3GPP TSG CN Plenary Meeting #19 **NP-030080**
12th - 14th March 2003. Birmingham, U.K.

Source: TSG CN WG3

Title: CRs on Rel-5 Work Item E2EQoS.

Agenda item: 8.5

Document for: APPROVAL

Introduction:

This document contains **8** CRs on **Rel-5 Work Item E2EQoS,** including the corresponding mirror CRs (as required).

These CRs have been agreed by TSG CN WG3 and are forwarded to TSG CN Plenary meeting #19 for approval.

WG_tdoc	Title	Spec	CR	Rev	Cat	Rel	C_Ver
N3-030165	Terminology corrections and capability section update	29.207	073	2	F	Rel-5	5.2.0
N3-030047	Invalid Flow ID	29.207	075		F	Rel-5	5.2.0
N3-030127	Clarification to binding information handling	29.207	076	1	F	Rel-5	5.2.0
N3-030132	Restrictions to PDP context policy decisions	29.207	077	1	F	Rel-5	5.2.0
N3-030128	Mechanism for wildcarding filter elements	29.207	078	1	F	Rel-5	5.2.0
N3-030181	Reject change of token in PDP context modification	29.207	081	3	F	Rel-5	5.2.0
N3-030167	Clarification on TFT filters	29.207	084	2	F	Rel-5	5.2.0
N3-030113	Correction of what is identified with the policy element AUTH_SESSION	29.207	088		F	Rel-5	5.2.0

3GPP TSG-CN WG3 Meeting #27
Dublin, Ireland, 10th - 14th February 2003.

Tdoc ⌘N3-030047

CR-Form-v7

CHANGE REQUEST

⌘ **29.207** **CR** **075** ⌘ **rev** **-** ⌘ Current version: **5.2.0** ⌘

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

Title:	⌘	Invalid Flow ID
Source:	⌘	TSG_CN WG3 *[Nokia]*
Work item code:	⌘	QoS
Date:	⌘	14/02/2003
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:	⌘	Binding information consists of one Authorisation token and one or more Flow id(s). The PDF shall authorise all media components, which may contain one or more IP flows each represented by a Flow id. Two different error codes specify errors of binding information: - Error code No. 3 "Invalid binding information". This error code indicates that the PDP context activation/modification request is rejected because the authorizing entity could not be resolved from the binding information. - Error code No. 6 “No corresponding session“. This error code indicates that the PDP context activation request is rejected because the authorizing entity cannot associate the binding information with any ongoing session. There is no error code for PDF to indicate invalid Flow id but only error code at session level.
Summary of change:	⌘	Error code No.6 “No corresponding session“ is expanded to cover both session and flow levels.
Consequences if not approved:	⌘	Incomplete error case information in the specification.

Clauses affected:	⌘	5.2.1.1 and Annex D

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

Other comments: ⌘

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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

5.2.1.1 SBLP authorisation decision

The information needed for the PDF 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 set-up information to the PDF upon every SIP message that includes an SDP payload. This ensures that the PDF passes proper information to perform media authorization for all possible IMS session set-up scenarios. The policy set-up information provided by the P-CSCF to the PDF 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 PDF.

The PDF 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 PDF shall include an AUTH_ENT_ID attribute containing the Fully Qualified Domain Name of the PDF and the SESSION_ID attribute.

Upon receiving the bearer authorization request from the GGSN, the PDF 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 PDF shall identify whether the binding information indeed corresponds to an initiated SIP session. If the corresponding SIP session cannot be found or binding information contains invalid flow identifier(s), the PDF shall enforce the rejection of this PDP context request by sending an INSTALL and REMOVE decision to the GGSN. The reason for the rejection is indicated by the INSTALL decision with the "noCorrespondingSession" reason in the Authorisation Request Failure Decision. If the PDF is otherwise unable to authorise the binding information, the INSTALL decision shall identify a general authorisation failure with the "authorisationFailure" of the request reason in the Authorisation Request Failure Decision.

  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 PDF 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 PDF shall enforce the rejection of this PDP context request by sending an INSTALL and REMOVE decision to the GGSN. The reason for the rejection is indicated by the INSTALL decision with the "invalidBundling" reason in the Authorisation Request Failure Decision.

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

If the PDF 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 PDF shall define the direction (upstream or downstream) of the "Authorised QoS" and the packet classifier(s).

- Packet classifier(s):

  The PDF 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 PDF.

  - 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 PDF in the packet classifier.

  - The PDF 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 QoS Class and Data Rate) for a media component is extracted from the media type information and bandwidth parameter of the SDP. The PDF shall map the media type information into a QoS Class which is the highest class that can be used for the media. The PDF shall use an equal QoS 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 QoS class A.

  The PDF shall derive the Data Rate value from the "b=AS" SDP parameter. The "b=AS" parameter in the SDP shall contain all the overhead coming from the IP-layer and the layers above, e.g. UDP and RTP. If RTP is used, then overhead coming from RTCP shall be added by the PDF 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 PDF shall provide the "Authorised QoS" for the bearer as the combination of the "Authorised QoS" information of the individual media components. The QoS Class in the "Authorised QoS" for the bearer shall contain the highest QoS class amongst the ones applied for the individual media components and indicates the highest UMTS traffic class that can be applied to the PDP context.

  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 [18].

The PDF may include the gate enabling command as part of the authorisation decision, for instance to enable early media. Alternatively, the PDF may provide a separate decision for opening the gate.

The PDF 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 PDF shall update the media authorization information for the session. The PDF may push this updated authorisation information to the GGSN. Under certain condition e.g. revoke of authorization, the PDF shall push the updated policy decision to the GGSN.

Next modified section

Annex D (normative): Go interface related error code values for the PDP context handling

The following error codes are used to indicate Go interface related errors from the GGSN to the UE. The error codes listed below are transferred to the UE in the Protocol Configuration Options information element as defined in 3GPP TS 24.008 [12]:
The error code values transported in the container contents field shall be the binary representations of the error code numbers listed below.

In all the cases listed below a common GTP cause code, “User authentication failed”, see 3GPP TS 29 060 [22], shall be used in the response message.

Error code No. 1 "Authorization failure of the request"
This error code indicates that the PDP context activation/modification request is rejected because the authorizing entity is unable to provide an authorization decision for the binding information.

Error code No. 2 "Missing binding information"

This error code indicates that the PDP context activation/modification request is rejected because the binding information was not included in the request although required.

Error code No. 3 "Invalid binding information"

This error code indicates that the PDP context activation/modification request is rejected because the authorizing entity could not be resolved from the binding information.

Error code No. 4 "Binding information not allowed"

This error code indicates that the PDP context activation/modification request is rejected because the Go interface is disabled or not supported in the GGSN and hence binding information is not allowed.

Error code No.5 "Authorizing entity temporarily unavailable"

This error code indicates that the PDP context activation/modification request is rejected because the authorizing entity indicated by the binding information is temporarily unavailable.

Error code No. 6 "No corresponding session"

This error code indicates that the PDP context activation request is rejected because the authorizing entity cannot associate the Authorisation token of binding information with any ongoing session or binding information contains invalid flow identifier(s).

Error code No. 7 "Invalid bundling"

This error code indicates that the PDP context activation request is rejected because the authorizing entity doesn't allow the grouping of the flow IDs contained in the PDP context activation request to be carried in the requested PDP Context.

End of modified section

3GPP TSG-CN WG3 Meeting #27
Dublin, Ireland, 10rd - 14th February 2003.

Tdoc ⌘N3-030113

CR-Form-v7

CHANGE REQUEST

⌘ **29.207** **CR** **088** ⌘ **rev** **-** ⌘ Current version: **5.2.0** ⌘

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Proposed change affects: UICC apps⌘ [ ] ME [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	A correction of what is identified with the policy element AUTH_SESSION.
Source:	⌘	TSG_CN WG3 *[Ericsson]*
Work item code:	⌘	E2EQoS
Date:	⌘	5/02/2003
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:	⌘	In section 5.1.1 the binding information, instead of the authorization token, is wrongly stated to be formatted according to the structure of the policy element AUTH_SESSION.
Summary of change:	⌘	Correct that it is the authorization token, not the binding information, that is formatted according to the structure of the policy element AUTH_SESSION.
Consequences if not approved:	⌘	An incorrect description of what the policy element AUTH_SESSION identifies, which might cause wrong implementation.

Clauses affected:	⌘	5.1.1

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

⌘

Other comments: ⌘

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Corrected section

5.1.1 Initial authorization at PDP context activation

The GGSN receives binding information during the activation of a PDP context by the UE. To perform initial authorization at the PDP context activation the GGSN shall send an authorisation request to the PDF including the binding information received from the UE.

The GGSN identifies the required PDF from the authorisation token of the binding information. The ~~binding information~~ authorisation token is formatted according to the structure of the policy element AUTH_SESSION defined in [11]. The policy element AUTH_SESSION ~~and~~ shall include the AUTH_ENT_ID and the SESSION_ID attributes. The GGSN checks for ~~a~~ that Policy Element ~~of type AUTH_SESSION ([11])~~ and retrieves the AUTH_ENT_ID attribute from this. If this is in the form of a Fully Qualified Domain Name, then this is used to identify the correct PDF.

The GGSN authorisation request message to the PDF shall allow the GGSN to request policy information for authorisation of the media components carried by a PDP context identified by binding information.

When the GGSN receives the PDF decision regarding authorisation of the media components, the GGSN shall enforce the policy decision. To enforce the policy decision, the GGSN shall install the packet filters received from the PDF, and ignore the UE supplied TFT.

If the PDF decision information indicates that the binding information provided by the GGSN is authorised, the GGSN shall proceed with activation of the PDP context. The GGSN shall map the authorized QoS resources into authorized resources for the bearer admission control.

To ensure charging correlation, the GGSN shall send the GCID and GGSN address information to the PDF after the successful establishment of the PDP context, i.e. with the report following the initial authorization decision.

When the PDF detects that the binding information provided by the GGSN is not associated with an ongoing SIP session at application layer, or is otherwise unable to authorise the binding information, the GGSN will receive a COPS decision message from the PDF carrying both an INSTALL and REMOVE decision. The reason for the rejection is indicated by the INSTALL decision with an appropriate authorisation request failure reason. The GGSN shall reject the PDP context activation with a corresponding error code, see annex D. The error code is transferred to the UE in the Protocol Configuration Options information element as defined in 3GPP TS 24.008 [12]. The GGSN shall subsequently remove this state according to the REMOVE decision. For an initial authorisation request, the GGSN shall then send a COPS Delete Request State (DRQ) message to the PDF to remove the state in the GGSN and the PDF.

When the GGSN sends an authorization request to the PDF but the PDF does not respond with the decision message or the communication between the GGSN and the PDF fails, the authorization action is according to the local policy in the GGSN. The local policy may be configured by the operator. If the local policy in the GGSN does not allow the GGSN to make local policy decisions in the absence of the PDF, the GGSN shall reject the PDP context activation with the error code "Authorizing entity temporarily unavailable" (see annex D).

If the GGSN supports a local policy decision point (LPDP) configuration it may make local policy decisions in the absence of the PDF. The local policy decisions may be used to accept new PDP context activations while the connection to the PDF is lost. The synchronization behaviour between the GGSN and the PDF is based on the local policy configured by operators.

End of corrected section

3GPP TSG-CN WG3 #27 ***N3-030127***
Dublin, 10.Feb – 14.Feb 2003

CR-Form-v7

CHANGE REQUEST

⌘ **29.207** **CR** **076** ⌘**rev** **1** ⌘ Current version: **5.2.0** ⌘

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

Title:	⌘	Clarification to Go Binding Info Handling
Source:	⌘	TSG_CN WG3 *[Nokia]*
Work item code:	⌘	E2EQoS
Date:	⌘	14.02.2003
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.

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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 Binding Information Handling is not clear regarding the case where multiple sets of binding information are sent making the interface between the GGSN and PDF likely to have interworking problems regarding the situation with multiple sets of binding information.
Summary of change:	⌘	- Clarification that the first set of binding information is used if several sets are sent. - Clarification that the GGSN replaces the old binding information by the new one in case of binding information modification using PDP context modification. - Reordering the existing sentences to describe the PDF address discovery in one paragraph.
Consequences if not approved:	⌘	Possible mismatches between nodes regarding Binding Information.

Clauses affected:	⌘	4.3.1.5			
Other specs Affected:	⌘	**Y**	**N**		
			X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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< Modified section>

4.3.1.5 Binding mechanism handling

The binding information is used by the GGSN to identify the correct PDF and subsequently request service-based local policy information from the PDF. 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 set of 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 PDF from the PDF identifier received as part of the Authorization Token. This identifier shall be in the format of a fully qualified domain name. If the GGSN receives multiple sets of binding information in the PDP context activation, the GGSN shall search for the first Authorization Token containing the PDF identifier (Authorization Token is of type AUTH_SESSION and contains AUTH_END_ID) and use that to identify the correct PDF. 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 PDF 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].

The GGSN shall forward the binding information received from the UE to the PDF. If multiple sets of binding information are received by the GGSN, it shall forward them to the PDF. ~~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 PDF 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].~~
If the binding information is successfully modified using the PDP context modification procedure, the GGSN shall replace the old binding information with the new binding information.

When the GGSN receives a PDP context activation request to an APN for which the Go interface is enabled and no binding information is received, the GGSN may either reject the PDP context activation 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 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.

If the Go interface is disabled and the GGSN receives a Create PDP Context Request or Update PDP Context Request message that includes binding information, the GGSN shall reject the request with the error code "Binding information not allowed" (see annex D).

3GPP TSG-CN WG3 Meeting #27
Dublin, Ireland, 10rd - 14th February 2003.

Tdoc ⌘N3-030128

CR-Form-v7

CHANGE REQUEST

⌘ **29.207** **CR** **078** ⌘**rev** **1** ⌘ Current version: **5.2.0** ⌘

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

Title:	⌘	Mechanism for wildcarding filter elements
Source:	⌘	TSG_CN WG3 *[Ericsson]*
Work item code:	⌘	E2EQoS
Date:	⌘	6/02/2003
Category:	⌘	**F**
Release:	⌘	Rel-5

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

Reason for change:	⌘	The IP filter from the framework PIB is now used for the Go interface. The PIB specifies explicit wildcard values for certain fields, but it is not clear whether the explicit wildcarding shall be used, or whether the attribute length should be set to 0.
Summary of change:	⌘	Specify the mechanism to indicate wildcards for the IP filter.
Consequences if not approved:	⌘	Possible source of inter-operability issues.

Clauses affected:	⌘	6.3.2, Appendix B			
Other specs affected:	⌘	**Y**	**N**		⌘
			X	Other core specifications	
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘				

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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 amended section

6.3.2 Message description

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→PDF):

  This event allows the GGSN to request authorisation data from the PDF. 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 (PDF→GGSN):

  This event provides the GGSN with the relevant authorisation data. The event contains the following information:

  - Client Handle;
  - ICID(s) (only in the initial Authorisation_Decision) .Only one ICID is transferred in this Release. The format of the ICID is defined in 3GPP TS 32.225 [21];
  - 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.

        The Base and IP Filter definitions from the IETF Framework PIB [15] shall be used in the 3GPP Go PIB to represent the filter specification. Only a subset of the available filter attributes shall be used. The attributes frwkBaseFilterNegation, frwkIpFilterDscp, and frwkIpFilterFlowId in the filter description shall have the length field in its encoding set to 0 by the PDF to indicate they are not used. The GGSN shall ignore them if they are set otherwise. Wildcarding of filter elements is detailed in Annex B.

- Gate status (opened/closed)

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

- Authorisation_Failure (PDF→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 (PDF→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.

      The Base and IP Filter definitions from the IETF Framework PIB [15] shall be used in the 3GPP Go PIB to represent the filter specification. Only a subset of the available filter attributes shall be used. The attributes frwkBaseFilterNegation, frwkIpFilterDscp, and frwkIpFilterFlowId in the filter description shall have the length field in its encoding set to 0 by the PDF to indicate they are not used. The GGSN shall ignore them if they are set otherwise. Wildcarding of filter elements is detailed in Annex B.
  - 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→PDF):
  - Authorisation_report; Gate_report:

    The GGSN sends a COPS RPT message back to the PDF 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 PDF reporting that 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 event contains the following information:

    - Client Handle;
    - Maximum bit rate (set to 0 kbps / changed from 0 kbps).
- Delete request state (GGSN→PDF):

  The GGSN informs the PDF 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 PDF.

  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 (PDF→GGSN):

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

  The event contains the following information:

  - Client Handle.

