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.

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

Tdoc #	**Title**	**Spec**	**CR #**	**cat**	**Rel**	**WI**
S2-020169	Clarification of the QoS mapping on the MS	23.107	083	F	R99	TEI
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

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

Tdoc S2-020169

CR-Form-v4

CHANGE REQUEST

⌘ **23.107** **CR** **083** ⌘ ev ⌘ Current version: **3.7.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☒

Title:	⌘	Clarification of the QoS mapping on the MS
Source:	⌘	Siemens AG
Work item code:	⌘	TEI
Date:	⌘	2002-01-09
Category:	⌘	**F**
Release:	⌘	R99

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

Use one of the following releases:

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

Reason for change:	⌘	At the moment it is not specified that the mapping between R99 - R97/98 QoS attributes applies also for the MS. Furthermore, it is open which precedence class value the MS shall assume for the R97/98 attributes if it gets only the R99 QoS attributes from the application.
Summary of change:	⌘	It is proposed to define, that in the above mentioned case the MS shall set the precedence value to subscribed.
Consequences if not approved:	⌘	Different MS implementations.

Clauses affected:	⌘	2, 9.1.2.2; 9.1.2.3
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TS 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.

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

Resulting R99 Attribute		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 in the SGSN and the GGSN PDP Contexts)
	'no'	'no'	
Maximum SDU size	1 500 octets	(Fixed value)	

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.;

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

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

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 (Information in the SGSN and the GGSN PDP Contexts)	yes'	yes'	Delivery order
	'no'	'no'	

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

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

Tdoc S2-020170

CR-Form-v4

CHANGE REQUEST

⌘ **23.107** **CR** **084** ⌘ ev ⌘ Current version: **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 change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network **X**

Title:	⌘	Clarification of the QoS mapping on the MS
Source:	⌘	Siemens AG
Work item code:	⌘	TEI
Date:	⌘	2002-01-09
Category:	⌘	**A**
Release:	⌘	Rel 4

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

Use one of the following releases:

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

Reason for change:	⌘	At the moment it is not specified that the mapping between R99 - R97/98 QoS attributes applies also for the MS. Furthermore, it is open which precedence class value the MS shall assume for the R97/98 attributes if it gets only the R99 QoS attributes from the application.
Summary of change:	⌘	It is proposed to define, that in the above mentioned case the MS shall set the precedence value to subscribed.
Consequences if not approved:	⌘	Different MS implementations.

Clauses affected:	⌘	2, 9.1.2.2; 9.1.2.3
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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.

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

Resulting R99 Attribute		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 in the SGSN and the GGSN PDP Contexts)
	'no'	'no'	
Maximum SDU size	1 500 octets	(Fixed value)	

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;.

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

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

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 (Information in the SGSN and the GGSN PDP Contexts)	yes'	yes'	Delivery order
	'no'	'no'	

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

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

Tdoc S2-020171

CR-Form-v4

CHANGE REQUEST

⌘ **23.107** **CR** **085** ⌘ ev ⌘ Current version: **5.3.0** ⌘

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

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

Title:	⌘	Clarification of the QoS mapping on the MS
Source:	⌘	Siemens AG
Work item code:	⌘	TEI
Date:	⌘	2002-01-09
Category:	⌘	**A**
Release:	⌘	Rel 5

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

Use one of the following releases:

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

Reason for change:	⌘	At the moment it is not specified that the mapping between R99 - R97/98 QoS attributes applies also for the MS. Furthermore, it is open which precedence class value the MS shall assume for the R97/98 attributes if it gets only the R99 QoS attributes from the application.
Summary of change:	⌘	It is proposed to define, that in the above mentioned case the MS shall set the precedence value to subscribed.
Consequences if not approved:	⌘	Different MS implementations.

Clauses affected:	⌘	2, 9.1.2.2; 9.1.2.3
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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.

