Source:	TSG CN WG3
Title:	CRs on Rel5 Work Item e2eQoS (CR Pack1)
Agenda item:	8.5
Document for:	APPROVAL

Introduction:

This document contains **2** CRs on **Rel-5 WI e2eQoS**.

These CRs have been agreed by TSG CN WG3 and are forwarded to TSG CN Plenary meeting #18 for approval.

WG_tdoc	Title	Spec	CR	Rev	Cat	Rel	Version_old
N3-021025	Clarification on the authorized	29.207	051	2	F	Rel-5	5.1.0
N3-020932	Removal of editors note regarding	29.208	014		F	Rel-5	5.1.0

CR-Form-v7

CHANGE REQUEST

⌘	**29.208** CR **014**	⌘ **rev**	**-**	⌘	Current version:	**5.1.0**	⌘

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

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

Title: ⌘	Removal of editors note regarding calculation of 'b=AS:'.	
Source: ⌘	TSG_CN WG3	
Work item code: ⌘	e2eQoS	***Date:*** ⌘ 31/10/2002
Category: ⌘ **F**		***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)
Rel-6 (Release 6)

Reason for change: ⌘	At CN3 meeting #24 in Helsinki there were some discussions on whether or not the SDP bandwidth parameter 'b=AS:<bandwidth>' also contains the bandwidth of the RTCP IP flow in the case of a RTP media stream. The fact that the IETF specifications are not clear and in some cases generates different interpretations regarding this issue, lead to that we did not reach any agreement. Therefore editor's note was added in the clauses 7.1.1. and 7.2.2 and the "LS on RTCP overhead in SDP bandwidth parameter" (N3-020733) was sent to SA4 (cc: CN1 and SA2) asking for background information on the usage of the SDP bandwidth parameter.
	In SA4's reply-LS SA4-020567 to our LS it is clearly stated that "The b=AS parameter does not include RTCP bandwidth". Therefore the editor's notes regarding this subject can be removed.
Summary of change: ⌘	The editor's notes regarding whether or not the 'b=AS:' parameter includes the bandwidth of an associated RTCP IP flow are removed..
Consequences if not approved: ⌘	Different interpretations of how the 'b=AS:<bandwidth>' parameter is calculated.

Clauses affected: ⌘	7.1.1 and 7.2.2.

	Y	N			
Other specs affected: ⌘		X	Other core specifications	⌘	
		X	Test specifications		
		X	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.

<div style="border: 1px solid black; text-align: center;">

First amended section

</div>

7.1.1 SDP parameters to Authorized IP QoS parameters mapping in PCF

The QoS authorization is to be based on the parameters Maximum Authorized DiffServ PHB and Maximum Authorized Data Rate UL/DL.

The PCF shall use the mapping rules in table 7.1.1.1 to derive the Authorized IP QoS parameters Maximum Authorized Data Rate DL/UL and the Maximum Authorized DiffServ PHB from the SDP Parameters. In case of forking, the additional rule in section 7.3 shall apply.

**Table 7.1.1.1: Rules for derivation of the Maximum Authorized Data Rates
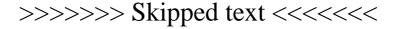and Maximum Authorized DiffServ PHB per media flow in the PCF**

Authorized IP QoS Parameter per media flow	Derivation from SDP Parameters

Maximum Authorized Data Rate DL (Max_DR_DL) and UL (Max_DR_UL) per media flow (see note 1)	IF a=recvonly THEN
	    IF <SDP direction> = mobile originated THEN
	       Direction:= downlink;
	    ELSE /* mobile teminated */
	       Direction:= uplink;
	    ENDIF;
	ELSE
	    IF a=sendonly THEN
	       IF <SDP direction> = mobile originated THEN
	         Direction: = uplink;
	       ELSE /* mobile teminated */
	         Direction:= downlink;
	       ENDIF;
	    ELSE /*sendrecv or no direction attribute*/
	       Direction:=both;
	    ENDIF;
	ENDIF;
	
