**3GPP TSG-CT WG1 Meeting #136-eC1-223835**

**E-Meeting, 12th – 20th May 2022**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **24.554** | **CR** | **0104** | **rev** | **-** | **Current version:** | **17.0.0** |  |
|  |
| *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:***  | PKMF address request procedure over PC3a interface |
|  |  |
| ***Source to WG:*** | vivo, Nokia, Nokia Shanghai Bell |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | 5G\_ProSe |  | ***Date:*** | 2022-04-27 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-17 |
|  | *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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | SA3 has specified that when performing security procedure over user plane, the remote UE and the relay UE can obtain the 5G PKMF address from 5G DDNMF in clause 6.3.3.2.2 of TS33.503 (see below):*0a. The 5G ProSe Remote UE gets the 5G PKMF address from the 5G DDNMF of its HPLMN. Alternatively, the 5G ProSe Remote UE may be provisioned with the 5G PKMF address by PCF. If the 5G ProSe Remote UE is provisioned with the 5G PKMF address, the 5G ProSe Remote UE may access the 5G PKMF directly without requesting it to the 5G DDNMF. In case that the 5G ProSe Remote UE cannot access the 5G PKMF using the provisioned 5G PKMF address, the 5G ProSe Remote UE may request the 5G PMKF address to the 5G DDNMF.*and*0c. The 5G ProSe UE-to-Network Relay gets the 5G PKMF address from its HPLMN in the same way as described in step 0a.* Therefore, the control plane protocal over PC3a should be defined in TS 24.554. |
|  |  |
| ***Summary of change:*** | Add 5G DDNMF address request and response over PC3a interface. |
|  |  |
| ***Consequences if not approved:*** | Missing stage-2 requirements. |
|  |  |
| ***Clauses affected:*** | 6.2.X (new), 6.2.X.1(new), 6.2.X.2(new), 6.2.X.3(new), 6.2.X.4(new), 6.2.X.5(new), 6.2.X.6(new), 6.2.X.6.1(new), 6.2.X.6.2(new), 10.5.2, 10.5.3, 10.5.4.1, 10.5.4.y(new), 10.5.4.z(new), 11.4.2.a(new) |
|  |  |
|  | **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 \* \* \* \*

### 6.2.X 5G PKMF address request procedure

#### 6.2.X.1 General

The purpose of the 5G PKMF address request procedure is to allow a UE to obtain a 5G PKMF address from the 5G DDNMF in HPLMN over PC3a interface as specified in 3GPP TS 33.503 [34] for the security procedure over user plane. A UE may initiate a 5G PKMF address request procedure:

a) when the UE needs to obtain a 5G PKMF address from the 5G DDNMF in HPLMN on demand; or

b) when the UE can not access the 5G PKMF using the 5G PKMF address provisioned by the network as specified in clause 5.2.5.

To initiate a 5G PKMF address request procedure, the UE shall be configured with the authorized parameters for 5G ProSe UE-to-network relay as specified in clause 5.2.5. Both the 5G ProSe remote UE and the 5G ProSe UE-to-network relay UE are allowed to initiate the 5G PKMF address request procedure.

NOTE: The UE is allowed to access the 5G PKMF directly without initiating a 5G PKMF address request procedure if it is pre-configured with the 5G PKMF address as specified in clause 5.2.5.

#### 6.2.X.2 5G PKMF address request procedure initiation by the UE

The UE shall initiate the 5G PKMF address request procedure by sending a PROSE\_5GPKMF\_ADDRESS\_REQUEST message with the <PKMF-address-request> element. In the <PKMF-address-request> element, the UE:

a) shall include a new transaction ID not used in any other direct discovery procedures in PC3a interface.

Figure 6.2.X.2.1 illustrates the interaction of the UE and the 5G DDNMF in the 5G PKMF address request procedure.



Figure 6.2.X.2.1: 5G PKMF address request procedure

#### 6.2.X.3 5G PKMF address request procedure accepted by the 5G DDNMF

Upon receiving a PROSE\_5GPKMF\_ADDRESS\_REQUEST message, the 5G DDNMF shall check whether the UE is authorized to act as a 5G ProSe remote UE or act as a 5G ProSe UE-to-network relay UE. If authorized, the 5G PKMF shall then send a PROSE\_5GPKMF\_ADDRESS\_RESPONSE message with the <PKMF-address-response> element. In the <PKMF-address-response> element, the 5G DDNMF shall include:

a) the transaction ID set to the value of the transaction ID received in the PROSE\_5GPKMF\_ADDRESS\_REQUEST message from the UE; and

b) the PKMF address set to the value of the 5G PMKF address in the HPLMN of the UE.

