**3GPP TSG-CT WG1 Meeting #124-eC1-203879**

**Electronic meeting, 2-10 June 2020**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **24.229** | **CR** | **6420** | **rev** | **1** | **Current version:** | **16.5.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network |  | Core Network | **x** |

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|  |
| ***Title:***  | Adding NID to PANI |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | Vertical\_LAN |  | ***Date:*** | 2020-06-07 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-16 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
|  |  |
| ***Reason for change:*** | For the standalone non-public networks, the Network ID needs to be provided in the PANI to identify which network originates a request or response. |
|  |  |
| ***Summary of change:*** | Added the NID to the coding of the serving network identity in the coding of the P-Access-Network-Info header field and new note to indicate that NID is present only when the serving network is SNPN. |
|  |  |
| ***Consequences if not approved:*** | Identitification of an SNPN not possible. |
|  |  |
| ***Clauses affected:*** | 3.2, 7.2A.4.3 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **x** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

\*\*\* First Change \*\*\*

## 3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

1xx A status-code in the range 101 through 199, and excluding 100

2xx A status-code in the range 200 through 299

5GC 5G Core Network

5GS 5G System

5G-AN 5G Access Network

AAA Authentication, Authorization and Accounting

ANBR Access Network Bitrate Recommendation

APN Access Point

APN Access Point Name

AS Application Server

ATCF Access Transfer Control Function

AUTN Authentication TokeN

AVP Attribute-Value Pair

B2BUA Back-to-Back User Agent

BFCP Binary Floor Control Protocol

BGCF Breakout Gateway Control Function

c conditional

BRAS Broadband Remote Access Server

BSSID Basic Service Set Identifier

CCF Charging Collection Function

CDF Charging Data Function

CDR Charging Data Record

CK Ciphering Key

CN Core Network

CPC Calling Party's Category

CLF Connectivity session Location and repository Function

CSCF Call Session Control Function

DHCP Dynamic Host Configuration Protocol

DNN Data Network Name

DNS Domain Name System

DOCSIS Data Over Cable Service Interface Specification

DRVCC Dual Radio Voice Call Continuity

DTD Document Type Definition

DTLS Datagram Transport Layer Security

DTMF Dual Tone Multi Frequency

DVB Digital Video Broadcast

DVB-RCS2 Second Generation DVB Interactive Satellite System

e2ae-security End-to-access edgesecurity

EATF Emergency Access Transfer Function

EC Emergency Centre

ECF Event Charging Function

ECI E-UTRAN Cell Identity

ECN Explicit Congestion Notification

E-CSCF Emergency CSCF

EF Elementary File

eP-CSCF P-CSCF enhanced for WebRTC

ePDG Evolved Packet Data Gateway

EPS Evolved Packet System

FAP cdma2000® 1x Femtocell Access Point

FQDN Fully Qualified Domain Name

GBA Generic Bootstrapping Architecture

GBR Guaranteed Bit Rate

GCID GPRS Charging Identifier

GGSN Gateway GPRS Support Node

GPON Gigabit-capable Passive Optical Networks

GPRS General Packet Radio Service

GRUU Globally Routable User agent URI

GSTN General Switched Telephone Network

HPLMN Home PLMN

HSS Home Subscriber Server

HTTP HyperText Transfer Protocol

i irrelevant

IARI IMS Application Reference Identifier

IBCF Interconnection Border Control Function

ICE Interactive Connectivity Establishment

I-CSCF Interrogating CSCF

ICS Implementation Conformance Statement

ICID IM CN subsystem Charging Identifier

ICSI IMS Communication Service Identifier

ID Identifier

IK Integrity Key

