ETSI TS 124 526 V17.6.0 (2022-05)

5G;
User Equipment (UE) policies for 5G System (5GS);
Stage 3
(3GPP TS 24.526 version 17.6.0 Release 17)

Reference
RTS/TSGC-0124526vh60

Keywords
5G

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° w061004871

Intellectual Property Rights

Essential patents

IPRs essential or potentially essential to normative deliverables may have been declared to ETSI. The declarations pertaining to these essential IPRs, if any, are publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (https://ipr.etsi.org/).

Pursuant to the ETSI Directives including the ETSI IPR Policy, no investigation regarding the essentiality of IPRs, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Trademarks

The present document may include trademarks and/or tradenames which are asserted and/or registered by their owners. ETSI claims no ownership of these except for any which are indicated as being the property of ETSI, and conveys no right to use or reproduce any trademark and/or tradename. Mention of those trademarks in the present document does not constitute an endorsement by ETSI of products, services or organizations associated with those trademarks.

DECT™, **PLUGTESTS™**, **UMTS™** and the ETSI logo are trademarks of ETSI registered for the benefit of its Members. **3GPP™** and **LTE™** are trademarks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners. **oneM2M™** logo is a trademark of ETSI registered for the benefit of its Members and of the oneM2M Partners. **GSM**® and the GSM logo are trademarks registered and owned by the GSM Association.

Legal Notice

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

The present document may refer to technical specifications or reports using their 3GPP identities. These shall be interpreted as being references to the corresponding ETSI deliverables.

The cross reference between 3GPP and ETSI identities can be found under http://webapp.etsi.org/key/queryform.asp.

Modal verbs terminology

In the present document "**shall**", "**shall not**", "**should**", "**should not**", "**may**", "**need not**", "**will**", "**will not**", "**can**" and "**cannot**" are to be interpreted as described in clause 3.2 of the ETSI Drafting Rules (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

Contents

Foreword

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

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

Version x.y.z

where:

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

1 Scope

The present document defines UE policies for 5G System (5GS) as specified in 3GPP TS 23.503 [2] including:

- UE route selection policy; and
- Access network discovery and selection policy.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] 3GPP TS 23.503: " Policy and Charging Control Framework for the 5G System; Stage 2".

[3] 3GPP TS 24.502: "Access to the 3GPP 5G Core Network (5GCN) via Non-3GPP Access Networks (N3AN); Stage 3".

[4] 3GPP TS 23.003: "Numbering, addressing and identification".

[5] 3GPP TS 25.331: "Radio Resource Control (RRC); Protocol Specification".

[6] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA) Radio Resource Control (RRC); Protocol specification".

[7] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".

[8] IEEE Std 802.11™-2016: "Information Technology- Telecommunications and information exchange between systems-Local and metropolitan area networks-Specific requirements-Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications".

[9] Wi-Fi Alliance: "Hotspot 2.0 (Release 2) Technical Specification, version 1.0.0", 2014-08-08.

[10] ITU-T Recommendation E.212: "The international identification plan for public networks and subscriptions", 2016-09-23.

[11] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".

[12] IETF RFC 1035: "Domain names - implementation and specification".

[13] ISO 8601:2004: "Data elements and interchange formats -- Information interchange -- Representation of dates and times".

[14] 3GPP TS 38.413: "NG-RAN; NG Application Protocol (NGAP)".

[15] 3GPP TS 23.501: "System Architecture for the 5G System; Stage 2".

[16] IETF RFC 4122: "A Universally Unique IDentifier (UUID) URN Namespace".

[17] IETF RFC 5905: "Network Time Protocol Version 4: Protocol and Algorithms Specification".

[18] 3GPP TS 24.588: "Vehicle-to-Everything (V2X) services in 5G System (5GS); User Equipment (UE) policies; Stage 3".

[18A] 3GPP TS 24.555: "Proximity-services (ProSe) in 5G System (5GS); User Equipment (UE) policies; Stage 3".

[19] IEEE 1003.1-2004, Part 1: Base Definitions.

[20] IEEE Std 802.1Q-2018: "IEEE Standard for Local and metropolitan area networks--Bridges and Bridged Networks".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1]apply. A term defined in the present document takes precedence over the definition of the same term, if any, in 3GPP TR 21.905 [1].

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.501 [15] apply:

non-seamless non-3GPP offload

For the purposes of the present document, the following terms and definitions given in 3GPP TS 23.503 [2] apply:

UE local configuration
User preferences on non-3GPP access selection

For the purposes of the present document, the following terms and definitions given in 3GPP TS 24.501 [11] apply:

5GMM-IDLE mode

3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

5GCN	5G Core Network
5GS	5G System
ANDSP	Access Network Discovery and Selection Policy
DNN	Data Network Name
ePDG	evolved Packet Data Gateway
FQDN	Fully Qualified Domain Name
H-PCF	A PCF in the HPLMN
IMS	IP Multimedia Subsystem
LADN	Local Area Data Network
MCC	Mobile Country Code
ME	Mobile Equipment
MMS	Multimedia Messaging Service
MNC	Mobile Network Code
N3AN	Non-3GPP Access Network
N3IWF	Non-3GPP InterWorking Function
OS	Operating System
PCF	Policy Control Function
ProSeP	5G ProSe Policy
RSN	Redundancy Sequence Number
S-NSSAI	Single Network Slice Selection Assistance Information
SSC	Session and Service Continuity
SUPI	Subscriber Permanent Identifier
SUPL	Secure User Plane Location
URSP	UE Route Selection Policy
USIM	User Services Identity Module
V-PCF	A PCF in the VPLMN

V2XP V2X Policy
WLANSP WLAN Selection Policy

4 Descriptions of UE policies for 5GS

4.1 Overview

The UE policies for 5GS include:

- UE route selection policy (URSP)(see clause 4.2);
- Access network discovery and selection policy (ANDSP)(see clause 4.3);
- V2X policy (V2XP); and
- 5G ProSe policy (ProSeP).

The UE policies can be delivered from the PCF to the UE. The UE policy delivery procedure is specified in 3GPP TS 24.501 [11].

The UE policies can also be pre-configured in the UE. The pre-configured policy shall be applied by the UE only when the UE has not received the same type of policy from the PCF. The implementation of pre-configured UE policies is out of scope of this specification.

The UE policies can be delivered from the PCF to the 5G-RG or a W-AGF acting on behalf of the FN-RG. The UE policy delivery service is specified in 3GPP TS 24.501 [11]. These UE policies include the UE route selection policy (URSP) (see clause 4.2).

The UE policies can also be pre-configured in the 5G-RG or a W-AGF acting on behalf of the FN-RG. The pre-configured policy shall be applied by the 5G-RG or a W-AGF acting on behalf of the FN-RG only when the 5G-RG or a W-AGF acting on behalf of the FN-RG has not received the same type of policy from the PCF. The implementation of pre-configured UE policies is out of scope of this specification.

The UE policies for V2X (V2XP) are specified in 3GPP TS 24.588 [18].

The UE policies for 5G ProSe policy (ProSeP) are specified in 3GPP TS 24.555 [18A].

4.2 UE route selection policy (URSP)

4.2.1 General

The URSP is defined in 3GPP TS 23.503 [2] and is a set of one or more URSP rules, where a URSP rule is composed of:

a) a precedence value of the URSP rule identifying the precedence of the URSP rule among all the existing URSP rules;

b) a traffic descriptor, including either:

   1) match-all traffic descriptor; or

   2) at least one of the following components:

      A) one or more application identifiers;

      B) one or more IP 3 tuples as defined in 3GPP TS 23.503 [2] i.e. the destination IP address, the destination port number, and the protocol in use above the IP;

      C) one or more non-IP descriptors, i.e. destination information of non-IP traffic;

      D) one or more DNNs;

E) one or more connection capabilities; and

F) one or more domain descriptors, i.e. destination FQDN(s) or a regular expression as a domain name matching criteria; and

c) one or more route selection descriptors each consisting of a precedence value of the route selection descriptor and either

1) one PDU session type and, optionally, one or more of the followings:

A) SSC mode;

B) one or more S-NSSAIs;

C) one or more DNNs;

D) Void;

E) preferred access type;

F) multi-access preference;

G) a time window;

H) location criteria;

I) PDU session pair ID; and

J) RSN;

2) non-seamless non-3GPP offload indication; or

3) 5G ProSe layer-3 UE-to-network relay offload indication.

Only one URSP rule in the URSP can be a default URSP rule and the default URSP rule shall contain a match all traffic descriptor. If a default URSP rule and one or more non-default URSP rules are included in the URSP, any non-default URSP rule shall have lower precedence value than (i.e. shall be prioritised over) the default URSP rule.