#### 6.2.X.4 5G PKMF address request procedure completed by the UE

Upon receiving the PROSE\_5GPKMF\_ADDRESS\_RESPONSE message, if the transaction ID matches the value sent by the UE in a PROSE\_5GPKMF\_ADDRESS\_REQUEST message, the UE shall store the received 5G PKMF address.

#### 6.2.X.5 5G PKMF address request procedure not accepted by the 5G DDNMF

If the PROSE\_5GPKMF\_ADDRESS\_REQUEST message cannot be accepted by the 5G DDNMF, the 5G DDNMF sends a PROSE\_5GPKMF\_ADDRESS\_RESPONSE message containing a <PKMF-address-reject> element to the UE including an appropriate PC3a control protocol cause value and including the transaction ID set to the value of the transaction ID received in the PROSE\_5GPKMF\_ADDRESS\_REQUEST message.

Upon receipt of the PROSE\_5GPKMF\_ADDRESS\_RESPONSE message, if the transaction ID matches the value sent by the UE in a PROSE\_5GPKMF\_ADDRESS\_REQUEST message, the UE shall consider the 5G PKMF address request procedure as rejected.

If the UE is not authorized for acting as a 5G ProSe remote UE or a 5G ProSe UE-to-network relay UE, the 5G PKMF shall send the PROSE\_5GPKMF\_ADDRESS\_RESPONSE message containing a <PKMF-address-reject> element with PC3a control protocol cause value #3 "UE authorization failure".

#### 6.2.X.6 Abnormal cases

##### 6.2.X.6.1 Abnormal cases in the UE

The following abnormal cases can be identified:

a) Indication from the transport layer of transmission failure of PROSE\_5GPKMF\_ADDRESS\_REQUEST message (e.g., after TCP retransmission timeout)

 The UE shall close the existing secure connection to the 5G DDNMF, establish a new secure connection and then restart the 5G PKMF address request procedure.

b) No response from the 5G DDNMF after the PROSE\_5GPKMF\_ADDRESS\_REQUEST message has been successfully delivered (e.g., TCP ACK has been received for the PROSE\_5GPKMF\_ADDRESS\_REQUEST message)

 The UE shall retransmit the PROSE\_5GPKMF\_ADDRESS\_REQUEST message.

NOTE: The timer to trigger retransmission and the maximum number of allowed retransmissions are UE implementation specific.

c) Change of PLMN

 If a PLMN change occurs before the 5G PKMF address request procedure is completed, the procedure shall be aborted. If the UE is authorized to initiate the 5G PKMF address request procedure in the new PLMN, the procedure shall be restarted once the UE is registered on the new PLMN.

##### 6.2.X.6.2 Abnormal cases in the 5G DDNMF

The following abnormal cases can be identified:

a) Indication from the lower layer of transmission failure of PROSE\_5GPKMF\_ADDRESS\_REQUEST message

 After receiving an indication from lower layer that the PROSE\_5GPKMF\_ADDRESS\_REQUEST message has not been successfully acknowledged (e.g., TCP ACK is not received), the 5G DDNMF shall abort the procedure.

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

### 10.5.2 application/3gpp-5gprose+xml

The MIME type is used to carry information related to the 5G ProSe discovery operation. It shall be coded as an XML document containing one of the following 5G ProSe discovery messages:

a) DISCOVERY\_REQUEST;

b) DISCOVERY\_RESPONSE;

c) MATCH\_REPORT;

d) MATCH\_REPORT\_ACK;

e) DISCOVERY\_UPDATE\_REQUEST;

f) DISCOVERY\_UPDATE\_RESPONSE;

g) ANNOUNCING\_ALERT\_REQUEST;

h) ANNOUNCING\_ALERT\_RESPONSE;

i) PROSE\_5GPKMF\_ADDRESS\_REQUEST; or

j) PROSE\_5GPKMF\_ADDRESS\_RESPONSE.

Each of those messages is presented in the XML document as an XML element named after the corresponding message.

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

### 10.5.3 XML schema

Implementations in compliance with the present document shall implement the XML schema defined below for messages used in 5G ProSe direct discovery procedures over PC3a interface.

