3GPP TSG CN Plenary Meeting #18 **NP-020625**
4th - 6th December 2002. New Orleans, USA.

Source: TSG CN WG3

Title: CRs on Rel5 Work Item e2eQoS (CR Pack 6)

Agenda item: 8.5

Document for: APPROVAL

Introduction:

This document contains **12** 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_
N3-020867	Validating binding information against the UE	29.207	034	1	F	Rel-5	5.1.0
N3-020876	Clarification on Flow identifier coding	29.207	041	2	F	Rel-5	5.1.0
N3-020826	Clarifications on GGSN messages	29.207	045		F	Rel-5	5.1.0
N3-020848	Clarification on multiple codecs	29.207	047	1	F	Rel-5	5.1.0
N3-021024	Clarifications on Early Media	29.207	049	3	F	Rel-5	5.1.0
N3-020905	Added reference to TS29.208	29.207	052		D	Rel-5	5.1.0
N3-020978	Update reference [11]	29.207	056	1	F	Rel-5	5.1.0
N3-020990	Changes to GGSN behavior when no binding	29.207	060	2	F	Rel-5	5.1.0
N3-020993	Clarification on use of charging correlation	29.207	061	1	F	Rel-5	5.1.0
N3-021023	Update of Device Capabilities and Limitations section	29.207	065	2	F	Rel-5	5.1.0
N3-020946	Corrections in Message Description Section	29.207	066		F	Rel-5	5.1.0
N3-020953	DiffServ Class definition for UL and DL in the Go	29.207	068		F	Rel-5	5.1.0

3GPP TSG-CN WG3 Meeting #25
Miami, USA, 23rd - 27th September 2002.

Tdoc ⌘N3-020826

CR-Form-v7

CHANGE REQUEST

⌘ **29.207** **CR** **045** ⌘ **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 ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Clarifications on GGSN messages
Source:	⌘	TSG_CN WG3
Work item code:	⌘	E2eQoS
Date:	⌘	04/09/2002
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:	⌘	Clarify which COPS messages are used to initiate PDP context modification/deactivation. This is currently missing in section 5.1 in two cases.
Summary of change:	⌘	GGSN issues a COPS RPT message to indicate that the requested QoS maximum bit rate has changed to/from 0 kbits/s GGSN issues a COPS DRQ message in the case of a PDP context deactivation
Consequences if not approved:	⌘	Inconsistent section 5.1

Clauses affected:	⌘	5.1.2, 5.1.4

	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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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.

First modified section

5.1.2 Modification of previously authorized PDP context

The GGSN is responsible for notifying the PCF when a procedure of PDP context modification of a previously authorized PDP context is performed. To authorise the PDP context modification the GGSN shall send an authorisation request to the PCF including the binding information received from the UE in the following cases:

- Requested QoS exceeds "Authorised QoS";
- New binding information is received.

The GGSN on receiving the PDP context modification request from the UE will verify the authorisation. If the GGSN does not have sufficient information to authorize the PDP context modification request then the GGSN shall interrogate the PCF for modification request authorisation.

If the requested QoS is within the already "Authorized QoS" and the binding information is not changed, the GGSN need not send an authorization request to the PCF.

The GGSN is responsible for notifying ~~to~~ the PCF, by sending a COPS Report State (RPT) message, when the procedure of the PDP context modification is performed in the following cases:

- Requested QoS maximum bit rate is 0 kbit/s;
- Requested QoS maximum bit rate changes from 0 kbit/s.

Next modified section

5.1.4 PDP context deactivation

The GGSN is responsible for notifying the PCF when a procedure of a PDP context deactivation is performed. In case of a PDP context deactivation, the GGSN shall inform the PCF of the bearer release related to the SIP session by sending a COPS Delete Request State (DRQ) message.

When a revoke authorisation for the set of media components on that PDP context is performed, the GGSN receives a decision message from the PCF for disabling the use of the "Authorised QoS" resources and deactivation of the PDP context associated with the binding information. The GGSN shall disable the use of the "Authorized QoS" resources. The GGSN shall initiate deactivation of the PDP context used for carrying these media components, in case that the UE has not performed it yet.

End

3GPP TSG-CN WG3 Meeting #25
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CR-Form-v7

CHANGE REQUEST

⌘ **29.207** **CR** **047** ⌘ **rev** **1** ⌘ Current version: **5.1.0** ⌘

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

Title:	⌘	Clarification on multiple codecs
Source:	⌘	TSG_CN WG3
Work item code:	⌘	E2EQoS
Date:	⌘	27/09/2002
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)*
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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 specification does not define the context between the used codec and the authorized data rate in case of multiple codecs.
Summary of change:	⌘	A statement is added to declare that the user may underuse the available bandwidth in case of multiple codecs.
Consequences if not approved:	⌘	The specification is ambiguous leading to different interpretations.

Clauses affected:	⌘	4.1			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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4 Go interface

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 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, RTP. The Data rate shall also include the overhead coming from the possible usage of RTCP. If multiple codecs are agreed to be used in a session, the authorized data rate is set according to the codec requiring the highest bandwidth, meaning that terminals may underuse the authorized data rate when choosing to use another agreed codec. 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.

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CHANGE REQUEST

⌘ **29.207** **CR** **034** ⌘ **rev** **1** ⌘ Current version: **5.1.0** ⌘

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

Title:	⌘	Validating binding information against the UE		
Source:	⌘	TSG_CN WG3		
Work item code:	⌘	E2EQoS	***Date:*** ⌘	23/09/2002
Category:	⌘	**F**	***Release:*** ⌘	REL-5

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Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change: ⌘

In TS 29.207, the UE provides binding information that is used for authorisation against the session. The binding information is sent up to the PCF for validation. The PCF validates that the token and media flow identifier received in the binding information are correct for a SIP session. The PCF will then authorise the PDP context in a COPS decision message to the GGSN. The decision message may contain authorisation data and filters to be applied to the PDP context at the GGSN.

In addition to the authorisation data, the GGSN and PCF shall also exchange charging identifiers which are output in charging records.

The binding information identifies the session, and so the PCF can be sure that the sender of the binding information is the entity involved in the SIP layer session (or something acting on its behalf). It is important, or rather *essential*, that the PCF does not authorise the same bandwidth more than once.

Consider the following case: UE-A initiates a SIP session and receives a token from the PCF. UE-A then requests a PDP context, including binding information for a media component within the SIP session. The PCF authorises the binding information and sends authorisation data to the GGSN, which completes establishing the PDP context. The GGSN and PCF exchange and record the charging identifiers.

Now, UE-A uses a background bearer to pass this binding information to a cooperating UE-X which is connected to the same PLMN. UE-X then requests a PDP context, including the same binding information as previously used by UE-A. The GGSN identifies the PCF, and sends the binding information. As in the earlier sequence, the PCF will validate the binding information, and reply to the GGSN with the authorisation data, and the GGSN would complete the PDP context establishment. Again, the GGSN and PCF would exchange and record the charging identifiers.