If a traffic descriptor lists one or more application identifiers together with one or more connection capabilities, the UE shall consider that the application identifiers identify the applications requesting access to the connection capabilities.

NOTE 1: The connection capabilities requested by the applications are OS dependent. The connection capability identifiers defined in table 5.2.1 are OS independent. It is based on the UE implementation how the UE matches the connection capabilities requested by the applications to the connection capability identifiers in table 5.2.1.

NOTE 2: If the UE has multiple concurrently active OS, the traffic descriptor can list as many multiple OS Ids.

NOTE 3: It is recommended to avoid the combination of more than two components in the traffic descriptor.

4.2.2 Association between an application and a PDU session, non-seamless non-3GPP offload or 5G ProSe layer-3 UE-to-network relay offload

4.2.2.1 General

Association between an application and a PDU session, non-seamless non-3GPP offload or 5G ProSe Layer-3 UE-to-network relay offload is described separately for a UE and for a 5G-RG or a W-AGF acting on behalf of an FN-RG. Clause 4.2.2.2 is not applicable for the 5G-RG or the W-AGF acting on behalf of the FN-RG.

4.2.2.2 Association between an application and a PDU session, non-seamless non-3GPP offload or 5G ProSe layer-3 UE-to-network relay offload by a UE

In order to send a PDU of an application, the upper layers require information on the PDU session (e.g. PDU address) via which to send a PDU of an application.

NOTE 0: If PAP/CHAP is used, it is recommended that the request from the upper layers includes a DNN.

When the upper layers request information of the PDU session via which to send a PDU of an application;

- information on the non-3GPP access outside of a PDU session shall be provided to the upper layers, without evaluating the URSP rules, if due to UE local configuration non-seamless non-3GPP offload is requested; or
- information on the 5G ProSe layer-3 UE-to-network relay shall be provided to the upper layers, without evaluating the URSP rules, if due to UE local configuration 5G ProSe layer-3 UE-to-network relay offload is requested;

otherwise, the UE shall proceed in the following order:

a) the UE shall evaluate the URSP rules, except the default URSP rule, with a traffic descriptor matching the application information in increasing order of their precedence values, if any. If the traffic descriptor contains more than one traffic descriptor component type, each of a different type, all of them shall be matched. If the traffic descriptor contains more than one traffic descriptor component of the same traffic descriptor component type, at least one of the traffic descriptor components of the same traffic descriptor component type shall be matched with the application information. A URSP rule is determined not to be applicable when for any given component in the traffic descriptor no corresponding information from the application is available or the corresponding information from the application does not match any of the values in the traffic descriptor component as specified in clause 6.6.2.1 of 3GPP TS 23.503 [2].

   If the UE finds the traffic descriptor in a non-default URSP rule matching the application information, and:

   I) if:

      1) at least one of the route selection descriptors of the URSP rule contains a non-seamless non-3GPP offload indication and the information on the non-3GPP access outside of a PDU session is available;

         the UE shall provide information on the non-3GPP access outside of a PDU session to the upper layers; and

      2) there is one or more PDU sessions:

         i) matching at least one of the route selection descriptors of the URSP rule except the preferred access type and the multi-access preference, if any, wherein a route selection descriptor with PDU session type IPv4v6 matches also with PDU session type IPv4 if the network has sent 5GSM cause value #50 "PDU session type IPv4 only allowed" in the PDU SESSION ESTABLISHMENT ACCEPT message, a route selection descriptor with PDU session type IPv4v6 matches also with PDU session type IPv6 if the network has sent 5GSM cause value #51 "PDU session type IPv6 only allowed" in the PDU SESSION ESTABLISHMENT ACCEPT message and a route selection descriptor with PDU session type IPv4v6 matches also with PDU session type IPv6 or IPv4 if the UE requested the PDU session type IPv4v6 but the selected PDU session type is set to IPv4 or IPv6 in the PDU SESSION ESTABLISHMENT ACCEPT message; and

         ii) established without requesting any parameter for which the matching route selection descriptor of the URSP rule does not provide a route selection descriptor component, except:

            A) the preferred access type;

            B) the multi-access preference;

            C) the DNN, if no DNN is included in the route selection descriptor component and the DNN provided by the application is the same as the DNN requested by the UE during the PDU session establishment; and

            D) the S-NSSAI, if the UE has only one S-NSSAI in the allowed NSSAI.

the UE shall provide information on the PDU session that matches the route selection descriptor of the lowest precedence value to the upper layers;

NOTE 1: It is up to the UE implementation which PDU session to select if there exist multiple PDU sessions matching the same route selection descriptor of the lowest precedence value.

II) otherwise:

1) the UE shall select a route selection descriptor with the next smallest precedence value which has not yet been evaluated;

2) if:

i) the selected route selection descriptor contains a non-seamless non-3GPP offload indication:

A) if the information on the non-3GPP access outside of a PDU session is available, it shall be provided to the upper layers and the UE shall stop selecting a route selection descriptor matching the application information.

B) if the information about the non-3GPP access outside of a PDU session is not available, or non-3GPP access is not available the UE shall proceed to step 4);

ia) the selected route selection descriptor contains a 5G ProSe layer-3 UE-to-network relay offload indication:

A) if the information on the 5G ProSe layer-3 UE-to-network relay is available and the UE supports acting as ProSe layer-3 UE-to-network remote UE as specified in 3GPP TS 24.501 [11], it shall be provided to the upper layers and the UE shall stop selecting a route selection descriptor matching the application information.

B) if the information about the 5G ProSe layer-3 UE-to-network relay is not available or the UE does not support acting as ProSe layer-3 UE-to-network remote UE as specified in 3GPP TS 24.501 [11], the UE shall proceed to step 4);

ii) the selected route selection descriptor includes a PDU session type or an SSC mode which is not supported by the UE, the UE shall proceed to step 4);

iii) the selected route selection descriptor contains a time window but the time does not match the time window, the UE shall proceed to step 4);

iv) the selected route selection descriptor contains location criteria but the UE location does not match the location criteria, the UE shall proceed to step 4);

v) the selected route selection descriptor includes the multi-access preference but the UE does not support ATSSS, the UE shall proceed to step 4);

va) the selected route selection descriptor includes an SSC mode which either has been rejected by the network with 5GSM cause value #68 "not supported SSC mode" for the same DNN (or no DNN, if no DNN was indicated by the UE) and the same S-NSSAI associated with (if available in roaming scenarios) a mapped S-NSSAI (or no S-NSSAI, if no S-NSSAI was indicated by the UE) or was not included in the Allowed SSC mode IE following a rejection with 5GSM cause value #68 "not supported SSC mode" for the same DNN (or no DNN, if no DNN was indicated by the UE) and the same S-NSSAI associated with (if available in roaming scenarios) a mapped S-NSSAI (or no S-NSSAI, if no S-NSSAI was indicated by the UE), the UE shall proceed to step 4); or

vi) the selected route selection descriptor does not contain a non-seamless non-3GPP offload indication nor a 5G ProSe layer-3 UE-to-network relay offload indication, the URSP handling layer requests the UE NAS layer to establish a PDU session providing the following PDU session attributes based on the selected route selection descriptor:

A) SSC mode if there is a SSC mode in the route selection descriptor;

NOTE 2: The SSC mode 3 is only used when the PDU session type is IPv4, IPv6 or IPv4v6.

B) one S-NSSAI if the S-NSSAI is in the route selection descriptor; and the S-NSSAI is in the allowed NSSAI. If none of the S-NSSAI(s) in the route selection descriptor is in the allowed NSSAI, the UE shall proceed to step 4);

NOTE 3: If there are multiple S-NSSAIs in the route selection descriptor, an S-NSSAI is chosen among the S-NSSAIs based on UE implementation.

C) one DNN, if the DNN is in the route selection descriptor; and if the DNN is an LADN DNN and the UE is in the service area of that LADN;

NOTE 4: If one or more DNNs are included in the traffic descriptor and no DNN is included in the route selection descriptor, the DNN provided by the application is selected as one of the PDU session attributes by the URSP handling layer to request the UE NAS layer.

NOTE 5: If there are multiple DNNs in the route selection descriptor, a DNN is chosen based on UE implementation.

D) the PDU session type of the route selection descriptor;

E) preferred access type or multi-access preference, if the preferred access type or the multi-access preference is in the route selection descriptor;

NOTE 6: If a preferred access type or a multi-access preference is included in the route selection descriptor of a URSP rule, it is recommended that the UE establishes a PDU session based on the preferred access type or the multi-access preference.