	IF b=AS:<bandwidth> is present THEN
	    IF Direction=downlink THEN
	       IF <transport>="RTP/AVP" then
	         Max_DR_UL:=0.025 * <bandwidth>;
	         Max_DR_DL:=1.025 * <bandwidth>;
	       ELSE
	         Max_DR_UL:=0;
	         Max_DR_DL:=<bandwidth>;
	       ENDIF;
	    ELSE
	       IF Direction=uplink THEN
	         IF <transport>="RTP/AVP" then
	            Max_DR_UL:= 1.025 * <bandwidth>;
	            Max_DR_DL:=0.025 * <bandwidth>;
	         ELSE
	            Max_DR_UL:=<bandwidth>;
	            Max_DR_DL:=0;
	         ENDIF;
	       ELSE /*Direction=both*/
	         Max_DR_UL:= 1.025 * <bandwidth>;
	         Max_DR_DL:= 1.025 * <bandwidth>;
	       ENDIF;
	    ENDIF;
	ELSE
	    bw:= as set by the operator;
	    IF Direction=downlink THEN
	       Max_DR_UL:=0;
	       Max_DR_DL:=bw;
	    ELSE
	       IF Direction=uplink THEN
	         Max_DR_UL:=bw;
	         Max_DR_DL:=0;
	       ELSE /*Direction=both*/
	         Max_DR_UL:=bw;
	         Max_DR_DL:=bw;
	       ENDIF;
	    ENDIF;
	ENDIF;

Maximum Authorized DiffServ PHB [MaxClass] per media flow (see note 2)	CASE <media> OF
	  "audio": MaxClass:=EF; /*conversational*/
	  "video": MaxClass:=EF; /*conversational*/
	  "application": MaxClass:=EF; /*conversational*/
	  "data": MaxClass:=AF1; /*interactive with priority 3*/
	  "control": MaxClass:=AF3 /*interactive with priority 1*/
	  /*new media type*/
	  OTHERWISE: MaxClass:=BE; /*background*/
	END;

NOTE 1:	For a RTP media flow the Maximum Authorized Bandwidth DL/UL are the sum of the RTP flow DL/UL and the associated RTCP flow DL/UL.
NOTE 2:	The Maximum Authorized Traffic Class for a RTCP flow is the same as the corresponding RTP flow.

Editor's note: Further clarification is required if the SDP b=AS:<bandwidth> parameter includes the bandwidth for RTCP.

>>>>>>> Skipped text <<<<<<<

Next amended section

7.2.2 SDP parameters to Authorized UMTS QoS parameters mapping in UE

If the PDP Context is activated or modified in an IMS context then it is recommended that the UE uses the mapping rules in table 7.2.2.1 to derive the Maximum Authorized Bandwidth UL/DL.

Table 7.2.2.1 also has a mapping rule for derivation of Maximum Authorized Traffic Class. In future releases this mapping rule may change. For the reason of future compatibility, the release 5 mapping rule is optional for the UE.

In the case this mapping rule is implemented then it is recommended that the UE use the mapping rule in table 7.2.2.1 to derive the Maximum Authorised Traffic Class from the SDP Parameters.

When the maximum authorized QoS for a media flow in forked responses is derived, the additional rule in section 7.3 shall apply.