Next amended section

Annex B (normative): 3GPP Go PIB

```
GO3GPP-PIB  PIB-DEFINITIONS ::= BEGIN
```

```
IMPORTS
    Unsigned32, Integer32, MODULE-IDENTITY,
    MODULE-COMPLIANCE, OBJECT-TYPE, OBJECT-GROUP
            FROM COPS-PR-SPPI         -- Defined in RFC 3159 [9]
    InstanceId, Prid
            FROM COPS-PR-SPPI-TC         -- Defined in RFC 3159 [9]
    zeroDotZero               FROM SNMPv2-SMI

    InetAddress, InetAddressType,
    InetAddressPrefixLength
            FROM INET-ADDRESS-MIB       -- Defined in RFC 3291 [19]

     ;

go3gppPib  MODULE-IDENTITY
    SUBJECT-CATEGORIES   { go3gpp (0x8009) } -- Go 3GPP COPS Client Type

    LAST-UPDATED "200211150000Z"
    ORGANIZATION "3GPP TSG CN WG3"
    CONTACT-INFO
                 "Kwok Ho Chan
                  Nortel Networks
                  600 Technology Park Drive
                  Billerica, MA 01821 USA
                  Phone: +1 978 288 8175
                  Email: khchan@nortelnetworks.com

                  Louis-Nicolas Hamer
                  Nortel Networks
                  PO Box 3511 Station C
                  Ottawa, Ontario
                  Canada, K1Y 4H7
                  Phone: +1 613 768 3409
                  Email: nhamer@nortelnetworks.com"
    DESCRIPTION
            "A PIB module containing the set of provisioning
            classes that are required for support of policies for
            3GPP's GO interface, Release 5."
    REVISION "200211150000Z"
    DESCRIPTION
            "The 3GPP Go PIB for release 5
             Annex B of 3GPP TS 29.207 v5.2.0."

       ::= { 1.3.6.1.4.1.10415.1.1  } --  full specification of object ID tree.
                                             -- The final syntax should be { 3gpp_pib 1 }
                                             -- With imports from the document that shows
                                             -- that 3gpp_pib means ( 1.3.6.1.4.1.10415.1 )



--
-- The root OID for PRCs in the 3GPP GO PIB
--

go3gppCapabilityClasses      OBJECT IDENTIFIER ::= { go3gppPib 1 }
go3gppEventHandlerClasses    OBJECT IDENTIFIER ::= { go3gppPib 2 }
go3gppEventClasses           OBJECT IDENTIFIER ::= { go3gppPib 3 }
go3gppEventInfoClasses       OBJECT IDENTIFIER ::= { go3gppPib 4 }
go3gppReqInfoClasses         OBJECT IDENTIFIER ::= { go3gppEventInfoClasses 1 }
go3gppDecInfoClasses         OBJECT IDENTIFIER ::= { go3gppEventInfoClasses 2 }
go3gppReportClasses          OBJECT IDENTIFIER ::= { go3gppPib 5 }
go3gppConformance            OBJECT IDENTIFIER ::= { go3gppPib 6 }



-- ------------------------------------------------------------
--
-- Capability and Limitation Policy Rule Classes
--

--
-- 3GPP GO Capability Table
--

go3gppAuthReqCapTable OBJECT-TYPE
    SYNTAX         SEQUENCE OF Go3gppAuthReqCapEntry
    PIB-ACCESS     notify
    STATUS         current
```

```
        DESCRIPTION
            "The 3GPP Go Authorization Request Capability PRC."
        ::= { go3gppCapabilityClasses 1 }


    go3gppAuthReqCapEntry OBJECT-TYPE
        SYNTAX         Go3gppAuthReqCapEntry
        STATUS         current
        DESCRIPTION
            "An instance of the go3gppAuthReqCap class identifies a
            specific PRC and associated attributes as supported
            by the device."

        PIB-INDEX { go3gppAuthReqCapPrid }
        UNIQUENESS { }
        ::= { go3gppAuthReqCapTable 1 }


    Go3gppAuthReqCapEntry ::= SEQUENCE {
            go3gppAuthReqCapPrid          InstanceId,
            go3gppAuthReqCapBindingInfos  Unsigned32,
            go3gppAuthReqCapFlowIds       Unsigned32
    }


    go3gppAuthReqCapPrid OBJECT-TYPE
        SYNTAX         InstanceId
        STATUS         current
        DESCRIPTION
            "An arbitrary integer index that uniquely identifies an
            instance of the go3gppAuthReqCap class."
        ::= { go3gppAuthReqCapEntry 1 }


    go3gppAuthReqCapBindingInfos OBJECT-TYPE
        SYNTAX         Unsigned32
        STATUS         current
        DESCRIPTION
            "Indication of the maximum number of Binding Information
            the PEP can send with each Authorization Request.
            The value of zero indicates limit is not specified."
        DEFVAL  { 0 }
        ::= { go3gppAuthReqCapEntry 2 }


    go3gppAuthReqCapFlowIds OBJECT-TYPE
        SYNTAX         Unsigned32
        STATUS         current
        DESCRIPTION
            "Indication of the maximum number of Flow IDs the PEP can
            send with each Authorization Request.
            The value of zero indicates limit is not specified."
        DEFVAL  { 0 }
        ::= { go3gppAuthReqCapEntry 3 }


--
-- Go 3GPP Authorization Request Decision Capabilities
--

    go3gppAuthReqDecCapTable OBJECT-TYPE
        SYNTAX         SEQUENCE OF Go3gppAuthReqDecCapEntry
        PIB-ACCESS     notify
        STATUS         current
        DESCRIPTION
            "The 3GPP Go Authorization Request Decision Capability PRC."
        ::= { go3gppCapabilityClasses 2 }


    go3gppAuthReqDecCapEntry OBJECT-TYPE
        SYNTAX         Go3gppAuthReqDecCapEntry
        STATUS         current
        DESCRIPTION
            "An instance of the go3gppAuthReqDecCap class identifies a
            specific PRC and associated attributes as supported
            by the device."

        PIB-INDEX { go3gppAuthReqDecCapPrid }
```

```
    UNIQUENESS { }
    ::= { go3gppAuthReqDecCapTable 1 }


Go3gppAuthReqDecCapEntry ::= SEQUENCE {
        go3gppAuthReqDecCapPrid           InstanceId,
        go3gppAuthReqDecCapIcids          Unsigned32
}

go3gppAuthReqDecCapPrid OBJECT-TYPE
    SYNTAX         InstanceId
    STATUS         current
    DESCRIPTION
        "An arbitrary integer index that uniquely identifies an
        instance of the go3gppAuthReqDecCap class."
    ::= { go3gppAuthReqDecCapEntry 1 }

go3gppAuthReqDecCapIcids OBJECT-TYPE
    SYNTAX         Unsigned32
    STATUS         current
    DESCRIPTION
        "Indication of the maximum number of Icid possible
        in a single Authorization Request Decision.
        The value of zero indicates limit is not specified."
    DEFVAL  { 0 }
    ::= { go3gppAuthReqDecCapEntry 2 }




--
-- Component Limitations Table
--
-- This table supports the ability to export information
-- detailing provisioning class/attribute implementation limitations
-- to the policy decision function. This Component Limitiations Table
-- shall be implementation dependant and does not need to be standardized.


-- ------------------------------------------------------------
--
-- 3GPP GO Event Handler Provisioning Classes
--
-- PRCs sent from PDF to PEP for indicating how to handle each
-- kind of event that require actions by the GO interface.
--
-- For 3GPP Release 5, PRCs for Event Handling of Authorization
-- Request containing Binding Information, Flow IDs, and QoS is
-- specified.
--

--
-- 3GPP GO Authorization Request Event Handler Provisioning Table
--

go3gppAuthReqHandlerTable OBJECT-TYPE
    SYNTAX         SEQUENCE OF Go3gppAuthReqHandlerEntry
    PIB-ACCESS     install
    STATUS         current
    DESCRIPTION
        "PRC from PDF to PEP carried by COPS DEC messages
        indicating GO actions to take at the GGSN when an Authorization
        Request Event is detected by the GGSN.  An example of an
        Authorization Request Event is the receive of a PDP Context message."
    ::= { go3gppEventHandlerClasses 1 }


go3gppAuthReqHandlerEntry OBJECT-TYPE
    SYNTAX         Go3gppAuthReqHandlerEntry
    STATUS         current
    DESCRIPTION
        "An instance of the go3gppAuthReqHandler class sent by the PDF to
        the PEP what the PEP should send upon detection of an Authorization
        Request Event."
    PIB-INDEX { go3gppAuthReqHandlerPrid }
    UNIQUENESS { go3gppAuthReqHandlerEnable,
                 go3gppAuthReqHandlerBindingInfo
               }
```

```
    ::= { go3gppAuthReqHandlerTable 1 }


Go3gppAuthReqHandlerEntry ::= SEQUENCE {
        go3gppAuthReqHandlerPrid         InstanceId,
        go3gppAuthReqHandlerEnable       INTEGER,
        go3gppAuthReqHandlerBindingInfo  Unsigned32
}


go3gppAuthReqHandlerPrid OBJECT-TYPE
    SYNTAX         InstanceId
    STATUS         current
    DESCRIPTION
        "An arbitrary integer index that uniquely identifies an
        instance of this class."
    ::= { go3gppAuthReqHandlerEntry 1 }


go3gppAuthReqHandlerEnable OBJECT-TYPE
    SYNTAX         INTEGER {
                       enable(1),
                       disable(2)
                   }
    STATUS         current
    DESCRIPTION
        "Controls the usage of 3GPP Authorization Request Events
        to trigger COPS requests to PDF on the go interface."
    DEFVAL { enable }
    ::= { go3gppAuthReqHandlerEntry 2 }


go3gppAuthReqHandlerBindingInfo OBJECT-TYPE
    SYNTAX         Unsigned32
    STATUS         current
    DESCRIPTION
        "Indication of the maximum number of Binding Information
        be associated with a each Authorizating Request.
        The value of zero indicates policy control does not impose
        any limit."
    DEFVAL  { 0 }
    ::= { go3gppAuthReqHandlerEntry 3 }



-- ------------------------------------------------------------
--
-- 3GPP GO Event Classes
--
-- PRCs from PEP to PDF carried by COPS REQ messages
-- indicating the detection of specific events in the GGSN.
-- Information required for PDF to make decision on behave
-- of GGSN is also defined here to be carried by REQ messages.
--

--
-- 3GPP GO Authorization Request Event Table
--
go3gppAuthReqEventTable OBJECT-TYPE
    SYNTAX         SEQUENCE OF Go3gppAuthReqEventEntry
    PIB-ACCESS     notify
    STATUS         current
    DESCRIPTION
        "PRC for indication of Authorization Request Event
        and its relevant information.
        Sent by PEP to PDF upon receive of an Authorization
        Request.  Using COPS REQ message."
    ::= { go3gppEventClasses 1 }


go3gppAuthReqEventEntry OBJECT-TYPE
    SYNTAX         Go3gppAuthReqEventEntry
    STATUS         current
    DESCRIPTION
        "An entry in the Authorization Request Event Table
        describe a single Event sent by the PEP to the PDF."
    PIB-INDEX { go3gppAuthReqEventPrid }
    UNIQUENESS { }
```

```
    ::= { go3gppAuthReqEventTable 1 }


Go3gppAuthReqEventEntry ::= SEQUENCE {
        go3gppAuthReqEventPrid         InstanceId,
        go3gppAuthReqEventBindingInfos Prid
}


go3gppAuthReqEventPrid OBJECT-TYPE
    SYNTAX         InstanceId
    STATUS         current
    DESCRIPTION
        "An arbitrary integer index that uniquely identifies an
        instance of the go3gppAuthReqEvent class."
    ::= { go3gppAuthReqEventEntry 1 }


go3gppAuthReqEventBindingInfos OBJECT-TYPE
    SYNTAX         Prid
    STATUS         current
    DESCRIPTION
        "References the first of a list of go3gppBindingInfo
        class instances that are associated with this
        Authorization Request Event.
        A value of zeroDotZero indicates there are no
        go3gppBindingInfo class instance associated with
        this Authorization Event."
    ::= { go3gppAuthReqEventEntry 2 }


--
-- 3GPP Go Event Request Info Classes
--

--
-- 3GPP GO Binding Information Table
--
go3gppBindingInfoTable OBJECT-TYPE
    SYNTAX         SEQUENCE OF Go3gppBindingInfoEntry
    PIB-ACCESS     notify
    STATUS         current
    DESCRIPTION
        "PRC representing Binding Information.
        Sent by PEP to PDF as part of an Authorization
        Request.  In a COPS REQ message."
    ::= { go3gppReqInfoClasses 1 }


go3gppBindingInfoEntry OBJECT-TYPE
    SYNTAX         Go3gppBindingInfoEntry
    STATUS         current
    DESCRIPTION
        "An entry in the Binding Information Table
        describing a single Binding Info.
        Each entry is referenced by go3gppAuthReqEventBindingInfos
        or go3gppBindingInfoNext."
    PIB-INDEX { go3gppBindingInfoPrid }
    UNIQUENESS { }
    ::= { go3gppBindingInfoTable 1 }


Go3gppBindingInfoEntry ::= SEQUENCE {
        go3gppBindingInfoPrid          InstanceId,
        go3gppBindingInfoToken         OCTET STRING,
        go3gppBindingInfoFlowIds       Prid,
        go3gppBindingInfoNext          Prid
}


go3gppBindingInfoPrid OBJECT-TYPE
    SYNTAX         InstanceId
    STATUS         current
    DESCRIPTION
        "An arbitrary integer index that uniquely identifies an
        instance of the go3gppBindingInfo class."
    ::= { go3gppBindingInfoEntry 1 }
```

```
go3gppBindingInfoToken OBJECT-TYPE
    SYNTAX         OCTET STRING
    STATUS         current
    DESCRIPTION
        "The Authorization Token associated with this
        instance of the go3gppBindingInfo class.
        Each Binding Information must have a Token."
    ::= { go3gppBindingInfoEntry 2 }


go3gppBindingInfoFlowIds OBJECT-TYPE
    SYNTAX         Prid
    STATUS         current
    DESCRIPTION
        "References the first of a list of FlowIds associated
        with this instance of go3gppBindingInfo class.
        This is the anchor of a list of go3gppFlowIdEntry
        Instances.
        A value of zeroDotZero indicates an empty list which
        is an error condition."
    DEFVAL  { zeroDotZero }
    ::= { go3gppBindingInfoEntry 3 }


go3gppBindingInfoNext OBJECT-TYPE
    SYNTAX         Prid
    STATUS         current
    DESCRIPTION
        "References the next of a list of go3gppBindingInfo
        instances associated with an Authorization Request.
        A value of zeroDotZero indicates this is the last of
        a list of go3gppBindingInfo instances associated with
        an Authorization Request."
    DEFVAL  { zeroDotZero }
    ::= { go3gppBindingInfoEntry 4 }


--
-- 3GPP Go Authorization Request FlowID Table
--
go3gppFlowIdTable OBJECT-TYPE
    SYNTAX         SEQUENCE OF Go3gppFlowIdEntry
    PIB-ACCESS     notify
    STATUS         current
    DESCRIPTION
        "Represents the collection of FlowIDs."
    ::= { go3gppReqInfoClasses 2 }


go3gppFlowIdEntry OBJECT-TYPE
    SYNTAX         Go3gppFlowIdEntry
    STATUS         current
    DESCRIPTION
        "Each entry describes a single FlowID."
    PIB-INDEX { go3gppFlowIdPrid }
    UNIQUENESS { }
    ::= { go3gppFlowIdTable 1 }


Go3gppFlowIdEntry ::= SEQUENCE {
        go3gppFlowIdPrid         InstanceId,
        go3gppFlowIdFlowId       Unsigned32,
        go3gppFlowIdNext         Prid
}


go3gppFlowIdPrid OBJECT-TYPE
    SYNTAX         InstanceId
    STATUS         current
    DESCRIPTION
        "An arbitrary integer index that uniquely identifies an
        instance of the go3gppFlowId class."
    ::= { go3gppFlowIdEntry 1 }


go3gppFlowIdFlowId OBJECT-TYPE
    SYNTAX         Unsigned32
```

```
        STATUS         current
        DESCRIPTION
            "The FlowId itself."
        ::= { go3gppFlowIdEntry 2 }


    go3gppFlowIdNext OBJECT-TYPE
        SYNTAX         Prid
        STATUS         current
        DESCRIPTION
            "References the next FlowId in the list associated with the
            same Binding Information of an Authorization Request.
            This points to a list of go3gppFlowIdEntry Instances.
            A value of zeroDotZero indicates end of the list."
        DEFVAL  { zeroDotZero }
        ::= { go3gppFlowIdEntry 3 }



    -- ------------------------------------------------------------
    --
    -- 3GPP Go Authorization Request Decisions
    --
    -- PRCs for carrying the Event Decision send from PDF to PEP,
    -- carried by the COPS DEC message.
    -- These PRCs include support for Gates/Filters, QoS, ICIDs.
    --


    -- Failure Decisions can be defined by use of COPS-PR DEC message
    -- containing first an install decision (with objects indicating
    -- what failed and some indication to the GGSN how to react to this
    -- Error Decision), and second a remove decision (for cleanup of
    -- the installed Error Decision Object).
    --

-- Failures indicated by PDF to GGSN
--   Authorization Failure
--
    --
    -- Authorization Request Failure Decision Table
    --
    go3gppAuthReqFailDecTable OBJECT-TYPE
        SYNTAX         SEQUENCE OF Go3gppAuthReqFailDecEntry
        PIB-ACCESS     install
        STATUS         current
        DESCRIPTION
            "The Authorization failure Table. Indicates failures decisions to the PEP."
        ::= { go3gppDecInfoClasses 1 }


    go3gppAuthReqFailDecEntry OBJECT-TYPE
        SYNTAX         Go3gppAuthReqFailDecEntry
        STATUS         current
        DESCRIPTION
            "Each go3gppAuthReqFailDecEntry is per request."
        PIB-INDEX { go3gppAuthReqFailDecPrid }
        UNIQUENESS { }
        ::= { go3gppAuthReqFailDecTable 1 }


    Go3gppAuthReqFailDecEntry ::= SEQUENCE {
            go3gppAuthReqFailDecPrid        InstanceId,

            go3gppAuthReqFailDecReason      INTEGER
    }

    go3gppAuthReqFailDecPrid OBJECT-TYPE
        SYNTAX         InstanceId
        STATUS         current
        DESCRIPTION
            "An arbitrary integer index that uniquely identifies an
            instance of the go3gppAuthReqFailDec class."
        ::= { go3gppAuthReqFailDecEntry 1 }



    go3gppAuthReqFailDecReason OBJECT-TYPE
```

```
    SYNTAX         INTEGER {
                                    noCorrespondingSession (1),
                                    invalidBundling (2),
                                    authorisationFailure (3)
                               }
    STATUS         current
    DESCRIPTION
        "Reason for Auth Request Failure Decision given by PDF:

         noCorrespondingSession:    No corresponding session was found
                                    by the PDF

         invalidBundling:            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 or if the list
                                    of flow_IDs contained in the bearer authorization
                                    request doesn't match with the grouping indication
                                    information the PDF has received from the P-CSCF.

         authorisationFailure:      The PDF is unable to authorise the binding information.
                                    This is a generic failure indication that can be used
                                    if the actual reason is not any of the other specified
                                    reasons."
    ::= { go3gppAuthReqFailDecEntry 2 }



--
-- Authorization Request Decision Table
--
go3gppAuthReqDecTable OBJECT-TYPE
    SYNTAX         SEQUENCE OF Go3gppAuthReqDecEntry
    PIB-ACCESS     install
    STATUS         current
    DESCRIPTION
        "The Authorization Request Decision Table. "
    ::= { go3gppDecInfoClasses 2 }


go3gppAuthReqDecEntry OBJECT-TYPE
    SYNTAX         Go3gppAuthReqDecEntry
    STATUS         current
    DESCRIPTION
        "Each go3gppAuthReqDecEntry is per Authorization Request."
    PIB-INDEX { go3gppAuthReqDecPrid }
    UNIQUENESS { }
    ::= { go3gppAuthReqDecTable 1 }


Go3gppAuthReqDecEntry ::= SEQUENCE {
        go3gppAuthReqDecPrid       InstanceId,
        go3gppAuthReqDecIcids      Prid,
        go3gppAuthReqDecDirDecs    Prid
}


go3gppAuthReqDecPrid OBJECT-TYPE
    SYNTAX         InstanceId
    STATUS         current
    DESCRIPTION
        "An arbitrary integer index that uniquely identifies an
        instance of the go3gppAuthReqDec class."
    ::= { go3gppAuthReqDecEntry 1 }


go3gppAuthReqDecIcids OBJECT-TYPE
    SYNTAX         Prid
    STATUS         current
    DESCRIPTION
        "References the first of a list of IcIDs associated
        with this instance of go3gppAuthReqDec class.
        There should be one IcID on this list for each Binding
        Information in the corresponding Authorization Request.
        A value of zeroDotZero indicates an empty list and there
        is no IcID change associated with this Authorization Request
        Decision."
    DEFVAL  { zeroDotZero }
```

```
        ::= { go3gppAuthReqDecEntry 2 }


    go3gppAuthReqDecDirDecs OBJECT-TYPE
        SYNTAX          Prid
        STATUS          current
        DESCRIPTION
            "References the first of a list of Directional Decisions
            associated with this instance of go3gppAuthReqDec class.
            There should be at least one and at most two Directional
            Decisions per Authorization Request Decision.
            Hence a value of zeroDotZero is illegal."
        ::= { go3gppAuthReqDecEntry 3 }


--
-- 3GPP Go ICID Table
--
    go3gppIcidTable OBJECT-TYPE
        SYNTAX          SEQUENCE OF Go3gppIcidEntry
        PIB-ACCESS      install
        STATUS          current
        DESCRIPTION
            "Represents the collection of ICID entries"
        ::= { go3gppDecInfoClasses 3 }


    go3gppIcidEntry OBJECT-TYPE
        SYNTAX          Go3gppIcidEntry
        STATUS          current
        DESCRIPTION
            "Represents the ICID Entry"
        PIB-INDEX { go3gppIcidPrid }
        UNIQUENESS { go3gppIcidValue }
        ::= { go3gppIcidTable 1 }


    Go3gppIcidEntry ::= SEQUENCE {
            go3gppIcidPrid            InstanceId,
            go3gppIcidValue           OCTET STRING,
            go3gppIcidNext            Prid
    }


    go3gppIcidPrid OBJECT-TYPE
        SYNTAX          InstanceId
        STATUS          current
        DESCRIPTION
            "An arbitrary integer index that uniquely identifies an
            instance of the go3gppIcid class."
        ::= { go3gppIcidEntry 1 }


    go3gppIcidValue OBJECT-TYPE
        SYNTAX          OCTET STRING
        STATUS          current
        DESCRIPTION
            "The ICID itself. The syntax of this OBJECT-TYPE needs to be confirmed. "
        ::= { go3gppIcidEntry 2 }


    go3gppIcidNext OBJECT-TYPE
        SYNTAX          Prid
        STATUS          current
        DESCRIPTION
            "References the next go3gppIcidEntry of a list of IcIDs
            associated with this instance of go3gppAuthReqDec class.
            There should be one IcID on this list for each Binding
            Information in the corresponding Authorization Request.
            A value of zeroDotZero indicates the end of the list of
            IcIDs associated with an Authorization Request Decision."
        DEFVAL  { zeroDotZero }
        ::= { go3gppIcidEntry 3 }


--
-- 3GPP Go Authorization Request Directional Decision Table
--
```

```
   go3gppAuthReqDirDecTable OBJECT-TYPE
       SYNTAX         SEQUENCE OF Go3gppAuthReqDirDecEntry
       PIB-ACCESS     install
       STATUS         current