<?xml version="1.0" encoding="UTF-8"?>

<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"

 xmlns="urn:3GPP:ns:5GProSe:Discovery:2021"

 elementFormDefault="qualified"

 targetNamespace="urn:3GPP:ns:5GProSe:Discovery:2021">

 <xs:annotation>

 <xs:documentation>

 Info for 5G ProSe Discovery Control Messages Syntax

 </xs:documentation>

 </xs:annotation>

 <!-- Complex types defined for parameters with complicated structure -->

 <xs:complexType name="AppID-info">

 <xs:sequence>

 <xs:element name="OS-ID">

 <xs:simpleType>

 <xs:restriction base="xs:hexBinary">

 <xs:length value="16"/>

 </xs:restriction>

 </xs:simpleType>

 </xs:element>

 <xs:element name="OS-App-ID" type="xs:string"/>

 <xs:any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="PLMN-info">

 <xs:sequence>

 <xs:element name="mcc" type="xs:integer"/>

 <xs:element name="mnc" type="xs:integer"/>

 <xs:any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="SUPI-info">

 <xs:sequence>

 <xs:element name="MCC" type="xs:integer"/>

 <xs:element name="MNC" type="xs:integer"/>

 <xs:element name="MSIN" type="xs:integer"/>

 <xs:any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="DiscFilter-info">

 <xs:sequence>

 <xs:element name="ProSe-Application-Code" type="xs:hexBinary"/>

 <xs:element name="ProSe-Application-Mask" type="xs:hexBinary" maxOccurs="unbounded"/>

 <xs:element name="TTL-timer-T5064" type="xs:integer"/>

 <xs:any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

<xs:complexType name="MatchingFilter-info">

 <xs:sequence>

 <xs:element name="Code" type="xs:hexBinary"/>

 <xs:element name="Mask" type="xs:hexBinary" maxOccurs="unbounded"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

<xs:complexType name="DUCK-info">

 <xs:sequence>

 <xs:element name="discovery-user-confidentiality-key" type="xs:hexBinary"/>

 <xs:element name="encrypted-bitmask" type="xs:hexBinary"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

</xs:complexType>

 <xs:complexType name="RestrictedDiscFilter-info">

 <xs:sequence>

 <xs:element name="filter" type="MatchingFilter-info" maxOccurs="unbounded"/>

 <xs:element name="TTL-timer-T5066" type="xs:integer"/>

 <xs:element name="RPAUID" type="xs:string" minOccurs="0" />

 <xs:element name="metadata-indicator" type="xs:integer" minOccurs="0"/>

 <xs:element name="metadata" type="xs:string" minOccurs="0"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="RestrictedCodeSuffixRange-info">

 <xs:sequence>

 <xs:element name="beginning-suffix-code" type="xs:hexBinary" />

 <xs:element name="ending-suffix-code" type="xs:hexBinary" minOccurs="0"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="RestrictedMonitoringUpdate-info">

 <xs:sequence>

 <xs:element name="updated-filter" type="RestrictedDiscFilter-info" maxOccurs="unbounded"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="RestrictedAnnouncingUpdate-info">

 <xs:sequence>

 <xs:element name="ProSe-Restricted-Code" type="xs:hexBinary" />

 <xs:element name="validity-timer-T5062" type="xs:integer" />

 <xs:any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="MonitoringUpdate-info">

 <xs:sequence>

 <xs:element name="updated-filter" type="DiscFilter-info" maxOccurs="unbounded"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="AnnouncingUpdate-info">

 <xs:sequence>

 <xs:element name="ProSe-Application-Code" type="xs:hexBinary" />

 <xs:element name="validity-timer-T5060" type="xs:integer" />

 <xs:any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="Update-Option-info">

 <xs:choice>

 <xs:element name="update-info-restricted-announce" type="RestrictedAnnouncingUpdate-info" />

 <xs:element name="update-info-restricted-monitor" type="RestrictedMonitoringUpdate-info" />

 <xs:element name="update-info-open-annnounce" type="AnnouncingUpdate-info" />

 <xs:element name="update-info-open-monitor" type="MonitoringUpdate-info"/>

 <xs:element name="anyExt" type="anyExtType" />

 <xs:any namespace="##other" processContents="lax"/>

 </xs:choice>

 </xs:complexType>

 <xs:complexType name="Restricted-Code-Option-info">

 <xs:choice>

 <xs:element name="ProSe-Restricted-Code" type="xs:hexBinary" />

 <xs:element name="ProSe-Response-Code" type="xs:hexBinary" />

 <xs:element name="anyExt" type="anyExtType" />

 <xs:any namespace="##other" processContents="lax"/>

 </xs:choice>

 </xs:complexType>

 <xs:complexType name="Subquery-info">

 <xs:sequence>

 <xs:element name="ProSe-Rquery-Code" type="xs:hexBinary" />

 <xs:element name="response-filter" type="MatchingFilter-info" maxOccurs="unbounded"/>

 <xs:element name="validity-timer-T5070" type="xs:integer"/>

 <xs:element name="code-sending-security-parameter" type="Restricted-Security-info" />