F) PDU session pair ID if there is a PDU session pair ID in the route selection descriptor; and

G) RSN if there is an RSN in the route selection descriptor;

The UE NAS layer indicates the result of the PDU session establishment. Upon successful completion of the PDU session establishment, the UE NAS layer shall additionally indicate the attributes of the established PDU session (e.g. PDU session identity, SSC mode, S-NSSAI, DNN, PDU session type, access type, PDU address) to the URSP handling layer, and shall provide information (e.g. PDU address) of the successfully established PDU session to the upper layers. The UE shall stop selecting a route selection descriptor matching the application information. If the PDU session establishment is unsuccessful, the UE shall proceed to step 3);

3) Based on the rejection cause and if there is another value which can be used for the rejected component in the same route selection descriptor, the UE shall select another combination of values in the currently selected route selection descriptor by using this value of the rejected component and proceed to step 2), otherwise the UE shall proceed to step 4); and

4) if there is any route selection descriptor which has not yet been evaluated, the UE shall proceed to step 1). If all route selection descriptors for the matching non-default URSP rule have been evaluated and there is one or more non-default matching URSP rule which has not yet been evaluated, the UE shall proceed to step a). If all non-default matching URSP rules have been evaluated, the UE shall inform the upper layers of the failure.

b) if no non-default matching URSP rule can be found and if UE local configuration for the application is available, the UE shall perform the association of the application to a PDU session accordingly. If no matching PDU session exists, the UE NAS layer shall attempt to establish a PDU session using UE local configuration.

NOTE 7: Any missing information in the UE local configuration needed to build the PDU session establishment request can be the appropriate corresponding component from the default URSP rule with the "match-all" traffic descriptor.

NOTE 8: If a DNN was provided by the application and no DNN is included in the UE local configuration, the DNN provided by the application is selected as one of the PDU session attributes by the URSP handling layer to request the UE NAS layer.

NOTE 9: If there are multiple DNNs in the UE local configuration, a DNN is chosen based on UE implementation.

If the PDU session establishment is successful, the UE NAS layer shall provide information (e.g. PDU address) of the successfully established PDU session to the upper layers. Otherwise, the UE shall go to step c);

c) if no non-default matching URSP rule can be found and if either UE local configuration for the application is not available or the PDU session establishment based on UE local configuration for the application was unsuccessful, the UE shall perform the association of the application to a PDU session, to non-seamless non-3GPP offload or to 5G ProSe layer-3 UE-to-network relay offload according to the default URSP rule with the "match-all" traffic descriptor, if any. If the association is unsuccessful, the UE shall inform the upper layers of the failure.

NOTE 10: If a DNN was provided by the application and no DNN is included in the route selection descriptor of the default URSP rule, the DNN provided by the application is selected as one of the PDU session attributes by the URSP handling layer to request the UE NAS layer. If one or more DNNs are included in the route selection descriptor of the default URSP rule, the DNN in the route selection descriptor is selected as one of the PDU session attributes by the URSP handling layer to request the UE NAS layer. When there are multiple DNNs in the route selection descriptor, the DNN is selected based on UE implementation.

The HPLMN may pre-configure the UE with URSP in the ME or in the USIM and the SNPN(s) may pre-configure the UE with URSP in the corresponding entry of the "list of subscriber data" stored in ME, or the HPLMN and the SNPN(s) may provide URSP to the UE by signalling as described in annex D of 3GPP TS 24.501 [11]. The HPLMN pre-configured URSP in the ME and the HPLMN signalled URSP shall be stored in a non-volatile memory in the ME together with the SUPI from the USIM. The SNPN(s) signalled URSP shall be stored per SNPN in a non-volatile memory in the ME together with the subscriber identifier and the associated SNPN identity of the SNPN in the "list of subscriber data" configured in the ME. The SNPN(s) pre-configured URSP and the SNPN(s) signalled URSP shall be used only when the selected SNPN identity matches the associated SNPN identity. If the UE has both pre-configured URSP(s) and signalled URSP, the UE shall only use the signalled URSP. For a UE not operating in SNPN access operation mode, if the UE has no signalled URSP, the UE shall:

- only use the pre-configured URSP rules of the HPLMN and ignore URSP rules of other PLMN(s) in the USIM, if there are pre-configured URSP rules of the HPLMN in the USIM; or
- use the pre-configured URSP rules in the ME if the UE has pre-configured URSP in the ME and:
  - only pre-configured URSP rules of PLMN(s) other than HPLMN in the USIM; or
  - no pre-configured URSP in the USIM.

The HPLMN pre-configured URSP in the ME shall be stored until a new URSP is configured by HPLMN or the USIM is removed.

For a UE not operating in SNPN access operation mode, the signalled URSP may be modified by the procedures defined in annex D of 3GPP TS 24.501 [11] and shall be stored until USIM is removed. The URSP can only be used if the SUPI from the USIM matches the SUPI stored in the non-volatile memory of the ME. If the SUPI from the USIM does not match the SUPI stored in the non-volatile memory of the ME, the UE shall delete the URSP.

For a UE operating in SNPN access operation mode, the signalled URSP may be modified by the procedures defined in annex D of 3GPP TS 24.501 [11] and shall be stored until the entry of the "list of subscriber data" with the corresponding SNPN identity is updated or considered as "invalid".

The UE may re-evaluate the URSP rules, to check if the change of the association of an application to a PDU session is needed, when:

NOTE 11: The time when the UE performs the re-evaluation is up to UE implementation. It is recommended that the UE performs the re-evaluation in a timely manner.

a) the UE performs periodic URSP rules re-evaluation based on UE implementation;

b) the UE NAS layer indicates that an existing PDU session used for routing traffic of an application based on a URSP rule is released;

c) the URSP is updated by the PCF;

d) the UE NAS layer indicates that the UE performs inter-system change from S1 mode to N1 mode;

e) the UE NAS layer indicates that the UE is successfully registered in N1 mode over 3GPP access or non-3GPP access;

f) the UE establishes or releases a connection to a WLAN access and transmission of a PDU of the application via non-3GPP access outside of a PDU session becomes available/unavailable;

g) the allowed NSSAI or the configured NSSAI is changed; or

h) the LADN information is changed.

If the re-evaluation leads to a change of the association of an application to a PDU session, the UE may enforce such change immediately or when UE returns to 5GMM-IDLE mode.

NOTE 12: The time when the UE enforces the change of the association of an application to a PDU Session is up to UE implementation. It is recommended that the UE performs the enforcement in a timely manner.

The URSP handling layer may request the UE NAS layer to release an existing PDU session after the re-evaluation.

4.2.2.3 Association between an application and a PDU session by a 5G-RG or a W-AGF acting on behalf of FN-RG

In order to send a PDU of an application, the upper layers require information on the PDU session (e.g. PDU address) via which to send a PDU of an application.

NOTE 1: If PAP/CHAP is used, it is recommended that the request from the upper layers includes a DNN.

The 5G-RG or the W-AGF acting on behalf of the FN-RG shall proceed in the following order:

a) the 5G-RG or the W-AGF acting on behalf of the FN-RG shall evaluate the URSP rules, except the default URSP rule, with a traffic descriptor matching the application information in increasing order of their precedence values, if any. If the traffic descriptor contains more than one traffic descriptor component type, each of a different type, all of them shall be matched. If the traffic descriptor contains more than one traffic descriptor component of the same traffic descriptor component type, at least one of the traffic descriptor components of the same traffic descriptor component type shall be matched with the application information. A URSP rule is determined not to be applicable when for any given component in the traffic descriptor no corresponding information from the application is available or the corresponding information from the application does not match any of the values in the traffic descriptor component as specified in clause 6.6.2.1 of 3GPP TS 23.503 [2].

   If the 5G-RG or the W-AGF acting on behalf of the FN-RG finds the traffic descriptor in a non-default URSP rule matching the application information, and:

   I) if there is one or more PDU sessions:

      1) matching at least one of the route selection descriptors of the URSP rule except the preferred access type and the multi-access preference, if any, wherein a route selection descriptor with PDU session type IPv4v6 matches also with PDU session type IPv4 if the network has sent 5GSM cause value #50 "PDU session type IPv4 only allowed" in the PDU SESSION ESTABLISHMENT ACCEPT message, a route selection descriptor with PDU session type IPv4v6 matches also with PDU session type IPv6 if the network has sent 5GSM cause value #51 "PDU session type IPv6 only allowed" in the PDU SESSION ESTABLISHMENT ACCEPT message, and a route selection descriptor with PDU session type IPv4v6 matches also with PDU session type IPv6 or IPv4 if the UE requested the PDU session type IPv4v6 but the selected PDU session type is set to IPv4 or IPv6 in the PDU SESSION ESTABLISHMENT ACCEPT message; and

      2) established without requesting any parameter, except the preferred access type and the multi-access preference, for which the matching route selection descriptor of the URSP rule does not provide a route selection descriptor component,

   the 5G-RG or the W-AGF acting on behalf of the FN-RG shall provide information on the PDU session that matches the route selection descriptor of the lowest precedence value to the upper layers;

NOTE 2: It is up to the 5G-RG or the W-AGF acting on behalf of the FN-RG implementation which PDU session to select if there exist multiple PDU sessions matching the same route selection descriptor of the lowest precedence value.