       DESCRIPTION
           "This table represents the authorization request decision for
             unique direction (e.g. uplink and downlink)."
       ::= { go3gppDecInfoClasses 4 }


   go3gppAuthReqDirDecEntry OBJECT-TYPE
       SYNTAX         Go3gppAuthReqDirDecEntry
       STATUS         current
       DESCRIPTION
           "There should be one of these per direction per AuthReqDec."
       PIB-INDEX { go3gppAuthReqDirDecPrid }
       UNIQUENESS { }
       ::= { go3gppAuthReqDirDecTable 1 }


   Go3gppAuthReqDirDecEntry ::= SEQUENCE {
           go3gppAuthReqDirDecPrid      InstanceId,
           go3gppAuthReqDirDecDirection INTEGER,
           go3gppAuthReqDirDecQos       Prid,
           go3gppAuthReqDirDecGates     Prid,
           go3gppAuthReqDirDecNext      Prid
   }


   go3gppAuthReqDirDecPrid OBJECT-TYPE
       SYNTAX         InstanceId
       STATUS         current
       DESCRIPTION
           "An arbitrary integer index that uniquely identifies an
           instance of the go3gppAuthReqDirDec class."
       ::= { go3gppAuthReqDirDecEntry 1 }


   go3gppAuthReqDirDecDirection OBJECT-TYPE
       SYNTAX         INTEGER {
                           uplink   (1),
                           downlink (2)
                      }
       STATUS         current
       DESCRIPTION
           "Indicates the direction this decision applies to."
       ::= { go3gppAuthReqDirDecEntry 2 }


   go3gppAuthReqDirDecQos OBJECT-TYPE
       SYNTAX         Prid
       STATUS         current
       DESCRIPTION
           " The Authorized QoS. References the go3gppQos class."
       ::= { go3gppAuthReqDirDecEntry 3 }


   go3gppAuthReqDirDecGates OBJECT-TYPE
       SYNTAX         Prid
       STATUS         current
       DESCRIPTION
           "References the first instance of a list of the go3gppGate class."
       ::= { go3gppAuthReqDirDecEntry 4 }


   go3gppAuthReqDirDecNext OBJECT-TYPE
       SYNTAX         Prid
       STATUS         current
       DESCRIPTION
           "References the next instance of a list of
           go3gppAuthReqDirDec class."
       ::= { go3gppAuthReqDirDecEntry 5 }


--
-- 3GPP Go QoS Table
--
   go3gppQosTable OBJECT-TYPE
```

```
    SYNTAX         SEQUENCE OF Go3gppQosEntry
    PIB-ACCESS     install
    STATUS         current
    DESCRIPTION
        "This table represents the Authorised QoS.
        It is referenced by the go3gppAuthReqDirDecQos entry of the
        go3gppAuthReqDirDecEntry  class."
    ::= { go3gppDecInfoClasses 5 }


go3gppQosEntry OBJECT-TYPE
    SYNTAX         Go3gppQosEntry
    STATUS         current
    DESCRIPTION
        "There should be one of these per direction per AuthReqDec."
    PIB-INDEX { go3gppQosPrid }
    UNIQUENESS { }
    ::= { go3gppQosTable 1 }



Go3gppQosEntry ::= SEQUENCE {
        go3gppQosPrid                InstanceId,
        go3gppQosServiceClass        INTEGER,
        go3gppQosDataRateUnit        INTEGER,
        go3gppQosDataRate            Unsigned32
}


go3gppQosPrid OBJECT-TYPE
    SYNTAX         InstanceId
    STATUS         current
    DESCRIPTION
        "An arbitrary integer index that uniquely identifies an
        instance of the go3gppQos class."
    ::= { go3gppQosEntry 1 }



go3gppQosServiceClass OBJECT-TYPE
    SYNTAX         INTEGER {
                     QoSclassA    (1),
                     QoSclassB    (2),
                     QoSclassC    (3),
                     QoSclassD    (4),
                     QoSclassE    (5),
                     QoSclassF    (6)
                   }
    STATUS         current
    DESCRIPTION
        "The QoS Service Class indicates the highest authorized QoS class."
    ::= { go3gppQosEntry 2 }


go3gppQosDataRateUnit OBJECT-TYPE
    SYNTAX         INTEGER {
                     bps     (1),
                     kbps    (2),
                     mbps    (3)
                   }
    STATUS         current
    DESCRIPTION
        "Indication of the unit of measure for go3gppQosDataRate,
         in bits per second, kilo bits per second, or mega bits per
         second."
    ::= { go3gppQosEntry 3 }


go3gppQosDataRate OBJECT-TYPE
    SYNTAX         Unsigned32
    STATUS         current
    DESCRIPTION
        "The Data Rate with unit of measure indicated by
        go3gppQosDataRateUnit."
    ::= { go3gppQosEntry 4 }
```

```
--
-- 3GPP Go Gate Decision Table
--
--
-- There could be one of these per direction per GateDec.
--
-- This is for changing Gating Status only when used alone
-- (not as part of Direction Decision).

-- go3gppGateDec is sent in a different COPS DEC message
-- from the DEC message carrying go3gppAuthReqDec. PDF must
-- have sent a go3gppAuthReqDec before using go3gppGateDec.

   go3gppGateDecTable OBJECT-TYPE
       SYNTAX         SEQUENCE OF Go3gppGateDecEntry
       PIB-ACCESS     install
       STATUS         current
       DESCRIPTION
           "This table represents an updated gating decision."
       ::= { go3gppDecInfoClasses 6 }


   go3gppGateDecEntry OBJECT-TYPE
       SYNTAX         Go3gppGateDecEntry
       STATUS         current
       DESCRIPTION
           "There should be one of these per direction per AuthReqDec."
       PIB-INDEX { go3gppGateDecPrid }
       UNIQUENESS { }
       ::= { go3gppGateDecTable 1 }



   Go3gppGateDecEntry ::= SEQUENCE {
           go3gppGateDecPrid           InstanceId,
           go3gppGateDecDirection      INTEGER,
           go3gppGateDecGates          Prid,
           go3gppGateDecNext           Prid
   }


   go3gppGateDecPrid OBJECT-TYPE
       SYNTAX         InstanceId
       STATUS         current
       DESCRIPTION
           "An arbitrary integer index that uniquely identifies an
           instance of the go3gppGateDec class."
       ::= { go3gppGateDecEntry 1 }



   go3gppGateDecDirection OBJECT-TYPE
       SYNTAX         INTEGER {
                           uplink   (1),
                           downlink (2)
                      }
       STATUS         current
       DESCRIPTION
           "References the gate direction."
       ::= { go3gppGateDecEntry 2 }

    go3gppGateDecGates OBJECT-TYPE
       SYNTAX         Prid
       STATUS         current
       DESCRIPTION
           "References the first instance of a list of go3gppGate class."
       ::= { go3gppGateDecEntry 3 }


   go3gppGateDecNext OBJECT-TYPE
       SYNTAX         Prid
       STATUS         current
       DESCRIPTION
           "References the next instance of a list of go3gppGateDec class."
       ::= { go3gppGateDecEntry 4 }
```

```
--
-- 3GPP Go Gate Table
--
   go3gppGateTable OBJECT-TYPE
       SYNTAX         SEQUENCE OF Go3gppGateEntry
       PIB-ACCESS     install
       STATUS         current
       DESCRIPTION
           "PRC representing a Gate."
       ::= { go3gppDecInfoClasses 7 }


   go3gppGateEntry OBJECT-TYPE
       SYNTAX         Go3gppGateEntry
       STATUS         current
       DESCRIPTION
           "Each instance represents one Gate."
       PIB-INDEX { go3gppGatePrid }
       UNIQUENESS { }
       ::= { go3gppGateTable 1 }


   Go3gppGateEntry ::= SEQUENCE {
           go3gppGatePrid              InstanceId,
           go3gppGateFilter            Prid,
           go3gppGateStatus            INTEGER,
           go3gppGateNext              Prid
   }


   go3gppGatePrid OBJECT-TYPE
       SYNTAX         InstanceId
       STATUS         current
       DESCRIPTION
           "An arbitrary integer index that uniquely identifies an
           instance of the go3gppGate class."
       ::= { go3gppGateEntry 1 }



   go3gppGateFilter OBJECT-TYPE
       SYNTAX         Prid
       STATUS         current
       DESCRIPTION
           "References an entry in frwkIpFilterTable (Framework PIB)
           that describes the applicable classification filter.

           When a decision requiring the definition of an IP filter
           is sent to the GGSN, the IP filter will be represented by the
           IP filter definition frwkIpFilterTable, provided by the
           Framework PIB, RFC 3318. Such IP filter frwkIpFilterTable
           must be part of the same decision message. The attribute
           go3gppGateFilter is used to reference the frwkIpFilterTable
           entry for this Gate.
           Wildcarding of the attributes for deriving the address and protocol values
           is as specified in RFC 3318 [15]. Wildcarding of the source ports is achieved as follows:
           - frwkIpFilterSrcL4PortMin shall be set to 0,
           - and frwkIpFilterSrcL4PortMax shall be set to 65535

           The following attributes of the frwkIpFilterTable are not required,
           and shall have a length of 0 in its encoding:
           frwkBaseFilterNegation, frwkIpFilterDscp, and frwkIpFilterFlowId

           A value of zeroDotZero indicates no filter is
           used with this go3gppGate."
       ::= { go3gppGateEntry 2 }

   go3gppGateStatus OBJECT-TYPE

       SYNTAX         INTEGER {
                           close  (1),
                           open   (2)
                      }
       STATUS         current
       DESCRIPTION
           "Indicates if this gate will allow traffic to flow."
    DEFVAL  { close }
```

```
    ::= { go3gppGateEntry 3 }

go3gppGateNext OBJECT-TYPE
    SYNTAX         Prid
    STATUS         current
    DESCRIPTION
        "Reference the next Gate on a list of go3gppGate instances.
        A value of zeroDotZero indicates this is the last Gate
        on the list."
    ::= { go3gppGateEntry 4 }

-- ------------------------------------------------------------
--
-- 3GPP Go Reports
--
-- PRCs for carrying the Decision enforcement result sent from PEP to PDF,
-- carried using the COPS REPORT message.
-- These PRCs include support for the success or failure of the PEP in
-- carrying out the PDF's decision or -change of the state in the GGSN.
--

go3gppReportTable OBJECT-TYPE
    SYNTAX         SEQUENCE OF Go3gppReportEntry
    PIB-ACCESS     notify
    STATUS         current
    DESCRIPTION
        "This table represents the success or failure of the decision enforcement and
        state changes in the PEP."
    ::= { go3gppReportClasses 1 }


go3gppReportEntry OBJECT-TYPE
    SYNTAX         Go3gppReportEntry
    STATUS         current
    DESCRIPTION
        ""
    PIB-INDEX { go3gppReportPrid }
    UNIQUENESS { }
    ::= { go3gppReportTable 1 }


Go3gppReportEntry ::= SEQUENCE {
        go3gppReportPrid       InstanceId,
        go3gppReportStatus     INTEGER,
        go3gppReportDetails    Prid }


go3gppReportPrid OBJECT-TYPE
    SYNTAX         InstanceId
    STATUS         current
    DESCRIPTION
        "An arbitrary integer index that uniquely identifies an
        instance of the go3gpgReport class."
        ::= { go3gppReportEntry 1 }


go3gppReportStatus OBJECT-TYPE
    SYNTAX         INTEGER {
                             success (1),
                             failure (2),
                             usage   (3) }
    STATUS         current
    DESCRIPTION
        "When Status is:
           success: Indicates the successful implementation of the
                    decision.
                    go3gppReportDetails:
                      Reference an instance of go3gppRprtGPRSChrgInfo
                      for initial authorization request decision;
                      References nothing otherwise (contains the value
                      zeroDotZero).

           Failure: Indicates the failure of implementing the decision.

                    go3gppReportDetails may references an Error object,
                    or may have the value zeroDotZero when no error
                    object is needed, in which case COPS and COPS-PR
                    error codes and error objects are sufficient.
```

```
            Usage:   go3gppReportDetails references an instance of
                     go3gppRprtUsage class."

    ::= { go3gppReportEntry 2 }


go3gppReportDetails OBJECT-TYPE
    SYNTAX         Prid
    STATUS         current
    DESCRIPTION
        "May reference an instance of go3gppRprtGPRSChrgInfo,
        go3gppRprtError(not defined), or go3gppRprtUsage class,
        or may have the value of zeroDotZero depending on the value of
        go3gppReportStatus."
    ::= { go3gppReportEntry 3 }


go3gppRprtGPRSChrgInfoTable OBJECT-TYPE
    SYNTAX         SEQUENCE OF Go3gppRprtGPRSChrgInfoEntry
    PIB-ACCESS     notify
    STATUS         current
    DESCRIPTION
        "This table represents the GPRS Charging information"
    ::= { go3gppReportClasses 2 }


go3gppRprtGPRSChrgInfoEntry OBJECT-TYPE
    SYNTAX         go3gppRprtGPRSChrgInfoEntry
    STATUS         current
    DESCRIPTION
        "This entry represents the GPRS Charging Identifier and GGSN address."
    PIB-INDEX { go3gppRprtGPRSChrgInfoPrid }
    UNIQUENESS { go3gppRprtGPRSChrgInfoAddrType,
                 go3gppRprtGPRSChrgInfoGGSNAddr,
                 go3gppRprtGPRSChrgInfoGCID }
    ::= { go3gppRprtGPRSChrgInfoTable 1 }


go3gppRprtGPRSChrgInfoEntry ::= SEQUENCE {
        go3gppRprtGPRSChrgInfoPrid       InstanceId,

        go3gppRprtGPRSChrgInfoAddrType   InetAddressType,

        go3gppRprtGPRSChrgInfoGGSNAddr   InetAddress,
        go3gppRprtGPRSChrgInfoGCID       OCTET STRING }


go3gppRprtGPRSChrgInfoPrid OBJECT-TYPE
    SYNTAX         InstanceId
    STATUS         current
    DESCRIPTION
        "An arbitrary integer index that uniquely identifies an
        instance of the go3gpgRprtGPRSChrgInfo class."
        ::= { go3gppRprtGPRSChrgInfoEntry 1 }

go3gppRprtGPRSChrgInfoAddrType OBJECT-TYPE
    SYNTAX         InetAddressType
    STATUS         current
    DESCRIPTION
        "The address type enumeration value to specify
         the type of the packet's IP address."
    REFERENCE
        "Textual Conventions for Internet Network Addresses [INETADDR]."
    ::= { go3gppRprtGPRSChrgInfoEntry 2 }

go3gppRprtGPRSChrgInfoGGSNAddr OBJECT-TYPE
    SYNTAX         InetAddress
    STATUS         current
    DESCRIPTION
        "Contains the IP Address of the GGSN providing the GCID
        upon successful handling of an Authorization Request."
    REFERENCE
        "Textual Conventions for Internet Network Addresses [INETADDR]."
        ::= { go3gppRprtGPRSChrgInfoEntry 3 }


go3gppRprtGPRSChrgInfoGCID OBJECT-TYPE
    SYNTAX         OCTET STRING
```

```
        STATUS         current
        DESCRIPTION
            "The GPRS Charging ID related to this Authorization Request."
        ::= { go3gppRprtGPRSChrgInfoEntry 4 }


    --
    -- Notice go3gppRprtError PRC is currently not defined because all
    -- error condition handling is satisfactorily covered by using the
    -- standard COPS-PR error handling mechanism and error objects.
    -- go3gppRprtError PRC should only be used for 3GPP GO Application
    -- error indications if necessary.
    --

     go3gppRprtUsageTable OBJECT-TYPE
         SYNTAX         SEQUENCE OF Go3gppRprtUsageEntry
         PIB-ACCESS     notify
         STATUS         current
         DESCRIPTION
             ""
         ::= { go3gppReportClasses 3 }


     go3gppRprtUsageEntry OBJECT-TYPE
         SYNTAX         Go3gppRprtUsageEntry
         STATUS         current
         DESCRIPTION
             "This entry represents the PEP state changes."
         PIB-INDEX { go3gppRprtUsagePrid }
         UNIQUENESS { go3gppRprtUsageIndication }
         ::= { go3gppRprtUsageTable 1 }


     Go3gppRprtUsageEntry ::= SEQUENCE {
             go3gppRprtUsagePrid        InstanceId,
             go3gppRprtUsageIndication  INTEGER }



     go3gppRprtUsagePrid OBJECT-TYPE
         SYNTAX         InstanceId
         STATUS         current
         DESCRIPTION
             "An arbitrary integer index that uniquely identifies an
             instance of the go3gpgRprtUsage class."
             ::= { go3gppRprtUsageEntry 1 }


     go3gppRprtUsageIndication OBJECT-TYPE
         SYNTAX         INTEGER {
                          chngdTo0kbs   (1),
                          chngdFrom0kbs (2) }
         STATUS         current
         DESCRIPTION
             "Indication of GPRS Usage change.
             chngdTo0kbs indicates changing to 0kbs,
             chngdFrom0kbs indicates changing from 0kbs."
             ::= { go3gppRprtUsageEntry 2 }


     -- ------------------------------------------------------------
     --
     -- Conformance Section
     --

     go3gppCompliances         OBJECT IDENTIFIER ::= { go3gppConformance 1 }
     go3gppGroups                  OBJECT IDENTIFIER ::= { go3gppConformance 2 }


go3gppCompliance MODULE-COMPLIANCE
        STATUS  current
        DESCRIPTION
                "Describes the requirements for conformance to the
                3GPP GO PIB."


        MODULE FRAMEWORK-PIB               -- Defined in RFC 3318 [15]
            MANDATORY-GROUPS {
```

```
                frwkPrcSupportGroup,
                frwkDeviceIdGroup,
                frwkBaseFilterGroup,
                frwkIpFilterGroup }


        MODULE GO3GPP-PIB -- this module
            MANDATORY-GROUPS {
                go3gppAuthReqCapGroup,
                go3gppAuthReqDecCapGroup,
                go3gppAuthReqHandlerGroup,
                go3gppAuthReqEventGroup,
                go3gppBindingInfoGroup,
                go3gppFlowIdGroup,
                go3gppAuthReqFailDecGroup,
                go3gppAuthReqDecGroup,
                go3gppIcidGroup,
                go3gppAuthReqDirDecGroup,
                go3gppQosGroup,
                go3gppGateDecGroup,
                go3gppGateGroup,
                go3gppReportGroup,
                go3gppRprtGPRSChrgInfoGroup,
                go3gppRprtUsageGroup }
        ::= { go3gppCompliances 1 }



    go3gppAuthReqCapGroup OBJECT-GROUP
        OBJECTS {
        go3gppAuthReqCapBindingInfos,
        go3gppAuthReqCapFlowIds
        }
        STATUS current
        DESCRIPTION
            "This Group defines the PIB Objects that describe the
             Authorisation Request capabilities."
        ::= { go3gppGroups 1 }

go3gppAuthReqDecCapGroup OBJECT-GROUP
        OBJECTS {
      go3gppAuthReqDecCapIcids
         }
        STATUS current
        DESCRIPTION
           "This Group defines the PIB
           Objects that describe the Authorisation Decision capabilities."
        ::= { go3gppGroups 2 }

go3gppAuthReqHandlerGroup OBJECT-GROUP
        OBJECTS {
      go3gppAuthReqHandlerEnable,
      go3gppAuthReqHandlerBindingInfo
         }
        STATUS current
        DESCRIPTION
           "This Group defines the PIB
           Objects that describe the Authorisation request event handler."
        ::= { go3gppGroups 3 }

go3gppAuthReqEventGroup OBJECT-GROUP
        OBJECTS {
      go3gppAuthReqEventBindingInfos
        }
        STATUS current
        DESCRIPTION
           "This Group defines the PIB
           Objects that describe the Authorisation request events."
        ::= { go3gppGroups 4 }

go3gppBindingInfoGroup OBJECT-GROUP
        OBJECTS {
      go3gppBindingInfoToken,
      go3gppBindingInfoFlowIds,
      go3gppBindingInfoNext
         }
        STATUS current
```

```
       DESCRIPTION
          "This Group defines the PIB
          Objects that describe the binding information."
       ::= { go3gppGroups 5 }

go3gppFlowIdGroup OBJECT-GROUP
       OBJECTS {
     go3gppFlowIdFlowId,
     go3gppFlowIdNext
       }
       STATUS current
       DESCRIPTION
          "This Group defines the PIB
          Objects that describe the flow ID."
       ::= { go3gppGroups 6 }

go3gppAuthReqFailDecGroup OBJECT-GROUP
       OBJECTS {

     go3gppAuthReqFailDecReason
       }
       STATUS current
       DESCRIPTION
          "This Group defines the PIB
          Objects that describe the Authorisation failure decisions."
       ::= { go3gppGroups 7 }

go3gppAuthReqDecGroup OBJECT-GROUP
       OBJECTS {
     go3gppAuthReqDecIcids,
     go3gppAuthReqDecDirDecs
       }
       STATUS current
       DESCRIPTION
          "This Group defines the PIB
          Objects that describe the Authorisation decisions."
       ::= { go3gppGroups 8 }

go3gppIcidGroup OBJECT-GROUP
       OBJECTS {
     go3gppIcidValue,
     go3gppIcidNext
       }
       STATUS current
       DESCRIPTION
          "This Group defines the PIB
          Objects that describe the ICID."
       ::= { go3gppGroups 9 }

go3gppAuthReqDirDecGroup OBJECT-GROUP
       OBJECTS {
     go3gppAuthReqDirDecDirection,
     go3gppAuthReqDirDecQos,
     go3gppAuthReqDirDecGates,
     go3gppAuthReqDirDecNext
        }
       STATUS current
       DESCRIPTION
          "This Group defines the PIB
          Objects that describe the authorisation decision direction."
       ::= { go3gppGroups 10 }

go3gppQosGroup OBJECT-GROUP
       OBJECTS {
     go3gppQosServiceClass,
     go3gppQosDataRateUnit,
     go3gppQosDataRate
        }
       STATUS current
       DESCRIPTION
          "This Group defines the PIB
          Objects that describe the QoS information."
       ::= { go3gppGroups 11 }

go3gppGateDecGroup OBJECT-GROUP
       OBJECTS {
     go3gppGateDecDirection,
     go3gppGateDecGates,
```

```
     go3gppGateDecNext
        }
       STATUS current
       DESCRIPTION
          "This Group defines the PIB
          Objects that describe the Gate decision."
       ::= { go3gppGroups 12 }

go3gppGateGroup OBJECT-GROUP
       OBJECTS {
     go3gppGateFilter,
     go3gppGateStatus,
     go3gppGateNext
        }
       STATUS current
       DESCRIPTION
          "This Group defines the PIB
          Objects that describe the gate."
       ::= { go3gppGroups 13 }



go3gppReportGroup OBJECT-GROUP
       OBJECTS {
            go3gppReportStatus,
            go3gppReportDetails
        }
       STATUS current
       DESCRIPTION
          "This Group defines the PIB
          Objects that describe the PEP reports."
       ::= { go3gppGroups 14 }

go3gppRprtGPRSChrgInfoGroup OBJECT-GROUP
       OBJECTS {
            go3gppRprtGPRSChrgInfoAddrType,
            go3gppRprtGPRSChrgInfoGGSNAddr,
            go3gppRprtGPRSChrgInfoGCID
        }
       STATUS current
       DESCRIPTION
          "This Group defines the PIB
          Objects that describe the charging information."
       ::= { go3gppGroups 15 }

go3gppRprtUsageGroup OBJECT-GROUP
       OBJECTS {
           go3gppRprtUsageIndication
       }
       STATUS current
       DESCRIPTION
          "This Group defines the PIB
          Objects that describe the report usage."
       ::= { go3gppGroups 16 }


   END
```

