

Source: TSG SA WG2
Title: CRs on 23.207 (End to End QoS)
Agenda Item: 7.2.3

The following Change Request has been approved by TSG SA WG2 and is requested to be approved by TSG SA plenary #25.

S2 doc #	Title	Spec	CR #	cat	Versi on in	Rel	WI	S2 meeting	Clauses affected
S2-042844	SBLP and non-realtime PDP Contexts	23.207	084r1	F	6.3.0	6	IMS2 and QoS1	S2 #41	6.1.1, 6.1.2
S2-042708	Generation of multiple tokens	23.207	085	F	6.3.0	6	QoS1	S2 #41	5.2.4, 5.3a.2, 6.1.3, 6.1.4, 6.3.1

CHANGE REQUEST

⌘ **23.207 CR 084** ⌘ rev **1** ⌘ Current version: **6.3.0** ⌘

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Proposed change affects: | UICC apps ME Radio Access Network Core Network

Title:	⌘ SBLP and non-realtime PDP Contexts		
Source:	⌘ SA2 (Nokia, Ericsson)		
Work item code:	⌘ IMS2 and QoS1	Date:	⌘ 16/08/2004
Category:	⌘ F	Release:	⌘ Rel-6
	Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Use <u>one</u> of the following releases: <i>Ph2</i> (GSM Phase 2) <i>R96</i> (Release 1996) <i>R97</i> (Release 1997) <i>R98</i> (Release 1998) <i>R99</i> (Release 1999) <i>Rel-4</i> (Release 4) <i>Rel-5</i> (Release 5) <i>Rel-6</i> (Release 6) <i>Rel-7</i> (Release 7)

Reason for change: ⌘	Recent developments on IMS session-based messaging has introduced the problem of SBLP restricting the optimal deployment of IMS services that use non-realtime media. Such media does not require enhanced QoS, and could very well utilize a non-realtime PDP Context. Hence it is beneficial to allow the activation of such a PDP Context, whereby QoS authorization does not bring any benefit, without an Authorization Token. This allows optimal resource utilization, optimal and simpler session set-up, as there is no separate PDP Context required for IMS media.
Summary of change: ⌘	It is proposed to always allow the establishment of a non-realtime PDP Context without an Authorization Token.
Consequences if not approved: ⌘	Resources (PDP Contexts) would be wasted for non-realtime IMS services in case SBLP is applied. Also, the session set-up would otherwise be unnecessarily long and complex for these services

Clauses affected: ⌘	⌘ 6.1.1, 6.1.2
	<input type="checkbox"/> Y <input type="checkbox"/> N

Other specs affected:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications	<input type="checkbox"/>	TS 29.207, TS 24.229
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Test specifications		
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	O&M Specifications		
Other comments:	<input type="checkbox"/>				

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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.

6.1.1 Procedures in the GGSN

The QoS procedures in the GGSN are triggered by the QoS signaling messages from the UE, i.e., PDP Context Activation message or the RSVP messages. The exact QoS procedures in the GGSN depend on the GGSN and UE QoS capabilities. The GGSN is required to support DiffServ edge function. Other QoS capabilities that may be supported at the GGSN are RSVP functions and service-based local policy enforcement functions.

For UEs that do not support RSVP, the GGSN may use the PDP context level information to configure the DiffServ edge functionality and provide internetworking between PDP context and backbone IP network. The authorization token is included in the PDP context activation/modification messages.

For UEs that support RSVP, the GGSN may also support RSVP and use RSVP rather than the PDP context to control the QoS through the backbone IP network. The authorization token may be included in the RSVP signaling and the PDP context activation/modification messages. Alternatively, the RSVP messages may pass transparently through the GGSN.

If SBLP is implemented in the operator's network, the GGSN shall authorize the PDP context activation/modification messages that are subject to service based local policy by sending an authorization request to the PDF. Alternatively, the GGSN may authorize PDP context activation/modification messages that are subject to service based local policy using the cached policy in the Local Decision Point. The GGSN shall map the received IP flow based policy information into PDP context based policy information.

If SBLP is implemented in the operator's network, the GGSN shall nonetheless allow the activation/modification of at least one non-realtime PDP context per UE IP address and per APN (PDP Context with UMTS Traffic class 'background' or 'interactive') without a Media Authorization Token.

Note: The requirement above makes it possible for the UE to activate/modify at least one non-realtime PDP Context on each APN (with UMTS traffic class 'background' or 'interactive') without including the Media Authorization Token to the activation/modification message.

