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**Source:** SA5 (Telecom Management)  
**Title:** 3 Rel-5 CRs 32.215 (PS Charging): various  
**Document for:** Approval  
**Agenda Item:** 7.5.3

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Doc-1st-	Spec	CR	R	Phase	Subject	Cat	Version	Doc-2nd-	Workitem
SP-020738	32.215	022	-	Rel-5	IPv4-IPv6 co-existence in PS charging	C	5.1.0	S5-024588	OAM-CH
SP-020738	32.215	023	-	Rel-5	Correction of the list of parameters of the QoS profile (requested and negotiated)	F	5.1.0	S5-024418	OAM-CH
SP-020738	32.215	024	-	Rel-5	Extension of CDR encoding	C	5.1.0	S5-024560	OAM-CH

CR-Form-v7
<b>CHANGE REQUEST</b>
⌘ <b>32.215 CR 022</b> ⌘ rev <b>-</b> ⌘ Current version: <b>5.1.0</b> ⌘

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

<b>Title:</b>	⌘ IPv4-IPv6 co-existence in PS charging		
<b>Source:</b>	⌘ SA5		
<b>Work item code:</b>	⌘ OAM-CH	<b>Date:</b>	⌘ 22/11/2002
<b>Category:</b>	⌘ <b>C</b>	<b>Release:</b>	⌘ Rel-5
	Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)

<b>Reason for change:</b>	⌘ Currently, the usability of IPv6 features in an IPv6/IPv4 dual stack environment requires substantial operational effort. This addition of an optional information element tries to ensure an easier transition to an IPv6 environment.
<b>Summary of change:</b>	⌘ An optional information element is added to the Node Alive Request and Redirection Request charging protocol messages that enable both IPv4 and IPv6 addresses be supported simultaneously
<b>Consequences if not approved:</b>	⌘ If there are e.g. nodes that support only IPv4 in the charging interfaces, then problems can arise if such nodes receives only information about an IPv6 address of a node to communicate with. Also, without the possibility of advertising 2 address formats, it could be difficult to use IPv6 stacks in a (possibly multi-vendor) network if the existing network has IPv4-only nodes.

<b>Clauses affected:</b>	⌘ 7.3.4.1, 7.3.4.3										
<b>Other specs Affected:</b>	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="text-align: center;">Y</td> <td style="text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;">X</td> </tr> </table> Other core specifications ⌘ Test specifications ⌘ O&M Specifications ⌘	Y	N		X		X		X		
Y	N										
	X										
	X										
	X										
<b>Other comments:</b>	⌘										

### 7.3.4.1 Node Alive Request

The *Node Alive Request* message may be used to inform that a node in the network has started its service (e.g. after a service break due to software or hardware maintenance or data service interruption after an error condition). A node may send a different Node Address than its own in the Information Element, e.g. informing the "next node in the chain" that the "previous node in the chain" (which is located on the other side of the sender of this message) is now ready for service. This message type is optional if the Path Protocol is TCP.

The *Node Alive Request* message allows a quicker reconnect capability than the *Echo Request* message based polling can provide, and its usage will have a reduced load effect on the network, particularly when the number of network nodes using GTP' is high. It may also be used to inform when a new network node has become available for service. If the *Echo Request* message is also used then the usage of the *Node Alive Request* message allows the interval of *Echo Requests* to be longer than would be otherwise required, thus reducing network loading with many *Echo Requests*. The Information elements in a Node Alive Request message are shown in Table 9.

**Table 9: Information Elements in a Node Alive Request**

Information Element	Presence requirement
Node Address	Mandatory
<a href="#">Alternative Node Address</a>	<a href="#">Optional</a>
Private Extension	Optional

The Node Address format is the same as for the Charging Gateway Address format described in 3GPP TS 29.060 [8]).

[The format definition for the Node Address information element is the same as the format of the source and destination address of the IP packet that transports the GTP' messages. The optional Alternative Node Address IE can be used in the Node Alive Request if the message sender wants to advertise an IP address that is different from the node address format. This way both the IPv4 and IPv6 node address formats can be supported simultaneously in the messaging, regardless of whether IPv4 or IPv6 is used in the underlying transport.](#)

The optional Private Extension IE contains vendor- or operator-specific information.

### 7.3.4.2 Node Alive Response

The *Node Alive Response* message, shown in Table 10, shall be sent as a response to a received *Node Alive Request*.

**Table 10: Information Elements in a Node Alive Response**

Information Element	Presence requirement
Private Extension	Optional

The optional Private Extension IE contains vendor- or operator-specific information.