3GPP TSG-CN WG3 Meeting #27
Dublin, Ireland, 10th - 14th February 2003.

Tdoc ⌘N3-030132

CR-Form-v7

CHANGE REQUEST

⌘ **29.207** **CR** **077** ⌘ **rev** **1** ⌘ Current version: **5.2.0** ⌘

*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:	⌘	Restrictions to PDP context policy decisions
Source:	⌘	TSG_CN WG3 *[Nokia]*
Work item code:	⌘	E2EQoS
Date:	⌘	14/02/2003
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:	⌘	Currently the 29.207 specification allows the GGSN to accept a PDP context activation and modification request based on operator configurable locally handled policy rules, if the GGSN is not able to contact the PDF. Such local decisions create problems; for example, regarding charging as the charing correlation between the PDF and GGSN is missing and as the GGSN does not receive the SBLP supplied filters. The issue was discussed in CN3#26, refer to N3-020975, and a decision in principle was made to remove the problematic cases from 29.207. Note, however, that the GGSN should still be able to allow a PDP context modification if the change is within the PDP context's "Authorized QoS" previously granted by the PDF.
Summary of change:	⌘	The GGSN shall reject a PDP context activation and modification, if it cannot acquire a positive acknowledgement from the PDF and if the PDP context modification is not within the already Authorized QoS.
Consequences if not approved:	⌘	The GGSN does not have the SBLP supplied filters. There are also problems with charging as the charging correlation is missing between the GGSN and the PDF (P-CSCF).

Clauses affected:	⌘	4.3.1.1., 5.1.1 and 5.1.2.