IKEv2 Internet Key Exchange Protocol Version 2

IM IP Multimedia

IMC IMS Credentials

IMEI International Mobile Equipment Identity

IMS IP Multimedia core network Subsystem

IMS-AGW IMS Access Gateway

IMS-ALG IMS Application Level Gateway

IMSI International Mobile Subscriber Identity

IMSVoPS IMS Voice over PS Session

IOI Inter Operator Identifier

IP Internet Protocol

IP-CAN IP-Connectivity Access Network

IPsec IP security

IPv4 Internet Protocol version 4

IPv6 Internet Protocol version 6

ISC IP Multimedia Subsystem Service Control

ISIM IM Subscriber Identity Module

I-WLAN Interworking – WLAN

IWF Interworking Function

KMS Key Management Service

LRF Location Retrieval Function

m mandatory

MAC Message Authentication Code

MBR Maximum guaranteed Bit Rate

MCC Mobile Country Code

MCPTT Mission Critical Push To Talk

MEID Mobile Equipment IDentity

MGCF Media Gateway Control Function

MGW Media Gateway

MNC Mobile Network Code

MRB Media Resource Broker

MRFC Multimedia Resource Function Controller

MRFP Multimedia Resource Function Processor

MSC Mobile-services Switching Centre

MSD Minimum Set of emergency related Data

MSRP Message Session Relay Protocol

n/a not applicable

NAI Network Access Identifier

NA(P)T Network Address (and Port) Translation

NASS Network Attachment Subsystem

NAT Network Address Translation

NCC Network Control Center

NCC\_ID Network Control Center Identifier

NP Number Portability

o optional

OCF Online Charging Function

OLI Originating Line Information

OMR Optimal Media Routeing

PCC Policy and Charging Control

PCF Policy Control Function

PCO Protocol Configuration Options

PCRF Policy and Charging Rules Function

P-CSCF Proxy CSCF

PDG Packet Data Gateway

PDN Packet Data Network

PDP Packet Data Protocol

PDU Protocol Data Unit

P-GW PDN Gateway

PICS Protocol Implementation Conformance Statement

PIDF-LO Presence Information Data Format Location Object

PLMN Public Land Mobile Network

PSAP Public Safety Answering Point

PSI Public Service Identity

PSTN Public Switched Telephone Network

QCI QoS Class Identifier

QoS Quality of Service

RAND RANDom challenge

RCS Return Channel via Satellite

RCST Return Channel via Satellite Terminal

RES RESponse

RLOS Restricted Local Operator Services

RTCP Real-time Transport Control Protocol

RTP Real-time Transport Protocol

SAC Service Area Code

SAI Service Area Identifier

SBA Service Based Architecture

SBI Service Based Interface

S-CSCF Serving CSCF

SCTP Stream Control Transmission Protocol

SDES Session Description Protocol Security Descriptions for Media Streams

SDP Session Description Protocol

SDU Service Data Unit

SIP Session Initiation Protocol

SLF Subscription Locator Function

SNPN Stand-alone Non-Public Network

SNR Serial Number

SQN SeQuence Number

SRVCC Single Radio Voice Call Continuity

STUN Session Traversal Utilities for NAT

SVN Satellite Virtual Network

SVN-MAC SVN Medium Access Control label

TAC Type Approval Code

TFT Traffic Flow Template

TP Telepresence

TLS Transport Layer Security

TRF Transit and Roaming Function

TURN Traversal Using Relay NAT

TWAG Trusted WLAN Access Gateway

TWAN Trusted WLAN

UA User Agent

UAC User Agent Client

UAS User Agent Server

UDM Unified Data Management

UDPTL UDP Transport Layer

UDVM Universal Decompressor Virtual Machine

UE User Equipment

UICC Universal Integrated Circuit Card

URI Uniform Resource Identifier

URL Uniform Resource Locator

URN Uniform Resource Name

USAT Universal Subscriber Identity Module Application Toolkit

USIM Universal Subscriber Identity Module

VPLMN Visited PLMN

WebRTC Web Real-Time Communication

WIC WebRTC IMS Client

WLAN Wireless Local Area Network

x prohibited

xDSL Digital Subscriber Line (all types)