### 7.3.4.3 Redirection Request

There are two kinds of usage for the *Redirection Request* message. One is to advise that received CDR traffic is to be redirected to another CGF due to that CGF node is about to stop service (due to an outage for maintenance or an error condition). The second purpose is to inform a CDR generating node (e.g. SGSN) that is currently sending data to this node (e.g. CGF), that the next node in the chain (e.g. a mediator device or Billing Computer) has lost connection to this node (e.g. CGF).

The Information Elements in a *Redirection Request* Message are listed in Table 11. An *Address of Recommended Node* may be given if for example a CGF maintenance outage is handled by first introducing another CGF ready to take incoming CDRs. In this way the network performance can be maintained. The *Address of Recommended Node* shall only describe an intra-PLMN node containing a CGF, and not to a node in any other PLMN.

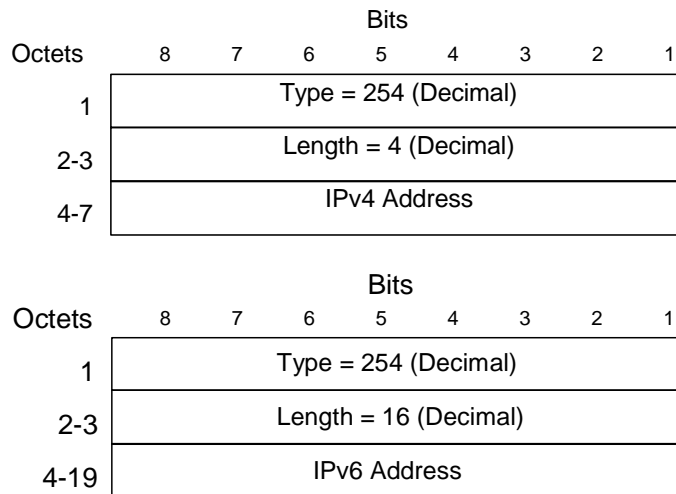
**Table 11: Information Elements in a Redirection Request**

Information Element	Presence requirement
Cause	Mandatory
Address of Recommended Node	Optional
<a href="#">Alternative Address of Recommended Node</a>	<a href="#">Optional</a>
Private Extension	Optional

Possible **Cause** values are:

- "This node is about to go down";
- "Another node is about to go down";
- "System failure";
- "Receive buffers becoming full";
- "Send buffers becoming full".

The *Address of Recommended Node* information element, shown in Figure 10, defines the IPv4 or IPv6 format address that the node is identified by in the UMTS network.



**Figure 10: Address of Recommended Node information elements**

The format definition for the *Address of Recommended Node* information element is the same as the format of the source and destination address of the IP packet that transports the GTP' messages. The optional *Alternative Address of Recommended Node IE* can be used in the *Node Alive Request* if the message sender wants to advertise an IP address that is different from the node address format. This way both the IPv4 and IPv6 node address formats can be supported simultaneously in the messaging, regardless of whether IPv4 or IPv6 is used in the underlying transport.

The optional Private Extension contains vendor- or operator- specific information.

CR-Form-v7
<b>CHANGE REQUEST</b>
⌘ <b>32.215 CR 023</b> ⌘ rev <b>-</b> ⌘ Current version: <b>5.1.0</b> ⌘

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

<b>Title:</b>	⌘	Correction of the list of parameters of the QoS profile (requested and negotiated)	
<b>Source:</b>	⌘	SA5	
<b>Work item code:</b>	⌘	OAM-CH	<b>Date:</b> ⌘ 11/10/2002
<b>Category:</b>	⌘	<b>F</b>	<b>Release:</b> ⌘ Rel-5
		Use <u>one</u> of the following categories: <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .	Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)

<b>Reason for change:</b>	⌘	Inconsistency between the parameter description of the requested/negotiated QoS profile and their encoding in the CDRs.
<b>Summary of change:</b>	⌘	Consistent description of the QoS parameters applicable for pre-release 99 only capable terminals versus those applicable for all other cases.
<b>Consequences if not approved:</b>	⌘	Possibility of misunderstanding, resulting in potential billing errors.

<b>Clauses affected:</b>	⌘	5.37					
<b>Other specs affected:</b>	⌘	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> Other core specifications	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	⌘
		Y	N				
		<input type="checkbox"/>	<input checked="" type="checkbox"/>				
<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> Test specifications	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Y	N						
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;">Y</td> <td style="width: 20px; text-align: center;">N</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> </table> O&M Specifications	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>			
Y	N						
<input type="checkbox"/>	<input checked="" type="checkbox"/>						
<b>Other comments:</b>	⌘						

**Change in Clause 5.37****5.37 QoS Requested/QoS Negotiated**

Quality of Service Requested contains the QoS desired by MS at PDP context activation. QoS Negotiated indicates the applied QoS accepted by the network.