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

Resulting R99 Attribute		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 in the SGSN and the GGSN PDP Contexts)
	'no'	'no'	
Maximum SDU size	1 500 octets	(Fixed value)	

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;.

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

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

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 (Information in the SGSN and the GGSN PDP Contexts)	yes'	yes'	Delivery order
	'no'	'no'	

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

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

Tdoc S2-020649

CR-Form-v4

CHANGE REQUEST

⌘ **23.107** **CR** **096** ⌘ rev **-** ⌘ Current version: **3.7.0** ⌘

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

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

Title:	⌘	QoS mapping rule for the R99 delivery order attribute
Source:	⌘	Siemens AG
Work item code:	⌘	TEI
Date:	⌘	13.02.2002
Category:	⌘	**F**
Release:	⌘	R99

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

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	At the moment it is not specified which value the MS shall assume for the R99 delivery order attributes if it gets only the R97/98 QoS attributes from the application.
Summary of change:	⌘	It is proposed to define, that in the above mentioned case the MS shall set the delivery order attribute to the value subscribed.
Consequences if not approved:	⌘	Different MS implementations.

Clauses affected:	⌘	9.1.2.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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.

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

Resulting R99 Attribute		**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 in the SGSN and the GGSN PDP Contexts)
	'no'	'no'	
Maximum SDU size	1 500 octets	(Fixed value)	

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 class			Reliability class			octet 3
spare								
Peak throughput				0	Precedence class			octet 4
				spare				
0	0	0	Mean throughput					octet 5
spare								
Traffic Class			Delivery order		Delivery of erroneous SDU			Octet 6
Maximum SDU size								Octet 7
Maximum bit rate for uplink								Octet 8
Maximum bit rate for downlink								Octet 9
Residual BER				SDU error ratio				Octet 10
Transfer delay					Traffic Handling priority			Octet 11
Guaranteed bit rate for uplink								Octet 12
Guaranteed bit rate for downlink								Octet 13

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

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

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

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

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

In MS to network direction and in network to MS direction :
0 0 1 Delay class 1
0 1 0 Delay class 2
0 1 1 Delay class 3
1 0 0 Delay class 4 (best effort)
1 1 1 Reserved

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

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

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

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

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

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

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

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

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

The MS shall consider all other values as reserved.

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

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

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

The MS shall consider all other values as reserved.

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

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

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

The MS shall consider all other values as reserved.

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

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

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

1 1 1 1 1 1 1 1 0kbps

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

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

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

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

The MS shall consider all other values as reserved.

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

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

The MS shall consider all other values as reserved.

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

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

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

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

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

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

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

1 1 1 1 1 1 Reserved

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

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

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

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

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

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

Tdoc S2-020652

CR-Form-v4

CHANGE REQUEST

⌘ **23.107** **CR** **097** ⌘ rev **-** ⌘ Current version: **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 change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network **X**

Title:	⌘	QoS mapping rule for the R99 delivery order attribute
Source:	⌘	Siemens AG
Work item code:	⌘	TEI4
Date:	⌘	13.02.2002
Category:	⌘	**A**
Release:	⌘	REL-4

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

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	At the moment it is not specified which value the MS shall assume for the R99 delivery order attributes if it gets only the R97/98 QoS attributes from the application.
Summary of change:	⌘	It is proposed to define, that in the above mentioned case the MS shall set the delivery order attribute to the value subscribed.
Consequences if not approved:	⌘	Different MS implementations.

Clauses affected:	⌘	9.1.2.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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.