**Table 7.2.2.1: Rules for derivation of the Maximum Authorized Bandwidth DL/UL
and the Maximum Authorized Traffic Class per media flow in the UE**

Authorized UMTS QoS Parameter per media flow	Derivation from SDP Parameters
	3GPP

Maximum Authorized Bandwidth DL (Max_BW_DL) and UL (Max_BW_UL) per media flow	/* Check if IMS context (the criteria for this check is an UE manufactures issue) */
	IF IMS context THEN

```
/* Check if IMS context (the criteria for this check is an UE manufactures issue ) */
IF IMS context THEN

IF a=recvonly THEN
    IF <SDP direction> = mobile originated THEN
        Direction:= downlink;
    ELSE /* mobile teminated */
        Direction:= uplink;
    ENDIF;
ELSE;
    IF a=sendonly THEN
        IF <SDP direction> = mobile originated THEN
            Direction: = uplink;
        ELSE /* mobile teminated */
            Direction:= downlink;
        ENDIF;
    ELSE /*sendrecv or no direction attribute*/
        Direction:=both;
    ENDIF;
ENDIF;

IF b=AS:<bandwidth> is present THEN
    IF Direction=downlink THEN
        IF <transport>="RTP/AVP" then
            Max_BW_UL:=0.025 * <bandwidth>;
            Max_BW_DL:=1.025 * <bandwidth>;
        ELSE
            Max_BW_UL:=0;
            Max_BW_DL:=<bandwidth>;
        ENDIF;
    ELSE
        IF Direction=uplink THEN
            IF <transport>="RTP/AVP" then
                Max_BW_UL:= 1.025 * <bandwidth>;
                Max_BW_DL:=0.025 * <bandwidth>;
            ELSE
                Max_BW_UL:=<bandwidth>;
                Max_BW_DL:=0;
            ENDIF;
        ELSE /*Direction=both*/
            Max_BW_UL:= 1.025 * <bandwidth>;
            Max_BW_DL:= 1.025 * <bandwidth>;
        ENDIF;
    ENDIF;
ELSE
    bw:= as set by the UE manufacturer;
    IF Direction=downlink THEN
        Max_BW_UL:=0;
        Max_BW_DL:= bw;
    ELSE
        IF Direction=uplink THEN
            Max_BW_UL:= bw;
            Max_BW_DL:=0;
        ELSE /*Direction=both*/
            Max_BW_UL:= bw;
            Max_BW_DL:= bw;
        ENDIF;
    ENDIF;
ENDIF;


ELSE
    No authorization is done ;
ENDIF ;
```

Maximum Authorized Traffic Class [MaxTrafficClass] per media flow	/* Check if IMS context (the criteria for this check is an UE manufactures issue) */
	IF IMS context THEN
	  CASE \<media\> OF
	    "audio": MaxTrafficClass:=conversational;
	    "video": MaxTrafficClass:=conversational;
	    "application": MaxTrafficClass:=conversational;
	    "data": MaxTrafficClass:=interactive with priority 3;
	    "control": MaxTrafficClass:=interactive with priority 1;
	    /*new media type*/
	    OTHERWISE:MaxTrafficClass:=background;
	  END;
	ELSE
	  No authorization is done ;
	ENDIF ;

Editor's note: Further clarification is required if the SDP b=AS:\<bandwidth\> parameter includes the bandwidth for RTCP.

>>>>>>> Skipped text <<<<<<<

End of amended sections

CR-Form-v7

CHANGE REQUEST

| | ⌘ | **29.207** CR **051** | ⌘ **rev** | **2** | ⌘ | Current version: | **5.1.0** | ⌘ |

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

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

Title:	⌘	Clarification on the authorized bandwidth for RTP media streams
Source:	⌘	TSG_CN WG3
Work item code: ⌘	e2eQoS	*Date:* ⌘ 15/10/2002
Category:	⌘ **F**	*Release:* ⌘ Rel-5

Use <u>one</u> 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 <u>TR 21.900</u>.