   II) otherwise:

1) the 5G-RG or the W-AGF acting on behalf of the FN-RG shall select a route selection descriptor with the next smallest precedence value which has not yet been evaluated;

2) if:

i) the selected route selection descriptor contains a non-seamless non-3GPP offload indication, the 5G-RG or the W-AGF acting on behalf of the FN-RG shall proceed to step 4);

ii) the selected route selection descriptor includes a PDU session type which is not supported by the 5G-RG or the W-AGF acting on behalf of the FN-RG, the 5G-RG or the W-AGF acting on behalf of the FN-RG shall proceed to step 4);

iii) the selected route selection descriptor contains a time window but the time does not match the time window, the 5G-RG or the W-AGF acting on behalf of the FN-RG shall proceed to step 4);

iv) the selected route selection descriptor contains location criteria but location of the 5G-RG or the W-AGF acting on behalf of the FN-RG does not match the location criteria, the 5G-RG or the W-AGF acting on behalf of the FN-RG shall proceed to step 4);

v) the selected route selection descriptor includes the multi-access preference but the 5G-RG or the W-AGF acting on behalf of the FN-RG does not support ATSSS, the 5G-RG or the W-AGF acting on behalf of the FN-RG shall proceed to step 4);

va) the selected route selection descriptor includes an SSC mode which either has been rejected by the network with 5GSM cause value #68 "not supported SSC mode" for the same DNN (or no DNN, if no DNN was indicated by the 5G-RG or the W-AGF acting on behalf of the FN-RG) and the same S-NSSAI associated with (if available in roaming scenarios) a mapped S-NSSAI (or no S-NSSAI, if no S-NSSAI was indicated by the 5G-RG or the W-AGF acting on behalf of the FN-RG) or was not included in the Allowed SSC mode IE following a rejection with 5GSM cause value #68 "not supported SSC mode" for the same DNN (or no DNN, if no DNN was indicated by the 5G-RG or the W-AGF acting on behalf of the FN-RG) and the same S-NSSAI associated with (if available in roaming scenarios) a mapped S-NSSAI (or no S-NSSAI, if no S-NSSAI was indicated by the 5G-RG or the W-AGF acting on behalf of the FN-RG), the 5G-RG or the W-AGF acting on behalf of the FN-RG shall proceed to step 4); or

vi) the URSP handling layer requests NAS layer of the 5G-RG or the W-AGF acting on behalf of the FN-RG to establish a PDU session providing at least one of the following PDU session attributes:

A) SSC mode if there is a SSC mode in the route selection descriptor;

NOTE 3: The SSC mode 3 is only used when the PDU session type is IPv4, IPv6 or IPv4v6.

B) one S-NSSAI if the S-NSSAI is in the route selection descriptor; and the S-NSSAI is in the allowed NSSAI. If none of the S-NSSAI(s) in the route selection descriptor is in the allowed NSSAI, the 5G-RG or the W-AGF acting on behalf of the FN-RG shall proceed to step 4);

NOTE 4: If there are multiple S-NSSAIs in the route selection descriptor, an S-NSSAI is chosen among the S-NSSAIs based on implementation of the 5G-RG or the W-AGF acting on behalf of the FN-RG.

C) one DNN, if the DNN is in the route selection descriptor; and if the DNN is an LADN DNN and the 5G-RG is in the service area of that LADN;

NOTE 5: The LADN service does not apply for either 5G-RG connected to 5GC via wireline access or the W-AGF acting on behalf of the FN-RG.

NOTE 6: If one or more DNNs are included in the traffic descriptor of a URSP rule and no DNN is included in the route selection descriptor, the DNN provided by the application is selected as one of the PDU session attributes by the URSP handling layer to request the UE NAS layer.

NOTE 7: If there are multiple DNNs in the route selection descriptor, a DNN is chosen based on implementation of the 5G-RG or the W-AGF acting on behalf of the FN-RG.

D) the PDU session type of the route selection descriptor;

E) preferred access type or multi-access preference, if the preferred access type or the multi-access preference is in the route selection descriptor;

NOTE 8: If a preferred access type or a multi-access preference is included in the route selection descriptor of a URSP rule, it is recommended that the 5G-RG or the W-AGF acting on behalf of the FN-RG establishes a PDU session based on the preferred access type or the multi-access preference.

F) PDU session pair ID if there is a PDU session pair ID in the route selection descriptor; and

G) RSN if there is an RSN in the route selection descriptor;

the NAS layer of the 5G-RG or the W-AGF acting on behalf of the FN-RG indicates the result of the PDU session establishment. Upon successful completion of the PDU session establishment, the NAS layer of the 5G-RG or the W-AGF acting on behalf of the FN-RG shall additionally indicate the attributes of the established PDU session (e.g. PDU session identity, SSC mode, S-NSSAI, DNN, PDU session type, access type, PDU address) to the URSP handling layer, and shall provide information (e.g. PDU address) of the successfully established PDU session to the upper layers. The 5G-RG or the W-AGF acting on behalf of the FN-RG shall stop selecting a route selection descriptor matching the application information. If the PDU session establishment is unsuccessful, the 5G-RG or the W-AGF acting on behalf of the FN-RG shall proceed to step 3);

3) Based on the rejection cause and if there is another value which can be used for the rejected component in the same route selection descriptor, the 5G-RG or the W-AGF acting on behalf of the FN-RG shall select another combination of values in the currently selected route selection descriptor by using this value of the rejected component and proceed to step 2), otherwise the 5G-RG or the W-AGF acting on behalf of the FN-RG shall proceed to step 4); and

4) if there is any route selection descriptor which has not yet been evaluated, the 5G-RG or the W-AGF acting on behalf of the FN-RG shall proceed to step 1). If all route selection descriptors for the matching non-default URSP rule have been evaluated and there is one or more non-default matching URSP rule which has not yet been evaluated, the 5G-RG or the W-AGF acting on behalf of the FN-RG shall proceed to step a). If all non-default matching URSP rules have been evaluated, the 5G-RG or the W-AGF acting on behalf of the FN-RG shall inform the upper layers of the failure.

b) if no non-default matching URSP rule can be found:

1) by the 5G-RG and local configuration of the 5G-RG for the application is available, the 5G-RG shall perform the association of the application to a PDU session accordingly. If no matching PDU session exists, the NAS layer of the 5G-RG shall attempt to establish a PDU session using local configuration of the 5G-RG.

NOTE 9: Any missing information in local configuration of the 5G-RG needed to build the PDU session establishment request can be the appropriate corresponding component from the default URSP rule with the "match-all" traffic descriptor.

If the PDU session establishment is successful, the NAS layer of the 5G-RG shall provide information (e.g. PDU address) of the successfully established PDU session to the upper layers. Otherwise, the 5G-RG shall go to step c); or

2) by the W-AGF acting on behalf of the FN-RG, the W-AGF acting on behalf of the FN-RG shall go to step c); and

c) if no non-default matching URSP rule can be found:

1) by the 5G-RG and if either local configuration of the 5G-RG for the application is not available or the PDU session establishment based on local configuration of the 5G-RG for the application was unsuccessful, the 5G-RG shall perform the association of the application to a PDU session according to the default URSP rule with the "match-all" traffic descriptor, if any. If the association is unsuccessful, the 5G-RG shall inform the upper layers of the failure; or

2) by the W-AGF acting on behalf of the FN-RG, the W-AGF acting on behalf of the FN-RG shall perform the association of the application to a PDU session according to the default URSP rule with the "match-all" traffic descriptor, if any. If the association is unsuccessful, and local configuration of the W-AGF acting on behalf of the FN-RG for the application is available, the W-AGF acting on behalf of the FN-RG shall perform the association of the application to a PDU session accordingly. If no matching PDU session exists, the NAS layer of the W-AGF acting on behalf of the FN-RG shall attempt to establish a PDU session using local configuration of the W-AGF acting on behalf of the FN-RG. If the PDU session establishment is successful, the NAS layer of the W-AGF acting on behalf of the FN-RG shall provide information (e.g. PDU

address) of the successfully established PDU session to the upper layers. Otherwise, the W-AGF acting on behalf of the FN-RG shall inform the upper layers of the failure.