6.1.2 Procedures in the UE

The QoS procedures in the UE are triggered by the application layer (e.g., SIP/SDP) QoS requirements. The exact QoS procedures in the UE depend on the UE QoS capabilities.

For UEs that support only UMTS QoS mechanism, the application QoS requirements will trigger a PDP Context Activation procedure with the corresponding UMTS QoS parameters. For UEs that support both IP (e.g., IP BS Manager) and UMTS QoS mechanism, the application QoS requirements are mapped down to the IP layer QoS parameters. The IP layer parameters are further mapped down to the PDP context parameters in the UE. For UEs that support RSVP, the application QoS requirements are mapped down to create an RSVP session. The UE shall establish a PDP context suitable for support of the RSVP session.

In addition in the case of IMS, the following procedures apply: if the UE received the Media Authorization Token in the SIP signalling, the UE shall include the Media Authorization Token in the PDP Context Activation request for the PDP Context(s) that are activated upon IMS session establishment to carry the media flows of the IMS session. In case the UE carries media flows from different AF sessions in the same PDP Context, the UE shall include the Media Authorization Tokens of all these AF sessions in the PDP Context Activation/Modification request.

Note: This also implies that if the UE initiates a new AF session and intends to carry media of this AF session in an already activated PDP context that carries media from other AF session(s), then the UE initiates a PDP Context Modification request and includes all authorization tokens of all AF sessions that use this PDP Context in this request.

It shall be possible for the UE to carry media flow(s) of an AF session in the non-realtime PDP Context that has already been established without a Media Authorization Token and matches the QoS requirements of the media flow(s). In this case, the Media Authorization Token received by the UE in AF session signaling will not be used, as no PDP Context with Media Authorization Token is required.

Note: Such a usage of an already activated non-realtime PDP Context is assumed to be applied only for non-realtime AF session media (e.g. for IMS session-based messaging), or for any AF session to provide a possibility for the transfer of early media (e.g. for PoC) until the PDP contexts with authorization token have been established.

For UEs that support RSVP, if the UE received the Media Authorization Token in AF session signalling, the UE shall include the Media Authorization Token in both the PDP Context Activation request for the PDP Context(s) that are activated to carry the media flows of the AF session, and the RSVP messages if the PDP Context/RSVP is associated to the session.

At the AF session release, the UE shall release all QoS resources allocated for the AF session.

NOTE: Service Based Local Policy may restrict the destination of packets to the addresses/ports included in the AF session signalling. Mechanisms such as MIPv6 Route Optimisation which send packets to other addresses/ports may therefore not operate correctly.

CR-Form-v7.1

CHANGE REQUEST

23.207 CR **085** rev - Current version: **6.3.0**

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Proposed change affects: | UICC apps ME Radio Access Network Core Network

Title:	Generation of multiple tokens		
Source:	SA2 (Nokia)		
Work item code:	QoS1	Date:	16/08/2004
Category:	F	Release:	Rel-6
	Use <u>one</u> of the following categories: F (correction) A (corresponds to a correction in an earlier release) B (addition of feature), C (functional modification of feature) D (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Use <u>one</u> of the following releases: Ph2 (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) Rel-7 (Release 7)

Reason for change:	Unresolved problems in this optional feature.
Summary of change:	Generation of multiple token option is removed.
Consequences if not approved:	Unclear requirements for the Gq interface.

Clauses affected:	5.2.4, 5.3a.2, 6.1.3, 6.1.4, 6.3.1										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">N</td> </tr> <tr> <td style="padding: 2px;"><input checked="" type="checkbox"/></td> <td style="padding: 2px;"><input checked="" type="checkbox"/></td> </tr> <tr> <td style="padding: 2px;"><input type="checkbox"/></td> <td style="padding: 2px;"><input checked="" type="checkbox"/></td> </tr> <tr> <td style="padding: 2px;"><input type="checkbox"/></td> <td style="padding: 2px;"><input checked="" type="checkbox"/></td> </tr> </table>	Y	N	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications	<input checked="" type="checkbox"/>
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/*/ First amended section ***/**

5.2.4 Application Function (AF)

The Application Function (AF) is an element offering applications that require the control of IP bearer resources (e.g. UMTS PS domain/GPRS domain resources). One example of an Application Function is the P-CSCF.