XGPON1 10 Gigabit-capable Passive Optical Networks

XMAC expected MAC

XML eXtensible Markup Language

\*\*\* Next Change \*\*\*

#### 7.2A.4.3 Additional coding rules for P-Access-Network-Info header field

The P-Access-Network-Info header field is populated with the following contents:

1) the access-type field set to one of "3GPP-GERAN","3GPP-UTRAN-FDD", "3GPP-UTRAN-TDD", "3GPP-E-UTRAN-FDD", "3GPP-E-UTRAN-TDD", "3GPP-E-UTRAN-ProSe-UNR", "3GPP-NR-FDD", "3GPP-NR-TDD", "3GPP-NR-U-FDD", "3GPP-NR-U-TDD", "3GPP2-1X", "3GPP2-1X-HRPD", "3GPP2-UMB", "3GPP2-1X-Femto", "IEEE-802.11", "IEEE-802.11a", "IEEE-802.11b", "IEEE-802.11g", "IEEE-802.11n", "IEEE-802.11ac", "ADSL", "ADSL2", "ADSL2+", "RADSL", "SDSL", "HDSL", "HDSL2", "G.SHDSL", "VDSL", "IDSL", "xDSL", "DOCSIS", "IEEE-802.3", "IEEE-802.3a", "IEEE-802.3e", "IEEE-802.3i", "IEEE-802.3j", "IEEE-802.3u", "IEEE-802.3ab", "IEEE-802.3ae", "IEEE-802.3ah", "IEEE-802.3ak", "IEEE-802.3aq", "IEEE-802.3an", "IEEE-802.3y", "IEEE-802.3z", or "DVB-RCS2" as appropriate to the access technology in use.

1A) the access-class field set to one of "3GPP-GERAN", "3GPP-UTRAN", "3GPP-E-UTRAN", "3GPP-NR", "3GPP-NR-U", "3GPP-WLAN", "3GPP-GAN", "3GPP-HSPA", "3GPP2", "untrusted-non-3GPP-VIRTUAL-EPC", "VIRTUAL-no-PS", or "WLAN-no-PS" as appropriate to the technology in use. The access-class field set to "untrusted-non-3GPP-VIRTUAL-EPC" indicates the IP-CAN associated with an EPC based untrusted non-3GPP access with unknown radio access technology. The access-class field set to "VIRTUAL-no-PS" indicates an IP-CAN associated with an unknown radio access technology, such that the IP-CAN is not provided by the packet switched domain of the PLMN of the P-CSCF. The access-class field set to "WLAN-no-PS" indicates an IP-CAN associated with WLAN, such that the IP-CAN is not provided by the packet switched domain of the PLMN of the P-CSCF.

2) if the access-type field or the access-class field is set to "3GPP-GERAN", a cgi-3gpp parameter set to the Cell Global Identity obtained from lower layers of the UE. The Cell Global Identity is a concatenation of MCC (3 decimal digits), MNC (2 or 3 decimal digits depending on MCC value), LAC (4 hexadeciaml digits) and CI (as described in 3GPP TS 23.003 [3]. The "cgi-3gpp" parameter is encoded in ASCII as defined in RFC 20 [212];

3) if the access-type field is equal to "3GPP-UTRAN-FDD", or "3GPP-UTRAN-TDD", and a UE provides the P-Acces-Network-Info header field, a "utran-cell-id-3gpp" parameter set to a concatenation of the MCC (3 decimal digits), MNC (2 or 3 decimal digits depending on MCC value), LAC (4 hexadecimal digits) as described in 3GPP TS 23.003 [3] and the UMTS Cell Identity (7 hexadecimal digits) as described in 3GPP TS 25.331 [9A]), obtained from lower layers of the UE. The "utran-cell-id-3gpp" parameter is encoded in ASCII as defined in RFC 20 [212];