 <xs:element name="code-receiving-security-parameter" type="Restricted-Security-info" minOccurs="0" />

 <xs:element name="RPAUID" type="xs:string" minOccurs="0" />

 <xs:element name="metadata" type="xs:string" minOccurs="0"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="Restricted-Security-info">

 <xs:sequence>

 <xs:element name="DUSK" type="xs:hexBinary" minOccurs="0" />

 <xs:element name="DUIK" type="xs:hexBinary" minOccurs="0" />

 <xs:element name="DUCK" type="DUCK-info" minOccurs="0" />

 <xs:element name="MIC-check-indicator" type="xs:boolean" minOccurs="0" />

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="ApplicationCodeSuffixRange-info">

 <xs:sequence>

 <xs:element name="beginning-suffix-code" type="xs:hexBinary" />

 <xs:element name="ending-suffix-code" type="xs:hexBinary" minOccurs="0"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="ProSeApplicationCodeACE-info">

 <xs:sequence>

 <xs:element name=" ProSe-Application-Code-Prefix" type="xs:hexBinary" />

 <xs:element name=" ProSe-Application-Code-Suffix-Range" type="ApplicationCodeSuffixRange-info" maxOccurs="unbounded" />

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="PC5-Security-Policies-info">

 <xs:sequence>

 <xs:element name="signalling-integrity-protection-policy" type="xs:integer"/>

 <xs:element name="signalling-ciphering-policy" type="xs:integer"/>

 <xs:element name="user-plane-integrity-protection-policy" type="xs:integer"/>

 <xs:element name="user-plane-ciphering-policy" type="xs:integer"/>

 <xs:any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <!-- Complex types defined for transaction-level -->

 <xs:complexType name="AnnounceRsp-info">

 <xs:sequence>

 <xs:element name="transaction-ID" type="xs:integer"/>

 <xs:element name="ProSe-Application-Code" type="xs:hexBinary" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="ProSe-Application-Code-ACE" type="ProSeApplicationCodeACE-info" minOccurs="0"/>

 <xs:element name="validity-timer-T5060" type="xs:integer" minOccurs="0" />

 <xs:element name="discovery-key" type="xs:hexBinary" minOccurs="0" />

 <xs:element name="discovery-entry-ID" type="xs:integer" minOccurs="0" />

 <xs:element name="ACE-enabled-indicator" type="xs:integer" minOccurs="0"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="MonitorRsp-info">

 <xs:sequence>

 <xs:element name="transaction-ID" type="xs:integer"/>

 <xs:element name="discovery-filter" type="DiscFilter-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="discovery-entry-ID" type="xs:integer" minOccurs="0" />

 <xs:element name="ACE-enabled-indicator" type="xs:integer" minOccurs="0"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="DiscReq-info">

 <xs:sequence>

 <xs:element name="transaction-ID" type="xs:integer"/>

 <xs:element name="command" type="xs:integer"/>

 <xs:element name="UE-identity" type="SUPI-info"/>

 <xs:element name="ProSe-Application-ID" type="xs:string"/>

 <xs:element name="application-identity" type="AppID-info"/>

 <xs:element name="discovery-entry-ID" type="xs:integer" minOccurs="0" />

 <xs:element name="Requested-Timer" type="xs:integer" minOccurs="0" />

 <xs:element name="metadata" type="xs:string" minOccurs="0"/>

 <xs:element name="Announcing-PLMN-ID" type="PLMN-info" minOccurs="0" />

 <xs:element name="ACE-enabled-indicator" type="xs:integer" minOccurs="0"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="RestrictedDiscReq-info">

 <xs:sequence>

 <xs:element name="transaction-ID" type="xs:integer"/>

 <xs:element name="command" type="xs:integer"/>

 <xs:element name="UE-identity" type="SUPI-info"/>

 <xs:element name="RPAUID" type="xs:string"/>

 <xs:element name="application-identity" type="AppID-info"/>

 <xs:element name="discovery-type" type="xs:integer"/>

 <xs:element name="ACE-enabled-indicator" type="xs:integer" minOccurs="0"/>

 <xs:element name="announcing-type" type="xs:integer" minOccurs="0"/>

 <xs:element name="application-level-container" type="xs:hexBinary" minOccurs="0"/>

 <xs:element name="discovery-model" type="xs:integer" minOccurs="0"/>

 <xs:element name="Announcing-PLMN-ID" type="PLMN-info" minOccurs="0" />

 <xs:element name="discovery-entry-ID" type="xs:integer"/>

 <xs:element name="Requested-Timer" type="xs:integer" minOccurs="0" />

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="RestrictedAnnounceRsp-info">