	At this point, the PCF has authorised the same bandwidth twice, which as noted above is not allowed. It should be noted that the same effect as above could be achieved if UE-A simply initiated two PDP Contexts with the same binding information – the PCF has no information which indicates from which UE a particular PDP Context activation originated. It has been suggested that the IP address of the UE could be used to ensure that the activation comes from the same UE, but this does not avoid the case where UE-A activates two PDP Contexts itself. Nor do UEs necessarily have a unique IP address since with stateless address autoconfiguration the UE is allocated an entire 64-bit prefix. The following principles are proposed: 1) Each flow authorised by the PCF should only be authorised once at any given time 2) The most recent mapping of components to PDP Contexts, proposed by the SIP User Agent, should be honoured. So, on receipt of a new Go Request containing binding information for a flow which has already been authorised, the previous authorisation is revoked, at the same time as the new one is approved. This will result in the downgrading of the QoS for the old PDP Context.
Summary of change: ⌘	Prevention of authorisation of the same bandwidth twice.
Consequences if not approved: ⌘	Incomplete specifications

Clauses affected:	⌘	4.3.2.3, 5.2.1.1, 5.2.1.3			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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First amended section

4.3.2.3 Binding mechanism handling

The binding information is used by the GGSN to identify the correct PCF and subsequently request service-based local policy information from the PCF. Each set of binding information consists of an authorisation token and one or more flow identifier(s).

During the session set-up the PCF generates an Authorisation Token for the IMS session. The Authorisation token shall be sent to the P-CSCF which forwards it to the UE in the SIP signalling. The PCF shall allocate its PCF identifier as part of the Authorization Token. This identifier shall be in the format of a fully qualified domain name.

The PCF receives the binding information and a Client Handle as part of a REQ from the GGSN. The PCF shall store the Client Handle for each media component identified by the binding information for subsequent message exchanges.

The authorisation token is applied by the PCF to identify the IMS session. If no IMS session can be found for an authorisation token, or if the PCF is otherwise unable to authorise the binding information, the PCF shall send a COPS decision message carrying both an INSTALL and REMOVE decision. The INSTALL decision shall identify an authorisation failure to the GGSN, and may include further details identifying the cause. The REMOVE decision shall subsequently remove this state from the GGSN. For an initial authorisation, the PCF shall then initiate a remove for the authorisation request.

For a valid authorisation token the flow identifier(s) is used to select the available information on the media component(s) of this IMS session. The PCF sends the available authorisation information on the media component(s) back to the GGSN. If the PCF has already communicated authorisation for the same authorisation token and flow identifier(s) to this (or another) GGSN on this IMS session, then the previous authorisation shall be revoked, and this revocation shall be communicated to the appropiate GGSN.

If the binding information consists of more than one flow identifier, the PCF shall also verify that the media components identified by the flow identifiers are allowed to be transferred in the same PDP context. If any of these media components was mandated to be carried in a separate PDP Context, the PCF shall send a COPS decision message carrying both an INSTALL and REMOVE decision. The INSTALL decision shall identify an authorisation failure to the GGSN, and may include further details identifying the cause. The REMOVE decision shall subsequently remove this state from the GGSN. For an initial authorisation, the PCF shall then initiate a remove for the authorisation request.

For a valid binding information consisting of more than one flow identifier, the information sent back to the GGSN shall include the aggregated QoS for all the flows and a packet filter for each flow. The flow identifiers within the binding information can span one or more media components.

********** Next amended section **********

5.2 PCF

5.2.1 SBLP decisions

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.

  If the PCF has already communicated authorisation for the same authorisation token and flow identifier(s) to this (or another) GGSN, then the previous authorisation shall be revoked, and this revocation shall be communicated 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(s), 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 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, RTP. The Data Rate includes the overhead coming from the possible usage of RTCP. 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.

5.2.1.2 Session modification initiated decision

A session modification may occur that modifies the media components without adding or removing media lines, for example, a change in the bandwidth for the media line, or a change to the port number.

When there are updates to the SDP parameters for media lines which are currently authorised, the authorisation information (QoS, packet classifiers) may change. The updated information (QoS, packet classifiers) shall be pushed down to the GGSN using an unsolicited authorisation decision.

5.2.1.3 SBLP revoke decision

Upon SIP session release the PCF shall send a revoke authorisation decision to the GGSN after an operator specific time. The revoke authorisation decision shall be sent for each handle (PDP context) related to the session as a separate decision to the GGSN corresponding to the previous SBLP authorisation decision.

The timer for a pending session release shall be terminated if the PCF receives an indication on the termination of all PDP context(s) related to the released session.

Additionally, when a media component which is bound to a PDP context is removed from a SIP session and the UE has not performed the corresponding modification or deactivation of the PDP context within an operator specific time the PCF shall revoke the authorisation for the set of media components on that PDP context.

The timer for a pending media component removal shall be terminated if the PCF receives either a new authorisation request with the same handle where that media component has been removed, or an indication of the termination of the PDP context.

NOTE: The values of the timers for session termination and media component removal might be different, e.g. to allow for some more time for the required modification of the PDP context.

If the PCF receives a request from a GGSN for the same authorisation token and flow identifier(s) that this (or another) GGSN was already communicated authorisation, then the previous authorisation shall be revoked, and this revocation shall be communicated to the GGSN.

********** End of amended section **********

3GPP TSG-CN WG3 Meeting #25 ***Tdoc ⌘N3-020876***
Miami Beach, USA 23rd – 27th September 2002.

CR-Form-v7

CHANGE REQUEST

⌘ 29.207 CR 041 ⌘ 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 ☒

Title:	⌘	Flow Identifier Encoding
Source:	⌘	TSG_CN WG3
Work item code:	⌘	e2eQoS *Date:* ⌘ 23/09/2002
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:	⌘	The actual status of the specifications do not specify how the UE encodes the Flow Identifier in the TFT IE. 24.008 indicates the parameter contents field of the Flow Identifier contains the binary representation of a flow identifier as specified in 24.229. 24.229 refers to 29.207 for a detailed description of how the flow identifiers are constructed. 29.207 states that the flow identifier is a 2-tuple (<Media component number, IP flow number>) where both are numbered starting from 1. But no clear indication is made of how to encode each of these “tuples” of the flow ID.
Summary of change:	⌘	A reference is made in annex C to 24.008 to clearly and unambiguously know how to encode flow ID.
Consequences if not approved:	⌘	Lack of specification on the Flow Identifier encoding in the UE. Possibly ambiguity in the implementations.

Clauses affected:	⌘	Annex C

		Y	N			
Other specs affected:	⌘	X		Other core specifications	⌘	24.008
			X	Test specifications		
			X	O&M Specifications		

Other comments: ⌘

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

Start of amended section

Annex C (normative): Flow identifiers: Format definition and examples

C.1 Format of a flow identifier

A flow identifier is expressed as a 2-tuple as follows:

<Media component no, IP flow no.>

where both are numbered starting from 1. The encoding of the flow identifier is as indicated in 24.008 [12].