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

4 Go interface

4.3.1 GGSN

4.3.1.1 Service-based local policy enforcement point

The Policy Enforcement Point (PEP) is a logical entity which resides in the GGSN and communicates with the PDF regarding Service-based local policy (SBLP) control. Hereafter in the present document, the GGSN is assumed to contain the PEP implicitly unless otherwise stated. The GGSN sends requests to and receives decisions from the PDF. The GGSN may cache the policy decision data of the PDF decisions. This cached information may be used later for a local policy decision allowing the GGSN to make policy control decision about the QoS authorization for PDP context modifications without requiring additional interaction with the PDF in case the modification request does not exceed the previously authorized QoS.

The following policy enforcement point functionalities for SBLP in the GGSN are identified:

- Policy based Authorisation:

  The GGSN requests authorisation information from PDF for the media components carried by a PDP context. The GGSN enforces the PDF decisions related to the media components carried by a PDP context.

  The GGSN shall enforce unsolicited authorisation decisions which update the QoS and packet classifiers.

  Additionally, policy-based authorisation ensures that the resources, which can be used by each particular media component, are within the “Authorised QoS” specified by the PDF. This information is mapped by the Translation/mapping function in the GGSN to give the authorised resources for GPRS bearer admission control.

  The GGSN shall also report to the PDF its success or failure in carrying out the PDF decision.

- Policy based gating functionality:

  Policy based gating functionality represent the control of the GGSN over the Gate Function in the user plane, i.e. the forwarding of IP packets associated with a media component. In the user plane, a "gate" is defined for each direction of a media component. The PDF provides the gate description and the commands to open or close the gate. The gate description is received from the PDF in the authorisation decision. The command to open or close the gate shall be sent either in the authorisation decision or in subsequent decisions from the PDF.

- Indication of bearer release/modification to/from 0 kb/s

  The GGSN shall inform the PDF when the bearer changes to or from a data rate of 0 kb/s (an indication of bearer loss/recovery), and at bearer release.

- Charging Correlation

  To ensure charging correlation, the PEP shall send the GCID and the GGSN address to the PDF. The PDF shall also send the IMS charging identifier to the GGSN.

Next amended section

5 Policy control procedures

5.1 GGSN

5.1.1 Initial authorization at PDP context activation

The GGSN receives binding information during the activation of a PDP context by the UE. To perform initial authorization at the PDP context activation the GGSN shall send an authorisation request to the PDF including the binding information received from the UE.

The GGSN identifies the required PDF from the binding information. The binding information is formatted according to the structure of the policy element defined in [11] and shall include the AUTH_ENT_ID and the SESSION_ID attributes. The GGSN checks for a Policy Element of type AUTH_SESSION ([11]) and retrieves the AUTH_ENT_ID attribute from this. If this is in the form of a Fully Qualified Domain Name, then this is used to identify the correct PDF.

The GGSN authorisation request message to the PDF shall allow the GGSN to request policy information for authorisation of the media components carried by a PDP context identified by binding information.

When the GGSN receives the PDF decision regarding authorisation of the media components, the GGSN shall enforce the policy decision. To enforce the policy decision, the GGSN shall install the packet filters received from the PDF, and ignore the UE supplied TFT.

If the PDF decision information indicates that the binding information provided by the GGSN is authorised, the GGSN shall proceed with activation of the PDP context. The GGSN shall map the authorized QoS resources into authorized resources for the bearer admission control.

To ensure charging correlation, the GGSN shall send the GCID and GGSN address information to the PDF after the successful establishment of the PDP context, i.e. with the report following the initial authorization decision.

When the PDF detects that the binding information provided by the GGSN is not associated with an ongoing SIP session at application layer, or is otherwise unable to authorise the binding information, the GGSN will receive a COPS decision message from the PDF carrying both an INSTALL and REMOVE decision. The reason for the rejection is indicated by the INSTALL decision with an appropriate authorisation request failure reason. The GGSN shall reject the PDP context activation with a corresponding error code, see annex D. The error code is transferred to the UE in the Protocol Configuration Options information element as defined in 3GPP TS 24.008 [12]. The GGSN shall subsequently remove this state according to the REMOVE decision. For an initial authorisation request, the GGSN shall then send a COPS Delete Request State (DRQ) message to the PDF to remove the state in the GGSN and the PDF.

When the GGSN sends an authorization request to the PDF but the PDF does not respond with the decision message or the communication between the GGSN and the PDF fails, ~~the authorization action is according to the local policy in the GGSN. The local policy may be configured by the operator. If the local policy in the GGSN does not allow the GGSN to make local policy decisions in the absence of the PDF,~~ the GGSN shall reject the PDP context activation with the error code "Authorizing entity temporarily unavailable" (see annex D).

~~If the GGSN supports a local policy decision point (LPDP) configuration it may make local policy decisions in the absence of the PDF. The local policy decisions may be used to accept new PDP context activations while the connection to the PDF is lost. The synchronization behaviour between the GGSN and the PDF is based on the local policy configured by operators.~~

5.1.2 Modification of previously authorized PDP context

The GGSN is responsible for notifying the PDF 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 PDF 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 PDF 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 PDF.

If the PDF does not respond with a decision message to an authorization request sent by the GGSN or the communication between the GGSN and the PDF fails, ~~and if the local policy in the GGSN does not allow the GGSN to make local policy decisions in the absence of the PDF,~~ the GGSN shall reject the PDP context modification with the error code "Authorizing entity temporarily unavailable" (see annex D).

The GGSN is responsible for notifying the PDF, 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.

3GPP TSG-CN WG3 Meeting #27
Dublin, Ireland, 10th - 14th February 2003.

Tdoc ⌘N3-030165

CR-Form-v7

CHANGE REQUEST

⌘ **29.207** **CR** **073** ⌘**rev** **2** ⌘ Current version: **5.2.0** ⌘

*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:	⌘	Terminology corrections and capability section update
Source:	⌘	TSG_CN WG3 *[Nortel Networks]*
Work item code:	⌘	E2EqoS
Date:	⌘	10/02/2003
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:	⌘	There are several wrong terminology used and some typos that need to be corrected. Also an editor note not longer applicable as the potencial theft of service was addressed in CR034r1 (N3-020867). Some text that is not correct is removed from the capability section, after CR065r2 that text should have been removed. Some other contributions habe been incorporated to the changes
Summary of change:	⌘	Typos." Flow ID" has been changed for "Flow Identifier". "Section" has been changed for "clause". An editor's note is removed. Also some text is removed from the capability section.
Consequences if not approved:	⌘	Wrong terminology and typos.

Clauses affected:	⌘	3.1, 4.1, 4.3.1.5, 4.3.2.1, 5.2.1.1, 5.2.2.1, 5.2.2.2, 6.3.1.5, 6.3.2, Annex B, Annex C, Annex E

	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.
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Contents

Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

The present document provides the stage 3 specification of the Go interface. The functional requirements and the stage 2 specifications of the Go interface are contained in 3GPP TS 23.002 [2] and 3GPP TS 23.207 [3]. The Go interface is the interface between the GGSN and the Policy Decision Function (PDF).

The present document defines:

- the protocol to be used between PDF and GGSN over the Go interface;
- the signalling interactions to be performed between PDF and GGSN over the Go interface;
- the information to be exchanged between PDF and GGSN over the Go interface.

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 qQuality of sService (QoS) concept and architecture".

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

[5] Void.

[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] Void.

[11] IETF RFC RFC tbdinternet-draft: "Session Authorization Policy Element" (draft-ietf-rap-rsvp-authsession-05.txt).

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

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

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

[18] 3GPP TS 29.208: ~~"~~"~~End~~ End-to-~~-~~end Quality of Service (QoS) signalling flows~~"~~".

[19] IETF RFC 3291: ~~"~~"Textual Conventions for Internet Network Addresses~~"~~".

[20] 3GPP TS 29.060: ~~"~~"General Packet Radio Service (GPRS); GPRS Tunnelling Protocol (GTP) across the Gn and Gp ~~I~~interface~~"~~".

[21] 3GPP TS 32.225: ~~"~~"Telecommunication management; Charging management; Charging data description for the IP Multimedia Subsystem (IMS)~~"~~".

~~[22] 3GPP TS 29.060: ""General Packet Radio Service (GPRS); GPRS Tunnelling Protocol (GTP) across the Gn and Gp interface"".~~

[22] IETF RFC 3313: "Private Session Initiation Protocol (SIP) Extensions for Media Authorization"

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)

Flow identifier: used for the identification of an IP flow within a media component associated with a SIP session

EXAMPLE: ~~For example, a~~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 bi-directional 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 (RFC 2327 [17]), session description and 2) IP flow number defined in the order of increasing port numbers within each media component, see ~~Annex~~ annex C.

Go Interface: interface between PDF and GGSN 3GPP TS 23.002~~[2]~~

GPRS Charging ID (GCID): the Charging Id generated by the GGSN as defined in 3GPP TS 29.060 ~~[20]~~.

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 Decision Function (PDF): is a logical policy decision element that uses standard IP mechanisms to implement policy in the IP media layer
The PDF 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 PDF. 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 carried by COPS-PR
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

QoS class: identifies a bearer service (which is associated with a set of bearer service characteristics)~~.~~

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~~given 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
DRQ	COPS Delete ReQuest state message
GCID	GPRS Charging IDentifier
ICID	IM CN Subsystem Charging IDentifier
IMS	IP Multimedia core network Subsystem
MIB	Management Information Base
P-CSCF	Proxy Call Session Control Function
PDF	Policy Decision Function
PEP	Policy Enforcement Point
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
RTCP	RTP Control Protocol
SBLP	Service Based Local Policy
SDP	Session Description Protocol

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 Decision Function (PDF). As defined in the stage 2 specifications 3GPP TS 23.207 [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 RFC 2748 [7].

In addition, COPS for Provisioning extensions have been developed as described in RFC 3084 [8] with RFC 3159 [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 (RFC 2748 [7]) and the extensions of COPS-PR (RFC 3084 [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 PDF 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 are~~is~~ specified in 3GPP TS 29.208 [18].

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 PDF. To authorise the PDP context activation, the GGSN shall send a media authorisation request to the PDF. To authorise the PDP context modification, the GGSN shall send a media authorisation request to the PDF 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 PDF and subsequently request service-based local policy information from the PDF. 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 identifier~~(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 PDF:

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

   - Decision on the binding information.

   The PDF 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 PDF shall verify if the multiple media components are correctly assigned to the PDP Context. If validated, the PDF 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:

- QoS class:

  The QoS class information represents the highest class that can be used for the media component. It is derived from the SDP media description. The QoS class within the "Authorized QoS" information for the bearer is determined from the QoS class values of the individual media components identified in the binding information.

- Data rate:

  The Data rate information is derived from the SDP bandwidth parameter. The Data rate shall include all the overhead coming from the IP-layer and the layers above, e.g. UDP and RTP. If RTP is used, then overhead coming from RTCP shall be added by the PDF. 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 under use 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 PDF 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 [20]) of the PDP Context and the GGSN address to the PDF as part of the authorisation report.

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

   The PDF 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 PDF to the GGSN.

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

   The GGSN informs the PDF 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.

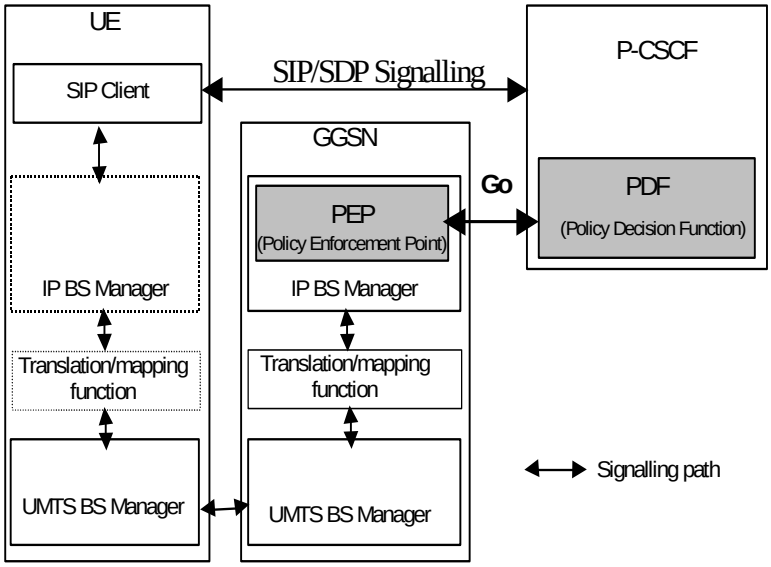
4.2 Go reference model

The Go interface is defined between the PDF and the GGSN (3GPP TS 23.002 [2]).

The PDF is a logical entity of the P-CSCF (if the PDF is implemented in a separate physical node, the interface between the PDF and P-CSCF is not standardised).

The P-CSCF (PDF) is in the same PLMN as the GGSN.

The relationships between the different functional entities involved are depicted in figure 4.2.



NOTE: For clarity in the diagram, network elements that are not involved in service-based local policy are not presented here (e.g. radio network elements, SGSN, etc).

Figure 4.2: Go interface architecture model

4.3 Functional elements and capabilities

4.3.1 GGSN

4.3.1.1 Service-based local policy enforcement point

The Policy Enforcement Point (PEP) is a logical entity which resides in the GGSN and communicates with the PDF regarding Service-based local policy (SBLP) control. Hereafter in the present document, the GGSN is assumed to contain the PEP implicitly unless otherwise stated. The GGSN sends requests to and receives decisions from the PDF. The GGSN may cache the policy decision data of the PDF decisions. This cached information may be used later for a local policy decision allowing the GGSN to make policy control decision about the QoS authorization for PDP context modifications without requiring additional interaction with the PDF.

The following policy enforcement point functionalities for SBLP in the GGSN are identified:

- Policy based Authorisation:

  The GGSN requests authorisation information from PDF for the media components carried by a PDP context. The GGSN enforces the PDF decisions related to the media components carried by a PDP context.

  The GGSN shall enforce unsolicited authorisation decisions which update the QoS and packet classifiers.

  Additionally, policy-based authorisation ensures that the resources, which can be used by each particular media component, are within the "Authorised QoS" specified by the PDF. This information is mapped by the Translation/mapping function in the GGSN to give the authorised resources for GPRS bearer admission control.

  The GGSN shall also report to the PDF its success or failure in carrying out the PDF decision.

- Policy based gating functionality:

  Policy based gating functionality represent the control of the GGSN over the Gate Function in the user plane, i.e. the forwarding of IP packets associated with a media component. In the user plane, a "gate" is defined for each direction of a media component. The PDF provides the gate description and the commands to open or close the gate. The gate description is received from the PDF in the authorisation decision. The command to open or close the gate shall be sent either in the authorisation decision or in subsequent decisions from the PDF.

- Indication of bearer release/modification to/from 0 kb/s:

  The GGSN shall inform the PDF when the bearer changes to or from a data rate of 0 kb/s (an indication of bearer loss/recovery), and at bearer release.

- Charging Correlation

  To ensure charging correlation, the PEP shall send the GCID and the GGSN address to the PDF. The PDF shall also send the IMS charging identifier to the GGSN.

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 PDF 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 PDF 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 QoS class in the "Authorized QoS" according to table 4.3.1.1.1.

Table 4.3.1.1.1

QoS class	UMTS Traffic Class	Traffic Handling Priority
A	Conversational	N/A
B	Streaming	N/A
C	Interactive	1
D		2
E		3
F	Background	N/A
NOTE: QoS class represents the highest class that can be used for the bearer.		

~~NOTE: QoS class represents the highest class that can be used for the bearer.~~

The QoS class values given by the PDF 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.

4.3.1.2 Initialisation and maintenance

The GGSN shall comply to the procedures described in RFC 2748 [7] for the initialisation and maintenance of the COPS protocol over the Go interface.

4.3.1.3 Gate function

The Gate Function represents a user plane function enabling or disabling the forwarding of IP packets. A gate is described by a set of packet classifiers that identify IP flows associated to the gate. The packet classifier includes the standard 5-tuple (source IP address, destination IP address, source port, destination port, protocol) explicitly describing a unidirectional IP flow.

The packet classifier is received from the PDF in an authorisation decision. In the packet classifier the source IP address shall be taken from the SDP information if provided. Otherwise, for bi-directional flows the operator may choose to identify the source IP address from the 64 bit prefix of the destination IP address in order to reduce the possibilities of bearer misuse. 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~~wild carded by the PDF. If the source port number is not identified by the SDP information then the source port number shall be ~~wildcarded~~wild carded by the PDF.

The GGSN installs the packet filter corresponding to the packet classifier. The packet classifier includes the status that the gate shall be set to.

The commands to open or close the gate lead to the enabling or disabling of the passage for IP packets. If the gate is closed all packets of the related IP flows are dropped. If the gate is opened the packets of the related IP flows are allowed to be forwarded. The opening of the gate may be part of the authorisation decision event. The closing of the gate may be part of the revoke authorisation decision event.

IP Packets matching a SBLP supplied filter are subject to the gate associated with that packet filter. In the uplink direction, IP packets which do not match any packet filter shall be silently discarded. In the downlink direction, IP packets which do not match any SBLP supplied filter shall be matched against TFT supplied filters.

4.3.1.4 Void

4.3.1.5 Binding mechanism handling

The binding information is used by the GGSN to identify the correct PDF and subsequently request service-based local policy information from the PDF. 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 PDF from the PDF 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 PDF. If multiple binding information are received by the GGSN, it shall forward them to the PDF. 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 PDF 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 request to an APN for which the Go interface is enabled and no binding information is received, the GGSN may either reject the PDP context activation 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 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.

If the Go interface is disabled and the GGSN receives a Create PDP Context Request or Update PDP Context Request message that includes binding information, the GGSN shall reject the request with the error code "Binding information not allowed" (see annex D).

4.3.2 PDF

4.3.2.1 Service-based local policy decision point

The PDF functions as a Policy Decision Point for the service-based local policy control. The PDF makes policy decisions based on session and media related information obtained from the P-CSCF. The PDF shall exchange the decision information with the GGSN via the Go interface.

The following policy decision point functionalities for SBLP are identified:

- Authorisation function:

  The PDF shall be able to provide an authorisation decision upon receiving a bearer authorisation request from the GGSN. The PDF shall authorise the request according to the stored session and media related information received from the P-CSCF.

  The PDF shall use the binding information to determine the IMS session and the set of media components. Based on the media components, the PDF shall determine the authorised QoS, packet filters, and gate status to be applied. The authorised QoS specifies the maximum allowed QoS class, and the data rate for the set of media components identified in the binding information.

  The PDF shall be able to provide updates to the authorisation decision at session modifications which change the QoS and packet classifiers for PDP contexts which are already established.

~~Editor's Note: a potential for theft of service scenario has been identified with the current mechanism for authorisation. Extensions to the authorisation mechanisms to close potential theft of service scenarios are currently under investigation, and will be specified when determined.~~

- Revoke function:

  The PDF may revoke the authorisation of resources at any time. Revoke Authorisation for GPRS and IP resources is communicated by the PDF to the GGSN.

- Approval of QoS Commit / Removal of QoS Commit:

  The PDF may allow or deny for the media component(s) the usage of the PDP context by controlling the correlated gate(s).

  The "Approval of QoS Commit" command may either be part of the authorisation decision, or the PDF may provide a separate decision with the "Approval of QoS Commit" command to open the gate.

  The "Removal of QoS Commit" command may either be part of the revoke authorisation decision, or the PDF may provide a separate decision with the "Removal of QoS Commit" command to close the gate.

- Actions due to Indication of bearer release:

When the GGSN informs the PDF of bearer deactivation, the PDF shall remove the corresponding authorisation request state. Additionally, the PDF shall inform the P-CSCF about this deletion event.

- Actions due to Indication of bearer modification:

  When the PDF receives an indication of bearer modification of the maximum bitrate to or from 0 kbits/s, the PDF shall inform the P-CSCF about this modification event.

- Generation of authorisation token:

  During the session set-up the PDF generates an authorisation token for the IMS session.

- Mapping SDP parameters to "Authorized QoS" parameters:

  To perform proper authorisation, the PDF shall map the necessary SDP parameters containing session and media related information to "Authorized QoS" parameters.

- Charging identifiers exchange:

  The PDF shall send the ICID provided by the P-CSCF as part of the initial authorisation decision of all the bearer authorization requests that correspond to the respective SIP session.

  When the PDF receives the GCID together with the GGSN address from the GGSN, it shall forward this information to the P-CSCF to ensure charging correlation.

4.3.2.2 Initialisation and maintenance

The PDF shall comply to the procedures described in RFC 2748 [7] for the initialisation and maintenance of the COPS protocol over the Go interface.

4.3.2.3 Binding mechanism handling

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

During the session set-up the PDF generates an Authorisation Token for the IMS session as described in RFC 3313 [22]. The Authorisation token shall be sent to the P-CSCF which forwards it to the UE in the SIP signalling. The PDF shall allocate its PDF identifier as part of the Authorization Token. This identifier shall be in the format of a fully qualified domain name.

The PDF receives the binding information and a Client Handle as part of a REQ from the GGSN. The PDF 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 PDF to identify the IMS session. If no IMS session can be found for an authorisation token, or if the PDF is otherwise unable to authorise the binding information, the PDF 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 PDF 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 PDF sends the available authorisation information on the media component(s) back to the GGSN. If the PDF 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 appropriate GGSN.

If the binding information consists of more than one flow identifier, the PDF 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 PDF 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 PDF 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.

5 Policy control procedures

5.1 GGSN

5.1.1 Initial authorization at PDP context activation

The GGSN receives binding information during the activation of a PDP context by the UE. To perform initial authorization at the PDP context activation the GGSN shall send an authorisation request to the PDF including the binding information received from the UE.

The GGSN identifies the required PDF from the binding information. The binding information is formatted according to the structure of the policy element defined in [11] and shall include the AUTH_ENT_ID and the SESSION_ID attributes. The GGSN checks for a Policy Element of type AUTH_SESSION ([11]) and retrieves the AUTH_ENT_ID attribute from this. If this is in the form of a Fully Qualified Domain Name, then this is used to identify the correct PDF.