 <xs:sequence>

 <xs:element name="transaction-ID" type="xs:integer"/>

 <xs:element name="ProSe-Restricted-Code" type="xs:hexBinary" minOccurs="0"/>

 <xs:element name="ProSe-Restricted-Code-Suffix-Range" type="RestrictedCodeSuffixRange-info" minOccurs="0"/>

 <xs:element name="validity-timer-T5062" type="xs:integer" minOccurs="0"/>

 <xs:element name="ACE-enabled-indicator" type="xs:integer" minOccurs="0" />

 <xs:element name="code-sending-security-parameter" type="Restricted-Security-info" />

 <xs:element name="on-demand-announcing-enabled-indicator" type="xs:boolean" minOccurs="0" />

 <xs:element name="discovery-entry-ID" type="xs:integer"/>

 <xs:element name="PC5-security-policies" type="xs:PC5-Security-Policies-info" minOccurs="0" />

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="RestrictedMonitorRsp-info">

 <xs:sequence>

 <xs:element name="transaction-ID" type="xs:integer"/>

 <xs:element name="restricted-discovery-filter" type="RestrictedDiscFilter-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="ACE-enabled-indicator" type="xs:integer" minOccurs="0" />

 <xs:element name="application-level-container" type="xs:hexBinary"/>

 <xs:element name="code-receiving-security-parameter" type="Restricted-Security-info" minOccurs="0" />

 <xs:element name="discovery-entry-ID" type="xs:integer"/>

 <xs:element name="PC5-security-policies" type="xs:PC5-Security-Policies-info" minOccurs="0" />

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="RestrictedDiscovereeRsp-info">

 <xs:sequence>

 <xs:element name="transaction-ID" type="xs:integer"/>

 <xs:element name="ProSe-Response-Code" type="xs:hexBinary" />

 <xs:element name="query-filter" type="MatchingFilter-info" maxOccurs="unbounded"/>

 <xs:element name="validity-timer-T5068" type="xs:integer"/>

 <xs:element name="code-sending-security-parameter" type="Restricted-Security-info" />

 <xs:element name="code-receiving-security-parameter" type="Restricted-Security-info" minOccurs="0" />

 <xs:element name="discovery-entry-ID" type="xs:integer"/>

 <xs:element name="PC5-security-policies" type="xs:PC5-Security-Policies-info" minOccurs="0" />

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="RestrictedDiscovererRsp-info">

 <xs:sequence>

 <xs:element name="transaction-ID" type="xs:integer"/>

 <xs:element name="subquery-result" type="Subquery-info" minOccurs="1" maxOccurs="unbounded"/>

 <xs:element name="discovery-entry-ID" type="xs:integer"/>

 <xs:element name="PC5-security-policies" type="xs:PC5-Security-Policies-info" minOccurs="0" />

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="RejectRsp-info">

 <xs:sequence>

 <xs:element name="transaction-ID" type="xs:integer"/>

 <xs:element name="PC3a-control-protocol-cause-value" type="xs:integer"/>

 <xs:any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="UE-RejectRsp-info">

 <xs:sequence>

 <xs:element name="DDNMF-transaction-ID" type="xs:integer"/>

 <xs:element name="PC3a-control-protocol-cause-value" type="xs:integer"/>

 <xs:any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="MatchRep-info">

 <xs:sequence>

 <xs:element name="transaction-ID" type="xs:integer"/>

 <xs:element name="ProSe-Application-Code" type="xs:hexBinary"/>

 <xs:element name="UE-identity" type="SUPI-info"/>

 <xs:element name="Monitored-PLMN-ID" type="PLMN-info"/>

 <xs:element name="VPLMN-ID" type="PLMN-info" minOccurs="0"/>

 <xs:element name="MIC" type="xs:hexBinary"/>

 <xs:element name="UTC-based-counter" type="xs:hexBinary"/>

 <xs:element name="Metadata-flag" type="xs:boolean"/>

 <xs:element name="MessageType" type="xs:hexBinary" minOccurs="0"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="RestrictedMatch-info">

 <xs:sequence>

 <xs:element name="transaction-ID" type="xs:integer"/>

 <xs:element name="UE-identity" type="SUPI-info"/>

 <xs:element name="discovery-type" type="xs:integer"/>

 <xs:element name="application-identity" type="AppID-info"/>

 <xs:element name="RPAUID" type="xs:string"/>

 <xs:element name="Restricted-Code-Discovered" type="Restricted-Code-Option-info" />