Service Based Local Policy related functions

- The AF shall use Gq interface to exchange service based policy set-up information with the PDF. This applies both during session establishment, as well as upon a mid-session modification effecting the media (e.g. addition of a new media in mid-session).
- The AF shall indicate to the PDF whether or not the PDF should contact the AF at UE resource reservation, even if policy set-up information is already available in the PDF.
- The AF shall indicate to the PDF whether or not the PDF may initiate a revoke of authorization.
- The AF shall indicate to the PDF whether or not the AF explicitly enables or disables the media.
- The AF shall indicate to the PDF whether or not the PDF shall forward bearer indications (e.g. bearer release indication).
- For bi-directional media flows, the AF, according to operator policy, may assume that the 64-bit IPv6 address prefix of the source address for downstream packets is the same as the prefix of the destination address for upstream packets of the same media flow. The implementation of this AF assumption would be determined by operator policy in order to reduce the possibilities of bearer misuse.

Binding Mechanism Handling

- The AF requests authorization token(s) from the PDF. The following are possible:
 - 1) The AF requests a single authorization token. The PDF authorizes QoS resources usage for that application for a particular session and user. The authorization token is only valid for the duration of the session for the specific user.
 - ~~2) The AF requests multiple authorization tokens. The PDF provides the requested number of authorization tokens. Each of these tokens may later be allocated to a session, and then used for subsequent QoS resource usage authorization procedures for the duration of the session for the specific user.~~
 - 3) The PDF rejects the authorisation because the service information is not consistent with the operator policy rules defined in the PDF. No token is sent to the AF. The PDF shall also indicate in the authorisation reject the service information that could be accepted by the PDF.
- For AF sessions to and from the same UE, the AF(s) shall request authorization tokens from the same PDF.

Note: As a consequence, the GGSN will contact the same PDF for SBLP authorization for all AF sessions using the same PDP context.

The AF sends the authorization token to the UE in AF session signaling.

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

5.3a.2 Information Exchanged via Gq interface

Service information:

The AF provides the following service information to the PDF to be used as a basis for the service-based local policy decisions.

- a) Description of session: the AF may provide one or more of the following information when describing the session (the set of information that needs to be sent in different cases depends on the service for which the media authorisation is required):
- Application identifier: identifies the particular service that the session belongs to. This information may be used by the PDF to differentiate QoS for different application services. For example application identifier may be used as additional information together with the indication of the type of service information when QoS class for the bearer authorisation in Gm interface is decided. The application identifier may be used also to complete the QoS authorisation with application specific default settings in the PDF if the AF does not provide all or any of the following information.
 - Information defining the media stream
 - Media stream Id (to uniquely identify the media stream within the session)
 - Information defining the IP flows of the media stream.
 - direction (bi-directional, uplink / downlink)
 - 5-tuple (source/destination address and port number, protocol Id)
 - indication of the maximum and/or mean bandwidth required
 - An indication of the requested type of service information per service-flow, e.g., conversational voice or video, streaming voice or video
- b) Resource Reservation Policy: Definition of whether PDF shall contact the AF at resource reservation during the session even if policy set-up information is already available in the PDF.
- c) Media Control Policy: Definition of whether explicit AF media control is used or not in the session. If explicit AF media control is not used, the AF does not explicitly enable or disable the media. At bearer authorization the PDF shall install the gates in the GGSN and derive their state (open/close) based on the information defining the media stream.
- d) Revoke Policy: Definition of whether the PDF itself may initiate a revoke of authorization.
- e) Indication Forwarding Policy: Definition of whether the PDF shall forward bearer indications (e.g. bearer release indication).

Authorisation token:

The PDF generates ~~one or more~~ Authorisation token(s) on request from the AF. The Authorization token contains the fully qualified domain name of the PDF and a reference in the PDF, which allows the PDF to uniquely identify the AF session.

Charging correlation related information:

The AF and PDF may exchange charging correlation related information. The AF charging identifier (e.g. ICID in case of IMS), if available, shall be transferred from the AF to the PDF, which shall forward it to the GGSN. GPRS charging identifier, if available in the PDF, shall be transferred to the AF.

Media control commands:

If explicit media control is used the AF instructs the PDF when a media is to be enabled or disabled to pass through the access network. The command contains information referencing the media and its required status (enabled/disabled). The PDF opens or closes the corresponding gate(s) in the GGSN based on this command. The PDF shall respond with the result of the operation to the AF.

Bearer reservation indication:

The PDF shall send bearer reservation indication to the AF to indicate that the bearer resources have been reserved, if the AF in the initial authorisation request had requested it.

Bearer release indication:

Information available at the PDF on the bearer resource release is forwarded to the AF. The indication may contain information about the reason of the release.