The GGSN authorisation request message to the PDF shall allow the GGSN to request policy information for authorisation of the media components carried by a PDP context identified by binding information.

When the GGSN receives the PDF decision regarding authorisation of the media components, the GGSN shall enforce the policy decision. To enforce the policy decision, the GGSN shall install the packet filters received from the PDF, and ignore the UE supplied TFT.

If the PDF decision information indicates that the binding information provided by the GGSN is authorised, the GGSN shall proceed with activation of the PDP context. The GGSN shall map the authorized QoS resources into authorized resources for the bearer admission control.

To ensure charging correlation, the GGSN shall send the GCID and GGSN address information to the PDF after the successful establishment of the PDP context, i.e. with the report following the initial authorization decision.

When the PDF detects that the binding information provided by the GGSN is not associated with an ongoing SIP session at application layer, or is otherwise unable to authorise the binding information, the GGSN will receive a COPS decision message from the PDF carrying both an INSTALL and REMOVE decision. The reason for the rejection is indicated by the INSTALL decision with an appropriate authorisation request failure reason. The GGSN shall reject the PDP context activation with a corresponding error code, see annex D. The error code is transferred to the UE in the Protocol Configuration Options information element as defined in 3GPP TS 24.008 [12]. The GGSN shall subsequently remove this state according to the REMOVE decision. For an initial authorisation request, the GGSN shall then send a COPS Delete Request State (DRQ) message to the PDF to remove the state in the GGSN and the PDF.

When the GGSN sends an authorization request to the PDF but the PDF does not respond with the decision message or the communication between the GGSN and the PDF fails, the authorization action is according to the local policy in the GGSN. The local policy may be configured by the operator. If the local policy in the GGSN does not allow the GGSN to make local policy decisions in the absence of the PDF, the GGSN shall reject the PDP context activation with the error code "Authorizing entity temporarily unavailable" (see annex D).

If the GGSN supports a ~~local~~ Local ~~p~~Policy ~~d~~Decision ~~p~~Point (LPDP) configuration it may make local policy decisions in the absence of the PDF. The local policy decisions may be used to accept new PDP context activations while the connection to the PDF is lost. The synchronization behaviour between the GGSN and the PDF is based on the local policy configured by operators.

5.1.2 Modification of previously authorized PDP context

The GGSN is responsible for notifying the PDF when a procedure of PDP context modification of a previously authorized PDP context is performed. A modification of a previously authorized PDP Context may occur for example when a media component is added or when the codec or media flow change requires new resources. To authorise the

PDP context modification the GGSN shall send an authorisation request to the PDF 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 PDF 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 PDF.

If the PDF does not respond with a decision message to an authorization request sent by the GGSN or the communication between the GGSN and the PDF fails, and if the local policy in the GGSN does not allow the GGSN to make local policy decisions in the absence of the PDF, the GGSN shall reject the PDP context modification with the error code "Authorizing entity temporarily unavailable" (see annex D).

The GGSN is responsible for notifying the PDF, 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.

5.1.3 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. The GGSN will receive unsolicited authorisation decision from the PDF due to such modifications.

When the GGSN receives an unsolicited authorisation decision from the PDF with updated QoS information, the GGSN shall update the stored authorised QoS. If the existing QoS of the PDP context exceeds the updated authorised QoS, the GGSN shall initiate a timer for the UE to modify the PDP context to decrease the QoS to within the authorised limit. At expiry of the timer, if the PDP context still exceeds the authorised QoS, the GGSN shall perform a network initiated PDP context modification to reduce the QoS to the authorised level.

When the GGSN receives an unsolicited authorisation decision from the PDF, the GGSN shall also install the new set of packet classifiers, removing any existing packet classifiers that are not included in the new set.

5.1.4 PDP context deactivation

The GGSN is responsible for notifying the PDF when a procedure of a PDP context deactivation is performed. In case of a PDP context deactivation, the GGSN shall inform the PDF 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 PDF 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.

5.1.5 Gate control operation

Upon receiving a gate decision from the PDF, the GGSN shall enforce this decision on the user plane. For each gate contained in the gate decision the GGSN shall perform the specified command. In case of an "Approval of QoS Commit" command the GGSN shall open the corresponding gate. In case of a "Removal of QoS Commit" command the GGSN shall close the corresponding gate.

5.1.6 User plane operation

The GGSN shall enforce the configuration of the policy based "gating" functionality according to additional authorisation information received from the PDF.

The filter(s) and associated gate(s) are connected to the PDP contexts where SBLP applies. For each such PDP context, the information received in the TFT is ignored. In the downlink direction, packets are processed against each filter in turn until a match is found. If a match is not found, packet processing shall then continue against filters installed from UE supplied TFTs for PDP contexts where SBLP is not applied. If a match is found against an SBLP supplied filter, the packet shall be processed according to the associated gate function. If the gate is open, the packet shall be passed to the UE on the associated PDP context. If the gate is closed, the packet shall be silently discarded.

In the uplink direction, packets received on a PDP context with SBLP supplied filters shall be matched against those filters. If a match is found, the packet shall be passed if the gate associated with that filter is open. If the gate is closed, or if the packet does not match any of the packet filters, the packet shall be silently discarded.

5.2 PDF

5.2.1 SBLP decisions

5.2.1.1 SBLP authorisation decision

The information needed for the PDF 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 is in subclause 3.1. The P-CSCF shall send policy set-up information to the PDF upon every SIP message that includes an SDP payload. This ensures that the PDF passes proper information to perform media authorization for all possible IMS session set-up scenarios. The policy set-up information provided by the P-CSCF to the PDF 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 receiving~~es~~ the ICID in SIP signalling, it shall send the ICID to the PDF.

The PDF 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 PDF shall include an AUTH_ENT_ID attribute containing the Fully Qualified Domain Name of the PDF and the SESSION_ID attribute.

Upon receiving the bearer authorization request from the GGSN, the PDF 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 PDF shall identify whether the binding information indeed corresponds to an initiated SIP session. If the corresponding SIP session cannot be found, the PDF shall enforce the rejection of this PDP context request by sending an INSTALL and REMOVE decision to the GGSN. The reason for the rejection is indicated by the INSTALL decision with the "noCorrespondingSession" reason in the Authorisation Request Failure Decision. If the PDF is otherwise unable to authorise the binding information, the INSTALL decision shall identify a general authorisation failure with the "authorisationFailure" of the request reason in the Authorisation Request Failure Decision.
  - The authorization shall also contain decision on the list of flow identifiers ~~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 PDF shall make this decision by comparing the list of flow identifiers ~~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 PDF shall enforce the rejection of this PDP context request by sending an INSTALL and REMOVE decision to the GGSN. The reason for the rejection is indicated by the INSTALL decision with the "invalidBundling" reason in the Authorisation Request Failure Decision.
  - If the binding information and the list of flow identifiers ~~IDs~~ are successfully authorised (verified) as per the means described above, the PDF shall also communicate the authorisation details for each media component to the GGSN.
  - If the PDF 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 PDF shall define the direction (upstream or downstream) of the "Authorised QoS" and the packet classifier(s).
- Packet classifier(s):
  - The PDF 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~~wild carded by the PDF.

- 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~~wild carded by the PDF in the packet classifier.

- The PDF 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 QoS Class and Data Rate) for a media component is extracted from the media type information and bandwidth parameter of the SDP. The PDF shall map the media type information into a QoS Class which is the highest class that can be used for the media. The PDF shall use an equal QoS 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 QoS class A.

  - The PDF shall derive the Data Rate value from the "b=AS" SDP parameter. The "b=AS" parameter in the SDP shall contain all the overhead coming from the IP-layer and the layers above, e.g. UDP and RTP. If RTP is used, then overhead coming from RTCP shall be added by the PDF 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 PDF shall provide the "Authorised QoS" for the bearer as the combination of the "Authorised QoS" information of the individual media components. The QoS Class in the "Authorised QoS" for the bearer shall contain the highest QoS class amongst the ones applied for the individual media components and indicates the highest UMTS traffic class that can be applied to the PDP context.

  - 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 [18].

The PDF may include the gate enabling command as part of the authorisation decision, for instance to enable early media. Alternatively, the PDF may provide a separate decision for opening the gate.

The PDF 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 PDF shall update the media authorization information for the session. The PDF may push this updated authorisation information to the GGSN. Under certain condition e.g. revoke of authorization, the PDF 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 PDF 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 PDF 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 PDF 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 PDF 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 PDF 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.

5.2.1.4 SBLP gate decision

The PDF may send a gate decision during the session set-up or whenever the status of a media component changes during the session (e.g. a media component is put on hold, resumed or removed). The PDF shall not send a gate decision to the GGSN before it has sent the initial authorisation decision. If the initial authorisation decision has already been sent, the PDF may send a gate decision to the GGSN to modify the status of one or several gate(s) on the user plane. The gate decision shall only contain the gate(s) for which the status was changed compared to the last authorisation or gate decision sent to the GGSN. The gate decision contains for each gate either the "Approval of QoS Commit" command to open the gate or the "Removal of QoS Commit" command to close the gate.

5.2.2 Support for forking

The PDF shall be able to handle forking when SBLP is applied. Forking can occur as specified in 3GPP TS 23.228 [4].

The related UE procedures are described in 3GPP TS 24.229 [14].

5.2.2.1 Authorization of resources for forked responses

When a SIP session has been originated by a connected UE, the P-CSCF may receive multiple provisional responses due to forking before the first final answer is received. The PDF shall allocate the same authorization token to all the forked responses and the corresponding early dialogues.

The UE and the P-CSCF become aware of the forking only when the second provisional response arrives. For this, and any subsequent provisional response, the PDF shall identify the existing authorization information for that session. The PDF shall authorize any additional media components and any increased QoS requirements for the previously authorized media components, as requested by the forked response. Thus, the QoS authorized for a media component shall be equal to the highest QoS requested for that media component by any of the forked responses. Authorization is done by the procedures for authorization request in ~~sections~~ subclauses 5.1.1 and 5.1.2 and SBLP decisions in subclause~~ection~~ 5.2.1.1.

Additional packet classifiers as required by the subsequent responses are sent to the GGSN by the session modification initiated decision specified in subclause~~ection~~ 5.2.1.2.

5.2.2.2 Updating the authorization information at the final answer

The PDF shall keep the authorization information requested for each of the individual early dialogues till the first final answer is received. Then the related early dialogue is progressed to establish the final SIP session. All the other early dialogues are terminated. The authorization information for the SIP session is updated to match the requirements of the remaining early dialogue only. Several actions may be needed in the PDF:

- Only the packet classifiers and the QoS indicated by the first final answer shall remain authorized. This information shall be sent to the GGSN by the session modification initiated decision specified in subclause~~ection~~ 5.2.1.2. This should be done without delay in order to reduce the risk for initial clipping of the media stream, and minimising possible misuse of resources.

- The authorization for PDP contexts that were used only for the terminated early dialogues, shall be revoked as specified in ~~section~~ subclause 5.1.4.

- The PDF shall await new authorization requests for remaining PDP contexts with updated binding information to remove any media components that were authorized for the terminated early dialogues only. If necessary (i.e. -after timeout), the authorization for these PDP contexts shall be revoked as specified in subclause~~ection~~ 5.2.1.3.

~~For example,~~ EXAMPLE: ~~a~~Assume that three forked responses for a certain media component indicate the bandwidths 10 kbps, 30 kbps and 20 kbps, respectively. This media component will first be authorized for 10 -kbps and then upgraded to 30 kbps, which will be its final value for the early dialogue phase. If the first final answer corresponds to the third forked, provisional response, then QoS is finally downgraded to 20 kbps.

6 Go protocol

6.1 Protocol support

6.1.1 TCP connection for COPS protocol

The GGSN receives the PDF identifier received as part of the Authorization Token, during the PDP context activation procedure. The GGSN resolves the PDF IP address from the PDF identifier, which is in the form of a fully qualified domain name.

If there is no existing TCP connection to the PDF, the GGSN shall establish a TCP connection for COPS interactions to the PDF. The GGSN shall use an existing TCP connection to the PDF, whenever present.

The TCP connection between the GGSN and the PDF may be pre-established by configuring the PDF addresses on the GGSN.

All communication between the GGSN and the PDFs shall use a standardised Client-Type with a corresponding standardised PIB, as defined in annex B.

The validity of the PDF may be ensured either by using a private DNS for resolving the PDF IP address or by configuring a list of allowed PDF IP addresses on the GGSN.

6.1.2 COPS protocol

The Go interface allows service-based local policy and QoS inter-working information to be "pushed" to or requested by the GGSN from a PDF.

The COPS protocol supports a client/server interface between the GGSN and the PDF. The Go interface shall conform to the IETF COPS framework as a requirement and guideline for Stage 3 work.

The COPS protocol allows both push and pull operations. For the purpose of the initial authorisation of QoS resources the pull operation shall be used. Subsequently the interactions between the PDF and the GGSN may use either pull or push operations.

Policy decisions may be stored by the COPS client in a local policy decision point allowing the GGSN to make admission control decisions without requiring additional interaction with the PDF.

The COPS client (PEP) can request a policy decision from the PDF triggered by a QoS signalling request. One PEP request may be followed by one or more asynchronous PDF decisions. Each of the decisions will allow the PDF to notify the PEP in the GGSN whenever necessary to change earlier decisions, generate errors etc.

Protocol stack: IP, TCP and COPS.

6.2 Basic COPS events/messages

The Go interface supports event triggered information transfer between the GGSN and PDF

6.2.1 Type of messages

The COPS protocol supports several messages between GGSN and PDF. The message content is dependent on the type of COPS operation (e.g. Client-Open/Client-Accept/Client-Close, Request, Decision and Delete Request State).

The Client Open, Client Accept, Client Close, Keep Alive, Synchronize State Request and Synchronize State Complete messages are used for setting up and maintaining the connection between the PDF and the GGSN.

The following messages supported by the COPS layer for Go interface are used for the policy control operations:

- **Request (REQ)** message from the GGSN to the PDF is used by the GGSN to request SBLP and QoS inter-working information.
- **Decision (DEC)** message from the PDF to the GGSN is a response to the Request message or an asynchronous notification from PDF to the GGSN whenever necessary in order to change earlier decisions, generate errors, etc.
- **Report State (RPT)** message from the GGSN to the PDF is used to communicate the success, failure or changes to the client state of the GGSN in carrying out the PDF's decision indicated in the Decision message.
- **Delete Request State (DRQ)** message from the GGSN to the PDF indicates that the state identified by the client handle is no longer available/relevant and the corresponding state may be removed from the PDF.

6.3 Go events/messages

The UMTS-specific information is carried in specific COPS-PR objects, as defined in the 3GPP Go PIB that is given in annex B.

6.3.1 Event descriptions

The Go Interface uses COPS-PR (RFC 3084 [8]) schematics and the 3GPP Go PIB. For COPS-PR to support the Outsourcing Model it is required to add a new 3GPP Go PIB with objects to:

- Describe the Triggering Event Handling.
- Describe the Outsourcing Event.
- Describe the Decision for the Outsourced Event.
- Describe the Termination of the Outsourced Event.
- Describe the resource used for the Outsourced Event.

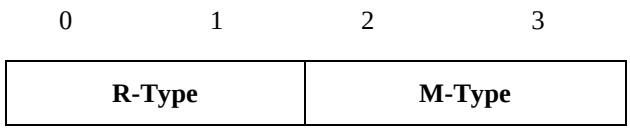
6.3.1.1 Common Header, Client Type

The COPS Client-type number for go3gpp is 0x8009 (Client type number assigned by IANA).

6.3.1.2 Context Object

The COPS Context Object is sent in the REQ and DEC messages. This object is used to indicate the triggering event.

C-Num = 2, C-Type = 1



R-Type (Request Type Flag)

0x08 for configuration request

M-Type (Message Type)

0x01 initial capability negotiation

0x02 create event state

0x03 update event state

0x04 terminate event state

6.3.1.3 Client Specific Information (ClientSI) for outsourcing Operation

The binding information consisting of the Authorization Token and flow identifier(s) received by the GGSN are encapsulated inside the Client Specific Information object of the COPS request message sent from the GGSN to the PDF. The PDF identifier is extracted from the token and used inside the GGSN to resolve the address of the actual PDF. However, from the Go message perspective, the token is treated as an opaque entity.

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 PDF by indicating the corresponding PRCs:

- Bearer authorisation capabilities:

  The GGSN notifies the PDF 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 PDF. 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 PDF 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 PDF. This also includes the following capabilities:

  - "Authorised QoS" capabilities:

    The GGSN notifies the PDF 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 PDF 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 PDF 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 PDF 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 PDF regarding disabling of the gate. The go3gppGateDecGroup together with the go3gppGateGroup are used for this purpose.

- Revoke media authorisation capabilities:

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

- Charging co-ordination:

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

  The GGSN informs the PDF that it is capable to receive ICID(s) from the PDF. 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 PDF 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 PDF 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 PDF that it supports the following COPS-PR (RFC 3084 [8]) specific capabilities:

  - Outsourcing capability:

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

6.3.1.5 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 PDF and includes provisioning client information to provide the PDF with client-specific configuration or capability information about the GGSN. The capability information to be exchanged could include additional PIB objects supported by the GGSN which 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:

- Indication of the maximum number of binding information:

  The GGSN may notify the PDF how many binding information the GGSN is able to send with an Authorization_Request.

- Indication of the maximum number of Flow ~~ID~~identifiers:

  The GGSN may notify the PDF how many Flow ~~ID~~identifiers the GGSN is able to send with an Authorization_Request.

- Indication of the maximum number of ICIDs:

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

~~- Indication of the maximum number of media authorisation sessions:~~

~~The GGSN may notify the PDF how many parallel media authorisation sessions can be supported.~~

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

6.3.1.6 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 PDF 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 PDF 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.

6.3.2 Message description

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

- Authorisation_Request (REQ) (GGSN→PDF):

  This event allows the GGSN to request authorisation data from the PDF. 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 (DEC)(PDF→GGSN):

  This event provides the GGSN with the relevant authorisation data. The event contains the following information:

  - Client Handle;
  - ICID(s) (only in the initial Authorisation_Decision) .Only one ICID is transferred in this Release. The format of the ICID is defined in 3GPP TS 32.225 [21];
  - 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.

The Base and IP Filter definitions from the IETF Framework PIB [15] shall be used in the 3GPP Go PIB to represent the filter specification. Only a subset of the available filter attributes shall be used. The attributes frwkBaseFilterNegation, frwkIpFilterDscp, and frwkIpFilterFlowId in the filter description shall have the length field in its encoding set to 0 by the PDF to indicate they are not used. The GGSN shall ignore them if they are set otherwise.

- Gate status (opened/closed)

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

- Authorisation_Failure (DEC) (PDF→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 (DEC) (PDF→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.

The Base and IP Filter definitions from the IETF Framework PIB [15] shall be used in the 3GPP Go PIB to represent the filter specification. Only a subset of the available filter attributes shall be used. The attributes frwkBaseFilterNegation, frwkIpFilterDscp, and frwkIpFilterFlowId in the

filter description shall have the length field in its encoding set to 0 by the PDF to indicate they are not used. The GGSN shall ignore them if they are set otherwise.

- 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→PDF):
  - Authorisation_report; Gate_report:

    The GGSN sends a COPS RPT message back to the PDF 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 PDF reporting that 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 event contains the following information:

    - Client Handle;
    - Maximum bit rate (set to 0 kbps / changed from 0 kbps).
- Delete request state (DRQ) (GGSN→PDF):

  The GGSN informs the PDF 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 PDF.

  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 (PDF→GGSN):

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

  The event contains the following information:

  - Client Handle.

6.4 Go data

The detailed data description is provided in annex B.

6.5 Security Considerations

The security mechanisms described in COPS (RFC 2748 [7]) and COPS-PR (RFC 3084 [8]) should be re-used in 3GPP.