Use <u>one</u> of the following releases:
2   (GSM Phase 2)
R96   (Release 1996)
R97   (Release 1997)
R98   (Release 1998)
R99   (Release 1999)
Rel-4   (Release 4)
Rel-5   (Release 5)
Rel-6   (Release 6)

Reason for change: ⌘	The current version may indicate that the RTCP overhead is included in the SDP bandwidth parameter. This would contradict the mapping rules specified in TS 29.208. Please also see the reply LS (N3-020897) from SA4 where it is stated that "The *b=AS* parameter does not include RTCP bandwidth".
Summary of change: ⌘	It is clarified that the authorized bandwidth for an RTP stream is derived from the SDP bandwidth parameter by adding RTCP overhead. Editorial simplification of the overview section to avoid duplicated text in the specification
Consequences if not approved: ⌘	Ambiguous specification wrt. calculation of authorized bandwidth in the PCF

Clauses affected:	⌘	4.1, 5.2.1.1

	Y	N		
Other specs affected: ⌘		X	Other core specifications	⌘
		X	Test specifications	
		X	O&M Specifications	

Other comments:	⌘	

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First modified section

4.1   Overview

The Go interface allows service-based local policy information to be "pushed" to or requested by the Policy Enforcement Point (PEP) in the GGSN from a Policy Control Function (PCF). As defined in the stage 2 specifications [3], this information is used by the GGSN for:

- GPRS bearer authorisation;

- Charging correlation;

- Policy based "gating" function in GGSN;

The Go interface uses IP flow based policies.

The Common Open Policy Service (COPS) protocol has been developed as a protocol for use between a policy server and a network device, as described in [7].

In addition, COPS for Provisioning extensions have been developed as described in [8] with [9] describing a structure for specifying policy information that can then be transmitted to a network device for the purpose of configuring policy at that device. The model underlying this structure is one of well-defined provisioning classes and instances of these classes residing in a virtual information store called the Policy Information Base (PIB).

The Go interface shall conform to the IETF COPS [7] and the extensions of COPS-PR [8]. For the purpose of exchanging the required specific Go information, a 3GPP Go COPS-PR Policy Information Base (PIB) is defined in the present document.

COPS Usage for Policy Provisioning (COPS-PR) is independent of the type of policy being provisioned (QoS, Security, etc.). In the present document, COPS-PR is used to communicate service-based local policy information between PCF and GGSN. COPS-PR can be extended to provide per-flow policy control along with a 3GPP Go Policy Information Base (PIB). The 3GPP Go PIB may inherit part of the data object definitions from other PIBs and MIBs defined in the IETF.

The minimum functionalities that the Go interface shall cover are introduced below.

1. Media Authorisation request from GGSN:

    The GGSN receives the binding information during the activation of a (Secondary) PDP context or during the modification of an existing PDP context that has been previously authorized by the PCF. To authorise the PDP context activation, the GGSN shall send a media authorisation request to the PCF. To authorise the PDP context modification, the GGSN shall send a media authorisation request to the PCF when the requested QoS exceeds the authorised QoS or new binding information is received.

    This authorisation request shall include the following information:

    - Binding information:

        The binding information is used by the GGSN to identify the correct PCF and subsequently request service-based local policy information from the PCF. The GGSN may receive one or more sets of the binding information during an activation or modification of a PDP context. Each binding information consists of:

        - One Authorisation token;

        - One or more Flow id(s) within the session.

    It is assumed that only one set of binding information is carried within a PDP context in this Release.

2. Media authorisation decision from PCF:

    The media authorisation information sent by the PCF to the GGSN, contains at a minimum the following information:

-    Decision on the binding information.

The PCF shall respond with an authorisation decision for the binding information. The authorisation decision shall identify that the binding information is validated with an ongoing SIP session. Additionally, the PCF shall verify if the multiple media components are correctly assigned to the PDP Context. If validated, the PCF shall also communicate the following media authorisation details to the GGSN:

-    "Authorised QoS".

     This information is used by the GGSN to authorise the media resources according to the service-based local policy and the requested bearer QoS.

     The "Authorised QoS" for media components signalled over the Go interface is based on the SDP requirements signalled and agreed previously within SIP signalling for this session.