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

6.1.4 Procedures in the AF

The authorize QoS resources procedure is triggered by the AF when it receives an AF session signalling message initiating a new AF session. Upon the authorize QoS procedure:

- The AF shall request one authorization token for the AF session, ~~or multiple authorisation tokens to be used for future AF sessions,~~ from the PDF in the initial authorisation request. For AF sessions to and from the same UE, the AF(s) shall request authorization tokens from the same PDF.

Note: This also implies that if different AF sessions of a user are controlled by different AFs, then all these AFs will request authorization tokens from the same PDF. Hence, the bearer authorization of the PDP Context(s) carrying the media of these AF sessions will be performed by the same PDF.

- If the AF indicates to the PDF that it wishes to be contacted upon bearer resource reservation, the service information shall be passed during the Gq interaction upon bearer resource reservation. Alternatively, if the initial AF session signalling message contains session description information, such as the end-point addresses, bandwidth requirements and the characteristics of the media exchange, the AF shall forward this information to the PDF as part of the service information at the same time with the authorisation token request.
- The AF generates the information (e.g. service information) conveyed over the Gq interface from the application specific media description (e.g. SDP media description).
- The PDF shall use the service information for the QoS policy set up for the AF session. During an AF session change, the AF shall send an update for service information to the PDF based on the new session description information exchanged within AF session signalling.

The AF orders the PDF to enable or disable a media to pass through the access network. The AF shall be able to send an instruction for the PDF to wait for the Approval of QoS Commit procedure or to enable the media as part of the authorization of the bearer establishment for the media. The AF may use Removal of QoS commit procedure to disable the media e.g. when a media component of an AF session is put on hold.

At AF session release, the AF shall send an instruction to the PDF to revoke the resource authorization.

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

6.3.1 Authorize QoS Resources, AF session establishment

The Authorize QoS Resources upon AF session establishment procedure is triggered by a session establishment event in the AF (e.g. the AF receiving an AF session signaling message containing session description information (e.g. SDP)). The session description negotiation between AF session endpoints contains information about the session, such as the end-points, bandwidth requirements, and the characteristics of the media exchange.

- Note: The exact type and amount of session description information exchanged between AF session endpoints depend on the nature of the session and the application.

The PDF shall authorize the required QoS resources for the session and install the IP bearer level policy based on service information received from the AF.

The following figure is applicable to both sides (i.e. originating and terminating) of the AF session.

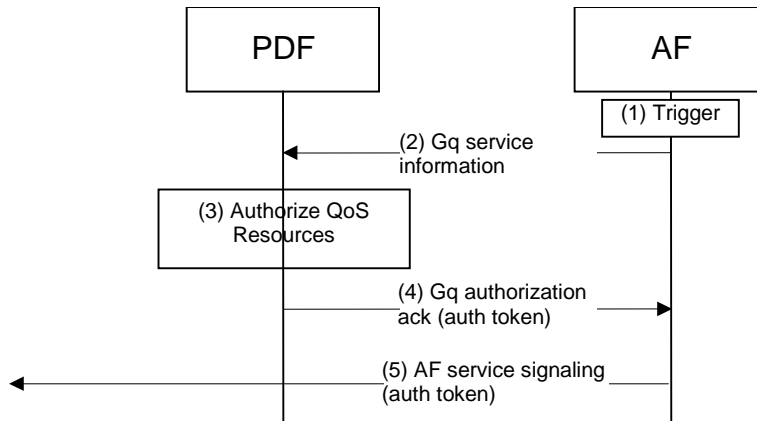


Figure 3: Authorize QoS Resources, AF session establishment

- 1) An AF session signaling message is received at or generated by the AF, or an internal action at the AF triggers the need for an authorization request.
- 2) The Application Function sends a request for authorization token to the PDF with service information, which may include session description information based on the AF session signaling. Some services may require further interaction between the AF and the PDF to provide the full service information, e.g. for IMS session establishment (mobile terminated).
~~Note that it is also possible that the AF initiates a request for multiple authorization tokens to use for future sessions, in which case the PDF can generate multiple authorization tokens.~~
- 3) If the PDF has received AF session description in the service information in Step 2, the PDF shall authorize the required QoS resources for the AF session if the session description is consistent with the operator policy rules defined in the PDF, and install the IP bearer level policy based on information received from the AF. If the service information was not received in Step 2 above, the QoS authorisation is deferred. The PDF generates an authorization token for the AF session.
- 4) The PDF sends the authorisation token to the AF.
- 5) The AF forwards the AF session signaling message containing the session description. The AF shall include the authorization token in this AF session signaling message.