Annex A:
(Void)

Annex B (normative): 3GPP Go PIB

```
GO3GPP-PIB  PIB-DEFINITIONS ::= BEGIN

IMPORTS
    Unsigned32, Integer32, MODULE-IDENTITY,
    MODULE-COMPLIANCE, OBJECT-TYPE, OBJECT-GROUP
            FROM COPS-PR-SPPI          -- Defined in RFC 3159 [9]
    InstanceId, Prid
            FROM COPS-PR-SPPI-TC       -- Defined in RFC 3159 [9]
    zeroDotZero               FROM SNMPv2-SMI

    InetAddress, InetAddressType,
    InetAddressPrefixLength
            FROM INET-ADDRESS-MIB;     -- Defined in RFC 3291 [19]

     ;

go3gppPib  MODULE-IDENTITY
    SUBJECT-CATEGORIES   { go3gpp (0x8009) } -- Go 3GPP COPS Client Type

    LAST-UPDATED "200302150000Z200211150000Z"
    ORGANIZATION "3GPP TSG CN WG3"
    CONTACT-INFO
                "Kwok Ho Chan
                 Nortel Networks
                 600 Technology Park Drive
                 Billerica, MA 01821 USA
                 Phone: +1 978 288 8175
                 Email: khchan@nortelnetworks.com

                 Louis-Nicolas Hamer
                 Nortel Networks
                 PO Box 3511 Station C
                 Ottawa, Ontario
                 Canada, K1Y 4H7
                 Phone: +1 613 768 3409
                 Email: nhamer@nortelnetworks.com"
    DESCRIPTION
            "A PIB module containing the set of provisioning
            classes that are required for support of policies for
            3GPP's GO interface, Release 5."
    REVISION "200302150000Z 200211150000Z"
    DESCRIPTION
            "The 3GPP Go PIB for release 5
             Annex B of 3GPP TS 29.207 v5.32.0."

       ::= { 1.3.6.1.4.1.10415.1.1  } --  full specification of object ID tree.
                                      -------- The final syntax should be { 3gpp_pib 1 }
                                      -------- With imports from the document that shows
                                      -------- that 3gpp_pib means ( 1.3.6.1.4.1.10415.1 )



----
---- The root OID for PRCs in the 3GPP GO PIB
----

    go3gppCapabilityClasses      OBJECT IDENTIFIER ::= { go3gppPib 1 }
    go3gppEventHandlerClasses    OBJECT IDENTIFIER ::= { go3gppPib 2 }
    go3gppEventClasses           OBJECT IDENTIFIER ::= { go3gppPib 3 }
    go3gppEventInfoClasses       OBJECT IDENTIFIER ::= { go3gppPib 4 }
    go3gppReqInfoClasses         OBJECT IDENTIFIER ::= { go3gppEventInfoClasses 1 }
    go3gppDecInfoClasses         OBJECT IDENTIFIER ::= { go3gppEventInfoClasses 2 }
    go3gppReportClasses          OBJECT IDENTIFIER ::= { go3gppPib 5 }
    go3gppConformance            OBJECT IDENTIFIER ::= { go3gppPib 6 }



---- ------------------------------------------------------------
----
---- Capability and Limitation Policy Rule Classes
```

```
--

--
-- 3GPP GO Capability Table
--

   go3gppAuthReqCapTable OBJECT-TYPE
       SYNTAX         SEQUENCE OF Go3gppAuthReqCapEntry
       PIB-ACCESS     notify
       STATUS         current
       DESCRIPTION
           "The 3GPP Go Authorization Request Capability PRC."
       ::= { go3gppCapabilityClasses 1 }


   go3gppAuthReqCapEntry OBJECT-TYPE
       SYNTAX         Go3gppAuthReqCapEntry
       STATUS         current
       DESCRIPTION
           "An instance of the go3gppAuthReqCap class identifies a
           specific PRC and associated attributes as supported
           by the device."

       PIB-INDEX { go3gppAuthReqCapPrid }
       UNIQUENESS { }
       ::= { go3gppAuthReqCapTable 1 }


   Go3gppAuthReqCapEntry ::= SEQUENCE {
           go3gppAuthReqCapPrid          InstanceId,
           go3gppAuthReqCapBindingInfos  Unsigned32,
           go3gppAuthReqCapFlowIds       Unsigned32
   }


   go3gppAuthReqCapPrid OBJECT-TYPE
       SYNTAX         InstanceId
       STATUS         current
       DESCRIPTION
           "An arbitrary integer index that uniquely identifies an
           instance of the go3gppAuthReqCap class."
       ::= { go3gppAuthReqCapEntry 1 }


   go3gppAuthReqCapBindingInfos OBJECT-TYPE
       SYNTAX         Unsigned32
       STATUS         current
       DESCRIPTION
           "Indication of the maximum number of Binding Information
           the PEP can send with each Authorization Request.
           The value of zero indicates limit is not specified."
       DEFVAL  { 0 }
       ::= { go3gppAuthReqCapEntry 2 }


   go3gppAuthReqCapFlowIds OBJECT-TYPE
       SYNTAX         Unsigned32
       STATUS         current
       DESCRIPTION
           "Indication of the maximum number of Flow IDidentifiers the PEP can
           send with each Authorization Request.
           The value of zero indicates limit is not specified."
       DEFVAL  { 0 }
       ::= { go3gppAuthReqCapEntry 3 }


--
-- Go 3GPP Authorization Request Decision Capabilities
--

   go3gppAuthReqDecCapTable OBJECT-TYPE
       SYNTAX         SEQUENCE OF Go3gppAuthReqDecCapEntry
       PIB-ACCESS     notify
       STATUS         current
       DESCRIPTION
           "The 3GPP Go Authorization Request Decision Capability PRC."
       ::= { go3gppCapabilityClasses 2 }
```

```
go3gppAuthReqDecCapEntry OBJECT-TYPE
    SYNTAX         Go3gppAuthReqDecCapEntry
    STATUS         current
    DESCRIPTION
        "An instance of the go3gppAuthReqDecCap class identifies a
        specific PRC and associated attributes as supported
        by the device."

    PIB-INDEX { go3gppAuthReqDecCapPrid }
    UNIQUENESS { }
    ::= { go3gppAuthReqDecCapTable 1 }


Go3gppAuthReqDecCapEntry ::= SEQUENCE {
        go3gppAuthReqDecCapPrid           InstanceId,
        go3gppAuthReqDecCapIcids          Unsigned32
}

go3gppAuthReqDecCapPrid OBJECT-TYPE
    SYNTAX         InstanceId
    STATUS         current
    DESCRIPTION
        "An arbitrary integer index that uniquely identifies an
        instance of the go3gppAuthReqDecCap class."
    ::= { go3gppAuthReqDecCapEntry 1 }

go3gppAuthReqDecCapIcids OBJECT-TYPE
    SYNTAX         Unsigned32
    STATUS         current
    DESCRIPTION
        "Indication of the maximum number of Icid possible
        in a single Authorization Request Decision.
        The value of zero indicates limit is not specified."
    DEFVAL  { 0 }
    ::= { go3gppAuthReqDecCapEntry 2 }



--
-- Component Limitations Table
--
-- This table supports the ability to export information
-- detailing provisioning class/attribute implementation limitations
-- to the policy decision function. This Component Limitiations Table
-- shall be implementation dependant and does not need to be standardized.


-- ------------------------------------------------------------
--
-- 3GPP GO Event Handler Provisioning Classes
--
-- PRCs sent from PDF to PEP for indicating how to handle each
-- kind of event that require actions by the GO interface.
--
-- For 3GPP Release 5, PRCs for Event Handling of Authorization
-- Request containing Binding Information, Flow ~~ID~~identifiers, and QoS is
-- specified.
--

--
-- 3GPP GO Authorization Request Event Handler Provisioning Table
--

go3gppAuthReqHandlerTable OBJECT-TYPE
    SYNTAX         SEQUENCE OF Go3gppAuthReqHandlerEntry
    PIB-ACCESS     install
    STATUS         current
    DESCRIPTION
        "PRC from PDF to PEP carried by COPS DEC messages
        indicating GO actions to take at the GGSN when an Authorization
        Request Event is detected by the GGSN.  An example of an
        Authorization Request Event is the receive of a PDP Context message."
    ::= { go3gppEventHandlerClasses 1 }


go3gppAuthReqHandlerEntry OBJECT-TYPE
```

```
        SYNTAX         Go3gppAuthReqHandlerEntry
        STATUS         current
        DESCRIPTION
            "An instance of the go3gppAuthReqHandler class sent by the PDF to
            the PEP what the PEP should send upon detection of an Authorization
            Request Event."
        PIB-INDEX { go3gppAuthReqHandlerPrid }
        UNIQUENESS { go3gppAuthReqHandlerEnable,
                     go3gppAuthReqHandlerBindingInfo
                   }
        ::= { go3gppAuthReqHandlerTable 1 }


    Go3gppAuthReqHandlerEntry ::= SEQUENCE {
            go3gppAuthReqHandlerPrid         InstanceId,
            go3gppAuthReqHandlerEnable       INTEGER,
            go3gppAuthReqHandlerBindingInfo  Unsigned32
    }


    go3gppAuthReqHandlerPrid OBJECT-TYPE
        SYNTAX         InstanceId
        STATUS         current
        DESCRIPTION
            "An arbitrary integer index that uniquely identifies an
            instance of this class."
        ::= { go3gppAuthReqHandlerEntry 1 }


    go3gppAuthReqHandlerEnable OBJECT-TYPE
        SYNTAX         INTEGER {
                           enable(1),
                           disable(2)
                       }
        STATUS         current
        DESCRIPTION
            "Controls the usage of 3GPP Authorization Request Events
            to trigger COPS requests to PDF on the go interface."
        DEFVAL { enable }
        ::= { go3gppAuthReqHandlerEntry 2 }


    go3gppAuthReqHandlerBindingInfo OBJECT-TYPE
        SYNTAX         Unsigned32
        STATUS         current
        DESCRIPTION
            "Indication of the maximum number of Binding Information
            be associated with a each Authorizating Request.
            The value of zero indicates policy control does not impose
            any limit."
        DEFVAL  { 0 }
        ::= { go3gppAuthReqHandlerEntry 3 }



    ----------------------------------------------------------------
    --
    -- 3GPP GO Event Classes
    --
    -- PRCs from PEP to PDF carried by COPS REQ messages
    -- indicating the detection of specific events in the GGSN.
    -- Information required for PDF to make decision on behave
    -- of GGSN is also defined here to be carried by REQ messages.
    --

    --
    -- 3GPP GO Authorization Request Event Table
    --
    go3gppAuthReqEventTable OBJECT-TYPE
        SYNTAX         SEQUENCE OF Go3gppAuthReqEventEntry
        PIB-ACCESS     notify
        STATUS         current
        DESCRIPTION
            "PRC for indication of Authorization Request Event
            and its relevant information.
            Sent by PEP to PDF upon receive of an Authorization
            Request.  Using COPS REQ message."
        ::= { go3gppEventClasses 1 }
```

```
go3gppAuthReqEventEntry OBJECT-TYPE
    SYNTAX         Go3gppAuthReqEventEntry
    STATUS         current
    DESCRIPTION
        "An entry in the Authorization Request Event Table
        describe a single Event sent by the PEP to the PDF."
    PIB-INDEX { go3gppAuthReqEventPrid }
    UNIQUENESS { }
    ::= { go3gppAuthReqEventTable 1 }


Go3gppAuthReqEventEntry ::= SEQUENCE {
        go3gppAuthReqEventPrid         InstanceId,
        go3gppAuthReqEventBindingInfos Prid
}


go3gppAuthReqEventPrid OBJECT-TYPE
    SYNTAX         InstanceId
    STATUS         current
    DESCRIPTION
        "An arbitrary integer index that uniquely identifies an
        instance of the go3gppAuthReqEvent class."
    ::= { go3gppAuthReqEventEntry 1 }


go3gppAuthReqEventBindingInfos OBJECT-TYPE
    SYNTAX         Prid
    STATUS         current
    DESCRIPTION
        "References the first of a list of go3gppBindingInfo
        class instances that are associated with this
        Authorization Request Event.
        A value of zeroDotZero indicates there are no
        go3gppBindingInfo class instance associated with
        this Authorization Event."
    ::= { go3gppAuthReqEventEntry 2 }


--
-- 3GPP Go Event Request Info Classes
--

--
-- 3GPP GO Binding Information Table
--
go3gppBindingInfoTable OBJECT-TYPE
    SYNTAX         SEQUENCE OF Go3gppBindingInfoEntry
    PIB-ACCESS     notify
    STATUS         current
    DESCRIPTION
        "PRC representing Binding Information.
        Sent by PEP to PDF as part of an Authorization
        Request.  In a COPS REQ message."
    ::= { go3gppReqInfoClasses 1 }


go3gppBindingInfoEntry OBJECT-TYPE
    SYNTAX         Go3gppBindingInfoEntry
    STATUS         current
    DESCRIPTION
        "An entry in the Binding Information Table
        describing a single Binding Info.
        Each entry is referenced by go3gppAuthReqEventBindingInfos
        or go3gppBindingInfoNext."
    PIB-INDEX { go3gppBindingInfoPrid }
    UNIQUENESS { }
    ::= { go3gppBindingInfoTable 1 }


Go3gppBindingInfoEntry ::= SEQUENCE {
        go3gppBindingInfoPrid          InstanceId,
        go3gppBindingInfoToken         OCTET STRING,
        go3gppBindingInfoFlowIds       Prid,
        go3gppBindingInfoNext          Prid
}
```

```
    go3gppBindingInfoPrid OBJECT-TYPE
        SYNTAX          InstanceId
        STATUS          current
        DESCRIPTION
            "An arbitrary integer index that uniquely identifies an
            instance of the go3gppBindingInfo class."
        ::= { go3gppBindingInfoEntry 1 }


    go3gppBindingInfoToken OBJECT-TYPE
        SYNTAX          OCTET STRING
        STATUS          current
        DESCRIPTION
            "The Authorization Token associated with this
            instance of the go3gppBindingInfo class.
            Each Binding Information must have a Token."
        ::= { go3gppBindingInfoEntry 2 }


    go3gppBindingInfoFlowIds OBJECT-TYPE
        SYNTAX          Prid
        STATUS          current
        DESCRIPTION
            "References the first of a list of FlowIds associated
            with this instance of go3gppBindingInfo class.
            This is the anchor of a list of go3gppFlowIdEntry
            Instances.
            A value of zeroDotZero indicates an empty list which
            is an error condition."
        DEFVAL  { zeroDotZero }
        ::= { go3gppBindingInfoEntry 3 }


    go3gppBindingInfoNext OBJECT-TYPE
        SYNTAX          Prid
        STATUS          current
        DESCRIPTION
            "References the next of a list of go3gppBindingInfo
            instances associated with an Authorization Request.
            A value of zeroDotZero indicates this is the last of
            a list of go3gppBindingInfo instances associated with
            an Authorization Request."
        DEFVAL  { zeroDotZero }
        ::= { go3gppBindingInfoEntry 4 }


    ----
    ---- 3GPP Go Authorization Request FlowID Table
    ----
    go3gppFlowIdTable OBJECT-TYPE
        SYNTAX          SEQUENCE OF Go3gppFlowIdEntry
        PIB-ACCESS      notify
        STATUS          current
        DESCRIPTION
            "Represents the collection of FlowIDs."
        ::= { go3gppReqInfoClasses 2 }


    go3gppFlowIdEntry OBJECT-TYPE
        SYNTAX          Go3gppFlowIdEntry
        STATUS          current
        DESCRIPTION
            "Each entry describes a single FlowID."
        PIB-INDEX { go3gppFlowIdPrid }
        UNIQUENESS { }
        ::= { go3gppFlowIdTable 1 }


    Go3gppFlowIdEntry ::= SEQUENCE {
            go3gppFlowIdPrid         InstanceId,
            go3gppFlowIdFlowId       Unsigned32,
            go3gppFlowIdNext         Prid
    }


    go3gppFlowIdPrid OBJECT-TYPE
```

```
        SYNTAX          InstanceId
        STATUS          current
        DESCRIPTION
            "An arbitrary integer index that uniquely identifies an
            instance of the go3gppFlowId class."
        ::= { go3gppFlowIdEntry 1 }


    go3gppFlowIdFlowId OBJECT-TYPE
        SYNTAX          Unsigned32
        STATUS          current
        DESCRIPTION
            "The FlowId itself."
        ::= { go3gppFlowIdEntry 2 }


    go3gppFlowIdNext OBJECT-TYPE
        SYNTAX          Prid
        STATUS          current
        DESCRIPTION
            "References the next FlowId in the list associated with the
            same Binding Information of an Authorization Request.
            This points to a list of go3gppFlowIdEntry Instances.
            A value of zeroDotZero indicates end of the list."
        DEFVAL  { zeroDotZero }
        ::= { go3gppFlowIdEntry 3 }



    ----------------------------------------------------------------
    --
    -- 3GPP Go Authorization Request Decisions
    --
    -- PRCs for carrying the Event Decision send from PDF to PEP,
    -- carried by the COPS DEC message.
    -- These PRCs include support for Gates/Filters, QoS, ICIDs.
    --


    -- Failure Decisions can be defined by use of COPS-PR DEC message
    -- containing first an install decision (with objects indicating
    -- what failed and some indication to the GGSN how to react to this
    -- Error Decision), and second a remove decision (for cleanup of
    -- the installed Error Decision Object).
    --

    -- Failures indicated by PDF to GGSN
    --   Authorization Failure
    --
    --
    -- Authorization Request Failure Decision Table
    --
    go3gppAuthReqFailDecTable OBJECT-TYPE
        SYNTAX          SEQUENCE OF Go3gppAuthReqFailDecEntry
        PIB-ACCESS      install
        STATUS          current
        DESCRIPTION
            "The Authorization failure Table. Indicates failures decisions to the PEP."
        ::= { go3gppDecInfoClasses 1 }


    go3gppAuthReqFailDecEntry OBJECT-TYPE
        SYNTAX          Go3gppAuthReqFailDecEntry
        STATUS          current
        DESCRIPTION
            "Each go3gppAuthReqFailDecEntry is per request."
        PIB-INDEX { go3gppAuthReqFailDecPrid }
        UNIQUENESS { }
        ::= { go3gppAuthReqFailDecTable 1 }


    Go3gppAuthReqFailDecEntry ::= SEQUENCE {
            go3gppAuthReqFailDecPrid        InstanceId,

            go3gppAuthReqFailDecReason      INTEGER
    }

    go3gppAuthReqFailDecPrid OBJECT-TYPE
```

```
        SYNTAX          InstanceId
        STATUS          current
        DESCRIPTION
            "An arbitrary integer index that uniquely identifies an
            instance of the go3gppAuthReqFailDec class."
        ::= { go3gppAuthReqFailDecEntry 1 }



    go3gppAuthReqFailDecReason OBJECT-TYPE
        SYNTAX          INTEGER {
                          noCorrespondingSession (1),
                          invalidBundling (2),
                          authorisationFailure (3)
                        }
        STATUS          current
        DESCRIPTION
            "Reason for Auth Request Failure Decision given by PDF:

             noCorrespondingSession:     No corresponding session was found
                                         by the PDF

             invalidBundling:            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 or if the list
                                         of flow ID identifiers contained in the bearer
authorization
                                         request doesn't match with the grouping indication
                                         information the PDF has received from the P-CSCF.

             authorisationFailure:       The PDF is unable to authorise the binding information.
                                         This is a generic failure indication that can be used
                                         if the actual reason is not any of the other specified
                                         reasons."
        ::= { go3gppAuthReqFailDecEntry 2 }



    --
    -- Authorization Request Decision Table
    --
    go3gppAuthReqDecTable OBJECT-TYPE
        SYNTAX          SEQUENCE OF Go3gppAuthReqDecEntry
        PIB-ACCESS      install
        STATUS          current
        DESCRIPTION
            "The Authorization Request Decision Table. "
        ::= { go3gppDecInfoClasses 2 }


    go3gppAuthReqDecEntry OBJECT-TYPE
        SYNTAX          Go3gppAuthReqDecEntry
        STATUS          current
        DESCRIPTION
            "Each go3gppAuthReqDecEntry is per Authorization Request."
        PIB-INDEX { go3gppAuthReqDecPrid }
        UNIQUENESS { }
        ::= { go3gppAuthReqDecTable 1 }


    Go3gppAuthReqDecEntry ::= SEQUENCE {
            go3gppAuthReqDecPrid       InstanceId,
            go3gppAuthReqDecIcids      Prid,
            go3gppAuthReqDecDirDecs    Prid
    }


    go3gppAuthReqDecPrid OBJECT-TYPE
        SYNTAX          InstanceId
        STATUS          current
        DESCRIPTION
            "An arbitrary integer index that uniquely identifies an
            instance of the go3gppAuthReqDec class."
        ::= { go3gppAuthReqDecEntry 1 }


    go3gppAuthReqDecIcids OBJECT-TYPE
```

```
        SYNTAX          Prid
        STATUS          current
        DESCRIPTION
            "References the first of a list of IcIDs associated
            with this instance of go3gppAuthReqDec class.
            There should be one IcID on this list for each Binding
            Information in the corresponding Authorization Request.
            A value of zeroDotZero indicates an empty list and there
            is no IcID change associated with this Authorization Request
            Decision."
        DEFVAL  { zeroDotZero }
        ::= { go3gppAuthReqDecEntry 2 }


    go3gppAuthReqDecDirDecs OBJECT-TYPE
        SYNTAX          Prid
        STATUS          current
        DESCRIPTION
            "References the first of a list of Directional Decisions
            associated with this instance of go3gppAuthReqDec class.
            There should be at least one and at most two Directional
            Decisions per Authorization Request Decision.
            Hence a value of zeroDotZero is illegal."
        ::= { go3gppAuthReqDecEntry 3 }


--
-- 3GPP Go ICID Table
--
    go3gppIcidTable OBJECT-TYPE
        SYNTAX          SEQUENCE OF Go3gppIcidEntry
        PIB-ACCESS      install
        STATUS          current
        DESCRIPTION
            "Represents the collection of ICID entries"
        ::= { go3gppDecInfoClasses 3 }


    go3gppIcidEntry OBJECT-TYPE
        SYNTAX          Go3gppIcidEntry
        STATUS          current
        DESCRIPTION
            "Represents the ICID Entry"
        PIB-INDEX { go3gppIcidPrid }
        UNIQUENESS { go3gppIcidValue }
        ::= { go3gppIcidTable 1 }


    Go3gppIcidEntry ::= SEQUENCE {
            go3gppIcidPrid            InstanceId,
            go3gppIcidValue           OCTET STRING,
            go3gppIcidNext            Prid
    }


    go3gppIcidPrid OBJECT-TYPE
        SYNTAX          InstanceId
        STATUS          current
        DESCRIPTION
            "An arbitrary integer index that uniquely identifies an
            instance of the go3gppIcid class."
        ::= { go3gppIcidEntry 1 }


    go3gppIcidValue OBJECT-TYPE
        SYNTAX          OCTET STRING
        STATUS          current
        DESCRIPTION
            "The ICID itself. The syntax of this OBJECT-TYPE needs to be confirmed. "
        ::= { go3gppIcidEntry 2 }


    go3gppIcidNext OBJECT-TYPE
        SYNTAX          Prid
        STATUS          current
        DESCRIPTION
            "References the next go3gppIcidEntry of a list of ICeIDs
            associated with this instance of go3gppAuthReqDec class.
```

```
            There should be one ICcID on this list for each Binding
            Information in the corresponding Authorization Request.
            A value of zeroDotZero indicates the end of the list of
            ICcIDs associated with an Authorization Request Decision."
        DEFVAL  { zeroDotZero }
        ::= { go3gppIcidEntry 3 }


    --
    -- 3GPP Go Authorization Request Directional Decision Table
    --
       go3gppAuthReqDirDecTable OBJECT-TYPE
           SYNTAX         SEQUENCE OF Go3gppAuthReqDirDecEntry
           PIB-ACCESS     install
           STATUS         current
           DESCRIPTION
               "This table represents the authorization request decision for
                unique direction (e.g. uplink and downlink)."
           ::= { go3gppDecInfoClasses 4 }


       go3gppAuthReqDirDecEntry OBJECT-TYPE
           SYNTAX         Go3gppAuthReqDirDecEntry
           STATUS         current
           DESCRIPTION
               "There should be one of these per direction per AuthReqDec."
           PIB-INDEX { go3gppAuthReqDirDecPrid }
           UNIQUENESS { }
           ::= { go3gppAuthReqDirDecTable 1 }


       Go3gppAuthReqDirDecEntry ::= SEQUENCE {
               go3gppAuthReqDirDecPrid      InstanceId,
               go3gppAuthReqDirDecDirection INTEGER,
               go3gppAuthReqDirDecQos       Prid,
               go3gppAuthReqDirDecGates     Prid,
               go3gppAuthReqDirDecNext      Prid
       }


       go3gppAuthReqDirDecPrid OBJECT-TYPE
           SYNTAX         InstanceId
           STATUS         current
           DESCRIPTION
               "An arbitrary integer index that uniquely identifies an
               instance of the go3gppAuthReqDirDec class."
           ::= { go3gppAuthReqDirDecEntry 1 }


       go3gppAuthReqDirDecDirection OBJECT-TYPE
           SYNTAX         INTEGER {
                               uplink   (1),
                               downlink (2)
                          }
           STATUS         current
           DESCRIPTION
               "Indicates the direction this decision applies to."
           ::= { go3gppAuthReqDirDecEntry 2 }


       go3gppAuthReqDirDecQos OBJECT-TYPE
           SYNTAX         Prid
           STATUS         current
           DESCRIPTION
               " The Authorized QoS. References the go3gppQos class."
           ::= { go3gppAuthReqDirDecEntry 3 }


       go3gppAuthReqDirDecGates OBJECT-TYPE
           SYNTAX         Prid
           STATUS         current
           DESCRIPTION
               "References the first instance of a list of the go3gppGate class."
           ::= { go3gppAuthReqDirDecEntry 4 }


       go3gppAuthReqDirDecNext OBJECT-TYPE
           SYNTAX         Prid
```

```
        STATUS         current
        DESCRIPTION
            "References the next instance of a list of
            go3gppAuthReqDirDec class."
        ::= { go3gppAuthReqDirDecEntry 5 }


--
-- 3GPP Go QoS Table
--
    go3gppQosTable OBJECT-TYPE
        SYNTAX         SEQUENCE OF Go3gppQosEntry
        PIB-ACCESS     install
        STATUS         current
        DESCRIPTION
            "This table represents the Authorised QoS.
            It is referenced by the go3gppAuthReqDirDecQos entry of the
            go3gppAuthReqDirDecEntry  class."
        ::= { go3gppDecInfoClasses 5 }


    go3gppQosEntry OBJECT-TYPE
        SYNTAX         Go3gppQosEntry
        STATUS         current
        DESCRIPTION
            "There should be one of these per direction per AuthReqDec."
        PIB-INDEX { go3gppQosPrid }
        UNIQUENESS { }
        ::= { go3gppQosTable 1 }



    Go3gppQosEntry ::= SEQUENCE {
            go3gppQosPrid                InstanceId,
            go3gppQosServiceClass        INTEGER,
            go3gppQosDataRateUnit        INTEGER,
            go3gppQosDataRate            Unsigned32
    }


    go3gppQosPrid OBJECT-TYPE
        SYNTAX         InstanceId
        STATUS         current
        DESCRIPTION
            "An arbitrary integer index that uniquely identifies an
            instance of the go3gppQos class."
        ::= { go3gppQosEntry 1 }



    go3gppQosServiceClass OBJECT-TYPE
        SYNTAX         INTEGER {
                         QqosSclassA    (1),
                         QqosSclassB    (2),
                         QqosSclassC    (3),
                         QqosSclassD    (4),
                         QqosSclassE    (5),
                         QqosSclassF    (6)
                       }
        STATUS         current
        DESCRIPTION
            "The QoS Service Class indicates the highest authorized QoS class."
        ::= { go3gppQosEntry 2 }


    go3gppQosDataRateUnit OBJECT-TYPE
        SYNTAX         INTEGER {
                         bps     (1),
                         kbps    (2),
                         mbps    (3)
                       }
        STATUS         current
        DESCRIPTION
            "Indication of the unit of measure for go3gppQosDataRate,
             in bits per second, kilo bits per second, or mega bits per
             second."
        ::= { go3gppQosEntry 3 }
```

```
   go3gppQosDataRate OBJECT-TYPE
       SYNTAX         Unsigned32
       STATUS         current
       DESCRIPTION
           "The Data Rate with unit of measure indicated by
           go3gppQosDataRateUnit."
       ::= { go3gppQosEntry 4 }



--
-- 3GPP Go Gate Decision Table
--
--
-- There could be one of these per direction per GateDec.
--
-- This is for changing Gating Status only when used alone
-- (not as part of Direction Decision).

-- go3gppGateDec is sent in a different COPS DEC message
-- from the DEC message carrying go3gppAuthReqDec. PDF must
-- have sent a go3gppAuthReqDec before using go3gppGateDec.

   go3gppGateDecTable OBJECT-TYPE
       SYNTAX         SEQUENCE OF Go3gppGateDecEntry
       PIB-ACCESS     install
       STATUS         current
       DESCRIPTION
           "This table represents an updated gating decision."
       ::= { go3gppDecInfoClasses 6 }


   go3gppGateDecEntry OBJECT-TYPE
       SYNTAX         Go3gppGateDecEntry
       STATUS         current
       DESCRIPTION
           "There should be one of these per direction per AuthReqDec."
       PIB-INDEX { go3gppGateDecPrid }
       UNIQUENESS { }
       ::= { go3gppGateDecTable 1 }



   Go3gppGateDecEntry ::= SEQUENCE {
           go3gppGateDecPrid           InstanceId,
           go3gppGateDecDirection      INTEGER,
           go3gppGateDecGates          Prid,
           go3gppGateDecNext           Prid
   }


   go3gppGateDecPrid OBJECT-TYPE
       SYNTAX         InstanceId
       STATUS         current
       DESCRIPTION
           "An arbitrary integer index that uniquely identifies an
           instance of the go3gppGateDec class."
       ::= { go3gppGateDecEntry 1 }



   go3gppGateDecDirection OBJECT-TYPE
       SYNTAX         INTEGER {
                           uplink   (1),
                           downlink (2)
                      }
       STATUS         current
       DESCRIPTION
           "References the gate direction."
       ::= { go3gppGateDecEntry 2 }

    go3gppGateDecGates OBJECT-TYPE
       SYNTAX         Prid
       STATUS         current
       DESCRIPTION
           "References the first instance of a list of go3gppGate class."
       ::= { go3gppGateDecEntry 3 }
```

```
   go3gppGateDecNext OBJECT-TYPE
       SYNTAX         Prid
       STATUS         current
       DESCRIPTION
           "References the next instance of a list of go3gppGateDec class."
       ::= { go3gppGateDecEntry 4 }



--
-- 3GPP Go Gate Table
--
   go3gppGateTable OBJECT-TYPE
       SYNTAX         SEQUENCE OF Go3gppGateEntry
       PIB-ACCESS     install
       STATUS         current
       DESCRIPTION
           "PRC representing a Gate."
       ::= { go3gppDecInfoClasses 7 }


   go3gppGateEntry OBJECT-TYPE
       SYNTAX         Go3gppGateEntry
       STATUS         current
       DESCRIPTION
           "Each instance represents one Gate."
       PIB-INDEX { go3gppGatePrid }
       UNIQUENESS { }
       ::= { go3gppGateTable 1 }


   Go3gppGateEntry ::= SEQUENCE {
           go3gppGatePrid              InstanceId,
           go3gppGateFilter            Prid,
           go3gppGateStatus            INTEGER,
           go3gppGateNext              Prid
   }


   go3gppGatePrid OBJECT-TYPE
       SYNTAX         InstanceId
       STATUS         current
       DESCRIPTION
           "An arbitrary integer index that uniquely identifies an
           instance of the go3gppGate class."
       ::= { go3gppGateEntry 1 }



   go3gppGateFilter OBJECT-TYPE
       SYNTAX         Prid
       STATUS         current
       DESCRIPTION
           "References an entry in frwkIpFilterTable (Framework PIB)
           that describes the applicable classification filter.

           When a decision requiring the definition of an IP filter
           is sent to the GGSN, the IP filter will be represented by the
           IP filter definition frwkIpFilterTable, provided by the
           Framework PIB, RFC 3318. Such IP filter frwkIpFilterTable
           must be part of the same decision message. The attribute
           go3gppGateFilter is used to reference the frwkIpFilterTable
           entry for this Gate.

           The following attributes of the frwkIpFilterTable are not required,
           and shall have a length of 0 in its encoding:
           frwkBaseFilterNegation, frwkIpFilterDscp, and frwkIpFilterFlowId

           A value of zeroDotZero indicates no filter is
           used with this go3gppGate."
       ::= { go3gppGateEntry 2 }

   go3gppGateStatus OBJECT-TYPE

       SYNTAX         INTEGER {
```

```
                        close  (1),
                        open   (2)
                    }
        STATUS          current
        DESCRIPTION
            "Indicates if this gate will allow traffic to flow."
     DEFVAL  { close }
        ::= { go3gppGateEntry 3 }

    go3gppGateNext OBJECT-TYPE
        SYNTAX          Prid
        STATUS          current
        DESCRIPTION
            "Reference the next Gate on a list of go3gppGate instances.
            A value of zeroDotZero indicates this is the last Gate
            on the list."
        ::= { go3gppGateEntry 4 }

--  ------------------------------------------------------------
--
--  3GPP Go Reports
--
--  PRCs for carrying the Decision enforcement result sent from PEP to PDF,
--  carried using the COPS REPORT message.
--  These PRCs include support for the success or failure of the PEP in
--  carrying out the PDF's decision or -change of the state in the GGSN.
--

    go3gppReportTable OBJECT-TYPE
        SYNTAX          SEQUENCE OF Go3gppReportEntry
        PIB-ACCESS      notify
        STATUS          current
        DESCRIPTION
            "This table represents the success or failure of the decision enforcement and
            state changes in the PEP."
        ::= { go3gppReportClasses 1 }


    go3gppReportEntry OBJECT-TYPE
        SYNTAX          Go3gppReportEntry
        STATUS          current
        DESCRIPTION
            ""
        PIB-INDEX { go3gppReportPrid }
        UNIQUENESS { }
        ::= { go3gppReportTable 1 }


    Go3gppReportEntry ::= SEQUENCE {
            go3gppReportPrid       InstanceId,
            go3gppReportStatus     INTEGER,
            go3gppReportDetails    Prid }


    go3gppReportPrid OBJECT-TYPE
        SYNTAX          InstanceId
        STATUS          current
        DESCRIPTION
            "An arbitrary integer index that uniquely identifies an
            instance of the go3gpgReport class."
            ::= { go3gppReportEntry 1 }


    go3gppReportStatus OBJECT-TYPE
        SYNTAX          INTEGER {
                                success (1),
                                failure (2),
                                usage   (3) }
        STATUS          current
        DESCRIPTION
            "When Status is:
               success: Indicates the successful implementation of the
                        decision.
                        go3gppReportDetails:
                          Reference an instance of go3gppRprtGPRSChrgInfo
                          for initial authorization request decision;
                          References nothing otherwise (contains the value
```

```
                        zeroDotZero).

            Failure: Indicates the failure of implementing the decision.

                     go3gppReportDetails may references an Error object,
                     or may have the value zeroDotZero when no error
                     object is needed, in which case COPS and COPS-PR
                     error codes and error objects are sufficient.
            Usage:   go3gppReportDetails references an instance of
                     go3gppRprtUsage class."

    ::= { go3gppReportEntry 2 }


go3gppReportDetails OBJECT-TYPE
    SYNTAX         Prid
    STATUS         current
    DESCRIPTION
        "May reference an instance of go3gppRprtGPRSChrgInfo,
        go3gppRprtError(not defined), or go3gppRprtUsage class,
        or may have the value of zeroDotZero depending on the value of
        go3gppReportStatus."
    ::= { go3gppReportEntry 3 }


go3gppRprtGPRSChrgInfoTable OBJECT-TYPE
    SYNTAX         SEQUENCE OF Go3gppRprtGPRSChrgInfoEntry
    PIB-ACCESS     notify
    STATUS         current
    DESCRIPTION
        "This table represents the GPRS Charging information"
    ::= { go3gppReportClasses 2 }


go3gppRprtGPRSChrgInfoEntry OBJECT-TYPE
    SYNTAX         go3gppRprtGPRSChrgInfoEntry
    STATUS         current
    DESCRIPTION
        "This entry represents the GPRS Charging Identifier and GGSN address."
    PIB-INDEX { go3gppRprtGPRSChrgInfoPrid }
    UNIQUENESS { go3gppRprtGPRSChrgInfoAddrType,
                 go3gppRprtGPRSChrgInfoGGSNAddr,
                 go3gppRprtGPRSChrgInfoGCID }
    ::= { go3gppRprtGPRSChrgInfoTable 1 }


go3gppRprtGPRSChrgInfoEntry ::= SEQUENCE {
        go3gppRprtGPRSChrgInfoPrid       InstanceId,

        go3gppRprtGPRSChrgInfoAddrType   InetAddressType,

        go3gppRprtGPRSChrgInfoGGSNAddr   InetAddress,
        go3gppRprtGPRSChrgInfoGCID       OCTET STRING }


go3gppRprtGPRSChrgInfoPrid OBJECT-TYPE
    SYNTAX         InstanceId
    STATUS         current
    DESCRIPTION
        "An arbitrary integer index that uniquely identifies an
        instance of the go3gpgRprtGPRSChrgInfo class."
        ::= { go3gppRprtGPRSChrgInfoEntry 1 }

go3gppRprtGPRSChrgInfoAddrType OBJECT-TYPE
    SYNTAX         InetAddressType
    STATUS         current
    DESCRIPTION
        "The address type enumeration value to specify
         the type of the packet's IP address."
    REFERENCE
        "Textual Conventions for Internet Network Addresses [INETADDR]."
    ::= { go3gppRprtGPRSChrgInfoEntry 2 }

go3gppRprtGPRSChrgInfoGGSNAddr OBJECT-TYPE
    SYNTAX         InetAddress
    STATUS         current
    DESCRIPTION
        "Contains the IP Address of the GGSN providing the GCID
```

```
            upon successful handling of an Authorization Request."
        REFERENCE
            "Textual Conventions for Internet Network Addresses [INETADDR]."
            ::= { go3gppRprtGPRSChrgInfoEntry 3 }


    go3gppRprtGPRSChrgInfoGCID OBJECT-TYPE
        SYNTAX          OCTET STRING
        STATUS          current
        DESCRIPTION
            "The GPRS Charging ID related to this Authorization Request."
        ::= { go3gppRprtGPRSChrgInfoEntry 4 }


--
-- Notice go3gppRprtError PRC is currently not defined because all
-- error condition handling is satisfactorily covered by using the
-- standard COPS-PR error handling mechanism and error objects.
-- go3gppRprtError PRC should only be used for 3GPP GO Application
-- error indications if necessary.
--

    go3gppRprtUsageTable OBJECT-TYPE
        SYNTAX          SEQUENCE OF Go3gppRprtUsageEntry
        PIB-ACCESS      notify
        STATUS          current
        DESCRIPTION
            ""
        ::= { go3gppReportClasses 3 }


    go3gppRprtUsageEntry OBJECT-TYPE
        SYNTAX          Go3gppRprtUsageEntry
        STATUS          current
        DESCRIPTION
            "This entry represents the PEP state changes."
        PIB-INDEX { go3gppRprtUsagePrid }
        UNIQUENESS { go3gppRprtUsageIndication }
        ::= { go3gppRprtUsageTable 1 }


    Go3gppRprtUsageEntry ::= SEQUENCE {
            go3gppRprtUsagePrid        InstanceId,
            go3gppRprtUsageIndication  INTEGER }



    go3gppRprtUsagePrid OBJECT-TYPE
        SYNTAX          InstanceId
        STATUS          current
        DESCRIPTION
            "An arbitrary integer index that uniquely identifies an
            instance of the go3gpgRprtUsage class."
            ::= { go3gppRprtUsageEntry 1 }


    go3gppRprtUsageIndication OBJECT-TYPE
        SYNTAX          INTEGER {
                          chngdTo0kbs   (1),
                          chngdFrom0kbs (2) }
        STATUS          current
        DESCRIPTION
            "Indication of GPRS Usage change.
            chngdTo0kbs indicates changing to 0kbs,
            chngdFrom0kbs indicates changing from 0kbs."
            ::= { go3gppRprtUsageEntry 2 }


-- ------------------------------------------------------------
--
-- Conformance Section
--

    go3gppCompliances         OBJECT IDENTIFIER ::= { go3gppConformance 1 }
    go3gppGroups              OBJECT IDENTIFIER ::= { go3gppConformance 2 }


  go3gppCompliance MODULE-COMPLIANCE
```

```
        STATUS  current
        DESCRIPTION
                "Describes the requirements for conformance to the
                3GPP GO PIB."


        MODULE FRAMEWORK-PIB               -- Defined in RFC 3318 [15]
            MANDATORY-GROUPS {
                frwkPrcSupportGroup,
                frwkDeviceIdGroup,
                frwkBaseFilterGroup,
                frwkIpFilterGroup }


        MODULE GO3GPP-PIB -- this module
            MANDATORY-GROUPS {
                go3gppAuthReqCapGroup,
                go3gppAuthReqDecCapGroup,
                go3gppAuthReqHandlerGroup,
                go3gppAuthReqEventGroup,
                go3gppBindingInfoGroup,
                go3gppFlowIdGroup,
                go3gppAuthReqFailDecGroup,
                go3gppAuthReqDecGroup,
                go3gppIcidGroup,
                go3gppAuthReqDirDecGroup,
                go3gppQosGroup,
                go3gppGateDecGroup,
                go3gppGateGroup,
                go3gppReportGroup,
                go3gppRprtGPRSChrgInfoGroup,
                go3gppRprtUsageGroup }
        ::= { go3gppCompliances 1 }



    go3gppAuthReqCapGroup OBJECT-GROUP
        OBJECTS {
        go3gppAuthReqCapBindingInfos,
        go3gppAuthReqCapFlowIds
        }
        STATUS current
        DESCRIPTION
            "This Group defines the PIB Objects that describe the
             Authorisation Request capabilities."
        ::= { go3gppGroups 1 }

    go3gppAuthReqDecCapGroup OBJECT-GROUP
        OBJECTS {
        go3gppAuthReqDecCapIcids
        }
        STATUS current
        DESCRIPTION
            "This Group defines the PIB
            Objects that describe the Authorisation Decision capabilities."
        ::= { go3gppGroups 2 }

    go3gppAuthReqHandlerGroup OBJECT-GROUP
        OBJECTS {
        go3gppAuthReqHandlerEnable,
        go3gppAuthReqHandlerBindingInfo
        }
        STATUS current
        DESCRIPTION
            "This Group defines the PIB
            Objects that describe the Authorisation request event handler."
        ::= { go3gppGroups 3 }

    go3gppAuthReqEventGroup OBJECT-GROUP
        OBJECTS {
        go3gppAuthReqEventBindingInfos
        }
        STATUS current
        DESCRIPTION
            "This Group defines the PIB
            Objects that describe the Authorisation request events."
        ::= { go3gppGroups 4 }
```

```
    go3gppBindingInfoGroup OBJECT-GROUP
        OBJECTS {
        go3gppBindingInfoToken,
        go3gppBindingInfoFlowIds,
        go3gppBindingInfoNext
        }
        STATUS current
        DESCRIPTION
           "This Group defines the PIB
           Objects that describe the binding information."
        ::= { go3gppGroups 5 }

    go3gppFlowIdGroup OBJECT-GROUP
        OBJECTS {
        go3gppFlowIdFlowId,
        go3gppFlowIdNext
        }
        STATUS current
        DESCRIPTION
           "This Group defines the PIB
           Objects that describe the flow identifierID."
        ::= { go3gppGroups 6 }

    go3gppAuthReqFailDecGroup OBJECT-GROUP
        OBJECTS {

        go3gppAuthReqFailDecReason
        }
        STATUS current
        DESCRIPTION
           "This Group defines the PIB
           Objects that describe the Authorisation failure decisions."
        ::= { go3gppGroups 7 }

    go3gppAuthReqDecGroup OBJECT-GROUP
        OBJECTS {
        go3gppAuthReqDecIcids,
        go3gppAuthReqDecDirDecs
        }
        STATUS current
        DESCRIPTION
           "This Group defines the PIB
           Objects that describe the Authorisation decisions."
        ::= { go3gppGroups 8 }

    go3gppIcidGroup OBJECT-GROUP
        OBJECTS {
        go3gppIcidValue,
        go3gppIcidNext
        }
        STATUS current
        DESCRIPTION
           "This Group defines the PIB
           Objects that describe the ICID."
        ::= { go3gppGroups 9 }

    go3gppAuthReqDirDecGroup OBJECT-GROUP
        OBJECTS {
        go3gppAuthReqDirDecDirection,
        go3gppAuthReqDirDecQos,
        go3gppAuthReqDirDecGates,
        go3gppAuthReqDirDecNext
        }
        STATUS current
        DESCRIPTION
           "This Group defines the PIB
           Objects that describe the authorisation decision direction."
        ::= { go3gppGroups 10 }

    go3gppQosGroup OBJECT-GROUP
        OBJECTS {
        go3gppQosServiceClass,
        go3gppQosDataRateUnit,
        go3gppQosDataRate
        }
        STATUS current
        DESCRIPTION
```

```
            "This Group defines the PIB
            Objects that describe the QoS information."
        ::= { go3gppGroups 11 }

    go3gppGateDecGroup OBJECT-GROUP
        OBJECTS {
        go3gppGateDecDirection,
        go3gppGateDecGates,
        go3gppGateDecNext
        }
        STATUS current
        DESCRIPTION
            "This Group defines the PIB
            Objects that describe the Gate decision."
        ::= { go3gppGroups 12 }

    go3gppGateGroup OBJECT-GROUP
        OBJECTS {
        go3gppGateFilter,
        go3gppGateStatus,
        go3gppGateNext
        }
        STATUS current
        DESCRIPTION
            "This Group defines the PIB
            Objects that describe the gate."
        ::= { go3gppGroups 13 }



    go3gppReportGroup OBJECT-GROUP
        OBJECTS {
        go3gppReportStatus,
        go3gppReportDetails
        }
        STATUS current
        DESCRIPTION
            "This Group defines the PIB
            Objects that describe the PEP reports."
        ::= { go3gppGroups 14 }

    go3gppRprtGPRSChrgInfoGroup OBJECT-GROUP
        OBJECTS {
        go3gppRprtGPRSChrgInfoAddrType,
        go3gppRprtGPRSChrgInfoGGSNAddr,
        go3gppRprtGPRSChrgInfoGCID
        }
        STATUS current
        DESCRIPTION
            "This Group defines the PIB
            Objects that describe the charging information."
        ::= { go3gppGroups 15 }

    go3gppRprtUsageGroup OBJECT-GROUP
        OBJECTS {
        go3gppRprtUsageIndication
        }
        STATUS current
        DESCRIPTION
            "This Group defines the PIB
            Objects that describe the report usage."
        ::= { go3gppGroups 16 }


    END
```

