profile, which contain the accepted and changed R97/98 attributes. A mapping of the changed attributes into R99 attributes will be done in serving SGSN and signalled to the mobile stationUE in the Activate PDP Context Accept message.

It is a general mapping rule that returned and unchanged attributes during negotiation procedures shall not be mapped a second time by serving SGSN, i.e. the unchanged R99 attributes received in the Create PDP Context Response message will be sent to <u>MSUE</u> in QoS Negotiated Profile of the Activate PDP Context Accept message.

MAP message of R99 shall also contain the R99 attributes as an extension of the R97/98 QoS Information Element when Insert Subscriber Data message is sent to a R99 SGSN. In the case when a R99 HLR send a Insert Subscriber Data message to a R97/98 SGSN, the message shall contain the R97/98 QoS attributes. A R99 SGSN shall use the R99 attributes of subscribed QoS profile when a R99 MSUE requests to use subscription data in the PDP Context Activation. The R99 SGSN shall use the R97/98 attributes of subscribed QoS profile when a R97/98 attributes of subscribed QoS profile when a R97/98 MS requests to use subscription data in the PDP Context Activation.

9.1.2.2 Determining R99 attributes from R97/98 attributes

This mapping is applicable in the following cases:

- hand over of PDP Context from GPRS R97/98 SGSN to GPRS R99 or UMTS SGSN;
- PDP Context Activation in a serving R99 SGSN with a R97/98 GGSN. When GGSN respond to the PDP Context Activation, mapping of the changed R97/98 QoS attributes received from the GGSN to R99 QoS attributes is performed in the serving SGSN.

This mapping is also applicable if a R99 <u>MSUE</u> allows an application to request a PDP Context Activation with R97/98 QoS attributes, e.g. via AT command.

Resulting R99 Attribute		Deri	Derived from R97/98 Attribute		
Name	Value	Value	Name		
Traffic class	Interactive	1, 2, 3	Delay class		
	Background	4			
Traffic handling priority	1	1	Delay class		
	2	2			
	3	3			
SDU error ratio	10 ⁻⁶	1, 2	Reliability class		
	10 ⁻⁴	3			
	10 ⁻³	4, 5			
Residual bit error ratio	10 ⁻⁵	1, 2, 3, 4	Reliability class		
	4*10 ⁻³	5			
Delivery of erroneous SDUs	'no'	1, 2, 3, 4	Reliability class		
	'yes'	5			
Maximum bitrate [kbps]	8	1	Peak throughput class		
	16	2			
	32	3			
	64	4			
	128	5			
	256	6			
	512	7			
	1024	8			
	2048	9			
Allocation/Retention priority	1	1	Precedence class		
	2	2			
	3	3			
Delivery order	yes'	yes'	Reordering Required (Information		
	'no'	'no'	in the SGSN and the GGSN PDP Contexts)		
Maximum SDU size	1 500 octets	(Fixed value)			

Table 6: Rules for determining R99 attributes from R97/98 attributes

Note: As the allocation/retention priority attribute is not available in the <u>MSUE</u> (see 6.4.4.1) the mapping of the allocation/retention priority attribute is not relevant for the <u>MSUE</u>.

9.1.2.3 Determining R97/98 attributes from R99 attributes

This mapping is applicable in the following cases:

- PDP Context is handed over from GPRS R99 or UMTS to GPRS R97/98;
- when a R99 <u>MSUE</u> perform a PDP Context Activation in a serving R99 SGSN while the GGSN is of R97/98. In this case the SGSN shall perform mapping of the R99 QoS attributes to the R97/98 QoS attributes;
- a R99 HLR may need to map the stored subscribed QoS attributes in the HLR subscriber data to R97/98 QoS attributes that are going to be sent in the Insert Subscriber Data message from the R99 HLR to the R97/98 and R99 SGSN. It is an implementation issue if the R97/98 QoS attributes are stored in the HLR in addition to the R99 QoS attributes;
- a R99 <u>MSUE</u> (except UMTS only <u>MSUE</u>) receives a request for a PDP Context Activation with R99 QoS attributes, e.g. via AT command.

Resulting R97/98 Attribute		Derived from R99 Attribute		
Name	Value	Value	Name	
Delay class	1	conversational	Traffic class	
	1	streaming	Traffic class	
	1	Interactive	Traffic class	
		1	Traffic handling priority	
	2	Interactive	Traffic class	
		2	Traffic handling priority	
	3	Interactive	Traffic class	
		3	Traffic handling priority	
	4	Background	Traffic class	
Reliability class	2	<= 10 ⁻⁵	SDU error ratio	
	3	$10^{-5} < x <= 5^{*}10^{-4}$	SDU error ratio	
	4	> 5*10 ⁻⁴	SDU error ratio	
		<= 2*10 ⁻⁴	Residual bit error ratio	
	5	> 5*10 ⁻⁴	SDU error ratio	
		> 2*10 ⁻⁴	Residual bit error ratio	
Peak throughput class	1	< 16	Maximum bitrate [kbps]	
	2	16 <= x < 32		
	3	32 <= x < 64		
	4	64 <= x < 128		
	5	128 <= x < 25 <u>6</u>		
	6	256 <= x < 512		
	7	512 <= x < 1024		
	8	1024 <= x < 2048		
	9	>= 2048		
Precedence class	1	1	Allocation/retention priority	
	2	2		
	3	3		
Mean throughput class	Always set to 31	-		
Reordering Required	yes'	yes'	Delivery order	
(Information in the SGSN and the GGSN PDP Contexts)	'no'	'no'		

Table 7: Rules for determining R97/98 attributes from R99 attributes

As the allocation/retention priority attribute is not available in the <u>MSUE</u>(see 6.4.4.1) the <u>MSUE</u> shall set the R97/98 precedence class attribute to the value "subscribed" (see 3GPP TS 24.008).

Note: In the case of asymmetric bearers, the higher value of the maximum bitrate attributes for downlink and uplink is selected and used for the maximum bitrate value.

Annex C (normative): Determine which QoS profile is of highest QoS

In handovers from Release 1999 to GPRS Release 97/98 networks, it will be necessary to determine which PDP context of a set of PDP contexts provides the highest QoS, since, of a set of PDP contexts with the same APN and PDP address, all PDP contexts except the one with the highest QoS profile will be deactivated.

To determine which PDP context that has the highest QoS table C.1 is used. Only the PDP context(s) with the highest QoS ranking will be maintained and the rest will be deactivated. In a second step, if more than one PDP context remain, the PDP context with the highest value forof the Mmaximum bitrate attributes for downlink or uplink is selected-and is compared. All PDP contexts except the PDP context(s) with the highest Maximum bitrate selected will be deactivated.

If more than one PDP context remain after the second step, all PDP contexts except that with the lowest NSAPI are deactivated.

Table C.1

QoS ranking	2	conversational	Traffic class
	3	streaming	Traffic class
	1	Interactive	Traffic class
		4	Traffic handling priority
	4	Interactive	Traffic class
		2	Traffic handling priority
	5	Interactive	Traffic class
		3	Traffic handling priority
	6	Background	Traffic class

QoS ranking	Traffic class	Traffic handling priority
<u>1</u>	Interactive	1
<u>2</u>	conversational	Not applicable
3	streaming	Not applicable
<u>4</u>	Interactive	<u>2</u>
<u>5</u>	Interactive	<u>3</u>
<u>6</u>	Background	Not applicable