~~0~~ ~~3~~

Media component no.	IP flow no.

C.2 Example 1

The second "m=" - line in the SDP information contains one RTP media specification, as follows:

m=video 49160 RTP/AVP 31

Two flow identifiers are assigned as shown in the table below:

IP flow	Port number	Flow id.
RTP	49160	<2,1>
Associated RTCP	49161	<2,2>

C.3 Example 2

In the general case, multiple ports may be specified with a “number of ports” qualifier as follows, ref. [17]:

m=<media> <port>/<number of ports> <transport> <fmt list>

If the third “m=”-line indicates a series of port numbers as follows:

m=video 49170/2 RTP/AVP 31

Four flow identifiers are assigned as shown in the table below:

IP flow	Port number	Flow id.
First RTP	49170	<3,1>
First associated RTCP	49171	<3,2>
Second RTP	49172	<3,3>
Second associated RTCP	49173	<3,4>

End of amended section

3GPP TSG-CN WG3 Meeting #26 ***Tdoc ⌘N3-020905***
Bangkok, Thailand, 11th - 15th November 2002.

CR-Form-v7

CHANGE REQUEST

⌘ **29.207** **CR** **052** ⌘ **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 ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Added reference to TS29.208
Source:	⌘	TSG_CN WG3
Work item code:	⌘	e2eQoS
Date:	⌘	15/10/2002
Category:	⌘	**D**
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:	⌘	TS 29.207 has been developed in parallell with, and is strongly related to, TS 29.208. TS 29.208 provides further details, especially in the areas of Go signalling flows and mapping rules for authorized QoS.
Summary of change:	⌘	References to TS 29.208 have been added
Consequences if not approved:	⌘	Reading and maintenance of the two specifications will be more prone to errors

Clauses affected:	⌘	2, 4.1, 5.2.1.1

	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:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

First modified section

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 and/or edition number or version number) 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 TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.002: "Network architecture".

[3] 3GPP TS 23.207: "End to end quality of service concept and architecture".

[4] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".

[5] IETF RFC 2475: "An Architecture for Differentiated Services".

[6] IETF RFC 2753: "A Framework for Policy-based Admission Control".

[7] IETF RFC 2748: "The COPS (Common Open Policy Service) Protocol".

[8] IETF RFC 3084: "COPS Usage for Policy Provisioning (COPS-PR)".

[9] IETF RFC 3159: "Structure of Policy Provisioning Information (SPPI)".

[10] IETF RFC 2205: "Resource ReSerVation Protocol (RSVP) – Version 1 Functional Specification".

[11] IETF RFC tbd: "Session Authorisation for RSVP" (draft-ietf-rap-rsvp-authsession-03.txt).

[12] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core network protocols; Stage 3".

[13] 3GPP TS 27.060: "Mobile Station (MS) supporting Packet Switched Services".

[14] 3GPP TS 24.229: ” IP Multimedia Call Control Protocol based on SIP and SDP”

[15] IETF RFC 3318: "Framework Policy Information Base".

[16] IETF RFC 3289: "Management Information Base for the Differentiated Services Architecture"

[17] IETF RFC 2327: "SDP: Session Description Protocol".

[xx] 3GPP TS 29.208: ”End to end Quality of Service (QoS) signalling flows”.

Next 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.

Signalling flows related to the Go interface is specified in 3GPP TS 29.208 [xx]

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 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, RTP. 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(s), 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 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, RTP. The Data Rate includes the overhead coming from the possible usage of RTCP. 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 detailed rules for calculating the “Authorized QoS” are specified in 3GPP TS 29.208 [xx].

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

3GPP TSG-CN WG3 Meeting #26
Bangkok, Thailand, 11th – 15th November, 2002

Tdoc ⌘N3-020946

CR-Form-v7

CHANGE REQUEST

⌘ **29.207** **CR** **066** ⌘ **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 ☐ Radio Access Network ☐ Core Network ☒

Title:	⌘	Corrections in Message Description Section
Source:	⌘	TSG_CN WG3
Work item code:	⌘	E2EQoS
Date:	⌘	06/11/2002
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:	⌘	The CR 017 rev2 (N3-020727) was not incorporated correctly. A text in brackets intended to clarify the usage of the ICID was inserted to the line above (mentioning the client handle).
Summary of change:	⌘	Some minor changes are proposed to update this section. The text in brackets is moved to the right place as agreed with the CR. The description of the Authorization_Decision is updated because an authorization status information is no longer necessary. If the authorization was successful the Authorization_Decision message is sent, otherwise an Authorization_Failure message. An editor's note is deleted because the ICID issue needs no further discussion at least for the fact that it is part of the message.
Consequences if not approved:	⌘	The Authorization_Decision message would be not described correctly, i.e. there is an inconsistency with the Go PIB.

Clauses affected:	⌘	6.3.2

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

Other comments:	⌘	The abbreviation kbit/s is replaced by kbps.

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

Start of modified section

6.3.2 Message description

~~The Go interface uses the COPS-PR protocol.~~

The following messages and events are available on the Go interface (after the initial policy provisioning described in section 6.3.1.5):

- Authorisation_Request (GGSN→PCF):

  This event allows the GGSN to request authorisation data~~etails~~ from the PCF. It contains the following information:

  - Client Handle;
  - Binding Information.

  The R-type = 0x08 for configuration request is used here and M-type = 0x02 create event state is used here.

- Authorisation_Decision (PCF→GGSN):

  This event provides the GGSN with the ~~authorisation status, and~~ relevant authorisation ~~decision~~ data ~~if applicable~~. The event contains the following information:

  - Client Handle ~~(only in the initial Authorisation_Decision)~~;
  - ICID(s) (only in the initial Authorisation_Decision);
  - Unidirectional set (this parameter shall appear once for each direction (uplink and downlink)):
    - Direction indicator;
    - "Authorised QoS";
    - Gate description (this parameter shall appear once for each required gate for this direction):
      - Filter Specification - The information about the authorised IP end points addresses and ports is detailed below. The Filter Specification parameters are:
        - Source IP address;
        - Destination IP address;
        - Source ports;
        - Destination ports;
        - Protocol ID.

        The Source and Destination ports are described with a range consisting of a minimum and maximum value. If only one port is authorised, the minimum value and maximum value of the range are identical.

        A filter specification describing more than one IP flow shall be only used in case of identical Protocol IDs, IP addresses and successive port numbers (e.g. RTP and RTCP flow of a media component). Furthermore, the gate status of all IP flows described by this filter specification shall be identical, too.
      - Gate status (opened/closed)

~~Editor's note: The ICID issue should still be discussed in SA5.~~

  The R-type = 0x08 for configuration request is used here and M-type = 0x02 create event state is used here.