     The "Authorised QoS" specifies the maximum QoS that is authorised for a PDP context for that specific binding information. In case of an aggregation of multiple media components within one PDP context, the combination of the "Authorised QoS" information of the individual media components is provided as the "Authorised QoS" for the bearer.

     The "Authorised QoS" contains the following information:

     -    DiffServ class:

          The DiffServ class determines the highest QoS class that can be used for the media component. It is derived from the media type information of the SDP media description.

     -    Data rate:

          The Data rate information is ~~extracted~~ derived from the SDP bandwidth parameter.~~, more specifically the bandwidth value indicated by the "b=AS:" parameter.~~ The Data rate shall include all the overhead coming from the IP-layer and the layers above, e.g. UDP~~,~~ and RTP. If RTP is used, then overhead coming from RTCP shall be added by the PCF.~~. The Data rate shall also include the overhead coming from the possible usage of RTCP~~. The Data rate within the "Authorized QoS" information for the bearer is determined from the data rate values of the individual media components identified in the binding information.

-    Packet Classifier.

     The packet classifier for media components is based on the IP-address and port number information in the SDP and shall allow for all IP flows associated with the SDP media component description.

3.   Charging correlation:

      The PCF shall send the ICID provided by the P-CSCF as part of the authorisation decision. The GGSN shall send the GCID of the PDP Context and the GGSN address to the PCF as part of the authorisation report.

4.   Approval of QoS Commit / Removal of QoS Commit / Revoke Authorisation for GPRS and IP resources:

      The PCF controls media components and may revoke resources at any time. Approval of QoS Commit / Removal of QoS Commit / Revoke Authorisation for GPRS and IP resources is communicated by the PCF to the GGSN.

5.   Indication of PDP Context Release / Modification to/from 0 kbit/s:

      The GGSN informs the PCF of bearer changes related to the authorised resources for the IMS session in the following cases:

      -    Loss of radio contact (modification to/from 0 kbit/s for conversational and streaming class);

      -    Deactivation of PDP context.

Next modified section

5.2.1.1 SBLP authorisation decision

The information needed for the PCF to perform media authorization is passed by the P-CSCF upon receiving a SIP message that contains SDP. The SDP contains sufficient information about the session, such as the end-points' IP address and port numbers and bandwidth requirements.

All media components in the SDP are authorised. The media components contain one or more IP flows each represented by a flow identifier. Cf. the definition of flow identifier in clause 3.1. The P-CSCF shall send policy setup information to the PCF upon every SIP message that includes an SDP payload. This ensures that the PCF passes proper information to perform media authorization for all possible IMS session setup scenarios. The policy setup information provided by the P-CSCF to the PCF for each media component shall contain the following:

- Destination IP address;

- Destination port number;

- Transport Protocol id;

- Media direction information;

- Direction of the source (originating or terminating side);

- Indication of the group that the media component belongs to;

  Editor's note: The format of this group indication in SIP/SDP is subject to CN1's decision.

- Media type information;

- Bandwidth parameter;

- Indication of forking/non-forking.

Additionally, upon the P-CSCF receives the ICID in SIP signalling, it shall send the ICID to the PCF.

The PCF stores the authorised policy information, and generates an Authorisation Token to identify this decision. The Authorisation Token is passed back to the P-CSCF for inclusion in the SIP signalling back to the UE.

The Authorisation Token is in the form of a Session Authorisation Data Policy Element as described in [11]. The PCF shall include an AUTH_ENT_ID attribute containing the Fully Qualified Domain Name of the PCF and the SESSION_ID attribute.

Upon receiving the bearer authorization request from the GGSN, the PCF shall authorize the request according to the stored service based local policy information for the session identified by the binding information in the request.

- Decision on the binding information:

  The authorisation shall contain the decision on verifying the binding information. The PCF shall identify whether the binding information indeed corresponds to an initiated SIP session.