The HPLMN may pre-configure the 5G-RG or the W-AGF acting on behalf of the FN-RG with URSP or may provide URSP to the 5G-RG or the W-AGF acting on behalf of the FN-RG by signalling as described in annex D of 3GPP TS 24.501 [11]. In the 5G-RG, the pre-configured URSP and the signalled URSP shall be stored in a non-volatile memory in the ME together with the SUPI from the USIM. If the 5G-RG or the W-AGF acting on behalf of the FN-RG has both pre-configured URSP and signalled URSP, the 5G-RG or the W-AGF acting on behalf of the FN-RG shall only use the signalled URSP. The pre-configured URSP shall be stored until a new URSP is configured by HPLMN or the USIM is removed from the 5G-RG. The signalled URSP may be modified by the procedures defined in annex D of 3GPP TS 24.501 [11] and shall be stored until USIM is removed from the 5G-RG or until W-AGF acting on behalf of the FN-RG deregisters on behalf of the FN-RG. In the 5G-RG, the URSP can only be used if the SUPI from the USIM matches the SUPI stored in the non-volatile memory of the ME. In the 5G-RG, if the SUPI from the USIM does not match the SUPI stored in the non-volatile memory of the ME, the 5G-RG shall delete the URSP.

The 5G-RG or the W-AGF acting on behalf of the FN-RG may re-evaluate the URSP rules, to check if the change of the association of an application to a PDU session is needed, when:

NOTE 10: The time when the 5G-RG or the W-AGF acting on behalf of the FN-RG performs the re-evaluation is up to implementation of the 5G-RG or the W-AGF acting on behalf of the FN-RG. It is recommended that the 5G-RG or the W-AGF acting on behalf of the FN-RG performs the re-evaluation in a timely manner.

a) the 5G-RG or the W-AGF acting on behalf of the FN-RG performs periodic URSP rules re-evaluation based on implementation of the 5G-RG or the W-AGF acting on behalf of the FN-RG;

b) the NAS layer of the 5G-RG or the W-AGF acting on behalf of the FN-RG indicates that an existing PDU session used for routing traffic of an application based on a URSP rule is released;

c) the URSP is updated by the PCF;

d) the NAS layer of the 5G-RG indicates that the 5G-RG performs inter-system change from S1 mode to N1 mode;

e) the NAS layer of the 5G-RG indicates that the 5G-RG is successfully registered in N1 mode over 3GPP access;

f) the allowed NSSAI or the configured NSSAI is changed; or

g) the LADN information is changed for the 5G-RG.

If the re-evaluation leads to a change of the association of an application to a PDU session, the 5G-RG or the W-AGF acting on behalf of the FN-RG may enforce such change immediately or when the 5G-RG or the W-AGF acting on behalf of the FN-RG returns to 5GMM-IDLE mode.

NOTE 11: The time when the 5G-RG or the W-AGF acting on behalf of the FN-RG enforces the change of the association of an application to a PDU Session is up to implementation of the 5G-RG or the W-AGF acting on behalf of the FN-RG. It is recommended that the 5G-RG or the W-AGF acting on behalf of the FN-RG performs the enforcement in a timely manner.

The URSP handling layer may request the NAS layer of the 5G-RG or the W-AGF acting on behalf of the FN-RG to release an existing PDU session after the re-evaluation.

4.2.3 Unknown or unexpected URSP rules

If the network provides URSP rules including any new component in the traffic descriptor or in the route selection descriptor which is not recognized by the UE, the 5G-RG or the W-AGF acting on behalf of an FN-RG, such URSP rules are unknown or unexpected to the UE, the 5G-RG or the W-AGF acting on behalf of an FN-RG. In this case:

- if the traffic descriptor of this URSP rule includes any component which is not recognized by the UE, the UE shall skip this URSP rule when evaluating the URSP rules to associate an application with a PDU session, with non-seamless non-3GPP offload or with 5G ProSe layer-3 UE-to-network relay offload;

- if the traffic descriptor of this URSP rule includes any component which is not recognized by the 5G-RG or the W-AGF acting on behalf of an FN-RG, the 5G-RG or the W-AGF acting on behalf of an FN-RG shall skip this URSP rule when evaluating the URSP rules to associate an application either with a PDU session;

- if the route selection descriptor of this URSP rule includes any component which is not recognized by the UE, the 5G-RG or the W-AGF acting on behalf of an FN-RG, the UE, the 5G-RG or the W-AGF acting on behalf of an FN-RG shall skip this route selection descriptor and handle this URSP rule with the remaining route selection descriptors.

4.3 Access network discovery and selection policy (ANDSP)

4.3.1 Overview

The ANDSP is used to control the UE behaviour related to access network discovery and selection over non-3GPP access network.

The ANDSP consists of:

- WLAN Selection Policy (WLANSP) which is described in clause 4.3.2.; and
- non-3GPP access network (N3AN) node configuration information which is described in clause 4.3.3.

The 5G-RG or a W-AGF acting on behalf of the FN-RG shall ignore any ANDSP information, if received.

4.3.2 WLAN selection policy (WLANSP)

4.3.2.1 General

The WLANSP is used to control UE behaviour related to selection and reselection of a WLAN.

The WLANSP consists of zero or more WLANSP rules.

Each WLANSP rule consists of:

- rule identifier;
- one or more groups of WLAN selection criteria;
- validity area;
- zero or more time of day;
- rule priority;
- roaming.

Each group of WLAN selection criteria contains:

- criteria priority;
- home network indication;
- preferred roaming partner list;
- min backhaul threshold;
- maximum BSS load value;
- required proto port tuple;
- SP exclusion list; and
- preferred SSID list.

The priority of a selection criteria is encoded in the criteria priority field. The WLAN priority defined in the preferred SSID list (see figure 5.3.2.4c) represents the priority of the WLAN matching the selection criteria.

The validity of the WLANSP rule can be restricted by validity conditions. The validity of the WLANSP rule takes into account validity area, roaming, and time of day where each condition shall match in order to make the WLANSP rule valid.

Each validity area consists of:

- 3GPP location;
- WLAN location; and
- Geo location.

Each time of day consists of:

- time start;
- time stop;
- date start;
- date stop; and
- day of week.

The WLANSP rule is considered valid if none of the validity conditions exist or all validity conditions match.

There can be multiple valid WLANSP rules at the same time. In addition to validity conditions and selection criteria, there is a rule priority that shall be set for each WLANSP rule. The rule priority is encoded in the rule priority field, and it enables the UE to determine which WLANSP rule, out of potentially several valid WLANSP rules, it should consider as active. A WLANSP rule is active if it is valid and has highest rule priority out of the valid WLANSP rules. At any point in time, there shall be at most one active WLANSP rule. A WLAN that matches a selection criteria of the active WLANSP rule is considered as matching the selection criteria.

If the UE is roaming and WLANSP rules from both HPLMN and VPLMN are available, visited WLANSP rules shall take precedence.

4.3.2.2 WLAN access selection

The procedure of UE selecting WLAN access network based on WLAN selection policy is specified in 3GPP TS 24.502 [3].

The 5G-RG and the W-AGF acting on behalf of an FN-RG shall ignore the WLAN selection policy, if received.

4.3.3 N3AN node configuration information

4.3.3.1 General

Non-3GPP access network (N3AN) node configuration information is used to control UE behaviour related to selection of either N3IWF or ePDG for accessing 5GCN or EPC respectively via non-3GPP access.

The non-3GPP access network (N3AN) node configuration information consists of:

- Non-3GPP access network (N3AN) node selection information;
- optionally, home ePDG identifier configuration; and
- optionally, home N3IWF identifier configuration.

4.3.3.2 N3AN node selection

The procedure of UE selecting an N3AN node based on N3AN node configuration information is specified in 3GPP TS 24.502 [3].

4.4 Interworking with EPC

4.4.1 Precedence between URSP, ANDSP, ANDSF and RAN rules

If the UE supports both S1 mode and N1 mode:

- the UE shall always use the ANDSP information and applicable user preferences on non-3GPP access selection, if available at the UE, for non-3GPP access node selection;

NOTE: This includes the case when the UE is registered to the 5GCN via 3GPP access, the case when the UE is registered to the EPC via 3GPP access, and the case when the UE is not registered to any CN via 3GPP access.