- Authorisation_Failure (PCF→GGSN):

This event provides the GGSN with an indication of an authorisation failure, and may carry additional reason details. The event contains the following information:

- Client Handle;
- Authorisation failure (including any provided reason information).

The R-type = 0x08 for configuration request is used here and M-type = 0x04 terminate event state is used here.

- Gate Decision (PCF→GGSN):

The Gate Decision indicates to the GGSN the new status of the gate(s) established for a client handle (PDP context). The gate status indicates to the GGSN that the gate shall be opened or closed. Only the gate(s) for which the status is changed are indicated by this event. The event contains the following information:

- Client Handle;
- Unidirectional set (this parameter shall appear once for each direction for which gates are being updated (uplink and/or downlink)):
  - Direction indicator;
  - Gate description (this parameter shall appear once for each gate to be modified for this direction) :
    - Filter Specification - The information about the authorised IP end points addresses and ports is detailed below. The Filter Specification parameters are:
      - Source IP address;
      - Destination IP address;
      - Source ports;
      - Destination ports;
      - Protocol ID.

      The Source and Destination ports are described with a range consisting of a minimum and maximum value. If only one port is authorised, the minimum value and maximum value of the range are identical.

      A filter specification describing more than one IP flow shall be only used in case of identical Protocol IDs, IP addresses and successive port numbers (e.g. RTP and RTCP flow of a media component). Furthermore, the gate status of all IP flows described by this filter specification shall be identical, too.
    - Gate status (opened/closed)

NOTE: The opening of the gate may occur at the same time / be part of the authorisation decision event.

The R-type = 0x08 for configuration request is used here and M-type = 0x03 update event state is used here.

- Report (RPT)s (GGSN→PCF):
  - Authorisation_report; Gate_report:

    The GGSN sends a COPS RPT message back to the PCF reporting that it enforced or not the Authorisation_Decision, or the Gate_Decision.

    The events contain the following information:

    - Client Handle;
    - Success / Failure.
  - The Authorization_report of the initial Authorisation_Decision includes:
    - GCID;

- GGSN address.

- Report of state changes:

  The GGSN sends the report of state change message to the PCF reporting that the maximum bit rate for the PDP context is modified to 0 kb~~it/~~ps or that the maximum bit rate for the PDP context is changed from 0 kb~~it/~~ps.

  The event contains the following information:

  - Client Handle;

  - Maximum bit rate (set to 0 kbps / changed from 0 kbps).

- Delete request state (GGSN→PCF):

  The GGSN informs the PCF via the delete request state message, that the PDP context is deactivated and the request state identified by the client handle is no longer available/relevant at the GGSN, so the corresponding state shall also be removed at the PCF.

  The DRQ message includes the reason why the request state was deleted.

  The event contains the following information:

  - Client Handle;

  - Reason code: "Tear", Sub-code: deactivation of the PDP context.

- Remove_Decision (PCF→GGSN):

  The PCF uses the Remove_Decision to inform the GGSN that the PCF revokes the authorized resources for the client handle (PDP context).

  The event contains the following information:

  - Client Handle.

End of modified section

3GPP TSG-CN WG3 Meeting #26 ***Tdoc ⌘N3-020953***
Bangkok, Thailand, 11th - 15th November 2002.

CR-Form-v7

CHANGE REQUEST

⌘ **29.207** **CR** **068** ⌘ **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 ☐ Radio Access Network ☐ Core Network **X**

Title:	⌘	DiffServ Class definition for uplink and downlink direction in the Go interface
Source:	⌘	TSG_CN WG3
Work item code:	⌘	E2EQoS
Date:	⌘	15/11/2002
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:	⌘	The Go PIB definition allows to set separate DiffServ Class values for uplink and downlink direction, although the same Traffic Class value shall be used for both the uplink and the downlink direction in a PDP context.
Summary of change:	⌘	This CR adds a clarifying sentence to avoid a conflict in the GGSN, when Authorised QoS is set for both uplink and downlink directions by PCF. The DiffServ Class value set by PCF shall be defined equal for both UL and DL direction, when both directions are used.
Consequences if not approved:	⌘	Different Traffic Class interpretations in GGSN if PCF sets uplink and downlink PHBs different value.

Clauses affected:	⌘	4.3.1.1.1 and 5.2.1.1.

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

Other comments:	⌘	Additional CRs change PCF to PDF and Diffserv Class to QoS class. These will be made after this CR is implemented.

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm.
Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

First modified section

4.3.1.1.1 QoS Information processing

The GGSN is responsible for the policy based authorisation, i.e. to ensure that the requested QoS is in-line with the "Authorized QoS".

The GGSN needs the "Authorised QoS" information of the PDP context for the uplink as well as for the downlink direction. Therefore, the "Authorized QoS" information for the combination of all IP flows of each direction associated with the media component as determined by the PCF is used.

In case of an aggregation of multiple media components within one PDP context, the "Authorised QoS" for the bearer is provided by the PCF as the combination of the "Authorised QoS" information of the individual media components.

The GGSN shall perform the proper mapping between the IP QoS information and the UMTS QoS information. This mapping is performed by the Translation/mapping function which maps the "Authorised QoS" information for the PDP context into authorised UMTS QoS information.

It is recommended that the GGSN derives the highest allowed UMTS Traffic class for the PDP context from the Diffserv PHB in the "Authorized QoS" according to table 4.3.1.1.1.

Table 4.3.1.1.1

Diffserv PHB	Traffic Class	Traffic Handling Priority
EF	Conversational	N/A
$AF4_1$	Streaming	N/A
$AF3_1$	Interactive	1
$AF2_1$		2
$AF1_1$		3
BE	Background	N/A

The DiffServ class values given by the PCF are equal for both the uplink and the downlink directions.

The Data rate within the "Authorized QoS" information for the bearer is the combination of the data rate values of the "Authorised QoS" of the individual media components.

In the case of real-time UMTS bearers (conversational and streaming traffic classes), the GGSN shall consider, the Data rate value of the "Authorized QoS" information as the maximum value of the 'Guaranteed bitrate' UMTS QoS parameter, whereas the ‘Maximum bitrate’ UMTS QoS parameter is limited by the subscriber and service specific setting in the HLR/HSS (SGSN) and by the capacity/capabilities/service configuration of the network (GGSN, SGSN). In the case of non-real-time bearers (interactive and background traffic classes) the GGSN shall consider, the Data rate value of the “Authorized QoS” information as the maximum value of the 'Maximum bitrate' UMTS QoS parameter.

The UMTS BS Manager receives the authorised UMTS QoS information for the PDP context from the Translation/mapping function. If the requested QoS exceeds the authorised QoS, the UMTS BS Manager shall downgrade the requested UMTS QoS information to the authorised UMTS QoS information.

The GGSN may store the authorized QoS for the binding information of an active PDP context in order to be able to make local decisions, when the UE requests for a PDP context modification.