3A) if the access-type field is equal to "3GPP-UTRAN-FDD", or "3GPP-UTRAN-TDD", and an entitiy that can use the "network-provided" header field parameter provides the P-Access-Network-Info header field, if available a "utran-sai-3gpp" parameter set to a concatenation of the MCC (3 decimal digits), MNC (2 or 3 decimal digits depending on MCC value), LAC (4 hexadecimal digits) as described in 3GPP TS 23.003 [3] and SAC (4 hexadecimal digits) as described in 3GPP TS 23.003 [3]. The "utran-sai-3gpp" parameter is encoded in ASCII as defined in RFC 20 [212];

3B) if the access-class field is equal to "3GPP-UTRAN", or "3GPP-HSPA", if available a "utran-sai-3gpp" parameter set to a concatenation of the MCC (3 decimal digits), MNC (2 or 3 decimal digits depending on MCC value), LAC (4 hexadecimal digits) as described in 3GPP TS 23.003 [3] and SAC (4 hexadecimal digits) as described in 3GPP TS 23.003 [3]. The "utran-sai-3gpp" parameter is encoded in ASCII as defined in RFC 20 [212];

4) void

5) if the access-type field is set to "3GPP2-1X", a ci-3gpp2 parameter set to the ASCII representation of the hexadecimal value of the string obtained by the concatenation of SID (16 bits), NID (16 bits), PZID (8 bits) and BASE\_ID (16 bits) (see 3GPP2 C.S0005-D [85]) in the specified order. The length of the ci-3gpp2 parameter shall be 14 hexadecimal characters. The hexadecimal characters (A through F) shall be coded using the uppercase ASCII characters. If the UE does not know the values for any of the above parameters, the UE shall use the value of 0 for that parameter. For example, if the SID is unknown, the UE shall represent the SID as 0x0000;

NOTE 1: The SID value is represented using 16 bits as supposed to 15 bits as specified in 3GPP2 C.S0005-D [85].

EXAMPLE: If SID = 0x1234, NID = 0x5678, PZID = 0x12, BASE\_ID = 0xFFFF, the ci-3gpp2 value is set to the string "1234567812FFFF".

6) if the access-type field is set to "3GPP2-1X-HRPD", a ci-3gpp2 parameter set to the ASCII representation of the hexadecimal value of the string obtained by the concatenation of Sector ID (128 bits) and Subnet length (8 bits) (see 3GPP2 C.S0024-B [86]) and Carrier-ID, if available, (see 3GPP2 X.S0060 [86B])in the specified order. The length of the ci-3gpp2 parameter shall be 34 or 40 hexadecimal characters depending on whether the Carrier-ID is included. The hexadecimal characters (A through F) shall be coded using the uppercase ASCII characters;

EXAMPLE: If the Sector ID = 0x12341234123412341234123412341234, Subnet length = 0x11, and the Carrier-ID=0x555444, the ci-3gpp2 value is set to the string "1234123412341234123412341234123411555444".

7) if the access-type field is set to "3GPP2-UMB" 3GPP2 C.S0084-000 [86A], a ci-3gpp2 parameter is set to the ASCII representation of the hexadecimal value of the Sector ID (128 bits) defined in 3GPP2 C.S0084-000 [86A]. The length of the ci-3gpp2 parameter shall be 32 hexadecimal characters. The hexadecimal characters (A through F) shall be coded using the uppercase ASCII characters;

EXAMPLE: If the Sector ID = 0x12341234123412341234123412341234, the ci-3gpp2 value is set to the string "12341234123412341234123412341234".

8) if the access-type field set to one of "IEEE-802.11", "IEEE-802.11a", "IEEE-802.11b", "IEEE-802.11g", "IEEE-802.11n", or "IEEE-802.11ac", an "i-wlan-node-id" parameter is set to the ASCII representation of the hexadecimal value of the AP's MAC address without any delimiting characters;

NOTE 2: The AP's MAC address is provided in the BSSID information element.