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

Resulting R99 Attribute		**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 in the SGSN and the GGSN PDP Contexts)
	'no'	'no'	
Maximum SDU size	1 500 octets	(Fixed value)	

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 class			Reliability class			octet 3
spare								
Peak throughput				0	Precedence class			octet 4
				spare				
0	0	0	Mean throughput					octet 5
spare								
Traffic Class			Delivery order		Delivery of erroneous SDU			Octet 6
Maximum SDU size								Octet 7
Maximum bit rate for uplink								Octet 8
Maximum bit rate for downlink								Octet 9
Residual BER				SDU error ratio				Octet 10
Transfer delay					Traffic Handling priority			Octet 11
Guaranteed bit rate for uplink								Octet 12
Guaranteed bit rate for downlink								Octet 13

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

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

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

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

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

In MS to network direction and in network to MS direction :
0 0 1 Delay class 1
0 1 0 Delay class 2
0 1 1 Delay class 3
1 0 0 Delay class 4 (best effort)
1 1 1 Reserved

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

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

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

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

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

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

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

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

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

The MS shall consider all other values as reserved.

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

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

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

The MS shall consider all other values as reserved.

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

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

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

The MS shall consider all other values as reserved.

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

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

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

1 1 1 1 1 1 1 1 0kbps

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

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

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

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

The MS shall consider all other values as reserved.

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

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

The MS shall consider all other values as reserved.

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

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

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

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

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

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

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

1 1 1 1 1 1 Reserved

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

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

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

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

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

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

Tdoc S2-020653

CR-Form-v4

CHANGE REQUEST

⌘ **23.107** **CR** **098** ⌘ rev **-** ⌘ Current version: **5.3.0** ⌘

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

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

Title:	⌘	QoS mapping rule for the R99 delivery order attribute
Source:	⌘	Siemens AG
Work item code:	⌘	TEI5
Date:	⌘	13.02.2002
Category:	⌘	**A**
Release:	⌘	REL-5

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

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	At the moment it is not specified which value the MS shall assume for the R99 delivery order attributes if it gets only the R97/98 QoS attributes from the application.
Summary of change:	⌘	It is proposed to define, that in the above mentioned case the MS shall set the delivery order attribute to the value subscribed.
Consequences if not approved:	⌘	Different MS implementations.

Clauses affected:	⌘	9.1.2.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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.

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

Resulting R99 Attribute		**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 in the SGSN and the GGSN PDP Contexts)
	'no'	'no'	
Maximum SDU size	1 500 octets	(Fixed value)	

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 class			Reliability class			octet 3
spare								
Peak throughput				0	Precedence class			octet 4
				spare				
0	0	0	Mean throughput					octet 5
spare								
Traffic Class			Delivery order		Delivery of erroneous SDU			Octet 6
Maximum SDU size								Octet 7
Maximum bit rate for uplink								Octet 8
Maximum bit rate for downlink								Octet 9
Residual BER				SDU error ratio				Octet 10
Transfer delay					Traffic Handling priority			Octet 11
Guaranteed bit rate for uplink								Octet 12
Guaranteed bit rate for downlink								Octet 13

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

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

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

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

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

In MS to network direction and in network to MS direction :
0 0 1 Delay class 1
0 1 0 Delay class 2
0 1 1 Delay class 3
1 0 0 Delay class 4 (best effort)
1 1 1 Reserved

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

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

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

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

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

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

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

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

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

The MS shall consider all other values as reserved.

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

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

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

The MS shall consider all other values as reserved.

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

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

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

The MS shall consider all other values as reserved.

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

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

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

1 1 1 1 1 1 1 1 0kbps

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

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

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

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

The MS shall consider all other values as reserved.

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

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

The MS shall consider all other values as reserved.

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

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

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

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

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

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

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

1 1 1 1 1 1 Reserved

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

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

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

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

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

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

S2-020723~~612~~

CR-Form-v3

CHANGE REQUEST

⌘ **23.107 CR 093** ⌘ rev **1-** ⌘ Current version: **3.7.0** ⌘

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

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

Title:	⌘	Corrections on attribute values
Source:	⌘	Nokia
Work item code:	⌘	E2EQoS
Date:	⌘	08.02.2002
Category:	⌘	**F**
Release:	⌘	R99

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

Use one of the following releases:

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

Reason for change:	⌘	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:	⌘	6.5.1, 6.5.2
Other specs affected:	⌘	☐ 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.