Next modified section

5.2 PCF

5.2.1 SBLP decisions

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(s), 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. The PCF shall use an equal DiffServ Class for both the uplink and the downlink directions when both directions are used. As an example, the audio media type shall be mapped into Expedited Forwarding PHB.

  The PCF shall extract 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,

RTP. The Data Rate includes the overhead coming from the possible usage of RTCP. 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 modified section

3GPP TSG-CN WG3 Meeting #26
Bangkok, Thailand, 11th – 15th November 2002.

Tdoc ⌘N3-020978

CR-Form-v7

CHANGE REQUEST

⌘ **29.207** **CR** **056** ⌘ **rev** **1** ⌘ 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 ☒

Title:	⌘	Update Reference [11]
Source:	⌘	TSG_CN WG3
Work item code:	⌘	E2EQoS
Date:	⌘	11/11/2002
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:	⌘	Update reference [11] to the correct draft revision approved by IETF.
Summary of change:	⌘	Change of reference
Consequences if not approved:	⌘	Incorrect reference

Clauses affected:	⌘	2

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

Other comments: ⌘

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

First amended section

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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 and/or edition number or version number) 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 TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.002: "Network architecture".

[3] 3GPP TS 23.207: "End to end quality of service concept and architecture".

[4] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".

[5] IETF RFC 2475: "An Architecture for Differentiated Services".

[6] IETF RFC 2753: "A Framework for Policy-based Admission Control".

[7] IETF RFC 2748: "The COPS (Common Open Policy Service) Protocol".

[8] IETF RFC 3084: "COPS Usage for Policy Provisioning (COPS-PR)".

[9] IETF RFC 3159: "Structure of Policy Provisioning Information (SPPI)".

[10] IETF RFC 2205: "Resource ReSerVation Protocol (RSVP) – Version 1 Functional Specification".

[11] IETF RFC tbd: "Session Authorizsation Policy Element ~~for RSVP~~" (draft-ietf-rap-rsvp-authsession-053.txt).

[12] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core network protocols; Stage 3".

[13] 3GPP TS 27.060: "Mobile Station (MS) supporting Packet Switched Services".

[14] 3GPP TS 24.229: " IP Multimedia Call Control Protocol based on SIP and SDP"

[15] IETF RFC 3318: "Framework Policy Information Base".

[16] IETF RFC 3289: "Management Information Base for the Differentiated Services Architecture"

[17] IETF RFC 2327: "SDP: Session Description Protocol".

End of amended sections

3GPP TSG-CN WG3 Meeting #26
Bangkok, Thailand, 11th - 15th November 2002.

Tdoc ⌘N3-020990

CR-Form-v7

CHANGE REQUEST

⌘ **29.207** **CR** **060** ⌘ **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 ☒

Title:	⌘	Changes to GGSN behavior when no binding information received.
Source:	⌘	TSG_CN WG3
Work item code:	⌘	e2eQoS
Date:	⌘	04/11/02
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:	⌘	Inconsistency, and unnecessary limitations imposed within the current specifications.
Summary of change:	⌘	If no binding information is received within the PDP context activation request from the UE, it should be left to operator defined local policy as to whether to reject or accept the UE.
Consequences if not approved:	⌘	Incosistency within the specifications.

Clauses affected:	⌘	4.3.1.5

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

Other comments:	⌘	

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1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

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

4.3.1.5 Binding mechanism handling

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 binding information associates a PDP context with one or more media components of an IMS session. 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 an authorisation token and the flow identifier(s) related to the IP flows of the actual media component. If there is more than one media component to be transported within the PDP context the binding information includes the flow identifier(s) for the IP flows of each of the media components.

The GGSN shall store the binding information and apply it to correlate events and actions between the PDP context and the service-based local policy.

The GGSN shall determine the IP address of the PCF from the PCF identifier received as part of the Authorization Token. This identifier shall be in the format of a fully qualified domain name.

The GGSN shall forward the binding information received from the UE to the PCF. If multiple binding information are received by the GGSN, it shall forward them to the PCF. If none of the tokens included in the binding information are of type AUTH_SESSION, or they do not contain an AUTH_ENT_ID attribute to resolve the PCF address, then the GGSN shall reject the PDP context activation request. The reason for the rejection is indicated to the UE with the error code value "Invalid binding information". The error code is transferred to the UE in the Protocol Configuration Options information element as defined in 3GPP TS 24.008 [12].

When the GGSN receives a PDP context activation~~/modification~~ request to an APN for which~~ binding information is required~~ the Go interface is enabled and no binding information is received, the GGSN ~~shall~~ may either reject the PDP context activation~~/modification~~ request, or accept it within the limit imposed by a locally stored QoS policy.~~ if binding information is not received~~. This local QoS policy shall be operator configurable within the GGSN. If the request is rejected, ~~T~~the reason for the rejection is indicated to the UE with the error code value "Missing binding information". The error code is transferred to the UE in the Protocol Configuration Options information element as defined in 3GPP TS 24.008 [12].

When the GGSN receives a PDP context modification request to an APN for which the Go interface is enabled, and no binding information is received, the GGSN shall reject the PDP context modification if binding information has been previously provided for the PDP context. If no binding information has previously been received, the GGSN may either reject the PDP context modification request, or accept it within the limit imposed by a locally stored QoS policy. This local QoS policy shall be operator configurable within the GGSN. If the request is rejected, the reason for the rejection is indicated to the UE with the error code value "Missing binding information". The error code is transferred to the UE in the Protocol Configuration Options information element as defined in 3GPP TS 24.008 [12].

When binding information is received, the GGSN shall ignore any UE supplied TFT, and filters in that TFT shall not be installed in the packet processing table.

3GPP TSG-CN WG3 Meeting #26
Bangkok, Thailand, 11-14 November 2002.

Tdoc N3-020993

CR-Form-v7

CHANGE REQUEST

⌘ **29.207** **CR** **061** ⌘ **rev** **1** ⌘ 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 ☒

Title:	⌘	Clarification on use of charging correlation informartion
Source:	⌘	TSG_CN WG3
Work item code:	⌘	E2EQoS
Date:	⌘	12/11/2002
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:	⌘	1. 29.207 currently does not include the definition of ICID and GCID. The existing text is confusing and may be misunderstood. Thus, 29.207 should make reference to 24.229 and 29.060, respectively. 2. ICID coding is still open issue for 29.207, but according to 32.225 , there is description on the structure of ICID.
Summary of change:	⌘	It is proposed to change the above items in the column of “reason for change” to 29.207.
Consequences if not approved:	⌘	The existing text is confusing and may be misunderstood. Coding of ICID remains open issue for Rel 5.

Clauses affected:	⌘	2, 3.1, 3.2, 4.1, 6.3.2

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

Other comments: ⌘

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Start of first change

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[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.002: "Network architecture".

[3] 3GPP TS 23.207: "End to end quality of service concept and architecture".

[4] 3GPP TS 23.228: "IP Multimedia Subsystem (IMS); Stage 2".