If a pre-Release '99 only capable terminal is served, the [applicable QoS profile-parameters and their encoding in the CDRs](#) ~~consists of five (5) attributes as follows: reliability, delay, precedence, peak throughput and mean throughput. The encoding of this QoS profile shall be in accordance with~~[are specified in TS 32.015 \[12\] GSM 12.15.](#)

~~In Release 99, the QoS profile consists of the above 2G parameters plus the following UMTS attributes: Traffic class ('conversational', 'streaming', 'interactive', 'background'), Maximum bit rate (kbps), Delivery order (y/n), Maximum SDU size (octets), SDU error ratio, Residual bit error ratio, Delivery of erroneous SDUs (y/n/-), Transfer delay (ms), Traffic handling priority, Allocation/Retention Priority. This QoS profile shall be encoded according to the "Quality of Service (QoS) Profile" parameter specified in 3GPP TS 29.060 [8].~~

~~In all other cases, the applicable QoS attributes are defined in the "Quality of Service profile" in TS 23.060 [2], and their encoding in the CDR corresponds to the "Quality of Service profile" specified in TS 29.060. [8].~~

**End of Change in Clause 5.37  
End of Document**

## CHANGE REQUEST

⌘ **32.215 CR 024** ⌘ rev **-** ⌘ Current version: **5.1.0** ⌘

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

<b>Title:</b>	⌘	Extension of CDR encoding		
<b>Source:</b>	⌘	SA5		
<b>Work item code:</b>	⌘	OAM-CH		
		<b>Date:</b> ⌘ 22/11/2002		
<b>Category:</b>	⌘	<b>C</b>		
		<table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <i>Use <u>one</u> of the following categories:</i>  <b>F</b> (correction)  <b>A</b> (corresponds to a correction in an earlier release)  <b>B</b> (addition of feature),  <b>C</b> (functional modification of feature)  <b>D</b> (editorial modification)                      Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a>.                 </td> <td style="width: 50%; vertical-align: top;"> <i>Use <u>one</u> of the following releases:</i>  <b>2</b> (GSM Phase 2)  <b>R96</b> (Release 1996)  <b>R97</b> (Release 1997)  <b>R98</b> (Release 1998)  <b>R99</b> (Release 1999)  <b>Rel-4</b> (Release 4)  <b>Rel-5</b> (Release 5)  <b>Rel-6</b> (Release 6)                 </td> </tr> </table>	<i>Use <u>one</u> of the following categories:</i> <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .	<i>Use <u>one</u> of the following releases:</i> <b>2</b> (GSM Phase 2) <b>R96</b> (Release 1996) <b>R97</b> (Release 1997) <b>R98</b> (Release 1998) <b>R99</b> (Release 1999) <b>Rel-4</b> (Release 4) <b>Rel-5</b> (Release 5) <b>Rel-6</b> (Release 6)
<i>Use <u>one</u> of the following categories:</i> <b>F</b> (correction) <b>A</b> (corresponds to a correction in an earlier release) <b>B</b> (addition of feature), <b>C</b> (functional modification of feature) <b>D</b> (editorial modification) Detailed explanations of the above categories can be found in 3GPP <a href="#">TR 21.900</a> .	<i>Use <u>one</u> of the following releases:</i> <b>2</b> (GSM Phase 2) <b>R96</b> (Release 1996) <b>R97</b> (Release 1997) <b>R98</b> (Release 1998) <b>R99</b> (Release 1999) <b>Rel-4</b> (Release 4) <b>Rel-5</b> (Release 5) <b>Rel-6</b> (Release 6)			

<b>Reason for change:</b>	⌘	<p>To allow for a more efficient encoding of CDRs on both the Ga and CGF-BS interfaces. The use of ASN.1 Packed Encoding Rules (PER) will reduce the required network bandwidth, and may be more efficient for the GSN and CGF nodes as well, particularly, where such records need be persisted.</p> <p>Packed Encoding Rules allow both a normal “packed” format, and an “aligned” packed format. The proposed solution allows either to be selected.</p>
<b>Summary of change:</b>	⌘	<p>Clarify and extend the use of the Data Record Format field in the GTP' messages for the Ga interface to indicate the use of ASN.1 Basic Encoding Rules (BER) is mandatory and also to allow the optional use of ASN.1 PER (either aligned or unaligned format).</p> <p>Additionally, for the CGF-BS interface clarify that BER must be supported while allowing optional use of PER in either format.</p> <p>Note: If accepted for the Packet Domain, this should be discussed for the other domains as well.</p>
<b>Consequences if not approved:</b>	⌘	<ol style="list-style-type: none"> <li>1. Ambiguity regarding which ASN.1 encoding(s) are allowed on the CGF-BS and Ga interfaces.</li> <li>2. As conventional usage is BER, the more efficient PER encoding could not be used.</li> </ol>