Table 4: Value ranges for UMTS Bearer Service Attributes

Traffic class	Conversational class	Streaming class	Interactive class	Background class
Maximum bitrate (kbps)	< 2 048 (1) (2)	< 2 048 (1) (2)	< 2 048 - overhead (2) (3)	< 2 048 - overhead (2) (3)
Delivery order	Yes/No	Yes/No	Yes/No	Yes/No
Maximum SDU size (octets)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)
SDU format information	(5)	(5)		
Delivery of erroneous SDUs	Yes/No/- (6)	Yes/No/- (6)	Yes/No/- (6)	Yes/No/- (6)
Residual BER	$5*10^{-2}$, 10^{-2}, $5*10^{-3}$, 10^{-3}, 10^{-4}, 10^{-5}, 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*** (~~9~~8)	250 up to ***FFS*** (~~9~~8)		
Guaranteed bit rate (kbps)	< 2 048 (1) (2)	< 2 048 (1) (2)		
Traffic handling priority			1,2,3 ~~(8)~~	
Allocation/Retention priority	1,2,3 ~~(8)~~	1,2,3 ~~(8)~~	1,2,3 ~~(8)~~	1,2,3 ~~(8)~~

1) Bitrate of 2 048 kbps requires that UTRAN operates in transparent RLC protocol mode, in this case the overhead from layer 2 protocols is negligible.

2) The granularity of the bit rate 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.

Table 5: Value ranges for Radio Access Bearer Service Attributes

Traffic class	Conversational class	Streaming class	Interactive class	Background class
Maximum bitrate (kbps)	< 2 048 (1) (2)	< 2 048 (1) (2)	< 2 048 - overhead (2) (3)	< 2 048 - overhead (2) (3)
Delivery order	Yes/No	Yes/No	Yes/No	Yes/No
Maximum SDU size (octets)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)
SDU format information	(5)	(5)		
Delivery of erroneous SDUs	Yes/No/-	Yes/No/-	Yes/No/-	Yes/No/-
Residual BER	$5*10^{-2}$, 10^{-2}, $5*10^{-3}$, 10^{-3}, 10^{-4}, 10^{-5}, 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*** (7~~8~~)	250 up to ***FFS*** (~~8~~7)		
Guaranteed bit rate (kbps)	< 2 048 (1) (2)	< 2 048 (1) (2)		
Traffic handling priority			1,2,3 ~~(7)~~	
Allocation/Retention priority	1,2,3 ~~(7)~~	1,2,3 ~~(7)~~	1,2,3 ~~(7)~~	1,2,3 ~~(7)~~
Source statistic descriptor	Speech/unknown	Speech/unknown		

1) Bitrate of 2 048 kbps requires that UTRAN operates in transparent RLC protocol mode, in this case the overhead from layer 2 protocols is negligible.

2) The granularity of the bit rate 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).

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18 – 22 February 2002

S2-020724

CR-Form-v3

CHANGE REQUEST

⌘ **23.107** **CR** **099** ⌘ rev **-** ⌘ Current version: **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 change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network **X**

Title:	⌘	Corrections on attribute values
Source:	⌘	Nokia
Work item code:	⌘	E2EQoS
Date:	⌘	18.02.2002
Category:	⌘	**F**
Release:	⌘	R4

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

Use one of the following releases:

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

Reason for change:	⌘	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:	⌘	6.5.1, 6.5.2
Other specs affected:	⌘	☐ 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.