[5] IETF RFC 2475: "An Architecture for Differentiated Services".

[18] 3GPP TS 29.060: “General Packet Radio Service (GPRS); GPRS Tunnelling Protocol (GTP) across the Gn and Gp Interface”.

[19] 3GPP TS 32.225: “Telecommunication management; Charging management; Charging data description for the IP Multimedia Subsystem (IMS)”.

[6] IETF RFC 2753: "A Framework for Policy-based Admission Control".

[7] IETF RFC 2748: "The COPS (Common Open Policy Service) Protocol".

[8] IETF RFC 3084: "COPS Usage for Policy Provisioning (COPS-PR)".

[9] IETF RFC 3159: "Structure of Policy Provisioning Information (SPPI)".

[10] IETF RFC 2205: "Resource ReSerVation Protocol (RSVP) – Version 1 Functional Specification".

[11] IETF RFC tbd: "Session Authorisation for RSVP" (draft-ietf-rap-rsvp-authsession-03.txt).

[12] 3GPP TS 24.008: "Mobile Radio Interface Layer 3 specification; Core network protocols; Stage 3".

[13] 3GPP TS 27.060: "Mobile Station (MS) supporting Packet Switched Services".

[14] 3GPP TS 24.229: ” IP Multimedia Call Control Protocol based on SIP and SDP; stage 3”

[15] IETF RFC 3318: "Framework Policy Information Base".

[16] IETF RFC 3289: "Management Information Base for the Differentiated Services Architecture"

[17] IETF RFC 2327: "SDP: Session Description Protocol".

End of first change

Start of second change

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] and the following apply:

Common Open Policy Service (COPS) protocol: is a simple query and response protocol that can be used to exchange policy information between a policy server (Policy Decision Point) and its clients (Policy Enforcement Points)

Differentiated Services (DiffServ): Diffserv networks classify packets into one of a small number of aggregated flows or "classes", based on the DiffServ codepoint (DSCP) in the packet's IP header
This is known as behaviour aggregate (BA) classification. At each DiffServ router, packets are subjected to a "per-hop behaviour" (PHB), which is invoked by the DSCP.

Flow identifier: used for the identification of an IP flow within a media component associated with a SIP session
For example, a single, unidirectional media component may contain one IP flow, or two IP flows in the case of an RTP media stream. In case of a bidirectional flow, the same flow identifier is used for both directions. A flow identifier consists of two parts: 1) Media component number defined in increasing order according to the sequence of the "m=" lines in the SDP [17], session description and 2) IP flow number defined in the order of increasing port numbers within each media component, see Annex C.

Go Interface: interface between PCF and GGSN [2]

GPRS Charging ID (GCID): the Charging Id generated by the GGSN as defined in 3GPP TS 29.060 [18].

IP Bearer Service Manager: uses standard IP mechanisms to manage the IP Bearer Service. It resides in the GGSN and optionally in the UE

Media component: is a part of an SDP session description conveying information about one media stream (e.g. type, format, IP address, port, transport protocol, bandwidth, direction)
The media stream described by a media component can be either bi- or unidirectional. A media stream containing an RTP flow may also contain an associated RTCP flow. An SDP session description can consist of more than one media component. A media component shall not be deleted nor its position changed within the SDP session description. A media component line where the port number has previously been set to 0 may be reused for a new media component.

Policy Control Function (PCF): is a logical policy decision element that uses standard IP mechanisms to implement policy in the IP media layer
The PCF makes decisions in regard to network based IP policy using policy rules, and communicates these decisions to the PEP in the GGSN.

Proxy Call Session Control Function (P-CSCF): is a network element providing session management services (e.g. telephony call control)

Policy Enforcement Point (PEP): is a logical entity that enforces policy decisions made by the PCF. It resides in the IP BS Manager of the GGSN

Policy Information Base (PIB): data carried by COPS-PR is a set of policy data
The protocol assumes a named data structure, known as a Policy Information Base (PIB), to identify the type and purpose of solicited and unsolicited policy information that is sent from the Policy Decision Point to the Policy Enforcement Point for provisioning policy or sent from the Policy Enforcement Point to the Policy Decision Point as a notification.

Provisioning Instance Identifier (PRID): uniquely identifies an instance of a PRC

Resource ReSerVation Protocol (RSVP): is used by a host to request specific qualities of service from the network for particular application data streams or flows
The network responds by explicitly admitting or rejecting RSVP requests.

Translation/mapping function: provides the inter-working between the mechanisms and parameters used within the UMTS Bearer Service and those used within the IP Bearer Service

UMTS Bearer Service Manager: handles resource reservation requests from the UE. It resides in the GGSN and the UE

3.2 Abbreviations

For the purposes of the present document, the abbreviations as specified in 3GPP TR 21.905 [1] and the following abbreviations apply:

COPS	Common Open Policy Service protocol
COPS-PR	COPS for policy PRovisioning
DEC	COPS DECision message
DiffServ	Differentiated Services
DRQ	COPS Delete ReQuest state message
DSCP	DiffServ Code Point
GCID	GPRS Charging IDentifier
ICID	~~IMS~~ IM CN Subsystem Charging IDentifier
IMS	IP Multimedia core network Subsystem
MIB	Management Information Base
PCF	Policy Control Function
P-CSCF	Proxy Call Session Control Function
PEP	Policy Enforcement Point
PHB	Per Hop Behaviour
PIB	Policy Information Base
PRC	PRovisioning Class (a type of policy data)
PRI	PRovisioning Instance (an instance of a PRC)
PRID	PRovisioning Instance iDentifier
QoS	Quality of Service
REQ	COPS REQuest message
RPT	COPS RePorT state message
RSVP	resource ReSerVation Protocol
RTCP	RTP Control Protocol
SBLP	Service Based Local Policy
SDP	Session Description Protocol

End of second change

Start of third change

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 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, RTP. 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 (see 3GPP TS 24.229 [14]) provided by the P-CSCF as part of the authorisation decision. The GGSN shall send the GCID (see 3GPP TS 29.060 [18]) 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.

End of third change

Start of fourth change

6.3.2 Message description

The Go interface uses the COPS-PR protocol.

The following messages and events are available on the Go interface:

- Authorisation_Request (GGSN→PCF):

  This event allows the GGSN to request authorisation details from the PCF. It contains the following information:

  - Client Handle;
  - Binding Information.

  The R-type = 0x08 for configuration request is used here and M-type = 0x02 create event state is used here.

- Authorisation_Decision (PCF→GGSN):

  This event provides the GGSN with the authorisation status, and relevant authorisation decision data if applicable. The event contains the following information:

- Client Handle (only in the initial Authorisation_Decision);
- ICID(s) (the format of the ICID is defined in 3GPP TS 32.225 [19]; only one ICID is transferred in this Release);
- Unidirectional set (this parameter shall appear once for each direction (uplink and downlink)):
  - Direction indicator;
  - "Authorised QoS";
  - Gate description (this parameter shall appear once for each required gate for this direction):
    - Filter Specification - The information about the authorised IP end points addresses and ports is detailed below. The Filter Specification parameters are:
      - Source IP address;
      - Destination IP address;
      - Source ports;
      - Destination ports;
      - Protocol ID.