 <xs:element name="MIC" type="xs:hexBinary" minOccurs="0"/>

 <xs:element name="MessageType" type="xs:hexBinary" minOccurs="0"/>

 <xs:element name="UTC-based-counter" type="xs:hexBinary" minOccurs="0"/>

 <xs:element name="Metadata-flag" type="xs:boolean" />

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="MatchAck-info">

 <xs:sequence>

 <xs:element name="transaction-ID" type="xs:integer"/>

 <xs:element name="ProSe-Application-ID" type="xs:string"/>

 <xs:element name="validity-timer-T5072" type="xs:integer"/>

 <xs:element name="metadata" type="xs:string" minOccurs="0"/>

 <xs:element name="metadata-index-mask" type="xs:hexBinary" minOccurs="0"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:attribute name="match-report-refresh-timer-T5074" type="xs:integer"/>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="RestrictedMatchAck-info">

 <xs:sequence>

 <xs:element name="transaction-ID" type="xs:integer"/>

 <xs:element name="application-identity" type="AppID-info"/>

 <xs:element name="RPAUID" type="xs:string"/>

 <xs:element name="validity-timer-T5076" type="xs:integer"/>

 <xs:element name="metadata" type="xs:string" minOccurs="0"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:attribute name="match-report-refresh-timer-T5077" type="xs:integer"/>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="MatchReject-info">

 <xs:sequence>

 <xs:element name="transaction-ID" type="xs:integer"/>

 <xs:element name="PC3a-control-protocol-cause-value" type="xs:integer"/>

 <xs:any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="DiscUpdateReq-info">

 <xs:sequence>

 <xs:element name="DDNMF-transaction-ID" type="xs:integer"/>

 <xs:element name="UE-identity" type="SUPI-info"/>

 <xs:element name="discovery-entry-ID" type="xs:integer"/>

 <xs:element name="update-info" type="Update-Option-info" minOccurs="0"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="DiscUpdateRsp-info">

 <xs:sequence>

 <xs:element name="DDNMF-transaction-ID" type="xs:integer"/>

 <xs:element name="discovery-entry-ID" type="xs:integer"/>

 <xs:any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="AnnouncingAlertReq-info">

 <xs:sequence>

 <xs:element name="DDNMF-transaction-ID" type="xs:integer"/>

 <xs:element name="RPAUID" type="xs:string"/>

 <xs:element name="UE-identity" type="SUPI-info"/>

 <xs:element name="discovery-entry-ID" type="xs:integer"/>

 <xs:element name="ProSe-Restricted-Code" type="xs:hexBinary"/>

 <xs:element name="ProSe-Restricted-Code-Suffix-Range" type="RestrictedCodeSuffixRange-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="AnnouncingAlertRsp-info">

 <xs:sequence>

 <xs:element name="DDNMF-transaction-ID" type="xs:integer"/>

 <xs:any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="PKMFAddrReq-info">

 <xs:sequence>

 <xs:element name="transaction-ID" type="xs:integer"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="PKMFAddrRsp-info">

 <xs:sequence>

 <xs:element name="transaction-ID" type="xs:integer"/>

 <xs:element name="PKMF-address" type="xs:string"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <!-- Complex types defined for Message-level -->

 <xs:complexType name="prose-direct-discovery-request">

 <xs:sequence>

 <xs:element name="discovery-request" type="DiscReq-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="restricted-discovery-request" type="RestrictedDiscReq-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:attribute name="network-initiated-transaction-method" type="xs:integer"/>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="prose-direct-discovery-response">

 <xs:sequence>

 <xs:element name="Current-Time" type="xs:dateTime"/>

 <xs:element name="Max-Offset" type="xs:integer"/>

 <xs:element name="response-announce" type="AnnounceRsp-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="response-monitor" type="MonitorRsp-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="restricted-announce-response" type="RestrictedAnnounceRsp-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="restricted-monitor-response" type="RestrictedMonitorRsp-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="restricted-discoveree-response" type="RestrictedDiscovereeRsp-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="restricted-discoverer-response" type="RestrictedDiscovererRsp-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="response-reject" type="RejectRsp-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:attribute name="network-initiated-transaction-method" type="xs:integer"/>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="prose-direct-discovery-update-request">

 <xs:sequence>

 <xs:element name="discovery-update-request" type="DiscUpdateReq-info" maxOccurs="unbounded"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="prose-direct-discovery-update-response">

 <xs:sequence>

 <xs:element name="response-update" type="DiscUpdateRsp-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="response-reject" type="UE-RejectRsp-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="prose-direct-discovery-match-report">

 <xs:sequence>

 <xs:element name="match-report" type="MatchRep-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="restricted-match" type="RestrictedMatch-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="prose-direct-discovery-match-report-ack">