Table 4: Value ranges for UMTS Bearer Service Attributes

Traffic class	Conversational class	Streaming class	Interactive class	Background class
Maximum bitrate (kbps)	< 2 048 (1) (2)	< 2 048 (1) (2)	< 2 048 - overhead (2) (3)	< 2 048 - overhead (2) (3)
Delivery order	Yes/No	Yes/No	Yes/No	Yes/No
Maximum SDU size (octets)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)
SDU format information	(5)	(5)		
Delivery of erroneous SDUs	Yes/No/- (6)	Yes/No/- (6)	Yes/No/- (6)	Yes/No/- (6)
Residual BER	$5*10^{-2}$, 10^{-2}, $5*10^{-3}$, 10^{-3}, 10^{-4}, 10^{-5}, 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*** (~~9~~8)	250 up to ***FFS*** (~~9~~8)		
Guaranteed bit rate (kbps)	< 2 048 (1) (2)	< 2 048 (1) (2)		
Traffic handling priority			1,2,3 ~~(8)~~	
Allocation/Retention priority	1,2,3 ~~(8)~~	1,2,3 ~~(8)~~	1,2,3 ~~(8)~~	1,2,3 ~~(8)~~

1) Bitrate of 2 048 kbps requires that UTRAN operates in transparent RLC protocol mode, in this case the overhead from layer 2 protocols is negligible.

2) The granularity of the bit rate 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.

Table 5: Value ranges for Radio Access Bearer Service Attributes

Traffic class	Conversational class	Streaming class	Interactive class	Background class
Maximum bitrate (kbps)	< 2 048 (1) (2)	< 2 048 (1) (2)	< 2 048 - overhead (2) (3)	< 2 048 - overhead (2) (3)
Delivery order	Yes/No	Yes/No	Yes/No	Yes/No
Maximum SDU size (octets)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)
SDU format information	(5)	(5)		
Delivery of erroneous SDUs	Yes/No/-	Yes/No/-	Yes/No/-	Yes/No/-
Residual BER	$5*10^{-2}$, 10^{-2}, $5*10^{-3}$, 10^{-3}, 10^{-4}, 10^{-5}, 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*** (7~~8~~)	250 up to ***FFS*** (~~8~~7)		
Guaranteed bit rate (kbps)	< 2 048 (1) (2)	< 2 048 (1) (2)		
Traffic handling priority			1,2,3 ~~(7)~~	
Allocation/Retention priority	1,2,3 ~~(7)~~	1,2,3 ~~(7)~~	1,2,3 ~~(7)~~	1,2,3 ~~(7)~~
Source statistic descriptor	Speech/unknown	Speech/unknown		

1) Bitrate of 2 048 kbps requires that UTRAN operates in transparent RLC protocol mode, in this case the overhead from layer 2 protocols is negligible.

2) The granularity of the bit rate 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

S2-020813~~725~~

CR-Form-v3

CHANGE REQUEST

⌘ **23.107 CR 100** ⌘ rev **1-** ⌘ Current version: **5.3.0** ⌘

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

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

Title:	⌘	Corrections on attribute values
Source:	⌘	Nokia
Work item code:	⌘	E2EQoS
Date:	⌘	18.02.2002
Category:	⌘	**F**
Release:	⌘	R5

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

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	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. Source Statistics Descriptor was added to the Table 4.
Consequences if not approved:	⌘	Confusion in the specs may create interoperability problems between various vendors.

Clauses affected:	⌘	6.5.1, 6.5.2
Other specs affected:	⌘	☐ 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.

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Delivery order	Yes/No	Yes/No	Yes/No	Yes/No
Maximum SDU size (octets)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)	<=1 500 or 1 502 (4)
SDU format information	(5)	(5)		
Delivery of erroneous SDUs	Yes/No/- (6)	Yes/No/- (6)	Yes/No/- (6)	Yes/No/- (6)
Residual BER	$5*10^{-2}$, 10^{-2}, $5*10^{-3}$, 10^{-3}, 10^{-4}, 10^{-5}, 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*** (~~9~~8)	250 up to ***FFS*** (~~9~~8)		
Guaranteed bit rate (kbps)	< 2 048 (1) (2)	< 2 048 (1) (2)		
Traffic handling priority			1,2,3 ~~(8)~~	
Allocation/Retention priority	1,2,3 ~~(8)~~	1,2,3 ~~(8)~~	1,2,3 ~~(8)~~	1,2,3 ~~(8)~~
Source statistic descriptor	Speech/unknown	Speech/unknown		

1) Bitrate of 2 048 kbps requires that UTRAN operates in transparent RLC protocol mode, in this case the overhead from layer 2 protocols is negligible.