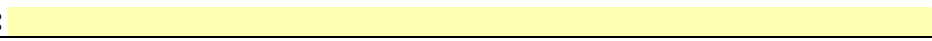
<b>Clauses affected:</b>	⌘					
<b>Other specs</b>	⌘	<table style="display: inline-table; border: none;"> <tr> <td style="border: 1px solid black; padding: 2px;">Y</td> <td style="border: 1px solid black; padding: 2px;">N</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;"><input type="checkbox"/></td> <td style="border: 1px solid black; padding: 2px;"><input checked="" type="checkbox"/></td> </tr> </table> Other core specifications ⌘	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Y	N					
<input type="checkbox"/>	<input checked="" type="checkbox"/>					

**affected:**

<input checked="" type="checkbox"/>	Test specifications
<input checked="" type="checkbox"/>	O&M Specifications



**Other comments:** ⌘





## Change in Clause 2 (References)

- [25] [ITU-T Recommendation X.690: "Information technology - ASN.1 encoding rules: Specification of Basic Encoding Rules \(BER\), Canonical Encoding Rules \(CER\) and Distinguished Encoding Rules \(DER\)".](#)
- [26] [ITU-T Recommendation X.691: "Information technology - ASN.1 encoding rules: Specification of Packed Encoding Rules \(PER\)".](#)

## End of Change in Clause 7.4

## Change in Clause 7.4

### 7.4 Data Record Format in GTP'

The format of the CDRs sent between the Network Elements that generate the PS domain CDRs and the CGF are defined by the *Data Record Format*, which is the 5<sup>th</sup> octet of *Data Record Packet* information element, shown in Figure 13.

The following rules govern the *Data Record Format*:

- This field consists of one octet (#5).
- The value range is 1-255 in decimal. The value '0' should not be used.
- Only the values 1-10 and 51-255 can be used for standards purposes.
- Values in the range of 11-50 are to be configured only by operators, and are not subject to standardization.
- The value '1' identifies ASN.1 [Basic Encoding Rules \(BER\) \[25\] encoding](#), ~~format (which must be supported in PS domain charging)~~. ~~If needed~~ Other values [for optional encodings](#) are specified in subclause 7.4.1.

## End of Change in Clause 7.4

## Change in Clause 7.4.1

### 7.4.1 Standard Data Record Format

For the PS Domain CDR transfer, defined by the present document, only an ASN.1 [BER encoding](#) ~~format~~ is ~~used~~ ~~mandatory~~. ~~For this format the Data Record Format value is '1'.~~ ~~For this encoding, the Data Record Format value is '1'.~~ ~~Supported~~ Other ASN.1 encodings may be supported optionally, with *Data Record Format* values ~~as~~ ~~are~~ indicated below:

- "1" signifies the use of [Basic Encoding Rules \(BER\) \[25\]](#)
- "2" signifies the use of [unaligned basic Packed Encoding Rules \(PER\) \[26\]](#)
- "3" signifies the use of [aligned basic Packed Encoding Rules \(PER\) \[26\]](#)

~~See clause~~ ~~Clause~~ 6 and the ASN.1 language descriptions for the definitions. ~~Basic Encoding Rules (BER)~~ provides the ~~transfer syntax for~~ abstract syntax, defined in ASN.1, [for these encodings](#).

## End of Change in Clause 7.4.1

**Change in Clause 7.6.2****7.6.2 The format of the CDRs at CGF - BS interface**

The contents of the CDRs sent between the CGF and the Billing System (BS) are defined by the ASN.1 language clause 6, Charging Data Record Structure. In addition, other CDR contents or formats are possible if the CGF and the BS provide processing functionality for the CDRs. [The Basic Encoding Rules \(BER\) \[25\] encoding must be supported by both the CGF and the Billing System. However, where supported by both nodes, Packed Encoding Rules \(PER\) \[26\] may also be used.](#)

**End of Change in Clause 7.6.2**  
**End of Document**