      The Source and Destination ports are described with a range consisting of a minimum and maximum value. If only one port is authorised, the minimum value and maximum value of the range are identical.

      A filter specification describing more than one IP flow shall be only used in case of identical Protocol IDs, IP addresses and successive port numbers (e.g. RTP and RTCP flow of a media component). Furthermore, the gate status of all IP flows described by this filter specification shall be identical, too.
    - Gate status (opened/closed)

~~Editor's note: The ICID issue should still be discussed in SA5.~~

The R-type = 0x08 for configuration request is used here and M-type = 0x02 create event state is used here.

- Authorisation_Failure (PCF→GGSN):

  This event provides the GGSN with an indication of an authorisation failure, and may carry additional reason details. The event contains the following information:

  - Client Handle;
  - Authorisation failure (including any provided reason information).

  The R-type = 0x08 for configuration request is used here and M-type = 0x04 terminate event state is used here.

- Gate Decision (PCF→GGSN):

  The Gate Decision indicates to the GGSN the new status of the gate(s) established for a client handle (PDP context). The gate status indicates to the GGSN that the gate shall be opened or closed. Only the gate(s) for which the status is changed are indicated by this event. The event contains the following information:

  - Client Handle;
  - Unidirectional set (this parameter shall appear once for each direction for which gates are being updated (uplink and/or downlink)):
    - Direction indicator;
    - Gate description (this parameter shall appear once for each gate to be modified for this direction) :

- Filter Specification - The information about the authorised IP end points addresses and ports is detailed below. The Filter Specification parameters are:
  - Source IP address;
  - Destination IP address;
  - Source ports;
  - Destination ports;
  - Protocol ID.

  The Source and Destination ports are described with a range consisting of a minimum and maximum value. If only one port is authorised, the minimum value and maximum value of the range are identical.

  A filter specification describing more than one IP flow shall be only used in case of identical Protocol IDs, IP addresses and successive port numbers (e.g. RTP and RTCP flow of a media component). Furthermore, the gate status of all IP flows described by this filter specification shall be identical, too.
- Gate status (opened/closed)

NOTE: The opening of the gate may occur at the same time / be part of the authorisation decision event.

The R-type = 0x08 for configuration request is used here and M-type = 0x03 update event state is used here.

- Report (RPT)s (GGSN→PCF):
  - Authorisation_report; Gate_report:

    The GGSN sends a COPS RPT message back to the PCF reporting that it enforced or not the Authorisation_Decision, or the Gate_Decision.

    The events contain the following information:
    - Client Handle;
    - Success / Failure.
  - The Authorization_report of the initial Authorisation_Decision includes:
    - GCID;
    - GGSN address.
  - Report of state changes:

    The GGSN sends the report of state change message to the PCF reporting that the maximum bit rate for the PDP context is modified to 0 kbit/s or that the maximum bit rate for the PDP context is changed from 0 kbit/s.

    The event contains the following information:
    - Client Handle;
    - Maximum bit rate (set to 0kbps / changed from 0 kbps).
- Delete request state (GGSN→PCF):

  The GGSN informs the PCF via the delete request state message, that the PDP context is deactivated and the request state identified by the client handle is no longer available/relevant at the GGSN, so the corresponding state shall also be removed at the PCF.

  The DRQ message includes the reason why the request state was deleted.

  The event contains the following information:

- Client Handle;
- Reason code: "Tear", Sub-code: deactivation of the PDP context.

- Remove_Decision (PCF→GGSN):

  The PCF uses the Remove_Decision to inform the GGSN that the PCF revokes the authorized resources for the client handle (PDP context).

  The event contains the following information:

- Client Handle.

End of fourth change

3GPP TSG-CN WG3 Meeting #26
Bangkok, Thailand, 11th – 15th November, 2002

Tdoc ⌘N3-021023

CR-Form-v7

CHANGE REQUEST

⌘ **29.207** **CR** **065** ⌘ **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 ☒

Title:	⌘	Update of Device Capabilities and Limitations section
Source:	⌘	TSG_CN WG3
Work item code:	⌘	E2EQoS
Date:	⌘	14/11/2002
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:	⌘	The Go PIB contains a conformance section describing the required objects which are necessary for conformance with a Go PIB. Consequently, there is no need to allow for a support of individual objects only and to indicate this using the reporting functionality for capabilities and limitations of COPS-PR. The whole set of objects has to be supported to be conform with a Go PIB. On the other hand, there are some objects defined in the Go PIB which are used to transfer information on capabilities and limitations. These objects are not yet described in section 6.3.1.4.
Summary of change:	⌘	The Reporting of Device Capabilities and Device Limitations section is updated. Some objects are added which are used to transfer information for device capabilities and limitations. A new section describing the Go PIB conformance section is added. The objects which are part of the Go PIB conformance section are moved to this new section and further objects and capabilities are added which are mandatory for the Go PIB. The corresponding PIB objects are added for each capability in the conformance section.
Consequences if not approved:	⌘	Inconsistency between the Go PIB and the section 6.3.1.4 could lead to misunderstandings and implementation problems.

Clauses affected:	⌘	6.3.1.4, 6.3.1.5			
Other specs affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

Start of modified section

6.3.1.4 Conformance Section

The conformance section indicates the PIB objects, i.e. provisioning classes (PRCs), that a PIB shall have to be conformant to 3GPP Go PIB. To be conformant to the 3GPP Go PIB, it is mandatory to have all the 3GPP Go PIB PRCs and the frwkPrcSupportGroup, frwkDeviceIdGroup included from the Framework PIB (RFC 3318 [15]). The supported PRCs are notified using these mandatory groups of PRCs from the Framework PIB.

The following GGSN capabilities are notified to the PCF by indicating the corresponding PRCs:

- Bearer authorisation capabilities:

  The GGSN notifies the PCF that it supports bearer authorisation capabilities. The GGSN will provide the token(s) and flow identifier(s) in the REQ for verifying the binding information and the grouping of the media flows by the PCF. The go3gppAuthReqEventGroup together with the go3gppBindingInfoGroup and the go3gppFlowIdGroup are used for this purpose.

  Furthermore, the GGSN will enforce any requested or unrequested decision for the authorisation of GPRS and IP resources. If the authorisation at the PCF fails the go3gppAuthReqFailDecGroup is used to give some information on the reason of failure to the GGSN. The go3gppAuthReqDecGroup together with the go3gppAuthReqDirDecGroup are used in case of a successful authorisation at the PCF. This also includes the following capabilities:

  - "Authorised QoS" capabilities:

    The GGSN notifies the PCF that it is capable to enforce the combined "Authorised QoS" for the bearer. The go3gppQosGroup is used for this purpose.