EXAMPLE: If the AP's MAC address = 00-0C-F1-12-60-28, then i-wlan-node-id is set to the string "000cf1126028".

NOTE 3: "i-wlan-node-id" parameter is not restricted to I-WLAN. "i-wlan-node-id" parameter can be inserted for a WLAN which is not an I-WLAN.

9) if the access-type field is set to "3GPP2-1X-Femto", a ci-3gpp2-femto parameter set to the ASCII representation of the hexadecimal value of the string obtained by the concatenation of femto MSCID (24 bit), femto CellID (16 bit), FEID (64bit), macro MSCID (24 bits) and macro CellID (16 bits) (3GPP2 X.P0059-200 [86E]) in the specified order. The length of the ci-3gpp2-femto parameter is 36 hexadecimal characters. The hexadecimal characters (A through F) are coded using the uppercase ASCII characters.

10) if the access-type field is set to one of "ADSL", "ADSL2", "ADSL2+", "RADSL", "SDSL", "HDSL", "HDSL2", "G.SHDSL", "VDSL", "IDSL", or "xDSL", the access-info field shall contain a dsl-location parameter obtained from the CLF (see NASS functional architecture);

11) if the access-type field set to "DOCSIS", the access info parameter is not inserted. This release of this specification does not define values for use in this parameter;

12) if the access-type field is equal to "3GPP-E-UTRAN-FDD" or "3GPP-E-UTRAN-TDD", a "utran-cell-id-3gpp" parameter set to a concatenation of the MCC (3 decimal digits), MNC (2 or 3 decimal digits depending on MCC value) which should be obtained from the E-UTRAN Cell Global Identifier (ECGI), Tracking Area Code (4 hexadecimal digits when accessing to EPC and 6 hexadecimal digits when accessing to 5GCN) as described in 3GPP TS 23.003 [3] and the E-UTRAN Cell Identity (ECI) (7 hexadecimal digits) as described in 3GPP TS 23.003 [3]. The "utran-cell-id-3gpp" parameter is encoded in ASCII as defined in RFC 20 [212];

EXAMPLE: If MCC is 111, MNC is 22, TAC is 33C4 and ECI is 76B4321, then P-Access-Network-Info header field looks like follows: P-Access-Network-Info: 3GPP-E-UTRAN-FDD;utran-cell-id-3gpp=1112233C476B4321;network-provided

NOTE 4: The total length of the "utran-cell-id-3gpp" parameter depends on the various combinations of MNC and TAC possible sizes. The actual length of MNC and TAC parts can be unambiguously deduced from the total length.

NOTE 5: The P-CSCF obtains the ECGI in the 3GPP-User-Location-Info AVP received from the PCRF, while the UE obtains the ECGI from RAN. In roaming scenarios with P-GW in the HPLMN, the MCC-MNC contained in the ECGI retrieved by the P-CSCF can differ from that contained in the ECGI retrieved by the UE. Using MNC and MCC from a different source than ECGI can lead to collision between cell-id values which makes the determination of the UE location not possible or incorrect and disables routing of emergency calls based on location information.

12A) if the access-class field is equal to "3GPP-E-UTRAN", a "utran-cell-id-3gpp" parameter set to a concatenation of the MCC (3 decimal digits), MNC (2 or 3 decimal digits depending on MCC value) which should be obtained from the E-UTRAN Cell Global Identifier (ECGI), Tracking Area Code (4 hexadecimal digits when accessing to EPC and 6 hexadecimal digits when accessing to 5GCN) as described in 3GPP TS 23.003 [3] and the E-UTRAN Cell Identity (ECI) (7 hexadecimal digits) as described in 3GPP TS 23.003 [3]. The "utran-cell-id-3gpp" parameter is encoded in ASCII as defined in RFC 20 [212];