- if the UE is:

  a) registered to the 5GCN via 3GPP access and not registered to any CN via non-3GPP access; or

  b) registered to the 5GCN via 3GPP access and registered to the 5GCN via non-3GPP access,

  the UE shall apply URSP rules and applicable UE local configuration, if available at the UE, to all uplink user data;

- if the UE is registered to the 5GCN via 3GPP access and registered to the EPC via non-3GPP access, the UE shall:

  a) use the ANDSF rules and RAN rules, if available at the UE, for uplink user data sent via the ePDG; and

  b) apply URSP rules and applicable UE local configuration, if available at the UE, to all other uplink user data;

- if the UE is:

  a) registered to the EPC via 3GPP access and not registered to any CN via non-3GPP access; or

  b) registered to the EPC via 3GPP access and registered to the EPC via non-3GPP access,

  the UE:

  a) shall use the ANDSF rules and RAN rules, if available at the UE, for all uplink user data for which there is one or more applicable ANDSF rule or RAN rule, except for the rules and parameters related to non-3GPP access node selection; and

  b) should use the URSP rules, if available at the UE, to derive the parameters to be used in EPS as specified in clause 4.4.2 for all uplink user data for which there is no applicable ANDSF rule or RAN rule except for the rules and parameters related to non-3GPP access node selection and there is no applicable UE local configuration; and

- if the UE is registered to the EPC via 3GPP access and registered to the 5GCN via non-3GPP access, the UE:

  a) shall apply URSP rules and applicable UE local configuration, if available at the UE, to uplink user data sent via the N3IWF;

  b) shall use the ANDSF rules and RAN rules, if available at the UE, for all other uplink user data for which there is one or more applicable ANDSF rule or RAN rule, except for the rules and parameters related to non-3GPP access node selection; and

  c) should use the URSP rules, if available at the UE, to derive the parameters to be used in EPS as specified in clause 4.4.2 for all uplink user data for which there is no applicable ANDSF rule or RAN rule except for the rules and parameters related to non-3GPP access node selection. and there is no applicable UE local configuration

4.4.2 Use of URSP in EPS

If the UE:

- supports both S1 mode and N1 mode;

- does not have preconfigured rules for associating an application to a PDN connection, a non-seamless non-3GPP offload or a 5G ProSe layer-3 UE-to-network relay offload (i.e. there are no rules in UE local configuration and no ANDSF rules applicable for the application); and

- is provisioned with URSP,

when in S1 mode, the UE should use a matching URSP rule, if available, to derive the parameters, e.g. APN, using the mapping between the parameters in the URSP rules and the parameters used for PDN connection establishment specified in table 4.4.2.1 and table 4.4.2.2. The URSP rule with the derived EPS parameters are used for associating the application to a PDN connection, non-seamless non-3GPP offload or a 5G ProSe layer-3 UE-to-network relay offload, as specified in clause 4.2.2. The precedence of URSP rule is reused in EPS.

If a route selection descriptor for the matching URSP rule includes:

- at least one parameter not applicable in EPS, the UE shall not use the route selection descriptor and shall proceed to evaluate the route selection descriptor with the next lowest precedence value; and

- one or more parameters ignored in EPS, the UE shall evaluate the route selection descriptor without considering the one or more parameters ignored in EPS.

Table 4.4.2.1: Mapping table for traffic descriptor parameters

Traffic descriptor parameter name	Description	Mapped EPS parameter description
Application descriptors	It consists of OSId and OSAppId(s)	OSId and OSAppId(s)
IP descriptors	Destination IP 3 tuple(s) (IP address or IPv6 network prefix, port number, protocol ID of the protocol above IP)	Destination IP 3 tuple(s) (IP address or IPv6 network prefix, port number, protocol ID of the protocol above IP)
Domain descriptors	Destination FQDN(s) or a regular expression as a domain name matching criteria	Destination FQDN(s) or a regular expression as a domain name matching criteria
Non-IP descriptors	Descriptor(s) for destination information of non-IP traffic	Descriptor(s) for destination information of non-IP traffic
DNN	This is matched against the DNN information provided by the application	APN
Connection Capabilities	This is matched against the information provided by a UE application when it requests a network connection with certain capabilities	This is matched against the information provided by a UE application when it requests a network connection with certain capabilities

Table 4.4.2.2: Mapping table for route selection descriptor parameters

Route selection descriptor parameter name	Description	Mapped EPS parameter description
Route selection descriptor precedence	Determines the order in which the route selection descriptors are to be applied	Determines the order in which the route selection descriptors are to be applied
SSC Mode Selection	One single value of SSC mode	Ignored in EPS if set to SSC mode 1 Not applicable in EPS if set to SSC mode 2 or 3
Network Slice Selection	Either a single value or a list of values of S-NSSAI(s)	Not applicable in EPS
DNN Selection	Either a single value or a list of values of DNN(s)	Either a single value or a list of values of APN(s). Not applicable in EPS if it contains at least one LADN DNN
PDU Session Type Selection	One single value of PDU Session Type	PDN type: - PDU session type "Unstructured" is mapped to PDN type "non-IP". - PDU session type "Ethernet" is mapped to PDN type "Ethernet", if supported by the UE. Otherwise PDU session type "Ethernet" is mapped to PDN type "non-IP"
Non-Seamless Offload indication	Indicates if the traffic of the matching application is to be offloaded to non-3GPP access outside of a PDU session	Indicates if the traffic of the matching application is to be offloaded to non-3GPP access outside of a PDN connection
5G ProSe layer-3 UE-to-network relay offload indication	Indicates if the traffic of the matching application is to be offloaded to 5G ProSe layer-3 UE-to-network relay outside of a PDU session	Not applicable in EPS
Access Type preference	Indicates the preferred Access Type (3GPP or non-3GPP) when the UE establishes a PDU Session for the matching application	preferred Access Type (3GPP or non-3GPP)
Multi-Access preference	Indicates that the PDU session should be established as a multi-access PDU session, using both 3GPP access and non-3GPP access.	Not applicable in EPS
Time window	The time window when the matching traffic is allowed.	Not applicable in EPS
Location criteria	The UE location where the matching traffic is allowed.	Not applicable in EPS
PDU session pair ID	One single value of PDU session pair ID for redundant PDU session establishment.	Ignored in EPS
RSN	One single value of RSN for redundant PDU session establishment.	Ignored in EPS

5 Encoding of UE policies

5.1 Overview

The content of UE policies is included in the UE policy part contents defined in annex D.6.2 of 3GPP TS 24.501 [11].

The UE policy part contents include URSP or ANDSP.

For URSP definition, the encoding is defined in clause 5.2.

For ANDSP definition, it includes encoding of WLANSP and encoding of N3AN node configuration information. The encoding of WLANSP is defined in clause 5.3.2. The encoding of N3AN node configuration information is defined in clause 5.3.3.

5.2 Encoding of UE policy part type URSP

The UE policy part type URSP contains one or more URSP rules which may be included in the UE policy part contents as defined in annex D.6.2 of 3GPP TS 24.501 [11].

If the UE policy part contents includes one or more URSP rules (i.e. the UE policy part type field is set to "URSP"), the UE policy part contents including URSP rules is encoded as shown in figures 5.2.1 to 5.2.4 and table 5.2.1.