 <xs:sequence>

 <xs:element name="Current-Time" type="xs:dateTime"/>

 <xs:element name="match-ack" type="MatchAck-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="match-reject" type="MatchReject-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="restricted-match-ack" type="RestrictedMatchAck-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="prose-direct-discovery-announcing-alert-request">

 <xs:sequence>

 <xs:element name="announcing-alert-request" type="AnnouncingAlertReq-info" maxOccurs="unbounded"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="prose-direct-discovery-announcing-alert-response">

 <xs:sequence>

 <xs:element name="announcing-alert-response" type="AnnouncingAlertRsp-info" maxOccurs="unbounded"/>

 <xs:element name="response-reject" type="UE-RejectRsp-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="prose-5gpkmf-address-request">

 <xs:sequence>

 <xs:element name="PKMF-address-request" type="PKMFAddrReq-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <xs:complexType name="prose-5gpkmf-address-response">

 <xs:sequence>

 <xs:element name="PKMF-address-response" type="PKMFAddrRsp-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="PKMF-address-reject" type="RejectRsp-info" minOccurs="0" maxOccurs="unbounded"/>

 <xs:element name="anyExt" type="anyExtType" minOccurs="0"/>

 <xs:any namespace="##other" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <!-- extension allowed -->

 <xs:complexType name="DiscMsgExtType">

 <xs:sequence>

 <xs:any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 <xs:anyAttribute namespace="##any" processContents="lax"/>

 </xs:complexType>

 <!-- XML attribute for any future extensions -->

 <xs:complexType name="anyExtType">

 <xs:sequence>

 <xs:any namespace="##any" processContents="lax" minOccurs="0" maxOccurs="unbounded"/>

 </xs:sequence>

 </xs:complexType>

<!-- Top levelDiscovery Message definition -->

 <xs:element name="prose-discovery-message">

 <xs:complexType>

 <xs:choice>

 <xs:element name="DISCOVERY\_REQUEST" type="prose-direct-discovery-request"/>

 <xs:element name="DISCOVERY\_RESPONSE" type="prose-direct-discovery-response"/>

 <xs:element name="MATCH\_REPORT" type="prose-direct-discovery-match-report"/>

 <xs:element name="MATCH\_REPORT\_ACK" type="prose-direct-discovery-match-report-ack"/>

 <xs:element name="DISCOVERY\_UPDATE\_REQUEST" type="prose-direct-discovery-update-request"/>

 <xs:element name="DISCOVERY\_UPDATE\_RESPONSE" type="prose-direct-discovery-update-response"/>

 <xs:element name="ANNOUNCING\_ALERT\_REQUEST" type="prose-direct-discovery-announcing-alert-request"/>

 <xs:element name="ANNOUNCING\_ALERT\_RESPONSE" type="prose-direct-discovery-announcing-alert-response"/>

 <xs:element name="PROSE\_5GPKMF\_ADDRESS\_REQUEST" type="prose-5gpkmf-address-request"/>

 <xs:element name="PROSE\_5GPKMF\_ADDRESS\_RESPONSE" type="prose-5gpkmf-address-response"/>

 <xs:element name="message-ext" type="DiscMsgExtType"/>

 <xs:any namespace="##other" processContents="lax"/>

 </xs:choice>

 </xs:complexType>

 </xs:element>

</xs:schema>

An entity receiving the XML body ignores any unknown XML element and any unknown XML attribute.

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

#### 10.5.4.1 General

The <prose-discovery-message> element is the root element of this XML document and it can be one of the following elements:

a) <DISCOVERY\_REQUEST>;

b) <DISCOVERY\_RESPONSE>;

c) <MATCH\_REPORT>;

d) <MATCH\_REPORT\_ACK>;

e) <DISCOVERY\_UPDATE\_REQUEST>;

f) <DISCOVERY\_UPDATE\_RESPONSE>

g) <ANNOUNCE\_ALERT\_REQUEST>;

h) <ANNOUNCE\_ALERT\_RESPONSE>;

i) <PROSE\_5GPKMF\_ADDRESS\_REQUEST>;

j) <PROSE\_5GPKMF\_ADDRESS\_RESPONSE>;

k) <message-ext> element containing other discovery message defined in future releases; or

l) an element from other namespaces defined in future releases.

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

#### 10.5.4.y Semantics of <PROSE\_5GPKMF\_ADDRESS\_REQUEST>

The <PROSE\_5GPKMF\_ADDRESS\_REQUEST> element contains one or more of the following elements:

a) zero, one or more <PKMF-address-request> element which contains transactions sent from the UE to the 5G DDNMF. Each <PKMF-address-request> consists of:

1) a <transaction-ID> element containing the parameter defined in clause 11.4.2.1;

2) zero or one <anyExt> element containing elements defined in future releases;

3) zero, one or more elements from other namespaces defined in future releases; and

4) zero, one or more attributes defined in future releases;

b) zero or one <anyExt> element containing elements defined in future releases;

c) zero, one or more elements from other namespaces defined in future releases; and

d) zero, one or more attributes defined in future releases.