2) The granularity of the bit rate attributes shall be studied. Although the UMTS network has capability to support a large number of different bitrate values, the number of possible values shall be limited not to unnecessarily increase the complexity of for example terminals, charging and interworking functions. Exact list of supported values shall be defined together with S1, N1, N3 and R2.

3) Impact from layer 2 protocols on maximum bitrate in non-transparent RLC protocol mode shall be estimated.

4) In case of PDP type = PPP, maximum SDU size is 1502 octets. In other cases, maximum SDU size is 1 500 octets.

5) Definition of possible values of exact SDU sizes for which UTRAN can support transparent RLC protocol mode, is the task of RAN WG3.

6) If *Delivery of erroneous SDUs* is set to 'Yes' error indications can only be provided on the MT/TE side of the UMTS bearer. On the CN Gateway side error indications can not be signalled outside of UMTS network in release 1999.

7) 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.

Table 5: Value ranges for Radio Access Bearer Service Attributes

Traffic class	Conversational class	Streaming class	Interactive class	Background class
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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^{-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*** (78)	250 up to ***FFS*** (~~8~~7)		
Guaranteed bit rate (kbps)	< 2 048 (1) (2)	< 2 048 (1) (2)		
Traffic handling priority			1,2,3 ~~(7)~~	
Allocation/Retention priority	1,2,3 ~~(7)~~	1,2,3 ~~(7)~~	1,2,3 ~~(7)~~	1,2,3 ~~(7)~~
Source statistic descriptor	Speech/unknown	Speech/unknown		

1) Bitrate of 2 048 kbps requires that UTRAN operates in transparent RLC protocol mode, in this case the overhead from layer 2 protocols is negligible.

2) The granularity of the bit rate 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 ***S2-020916***
Sophia Antipolis, France, 18-22 February

CR-Form-v5

CHANGE REQUEST

⌘ **23.107** **CR** **86** ⌘ **rev** **3** ⌘ Current version: **3.7.0** ⌘

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

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

Title:	⌘	Asymmetric Bearers – Mapping and Determining Highest QoS
Source:	⌘	Ericsson, Siemens
Work item code:	⌘	GPRS
Date:	⌘	18.02.2002
Category:	⌘	**F**
Release:	⌘	R99

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

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change: ⌘

Regarding the general case of asymmetric bearers, where it is possible in R99 and beyond to set different/separate values for maximum bitrate, guaranteed bitrate, and transfer delay for uplink and downlink, there is a need to clarify what 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:	⌘	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: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

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 ~~MS~~UE, 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 ~~MS~~UE 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 station~~UE 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 ~~MS~~UE 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 ~~MS~~UE 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 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 ~~MS~~UE allows an application to request a PDP Context Activation with R97/98 QoS attributes, e.g. via AT command.

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

Resulting R99 Attribute		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 in the SGSN and the GGSN PDP Contexts)
	'no'	'no'	
Maximum SDU size	1 500 octets	(Fixed value)	

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

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~~UE 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 ~~MS~~UE (except UMTS only ~~MS~~UE) receives a request for a PDP Context Activation with R99 QoS attributes, e.g. via AT command.