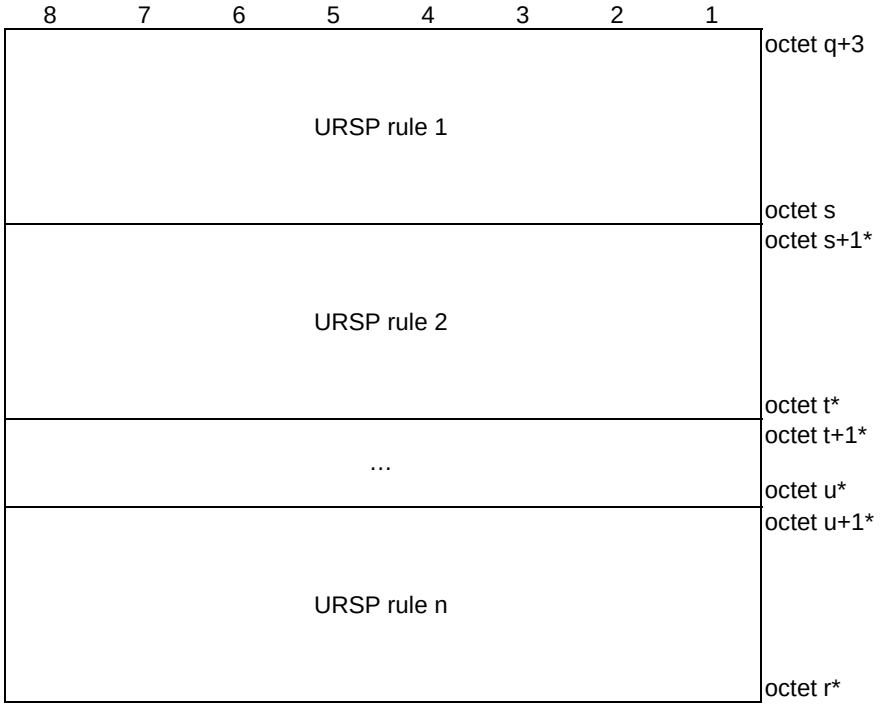

Figure 5.2.1: UE policy part contents including one or more URSP rules

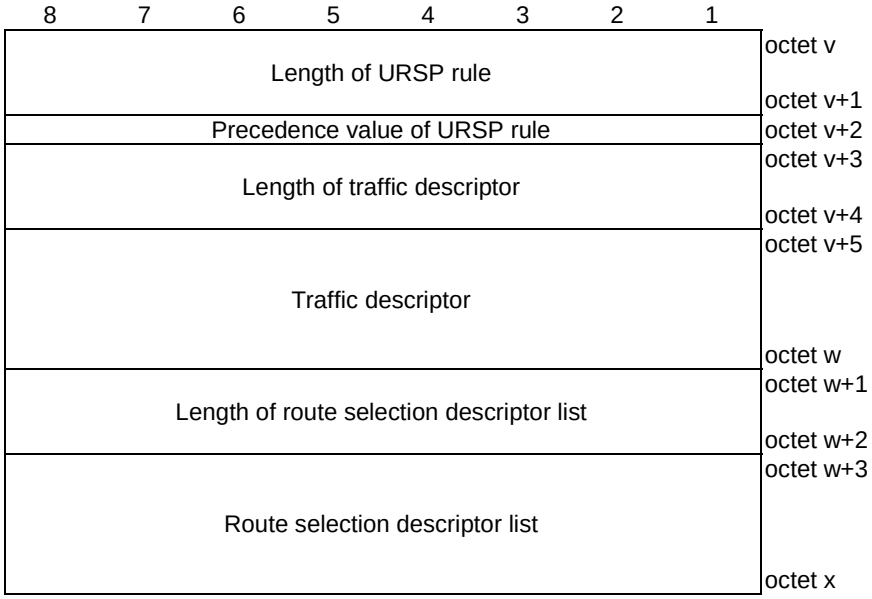

Figure 5.2.2: URSP rule

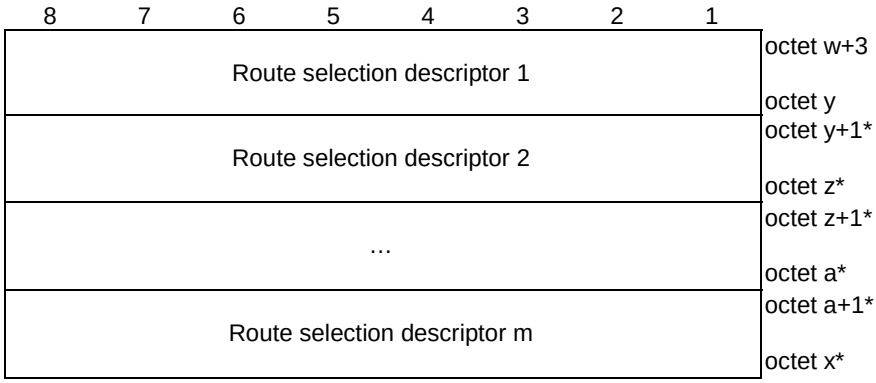

Figure 5.2.3: Route selection descriptor list

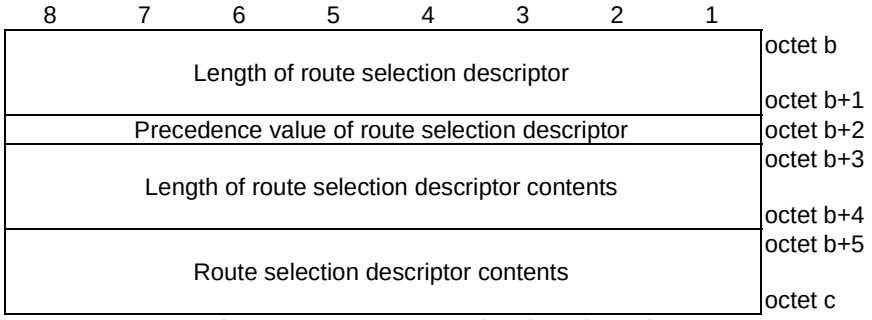

Figure 5.2.4: Route selection descriptor

Table 5.2.1: UE policy part contents including a URSP rule

Precedence value of URSP rule (octet v+2)
The precedence value of URSP rule field is used to specify the precedence of the URSP rule among all URSP rules in the URSP. This field includes the binary encoded value of the precedence value in the range from 0 to 255 (decimal). The higher the value of the precedence value field, the lower the precedence of the URP rule is. Multiple URSP rules in the URSP shall not have the same precedence value.

Traffic descriptor (octets v+5 to w)
The traffic descriptor field is of variable size and contains a variable number (at least one) of traffic descriptor components. Each traffic descriptor component shall be encoded as a sequence of one octet traffic descriptor component type identifier and a traffic descriptor component value field. The traffic descriptor component type identifier shall be transmitted first.

Traffic descriptor component type identifier

Bits	
8 7 6 5 4 3 2 1	
0 0 0 0 0 0 0 1	Match-all type
0 0 0 0 1 0 0 0	OS Id + OS App Id type (NOTE 1)(NOTE 3)
0 0 0 1 0 0 0 0	IPv4 remote address type
0 0 1 0 0 0 0 1	IPv6 remote address/prefix length type
0 0 1 1 0 0 0 0	Protocol identifier/next header type
0 1 0 1 0 0 0 0	Single remote port type
0 1 0 1 0 0 0 1	Remote port range type
0 1 0 1 0 0 1 0	IP 3 tuple type
0 1 1 0 0 0 0 0	Security parameter index type
0 1 1 1 0 0 0 0	Type of service/traffic class type
1 0 0 0 0 0 0 0	Flow label type
1 0 0 0 0 0 0 1	Destination MAC address type
1 0 0 0 0 0 1 1	802.1Q C-TAG VID type (NOTE 4)
1 0 0 0 0 1 0 0	802.1Q S-TAG VID type (NOTE 4)
1 0 0 0 0 1 0 1	802.1Q C-TAG PCP/DEI type (NOTE 4)
1 0 0 0 0 1 1 0	802.1Q S-TAG PCP/DEI type (NOTE 4)
1 0 0 0 0 1 1 1	Ethertype type
1 0 0 0 1 0 0 0	DNN type (NOTE 3)
1 0 0 1 0 0 0 0	Connection capabilities type (NOTE 3)
1 0 0 1 0 0 0 1	Destination FQDN
1 0 0 1 0 0 1 0	Regular expression
1 0 1 0 0 0 0 0	OS App Id type (NOTE 3)
1 0 1 0 0 0 0 1	Destination MAC address range type

All other values are spare. If received they shall be interpreted as unknown.

For "match-all type", the traffic descriptor component shall not include the traffic descriptor component value field. The "match-all type" traffic descriptor component shall not appear more than once among all traffic descriptors of the whole URSP rules in the URSP. If the "match-all type" traffic descriptor component is included in a traffic descriptor, there shall be no traffic descriptor component with a type other than "match-all type" in the traffic descriptor.

For "OS Id + OS App Id type", the traffic descriptor component value field shall be encoded as a sequence of a sixteen octet OS Id field, a one octet OS App Id length field, and an OS App Id field. The OS Id field shall be transmitted first. The OS Id field contains a Universally Unique IDentifier (UUID) as specified in IETF RFC 4122 [16].

For "IPv4 remote address type", the traffic descriptor component value field shall be encoded as a sequence of a four octet IPv4 address field and a four octet IPv4 address mask field. The IPv4 address field shall be transmitted first.

For "IPv6 remote address/prefix length type", the traffic descriptor component value field shall be encoded as a sequence of a sixteen octet IPv6 address field and one octet prefix length field. The IPv6 address field shall be transmitted first.

For "protocol identifier/next header type", the traffic descriptor component value field shall be encoded as one octet which specifies the IPv4 protocol identifier or IPv6 next header.

For "single remote port type", the traffic descriptor component value field shall be encoded as two octets which specify a port number.

For "remote port range type", the traffic descriptor component value field shall be encoded as a sequence of a two octet port range low limit field and a two octet port range high limit field. The port range low limit field shall be transmitted first.