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

C.~~1~~ 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 3GPP TS 24.008 [12].

Media component no.	IP flow no.

C.~~2~~ 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 identifier.
RTP	49160	<2,1>
Associated RTCP	49161	<2,2>

C.~~3~~ 3 Example 2

In the general case, multiple ports may be specified with a ~~"~~"number of ports~~"~~" qualifier as follows, ~~ref.~~RFC 2327 [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 identifier.
First RTP	49170	<3,1>
First associated RTCP	49171	<3,2>
Second RTP	49172	<3,3>
Second associated RTCP	49173	<3,4>

Annex D (normative): Go interface related error code values for the PDP context handling

The following error codes are used to indicate Go interface related errors from the GGSN to the UE. The error codes listed below are transferred to the UE in the Protocol Configuration Options information element as defined in 3GPP -TS -24.008 [12]:

- The error code values transported in the container contents field shall be the binary representations of the error code numbers listed below.

- In all the cases listed below a common GTP cause code, "User authentication failed", see 3GPP TS 29 060 [202], shall be used in the response message.

Error code No. 1 "Authorization failure of the request"

This error code indicates that the PDP context activation/modification request is rejected because the authorizing entity is unable to provide an authorization decision for the binding information.

Error code No. 2 "Missing binding information"

This error code indicates that the PDP context activation/modification request is rejected because the binding information was not included in the request although required.

Error code No. 3 "Invalid binding information"

This error code indicates that the PDP context activation/modification request is rejected because the authorizing entity could not be resolved from the binding information.

Error code No. 4 "Binding information not allowed"

This error code indicates that the PDP context activation/modification request is rejected because the Go interface is disabled or not supported in the GGSN and hence binding information is not allowed.

Error code No.5 "Authorizing entity temporarily unavailable"

This error code indicates that the PDP context activation/modification request is rejected because the authorizing entity indicated by the binding information is temporarily unavailable.

Error code No. 6 "No corresponding session"

This error code indicates that the PDP context activation request is rejected because the authorizing entity cannot associate the binding information with any ongoing session.

Error code No. 7 "Invalid bundling"

This error code indicates that the PDP context activation request is rejected because the authorizing entity doesn't allow the grouping of the flow ~~ID~~identifiers contained in the PDP context activation request to be carried in the requested PDP Context.

Annex E (informative): Overview of the 3GPP Go PIB working mode

When the GGSN initialise for the first time, the PEP instances are initialised. The GGSN will use a TCP connection with the PDF (that will be created as specified in the normative text above section subclause 6.1.1) in order to transport COPS protocol.

Then, the GGSN sends the first COPS REQ message to the PDF indicating capabilities and the supported PRCs. This is done using:

frwkSupportTable containing the supported PRCs and attributes.

frwkDeviceIdTable used to facilitate efficient policy communication by a PDP. The PDP can take into account certain device characteristics during policy installation as hardware and software of the GGSN, or maximum COPS-PR message size.

go3gppAuthReqCapTable indicating the maximum number of Binding Information and maximum number of Flow Identifiers the PEP can send with each Authorization Request.

go3gppAuthReqDecCapTable indicating the maximum number of ICID possible in a single Authorization Request Decision.

Then, the PDF send to the PEP PRCs for indicating how to handle each kind of event that require actions by the Go interface. This is done in a COPS DEC message using:

go3gppAuthReqHandlerTable indicating Go actions to take at the GGSN when an Authorization Request Event is detected by the GGSN (an example of an Authorization Request Event is the receive of a PDP Context message); the maximum number of Binding Information associated with each Authorization Request; and if COPS Req. can be triggered, are also indicated here.

Then, the GGSN will send PRCs to the PDF in a COPS REQ indicating the detection of specific events in the GGSN (i.e. when the GGSN receives the PDP context activation). Information required to PDF on behave of GGSN is carried also by REQ messages. This is done using:

go3gppAuthReqEventTable indicates Authorization Request Event and its relevant information (binding information **go3gppBindingInfoTable**, **go3gppFlowIDTable**).

Then, PRCs carrying the Event Decision sent from PDF to PEP are carried by the COPS DEC message. These PRCs include support for Gates/Filters, QoS, ICIDs.

If the authorization request is rejected (for reasons such as no corresponding session was found by the PDF, incorrect bundling and others) a COPS-PR DEC containing the reason (**go3gppAuthReqFailDecTable**) is sent.

If not, the following PRCs are sent:

go3gppAuthReqDecTable indicates an ICID for each binding information received. To do so, table **go3gppIcidTable** is used. Also for each binding information a Directional Decision is sent (**go3gppAuthreqDirDecTable**)

Within the later the following is indicated:

- The direction where the decision applies (uplink or downlink).
- The Auth QoS (**go3gppQoSTable**) indicating the service class through DSCP encoding, and the data rate to be applied in the PDP requesting authorization.
- The gate definition (**go3gppGateTable**): including status (open/closed), and Ip filter definition through the **frwkBaseFilterTable** and **frwkIpFilterTable** (which includes source and destination address, port, protocol, etc).

There is, also, the possibility of sending, in a different COPS DEC message from the one carrying the go3gppAuthReqDec, information about changing status of the Gate. This is done using the **go3gppGateDecTable**, that includes the direction to which this decision applies and a reference to a go3gppGateTable.

Finally, the PEP will send to the PDF PRCs with the information on the Decision enforcement result. This is done in the COPS REPORT message. These PRCs include support for the success or failure of the PEP in carrying out the PDF's decision or change of the state in the GGSN, and are:

go3gppReportTable will indicate the status of the enforcement: success or failure or usage.

- If success, then, the **go3gppRprtGPRSChrgInfoTable** is sent to indicate the details for charging (GGSN address and GCID).
- If failure, then, the standard COPS-PR error handling mechanism and error objects are enough.
- Usage means that GPRS Usage has changed to 0kbps or from 0kbps. **go3gppUsageTable** is used.

To be conformant to the Go PIB, on top of the Go PIB PRCs defined in ~~this document~~the present document, is mandatory to include from the framework PIB: frwkPrcSupportGroup, frwkDeviceGroup.

To revoke authorization, the PDF or the GGSN can send a COPS DRQ message at any time that this action is required as specified in the normative text.

The Handle included in the COPS message will be used as the unique number to correlate all the COPS messages, with the same dialogue.

Annex F (informative): Change history

Change history							
Date	**TSG #**	**TSG Doc.**	**CR**	**Rev**	**Subject/Comment**	**Old**	**New**
2002-06	NP#16	NP-020167			Approved at NP#16 and placed under change control	2.0.0	5.0.0
2002-09	NP#17	NP-020411	005	1	Revision to the 3GPP Go PIB	5.0.0	5.1.0
2002-09	NP#17	NP-020409	006	1	Authorized QoS vs. guaranteed and maximum bit rates	5.0.0	5.1.0
2002-09	NP#17	NP-020411	007	2	Editorial improvements in the specification	5.0.0	5.1.0
2002-09	NP#17	NP-020411	010	1	SBLP Gate Decision	5.0.0	5.1.0
2002-09	NP#17	NP-020413	011	1	Remove incomplete DS function	5.0.0	5.1.0
2002-09	NP#17	NP-020409	012	1	Align TS 29.207 with TS 23.207	5.0.0	5.1.0
2002-09	NP#17	NP-020411	014	1	User Plane Operation	5.0.0	5.1.0
2002-09	NP#17	NP-020410	016	4	Support for forking	5.0.0	5.1.0
2002-09	NP#17	NP-020411	017	2	Message Descriptions	5.0.0	5.1.0
2002-09	NP#17	NP-020411	018	1	Derivation of flow identifiers from SDP	5.0.0	5.1.0
2002-09	NP#17	NP-020411	019		Revoke Authorization Procedure	5.0.0	5.1.0
2002-09	NP#17	NP-020411	020	1	Go related error codes to UE	5.0.0	5.1.0
2002-09	NP#17	NP-020409	021		Removal of Annex A	5.0.0	5.1.0
2002-09	NP#17	NP-020414	022	2	Source Address filtering over the Go interface	5.0.0	5.1.0
2002-09	NP#17	NP-020411	025	1	Initialisation and maintenance / Security Considerations	5.0.0	5.1.0
2002-09	NP#17	NP-020411	030		Remove incomplete RSVP function	5.0.0	5.1.0
2002-09	NP#17	NP-020411	032		R-Type and M-Type for Authorization_Failure event	5.0.0	5.1.0
2002-09	NP#17	NP-020410	033	2	Session modification initiated decision	5.0.0	5.1.0
2002-12	NP#18	NP-020625	034	1	Validating binding information against the UE	5.1.0	5.2.0
2002-12	NP#18	NP-020621	035		Go PIB revision and update	5.1.0	5.2.0
2002-12	NP#18	NP-020623	039	4	Handling of binding information by GGSN	5.1.0	5.2.0
2002-12	NP#18	NP-020623	040	4	Connection failure between PDF and GGSN	5.1.0	5.2.0
2002-12	NP#18	NP-020625	041	2	Flow Identifier Encoding	5.1.0	5.2.0
2002-12	NP#18	NP-020625	045		Clarifications on GGSN messages	5.1.0	5.2.0
2002-12	NP#18	NP-020625	047	1	Clarification on multiple codecs	5.1.0	5.2.0
2002-12	NP#18	NP-020625	049	3	Clarifications on Early Media	5.1.0	5.2.0
2002-12	NP#18	NP-020621	050		Go PIB compiler fixes	5.1.0	5.2.0
2002-12	NP#18	NP-020620	051	2	Clarification on the authorized bandwidth for RTP media streams	5.1.0	5.2.0
2002-12	NP#18	NP-020625	052		Added reference to TS29.208	5.1.0	5.2.0
2002-12	NP#18	NP-020621	053	1	Re-Using filters from the IETF Framework PIB	5.1.0	5.2.0
2002-12	NP#18	NP-020625	056	1	Update Reference [11]	5.1.0	5.2.0
2002-12	NP#18	NP-020621	057	1	IANA numbers: COPS client-type and PIB branch number	5.1.0	5.2.0
2002-12	NP#18	NP-020621	059	1	PIB references and clarifications	5.1.0	5.2.0
2002-12	NP#18	NP-020625	060	2	Changes to GGSN behaviour when no binding information received.	5.1.0	5.2.0
2002-12	NP#18	NP-020625	061	1	Clarification on use of charging correlation information	5.1.0	5.2.0
2002-12	NP#18	NP-020623	063	1	GTP cause code for Go related errors	5.1.0	5.2.0
2002-12	NP#18	NP-020622	064	3	Replacement of DiffServ class with QoS class	5.1.0	5.2.0
2002-12	NP#18	NP-020625	065	2	Update of Device Capabilities and Limitations section	5.1.0	5.2.0
2002-12	NP#18	NP-020625	066		Corrections in Message Description Section	5.1.0	5.2.0
2002-12	NP#18	NP-020624	067		PCF to PDF Change - (MCC changed term in figure 4.2)	5.1.0	5.2.0
2002-12	NP#18	NP-020625	068		DiffServ Class definition for uplink and downlink direction in the Go interface	5.1.0	5.2.0
2002-12	NP#18	NP-020623	069	1	Go FailDecReason mapping to PCO error codes	5.1.0	5.2.0
2002-12	NP#18	NP-020621	071	2	Go PIB clarifications	5.1.0	5.2.0
2002-12	NP#18	NP-020623	072		Coding of Go related error codes	5.1.0	5.2.0

3GPP TSG-CN WG3 Meeting #27
Dublin, Ireland, 10th - 14th February 2003.

Tdoc ⌘N3-030167

CR-Form-v7

CHANGE REQUEST

⌘ **29.207** **CR** **084** ⌘ **rev** **2** ⌘ Current version: **5.2.0** ⌘

*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 TFT filters
Source:	⌘	TSG_CN WG3 *[Orange France]*
Work item code:	⌘	E2EQoS
Date:	⌘	13/02/2003
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:	⌘	Clarification is needed on the case where packets are processed against TFT filters. Indeed, the gate shall be applied to the PDP contexts where SBLP applies, and for such PDP contexts the information received in the TFT is ignored. In the downlink direction, IP packets are matched against filters installed from UE supplied TFTs only for PDP Contexts where SBLP is not applied.
Summary of change:	⌘	Some text is added to clarify the handling in the GGSN for matching TFT filters.
Consequences if not approved:	⌘	The handing in the GGSN for matching TFT filters is unclear.

Clauses affected:	⌘	4.3.1.3

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.

4.3.1.3 Gate function

The Gate Function represents a user plane function enabling or disabling the forwarding of IP packets. A gate is described by a set of packet classifiers that identify IP flows associated to the gate. The packet classifier includes the standard 5-tuple (source IP address, destination IP address, source port, destination port, protocol) explicitly describing a unidirectional IP flow.

The packet classifier is received from the PDF in an authorisation decision. In the packet classifier the source IP address shall be taken from the SDP information if provided. Otherwise, for bi-directional flows the operator may choose to identify the source IP address from the 64 bit prefix of the destination IP address in order to reduce the possibilities of bearer misuse. 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 PDF. If the source port number is not identified by the SDP information then the source port number shall be wildcarded by the PDF.

The GGSN installs the packet filter corresponding to the packet classifier. The packet classifier includes the status that the gate shall be set to.

The commands to open or close the gate lead to the enabling or disabling of the passage for IP packets. If the gate is closed all packets of the related IP flows are dropped. If the gate is opened the packets of the related IP flows are allowed to be forwarded. The opening of the gate may be part of the authorisation decision event. The closing of the gate may be part of the revoke authorisation decision event.

IP Packets matching a SBLP supplied filter are subject to the gate associated with that packet filter. In the uplink direction, IP packets which do not match any ~~packet~~ SBLP supplied filter shall be silently discarded. In the downlink direction, IP packets which do not match any SBLP supplied filter shall be matched against TFT supplied filters that are installed for PDP contexts where SBLP is not applied.

3GPP TSG-CN WG3 Meeting #27
Dublin, Ireland, 10rd - 14th February 2003.

Tdoc ⌘N3-030181

CR-Form-v7

CHANGE REQUEST

⌘ **29.207** **CR** **081** ⌘**rev** **3** ⌘ Current version: **5.2.0** ⌘

*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:	⌘	Reject change of token in PDP context modification
Source:	⌘	TSG_CN WG3 *[Ericsson]*
Work item code:	⌘	E2EQoS
Date:	⌘	14/02/2003
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 specification is ambiguous as to what happens at a PDP context modification if the token is modified (changed authorising entity or value). The specification could be interpreted that the token is ignored at a modification, and the GGSN shall continue to work towards the PDF using the pre-existing handle and thus the assoicated token. However, this means that potentially incorrect data can be recorded in GPRS charging records. Furthermore, it introduces compatibility problems if in the future there are cases where a token is changed, since the UE may not be aware that the token modification has been ignored.
Summary of change:	⌘	• If the token has been changed, the PDF shall reject the PDP context modification request with the new reason code "noCorrespondingSession" • Definition of the existing reason code "noCorrespondingSession" is reworded to cover the above case
Consequences if not approved:	⌘	Unspecified operation and possible future compatibility issues.

Clauses affected:	⌘	4.3.2.3, 5.2.1.1, Annex D

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

4.3.2.3 Binding mechanism handling

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

During the session set-up the PDF 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 PDF shall allocate its PDF identifier as part of the Authorization Token. This identifier shall be in the format of a fully qualified domain name.

The PDF receives the binding information and a Client Handle as part of a REQ from the GGSN. The PDF 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 PDF to identify the IMS session. If no IMS session can be found for an authorisation token, or if the authorization token for the Client Handle has been modified, or if the PDF is otherwise unable to authorise the binding information, the PDF 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 PDF 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 PDF sends the available authorisation information on the media component(s) back to the GGSN. If the PDF 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 appropriate GGSN.

If the binding information consists of more than one flow identifier, the PDF 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 PDF 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 PDF 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 version

5.2.1.1 SBLP authorisation decision

The information needed for the PDF 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 set-up information to the PDF upon every SIP message that includes an SDP payload. This ensures that the PDF passes proper information to perform media authorization for all possible IMS session set-up scenarios. The policy set-up information provided by the P-CSCF to the PDF 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 PDF.

The PDF 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 PDF shall include an AUTH_ENT_ID attribute containing the Fully Qualified Domain Name of the PDF and the SESSION_ID attribute.

Upon receiving the bearer authorization request from the GGSN, the PDF 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 PDF shall identify whether the binding information indeed corresponds to an initiated SIP session. If the corresponding SIP session cannot be found or the authorization token has changed in an authorization modification request, the PDF shall enforce the rejection of this PDP context request by sending an INSTALL and REMOVE decision to the GGSN. The reason for the rejection is indicated by the INSTALL decision with the "noCorrespondingSession" reason in the Authorisation Request Failure Decision. If the PDF is otherwise unable to authorise the binding information, the INSTALL decision shall identify a general authorisation failure with the "authorisationFailure" of the request reason in the Authorisation Request Failure Decision.

  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 PDF 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 PDF shall enforce the rejection of this PDP context request by sending an INSTALL and REMOVE decision to the GGSN. The reason for the rejection is indicated by the INSTALL decision with the "invalidBundling" reason in the Authorisation Request Failure Decision.

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

If the PDF 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 PDF shall define the direction (upstream or downstream) of the "Authorised QoS" and the packet classifier(s).

- Packet classifier(s):

  The PDF 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 PDF.

  - 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 PDF in the packet classifier.

  - The PDF 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 QoS Class and Data Rate) for a media component is extracted from the media type information and bandwidth parameter of the SDP. The PDF shall map the media type information into a QoS Class which is the highest class that can be used for the media. The PDF shall use an equal QoS 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 QoS class A.

  The PDF shall derive the Data Rate value from the "b=AS" SDP parameter. The "b=AS" parameter in the SDP shall contain all the overhead coming from the IP-layer and the layers above, e.g. UDP and RTP. If RTP is used, then overhead coming from RTCP shall be added by the PDF 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 PDF shall provide the "Authorised QoS" for the bearer as the combination of the "Authorised QoS" information of the individual media components. The QoS Class in the "Authorised QoS" for the bearer shall contain the highest QoS class amongst the ones applied for the individual media components and indicates the highest UMTS traffic class that can be applied to the PDP context.

  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 [18].

The PDF may include the gate enabling command as part of the authorisation decision, for instance to enable early media. Alternatively, the PDF may provide a separate decision for opening the gate.

The PDF 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 PDF shall update the media authorization information for the session. The PDF may push this updated authorisation information to the GGSN. Under certain condition e.g. revoke of authorization, the PDF shall push the updated policy decision to the GGSN.

Next amended section

Annex D (normative): Go interface related error code values for the PDP context handling

The following error codes are used to indicate Go interface related errors from the GGSN to the UE. The error codes listed below are transferred to the UE in the Protocol Configuration Options information element as defined in 3GPP TS 24.008 [12]:
The error code values transported in the container contents field shall be the binary representations of the error code numbers listed below.

In all the cases listed below a common GTP cause code, “User authentication failed”, see 3GPP TS 29 060 [22], shall be used in the response message.

Error code No. 1 "Authorization failure of the request"
This error code indicates that the PDP context activation/modification request is rejected because the authorizing entity is unable to provide an authorization decision for the binding information.

Error code No. 2 "Missing binding information"

This error code indicates that the PDP context activation/modification request is rejected because the binding information was not included in the request although required.

Error code No. 3 "Invalid binding information"

This error code indicates that the PDP context activation/modification request is rejected because the authorizing entity could not be resolved from the binding information.

Error code No. 4 "Binding information not allowed"

This error code indicates that the PDP context activation/modification request is rejected because the Go interface is disabled or not supported in the GGSN and hence binding information is not allowed.

Error code No.5 "Authorizing entity temporarily unavailable"

This error code indicates that the PDP context activation/modification request is rejected because the authorizing entity indicated by the binding information is temporarily unavailable.

Error code No. 6 "No corresponding session"

This error code indicates that the PDP context activation request is rejected because the authorizing entity cannot associate the binding information with any ongoing session. The error code also indicates that the PDP context modification request is rejected by the authorizing entity because the authorization token has changed or the binding information contains invalid flow identifier(s).

Error code No. 7 "Invalid bundling"

This error code indicates that the PDP context activation request is rejected because the authorizing entity doesn't allow the grouping of the flow IDs contained in the PDP context activation request to be carried in the requested PDP Context.

End of modifications