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

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 < 256	
	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 (Information in the SGSN and the GGSN PDP Contexts)	yes'	yes'	Delivery order
	'no'	'no'	

As the allocation/retention priority attribute is not available in the ~~M~~SUE(see 6.4.4.1) the ~~M~~SUE 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 for~~of~~ the ~~M~~maximum 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
		1	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	1
2	conversational	Not applicable
3	streaming	Not applicable
4	Interactive	2
5	Interactive	3
6	Background	Not applicable

3GPP TSG-SA2 Meeting #23 ***S2-020917***
Sophia Antipolis, France, 18-22 February

CR-Form-v5

CHANGE REQUEST

⌘ **23.107** **CR** **87** ⌘ **rev** **3** ⌘ Current version: **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 change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network **X**

Title:	⌘	Asymmetric Bearers – Mapping and Determining Highest QoS
Source:	⌘	Ericsson, Siemens
Work item code:	⌘	GPRS
Date:	⌘	18.02.2002
Category:	⌘	**A**
Release:	⌘	REL-4

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

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change: ⌘

Regarding the general case of asymmetric bearers, where it is possible in R99 and beyond to set different/separate values for maximum bitrate, guaranteed bitrate, and transfer delay for uplink and downlink, there is a need to clarify what 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:	⌘	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:
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1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.
3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

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 ~~MS~~UE, 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 ~~MS~~UE 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 station~~UE 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 ~~MS~~UE 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 ~~MS~~UE 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 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 ~~MS~~UE allows an application to request a PDP Context Activation with R97/98 QoS attributes, e.g. via AT command.

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

Resulting R99 Attribute		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 in the SGSN and the GGSN PDP Contexts)
	'no'	'no'	
Maximum SDU size	1 500 octets	(Fixed value)	

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

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~~UE 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 ~~MS~~UE (except UMTS only ~~MS~~UE) receives a request for a PDP Context Activation with R99 QoS attributes, e.g. via AT command.

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

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 < 256	
	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 (Information in the SGSN and the GGSN PDP Contexts)	yes'	yes'	Delivery order
	'no'	'no'	

As the allocation/retention priority attribute is not available in the ~~M~~SUE(see 6.4.4.1) the ~~M~~SUE 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 for~~of~~ the ~~M~~maximum 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
		1	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	1
2	conversational	Not applicable
3	streaming	Not applicable
4	Interactive	2
5	Interactive	3
6	Background	Not applicable

3GPP TSG-SA2 Meeting #23 **S2-020918**
Sophia Antipolis, France, 18-22 February

CR-Form-v5

CHANGE REQUEST

⌘ **23.107** **CR** **88** ⌘ **rev** **3** ⌘ Current version: **5.3.0** ⌘

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

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

Title:	⌘	Asymmetric Bearers – Mapping and Determining Highest QoS
Source:	⌘	Ericsson, Siemens
Work item code:	⌘	GPRS
Date:	⌘	18.02.2002
Category:	⌘	**A**
Release:	⌘	REL-5

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

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change: ⌘

Regarding the general case of asymmetric bearers, where it is possible in R99 and beyond to set different/separate values for maximum bitrate, guaranteed bitrate, and transfer delay for uplink and downlink, there is a need to clarify what 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:	⌘	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 ~~MS~~UE, 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 ~~MS~~UE 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 station~~UE 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 ~~MS~~UE 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 ~~MS~~UE 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 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 ~~MS~~UE allows an application to request a PDP Context Activation with R97/98 QoS attributes, e.g. via AT command.

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

Resulting R99 Attribute		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 in the SGSN and the GGSN PDP Contexts)
	'no'	'no'	
Maximum SDU size	1 500 octets	(Fixed value)	

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

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~~UE 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 ~~MS~~UE (except UMTS only ~~MS~~UE) receives a request for a PDP Context Activation with R99 QoS attributes, e.g. via AT command.

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

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 < 256	
	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 (Information in the SGSN and the GGSN PDP Contexts)	yes'	yes'	Delivery order
	'no'	'no'	

As the allocation/retention priority attribute is not available in the ~~M~~SUE(see 6.4.4.1) the ~~M~~SUE 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 for~~of~~ the ~~M~~maximum 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
		1	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	1
2	conversational	Not applicable
3	streaming	Not applicable
4	Interactive	2
5	Interactive	3
6	Background	Not applicable