  - Gating capabilities:

    The GGSN notifies the PCF that it is capable to enforce the gating functionality. The go3gppGateGroup together with the frwkBaseFilterGroup and the frwkIpFilterGroup are used for this purpose.

  - Indication of device capabilities and device limitations:

    The GGSN informs the PCF that it is able to notify its device capabilities and device limitations. The go3gppAuthReqCapGroup and the go3gppAuthReqDecCapGroup are used for this purpose.

- Open /close the gate capabilities:

  The GGSN informs the PCF that it is capable to enforce a separate decision on opening the gate for the authorised media flow and it is capable to enforce a separate decision from the PCF regarding disabling of the gate. The go3gppGateDecGroup together with the go3gppGateGroup are used for this purpose.

- Revoke media authorisation capabilities:

  The GGSN notifies the PCF that it is capable to enforce the revoke authorisation for GPRS and IP resources decision from the PCF. No PRCs are required to indicate this capability.

- Charging co-ordination:

  The GGSN informs the PCF that it is capable to send GCID(s) and GGSN address to the PCF. The go3gppReportGroup together with the go3gppRprtGPRSChrgInfoGroup are used for this purpose.

  The GGSN informs the PCF that it is capable to receive ICID(s) from the PCF. The go3gppAuthReqDecGroup together with the go3gppIcidGroup are used for this purpose.

- Indication of QoS modifications to 0 kbps and from 0 kbps:

  The GGSN informs the PCF that it is able to notify when the maximum bit rate for the PDP context is modified to 0 kbps or that the maximum bit rate for the PDP context is changed from 0 kbps. The go3gppReportGroup together with the go3gppRprtUsageGroup are used for this purpose.

- Indication of bearer release:

The GGSN notifies the PCF that it is capable to notify when the previously authorised GPRS and IP resources are released, i.e. PDP context is deactivated. No PRCs are required to indicate this capability.

- COPS-PR specific capabilities:

The GGSN informs the PCF that it supports the following COPS-PR [8] specific capabilities:

- Outsourcing capability:

The GGSN informs the PCF that it supports the outsourcing model. The go3gppAuthReqHandlerGroup is used for this purpose.

6.3.1.54 Reporting of Device Capabilities and Device Limitations

The functionality of reporting of device capabilities and device limitations is as described in RFC 3084 [8]. In addition, the following shall apply.

The configuration request message serves as a request from the GGSN to the PCF and includes provisioning client information to provide the PCF with client-specific configuration or capability information about the GGSN. The capability information to be exchanged ~~shall~~ could include ~~the~~ additional PIB objects supported by the GGSNwhich are part of the capability section. If no value information is exchanged then the default value will be used as if it had been exchanged. This information from the client assists the server in deciding what types of policy the GGSN can install and enforce.

The following GGSN capabilities and limitations may be provided in the configuration request message:

~~- Bearer authorisation capabilities:~~

~~The GGSN notifies the PCF that it supports bearer authorisation capabilities. The GGSN will provide the token(s) and media identifier(s) in the REQ for verifying the binding information and the grouping of the media components by the PCF.~~

~~- "Authorised QoS" capabilities:~~

~~The GGSN notifies the PCF that it's capable to enforce the combined "Authorised QoS" for the bearer.~~

~~- Packet classifier capabilities:~~

~~The GGSN notifies the PCF that it's capable to enforce the packet classifier for each media component direction.~~

~~- Open /close the gate capabilities:~~

~~The GGSN informs the PCF that it's capable to enforce a separate decision on opening the gate for the authorised media component and it' s capable to enforce a separate decision from the PCF regarding disabling of the gate.~~

~~- Revoke media authorisation capabilities:~~

~~The GGSN notifies the PCF that it's capable to enforce the revoke authorisation for GPRS and IP resources decision from the PCF.~~

~~- Charging coordination:~~

~~The GGSN informs the PCF that it's capable to send GCID(s) and GGSN address to the PCF.~~

~~The GGSN informs the PCF that it's capable to receive ICID(s) from the PCF.~~

~~- Indication of QoS modifications to 0 kbit/s and from 0 kbit/s:~~

~~The GGSN informs the PCF that it is able to notify when the maximum bit rate for the PDP context is modified to 0 kbit/s or that the maximum bit rate for the PDP context is changed from 0 kbit/s.~~

- Indication of the maximum number of binding information:

The GGSN may notify the PCF how many binding information the GGSN is able to send with an Authorization Request.

- Indication of the maximum number of Flow IDs:

The GGSN may notify the PCF how many Flow IDs the GGSN is able to send with an Authorization_Request.

- Indication of the maximum number of ICIDs:

The GGSN may notify the PCF how many ICIDs the GGSN is able to receive with an Authorization_Decision.

~~The PCF responds to the configuration request with an initial DEC message.~~

~~The R-type = 0x08 for configuration request is used here and M-type = 0x01 initial capability negotiation is used here.~~

The device capabilities information exchanged by the initial messages shall be stored in the PCF.

6.3.1.6~~5~~ Initial Go Policy Provisioning

The functionality of initial Go policy provisioning is as described in RFC 3084 [8]. In addition, the following shall apply:

- The DEC message is sent from the PCF to the GGSN in response to the REQ message received from the GGSN. The Client Handle shall be the same as that received in the corresponding REQ message.
- The DEC message is sent as an immediate response to a configuration request with the solicited message flag set in the COPS message header. ~~The PCF informs the GGSN of the capabilities that it supports. The capabilities exchanged shall include the PIB objects supported by the PCF.~~ The PCF shall also inform the GGSN what types of events shall trigger policy control requests over the Go interface.
- The R-type = 0x08 for configuration request is used here and M-type = 0x01 initial capability negotiation is used here.

End of modified section

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CR-Form-v7

CHANGE REQUEST

⌘ **29.207** **CR** **049** ⌘ **rev** **3** ⌘ 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:	⌘	Clarifications on Early Media
Source:	⌘	TSG_CN WG3
Work item code:	⌘	E2EQOS
Date:	⌘	06/11/2002
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:	⌘	State explicitely that a early media should be supported for the mobile originating call using audio media. Up to now, it was optional to open gates at the COPS authrisation decision, but no furher hints on the usage of this option were provided. It is desirable to state the support of early media explicitely to make RCF and UE implementors awre of this issue.
Summary of change:	⌘	Give example of early media for incluion of the gate enabling command to the authorisation decision.
Consequences if not approved:	⌘	Early media may not be supported, and interworking problems with the PSTN may therefore be encountered.

Clauses affected:	⌘	5.2.1.1

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

⌘

Other comments: ⌘

5.2 PCF

5.2.1 SBLP decisions

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(s), 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 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, RTP. The Data Rate includes the overhead coming from the possible usage of RTCP. 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~~.~~, for instance to enable early media. 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.