12B) if the access-type field is equal to "3GPP-E-UTRAN-ProSe-UNR", a "utran-cell-id-3gpp" parameter set to a concatenation of the MCC (3 decimal digits), MNC (2 or 3 decimal digits depending on MCC value) which should be obtained from the E-UTRAN Cell Global Identifier (ECGI) and the E-UTRAN Cell Identity (ECI) (7 hexadecimal digits) as described in 3GPP TS 23.003 [3] obtained from the ProSe-UE-to-network relay that the UE is connected to as specified in 3GPP TS 24.334 [8ZD]. The "utran-cell-id-3gpp" parameter is encoded in ASCII as defined in in RFC 20 [212];

EXAMPLE: If MCC is 111, MNC is 22 and ECI is 76B4321, then P-Access-Network-Info header field looks like follows: P-Access-Network-Info: 3GPP-E-UTRAN-ProSe-UNR;utran-cell-id-3gpp=1112276B4321.

13) if the access-type field is set to one of "IEEE-802.3", "IEEE-802.3a", "IEEE-802.3e", "IEEE-802.3i", "IEEE-802.3j", "IEEE-802.3u", "IEEE-802.3ab", "IEEE-802.3ae", IEEE-802.3ak", IEEE-802.3aq", IEEE-802.3an", "IEEE-802.3y" or "IEEE-802.3z" and NASS subsystem is used, the access-info field shall contain an eth-location parameter obtained from the CLF (see NASS functional architecture);

14) if the access-type field is set to one of "GPON", "XGPON1" or "IEEE-802.3ah" and NASS is used, the access-info field shall contain an fiber-location parameter obtained from the CLF (see NASS functional architecture);

15) if the access-type field is set to "GSTN", the access-info field may contain a gstn-location parameter if received from the GSTN;

NOTE 6: The "cgi-3gpp", the "utran-cell-id-3gpp", the "ci-3gpp2", the "ci-3gpp2-femto", the "i-wlan-node-id", eth-location, and the "dsl-location" parameters described above among other usage also constitute the location identifiers that are used for emergency services.

16) if the access-type field is set to "DVB-RCS2", the access-info field shall contain a "dvb-rcs2-node-id" parameter which consists of comma-separated list consisting of NCC\_ID, satellite\_ID, beam\_ID, and SVN-MAC as specified in ETSI TS 101 545-2 [194], ETSI TS 101 545-3 [195]; the NCC\_ID shall be represented as two digit hexadecimal value, the satellite\_ID shall be represented as a two digit hexadecimal value, the beam\_ID shall be respresented as a four digit hexadecimal value, and the SVN-MAC shall be represented as six digit hexadecimal value;

EXAMPLE: If the (8 bit) NCC\_ID = 0x3A, the (8 bit) satellite\_ID = 0xF5, the (16 bit) beam\_ID = 0xEA23, and the (24 bit) SVN-MAC = 0xE40AB9, then the "dvb-rcs2-node-id" is set to the string "3A,F5,EA23,E40AB9".

17) the "local-time-zone" parameter in the access-info field is coded as a text string as follows:

 UTC±[hh]:[mm]. [hh] is two digits, and [mm] is two digits from four values: "00", "15", "30" or "45", see ISO 8601 [203];

EXAMPLE: "UTC+01:00" indicates that the time difference between local time and UTC of day is one hour.