  The authorization shall also contain decision on the list of flow_IDs contained in the bearer authorisation request sent by the GGSN representing the list of media components intended to be carried in the same PDP Context. This decision shall verify that these media components are indeed allowed to be carried in the same PDP Context. The PCF shall make this decision by comparing the list of flow_IDs contained in the bearer authorization request received from the GGSN to the media component grouping indication information received from the P-CSCF.

  In case the UE violates the IMS level indication, and attempts to set up multiple IMS media components in a single PDP context despite of an indication that mandated separate PDP contexts, the PCF shall enforce the rejection of this PDP context request by sending an INSTALL and REMOVE decision to the GGSN.

  If the binding information and the list of flow_IDs are successfully authorised (verified) as per the means described above, the PCF shall also communicate the authorisation details for each media component to the GGSN.

The authorisation details contain the "Authorised QoS" and the packet classifier(s) of the associated IP flows. In case of an aggregation of multiple media components within one PDP context, the combination of the "Authorised QoS" information of the individual media components is provided as the "Authorised QoS".

Based on the media direction information and the direction of the source provided by the P-CSCF, the PCF shall define the direction (upstream or downstream) of the "Authorised QoS" and the packet classifier(s).

- Packet classifier(s):

The PCF shall use the destination IP address(es), destination port number(s) and transport protocol id(s) to formulate a packet classifier(s).

- If the source IP address, which is part of the standard 5-tuple for packet classifying, is provided by the P-CSCF in the SDP, then this shall be used. Based on operator policy the source IP address for bi-directional flows may be identified from the 64 bit prefix of the destination IP address. If the source IP address is not identified by the SDP information and not identified by the 64 bit prefix of the destination IP address then the source IP address shall be wildcarded by the PCF.

- If the source port number, which is part of the standard 5-tuple for packet classifying, is not provided by the P-CSCF in the SDP then the source port number shall be wildcarded by the PCF in the packet classifier.

- The PCF shall send the destination address and the destination port number for each IP flow associated with the media component.

- "Authorized QoS":

The "Authorised QoS" information (consisting of maximum DiffServ Class and Data Rate) for a media component is extracted from the media type information and bandwidth parameter of the SDP. The PCF shall map the media type information into a DiffServ Class which is the highest class that can be used for the media. As an example, the audio media type shall be mapped into Expedited Forwarding PHB.

The PCF shall extract derive the Data Rate value from the "b=AS" SDP parameter. The "b=AS" parameter in the SDP shall contain all the overhead coming from the IP-layer and the layers above, e.g. UDP, and RTP. The Data Rate includes the overhead coming from the possible usage of RTCP If RTP is used, then overhead coming from RTCP shall be added by the PCF. The PCF shall use this value when determining the data rate value applicable for the media component.

For non-real-time bearers the Data rate value shall be considered as the maximum value of the 'Maximum bitrate' parameter.

In case of an aggregation of multiple media components within one PDP context, the PCF shall provide the "Authorised QoS" for the bearer as the combination of the "Authorised QoS" information of the individual media components. The DiffServ Class in the "Authorised QoS" for the bearer shall contain the highest PHB amongst the ones applied for the individual media components and indicates the highest UMTS traffic class that can be applied to the PDP context.

Editor's note: It shall be possible the group identifiers to restrict the individual media components carried by the same PDP context to have the same PHBs.

The Data Rate of the "Authorised QoS" for the bearer shall be the sum of the Data Rate values of the individual media components/IP flows and it is used as the maximum Data Rate value for the PDP context.

The PCF may include the gate enabling command as part of the authorisation decision. Alternatively, the PCF may provide a separate decision for opening the gate.

The PCF shall send the IMS charging identifier provided by the P-CSCF as part of the authorisation decision to the GGSN.

Upon receiving the modified SDP information from the P-CSCF, the PCF shall update the media authorization information for the session. The PCF may push this updated authorisation information to the GGSN. Under certain condition e.g. revoke of authorization, the PCF shall push the updated policy decision to the GGSN.

End of modifications