#### 10.5.4.z Semantics of <PROSE\_5GPKMF\_ADDRESS\_RESPONSE>

The <PROSE\_5GPKMF\_ADDRESS\_RESPONSE> element contains one or more of the following elements:

a) zero, one or more <PKMF-address-response> element which contains transactions sent from the 5G DDNMF to the UE. Each < PKMF-address-response> consists of:

1) a <transaction-ID> element containing the parameter defined in clause 11.4.2.1;

2) a <PKMF-address> element containing the parameter defined in clause 11.4.2.a;

3) zero or one <anyExt> element containing elements defined in future releases;

4) zero, one or more elements from other namespaces defined in future releases; and

5) zero, one or more attributes defined in future releases;

b) zero, one or more <PKMF-address-reject> element which contains transactions sent from the 5G DDNMF to the UE as a response if the 5G DDNMF cannot accept the request. Each <PKMF-address-reject> consists of:

1) a <transaction-ID> element containing the parameter defined in clause 11.4.2.1;

2) a <PC3a-control-protocol-cause-value> element containing the parameter defined in clause 11.4.2.8.

3) zero, one or more elements defined in future releases; and

4) zero, one or more attributes defined in future releases;

c) zero or one <anyExt> element containing elements defined in future releases;

d) zero, one or more elements from other namespaces defined in future releases; and

e) zero, one or more attributes defined in future releases.

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

#### 11.4.2.a PKMF address

This parameter is used to carry a 5G PKMF address to the UE by the 5G DDNMF in order to find a 5G PKMF for the authentication based on security procedure over user plane as specified in 3GPP TS 33.503 [34].

The PKMF address information element is coded as shown in figure 11.4.2.a.1, figure 11.4.2.a.2, figure 11.4.2.a.3, and table 11.4.2.a.1.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Length of PKMF address | octet 1octet 2 |
| 0Spare | 0Spare | 0Spare | 0Spare | 0Spare | FQDNI | IPv6I | IPv4I | octet 3 |
| IPv4 address list | octet 4\*octet o\* |
| IPv6 address list | octet (o+1)\*octet m\* |
| FQDN | octet (m+1)\*octet n\* |

Figure 11.4.2.a.1: PKMF address

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Number of IPv4 addresses | octet 4 |
| IPv4 address 1 | octet 5octet 8 |
| IPv4 address 2 | octet 9octet 12 |
| … … |  |
| IPv4 address N | octet o-3octet o |

Figure 11.4.2.a.2: IPv4 address list

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 |  |
| Number of IPv6 addresses | octet o+1 |
| IPv6 address 1 | octet o+2octet o+17 |
| IPv6 address 2 | octet o+18octet o+33 |
| … … |  |
| IPv6 address N | octet m-15octet m |

Figure 11.4.2.a.3: IPv6 address list

Table 11.4.2.a.1: PKMF address information element

|  |
| --- |
| IPv4 addresses indicator (IPv4I) (octet 3 bit 1): (NOTE 1)Bit**1**0 IPv4 address list is not present1 IPv4 address list is present |
| IPv6 addresses indicator (IPv6I) (octet 3 bit 2): (NOTE 1)Bit**2**0 IPv6 address list is not present1 IPv6 address list is presentFQDN indicator (FQDNI) (octet 3 bit 3): (NOTE 2)Bit**3**0 FQDN is not present1 FQDN is present |
| IPv4 address list (octet 4 to octet o) |
| IPv4 address list contains the IPv4 address(es) of the 5G PKMF and shall be encoded as defined in figure 11.4.2.a.2.IPv6 address list (octet o+1 to octet m)IPv6 address list contains the IPv6 address(es) of the 5G PKMF and shall be encoded as defined in figure 11.4.2.a.3.FQDN (octet m+1 to n)FQDN field contains a sequence of one octet FQDN length field and a FQDN value of variable size. The FQDN value field shall be encoded as defined in clause 28.3.2.1 in 3GPP TS 23.003 [12]. |
| NOTE 1: If multiple IPv4 addresses and/or IPv6 addresses are included, which one of these addresses is selected is implementation dependent.NOTE 2: If the 5G PKMF supports the 5G PKMF Services with "https" URI scheme (i.e use of TLS is mandatory), then the FQDN shall be used to construct the target URI. |

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