18) the "daylight-saving-time" parameter in the access-info field is coded as a text string as follows:

 [hh]. [hh] is a two digits value from three values "00", "01" or "02" indicating the positive adjustment in hours;

19) void;

20) the operator-specific-GI in the access-info field is coded as a text string and conveys an operator-specifc geographical identifier;

21) if

a) the access-class field is set to "untrusted-non-3GPP-VIRTUAL-EPC"; or

b) the access-class field is set to "3GPP-WLAN" and the WLAN is an untrusted WLAN;

 then:

a) if a UE local IP address is available, then a "UE-local-IP-address" parameter set to the UE local IP address;

b) if the IKEv2 messages exchanged between the UE and the ePDG are encapsulated in the UDP messages according to IETF RFC 3948 [63A] and the UDP source port of the UDP messages received by ePDG is available, then a "UDP-source-port" parameter set to the UDP source port of the UDP messages:

- received by the ePDG; and

- encapsulating the IKEv2 messages;

c) if the IKEv2 messages exchanged between the UE and the ePDG are transported using the firewall traversal tunnel as described in 3GPP TS 24.302 [8U] and the TCP source port of the TCP messages of the firewall traversal tunnel received by ePDG is available, then a "TCP-source-port" parameter set to the TCP source port of the TCP messages:

- received by the ePDG; and

- of the firewall traversal tunnel transporting the IKEv2 messages; and

d) if an ePDG IP address used as IKEv2 tunnel endpoint with the UE is available, then an "ePDG-IP-address" parameter set to the ePDG IP address used as IKEv2 tunnel endpoint with the UE;

22) if the access-type field is equal to "3GPP-NR-FDD" or "3GPP-NR-TDD", a "utran-cell-id-3gpp" parameter set to a concatenation of the MCC (3 decimal digits), MNC (2 or 3 decimal digits depending on MCC value), Tracking Area Code (6 hexadecimal digits) as described in 3GPP TS 23.003 [3], the NR Cell Identity (NCI) (9 hexadecimal digits) and optionally, the Network Identifier (NID) (11 hexadecimal digits) as specified in 3GPP TS 23.003 [3]. The "utran-cell-id-3gpp" parameter is encoded in ASCII as defined in RFC 20 [212]; and

NOTE 7: NID is included only if a serving network is a Stand-Alone Non-Public Network (SNPN), defined in 3GPP TS 23.501 [257], identified by a combination of NID, MCC and MNC. The serving network type can be unambiguously deduced from the total length of the "utran-cell-id-3gpp" parameter.

22A) if the access-class field is equal to "3GPP-NR", a "utran-cell-id-3gpp" parameter set to a concatenation of the MCC (3 decimal digits), MNC (2 or 3 decimal digits depending on MCC value), Tracking Area Code (6 hexadecimal digits) as described in 3GPP TS 23.003 [3], the NR Cell Identity (NCI) (9 hexadecimal digits) and optionally, the Network Identifier (NID) (11 hexadecimal digits) as specified in 3GPP TS 23.003 [3]. The "utran-cell-id-3gpp" parameter is encoded in ASCII as defined in RFC 20 [212].

23) if the access-type field is equal to "3GPP-NR-U-FDD" or "3GPP-NR-U-TDD", a "utran-cell-id-3gpp" parameter set to a concatenation of the MCC (3 decimal digits), MNC (2 or 3 decimal digits depending on MCC value), Tracking Area Code (6 hexadecimal digits) as described in 3GPP TS 23.003 [3], the NR Cell Identity (NCI) (9 hexadecimal digits) and optionally, the Network Identifier (NID) (11 hexadecimal digits) as specified in 3GPP TS 23.003 [3]. The "utran-cell-id-3gpp" parameter is encoded in ASCII as defined in RFC 20 [212]; and

23A) if the access-class field is equal to "3GPP-NR-U", a "utran-cell-id-3gpp" parameter set to a concatenation of the MCC (3 decimal digits), MNC (2 or 3 decimal digits depending on MCC value), Tracking Area Code (6 hexadecimal digits) as described in 3GPP TS 23.003 [3], the NR Cell Identity (NCI) (9 hexadecimal digits) and optionally, the Network Identifier (NID) (11 hexadecimal digits) as specified in 3GPP TS 23.003 [3]. The "utran-cell-id-3gpp" parameter is encoded in ASCII as defined in RFC 20 [212].

\*\*\* End of Changes \*\*\*