For "IP 3 tuple type", the traffic descriptor component value field shall be encoded as a sequence of a one octet IP 3 tuple information bitmap field where:
- bit 1 set to zero indicates that the IPv4 address field is absent;
- bit 1 set to one indicates that the IPv4 address field is present;
- bit 2 set to zero indicates that the IPv6 remote address/prefix length field is absent;
- bit 2 set to one indicates that the IPv6 remote address/prefix length field is present;
- bit 3 set to zero indicates that the protocol identifier/next header field is absent;
- bit 3 set to one indicates that the protocol identifier/next header field is present;
- bit 4 set to zero indicates that the single remote port field is absent;
- bit 4 set to one indicates that the single remote port field is present;
- bit 5 set to zero indicates that the remote port range field is absent;
- bit 5 set to one indicates that the remote port range field is present; and
- bits 6,7, and 8 are spare bits;

followed by a four octet IPv4 address field and a four octet IPv4 address mask field, if the IPv4 address field is present;
followed by a sixteen octet IPv6 address field and one octet prefix length field, if the IPv6 remote address/prefix length field is present;
followed by one octet which specifies the IPv4 protocol identifier or IPv6 next header, if the protocol identifier/next header field is present;
followed by two octets which specify a port number, if the single remote port field is present;
followed by a two octet port range low limit field and a two octet port range high limit field, if the remote port range field is present.
The IP 3 tuple information bitmap field shall be transmitted first.
The traffic descriptor component value field shall not contain both the IPv4 address field and the IPv6 remote address/prefix length field. If the traffic descriptor component value field contains both the IPv4 address field and the IPv6 remote address/prefix length field, the receiving entity shall ignore the URSP rule.
The traffic descriptor component value field shall not contain both the single remote port field and the remote port range field. If the traffic descriptor component value field contains both the single remote port field and the remote port range field, the receiving entity shall ignore the URSP rule.
The traffic descriptor component value field shall contain at least one of the IPv4 address field, IPv6 remote address/prefix length field, the protocol identifier/next header field, the single remote port field and the remote port range field, otherwise the receiving entity shall ignore the URSP rule.

For "security parameter index type", the traffic descriptor component value field shall be encoded as four octets which specify the IPsec security parameter index.

For "type of service/traffic class type", the traffic descriptor component value field shall be encoded as a sequence of a one octet type-of-service/traffic class field and a one octet type-of-service/traffic class mask field. The type-of-service/traffic class field shall be transmitted first.

For "flow label type", the traffic descriptor component value field shall be encoded as three octets which specify the IPv6 flow label. The bits 8 through 5 of the first octet shall be spare whereas the remaining 20 bits shall contain the IPv6 flow label.

For "destination MAC address type", the traffic descriptor component value field shall be encoded as 6 octets which specify a MAC address.

For "802.1Q C-TAG VID type", the traffic descriptor component value field shall be encoded as two octets which specify the VID of the customer-VLAN tag (C-TAG) as specified in IEEE Std 802.1Q-2018 [20]. The bits 8 through 5 of the first octet shall be spare whereas the remaining 12 bits shall contain the VID.

For "802.1Q S-TAG VID type", the traffic descriptor component value field shall be encoded as two octets which specify the VID of the service-VLAN tag (S-TAG) as specified in IEEE Std 802.1Q-2018 [20]. The bits 8 through 5 of the first octet shall be spare whereas the remaining 12 bits shall contain the VID.

For "802.1Q C-TAG PCP/DEI type", the traffic descriptor component value field shall be encoded as one octet which specifies the 802.1Q C-TAG PCP and DEI as specified in IEEE Std 802.1Q-2018 [20]. The bits 8 through 5 of the octet shall be spare, and the bits 4 through 2 contain the PCP and bit 1 contains the DEI.

For "802.1Q S-TAG PCP/DEI type", the traffic descriptor component value field shall be encoded as one octet which specifies the 802.1Q S-TAG PCP as specified in IEEE Std 802.1Q-2018 [20]. The bits 8 through 5 of the octet shall be spare, and the bits 4 through 2 contain the PCP and bit 1 contains the DEI.

For "ethertype type", the traffic descriptor component value field shall be encoded as two octets which specify an ethertype.

For "DNN type", the traffic descriptor component value field shall be encoded as a sequence of a one octet DNN length field and a DNN value field of a variable size. The DNN value contains an APN as defined in 3GPP TS 23.003 [4].

For "connection capabilities" type, the traffic descriptor component value field shall be encoded as a sequence of one octet for number of network capabilities followed by one or more octets, each containing a connection capability identifier encoded as follows:

Bits

8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	
0	0	0	0	0	0	0	1	IMS
0	0	0	0	0	0	1	0	MMS
0	0	0	0	0	1	0	0	SUPL
0	0	0	0	1	0	0	0	Internet
0	0	1	0	0	0	0	0	
			to					Operator specific connection capabilities
0	0	1	1	1	1	1	1	

All other values are spare. If received, they shall be interpreted as unknown.

For "destination FQDN" type, the traffic descriptor component value field shall be encoded as a sequence of one octet destination FQDN length field and a destination FQDN value of variable size. The destination FQDN value field shall be encoded as defined in clause 28.3.2.1 in 3GPP TS 23.003 [4].

For "regular expression" type, the traffic descriptor component value field shall be encoded as a sequence of one octet regular expression length field and a regular expression value of variable size. The regular expression value field shall take the form of Extended Regular Expressions (ERE) as defined in chapter 9 in IEEE 1003.1-2004 Part 1 [19].

For "OS App Id type", the traffic descriptor component value field shall be encoded as a one octet OS App Id length field and an OS App Id field.

Precedence value of route selection descriptor (octet b+2)
The precedence value of route selection descriptor field is used to specify the precedence of the route selection descriptor among all route selection descriptors in the URSP rule. This field includes the binary encoded value of the precedence value in the range from 0 to 255 (decimal). The higher the value of the precedence value field, the lower the precedence of the route selection descriptor is.

For "destination MAC address range type", the traffic descriptor component value field shall be encoded as a sequence of a 6 octet destination MAC address range low limit field and a 6 octet destination MAC address range high limit field. The destination MAC address range low limit field shall be transmitted first.
Route selection descriptor contents (octets b+5 to c)
The route selection descriptor contents field is of variable size and contains a variable number (at least one) of route selection descriptor components. Each route selection descriptor component shall be encoded as a sequence of a one octet route selection descriptor component type identifier and a route selection descriptor component value field. The route selection descriptor component type identifier shall be transmitted first.

Route selection descriptor component type identifier

Bits	
8 7 6 5 4 3 2 1	
0 0 0 0 0 0 0 1	SSC mode type
0 0 0 0 0 0 1 0	S-NSSAI type
0 0 0 0 0 1 0 0	DNN type
0 0 0 0 1 0 0 0	PDU session type type
0 0 0 1 0 0 0 0	Preferred access type type (NOTE 2)
0 0 0 1 0 0 0 1	Multi-access preference type (NOTE 2)
0 0 1 0 0 0 0 0	Non-seamless non-3GPP offload indication type
0 1 0 0 0 0 0 0	Location criteria type
1 0 0 0 0 0 0 0	Time window type
1 0 0 0 0 0 0 1	5G ProSe layer-3 UE-to-network relay offload indication type
1 0 0 0 0 0 1 0	PDU session pair ID type (NOTE 5)
1 0 0 0 0 0 1 1	RSN type (NOTE 5)

All other values are spare. If received they shall be interpreted as unknown.

For "SSC mode type", the route selection descriptor component value field shall be encoded as a one octet SSC mode field. The bits 8 through 4 of the octet shall be spare, and the bits 3 through 1 shall be encoded as the value part of the SSC mode information element defined in clause 9.11.4.16 of 3GPP TS 24.501 [11]. The "SSC mode type" route selection descriptor component shall not appear more than once in the route selection descriptor.

For "S-NSSAI type", the route selection descriptor component value field shall be encoded as a sequence of a one octet S-NSSAI length field and an S-NSSAI value field of a variable size. The S-NSSAI value shall be encoded as the value part of the S-NSSAI information element defined in clause 9.11.2.8 of 3GPP TS 24.501 [11].

For "DNN type", the route selection descriptor component value field shall be encoded as a sequence of a one octet DNN length field and a DNN value field of a variable size. The DNN value contains an APN as defined in 3GPP TS 23.003 [4].

For "PDU session type type", the route selection descriptor component value field shall be encoded as a one octet PDU session type field. The bits 8 through 4 of the octet shall be spare, and the bits 3 through 1 shall be encoded as the value part of the PDU session type information element defined in clause 9.11.4.11 of 3GPP TS 24.501 [11]. The "PDU session type type" route selection descriptor component shall not appear more than once in the route selection descriptor.

For "preferred access type type", the route selection descriptor component value field shall be encoded as a one octet preferred access type field. The bits 8 through 3 shall be spare, and the bits 2 and 1 shall be encoded as the value part of the access type information element defined in clause 9.11.2.1A of 3GPP TS 24.501 [11]. The "preferred access type type" route selection descriptor component shall not appear more than once in the route selection descriptor.

For "multi-access preference type", the route selection descriptor component value field shall be of zero length. The "multi-access preference type" route selection descriptor component shall not appear more than once in the route selection descriptor. The "multi-access preference type" route selection descriptor component in the route selection descriptor indicates the multi-access preference.

For "non-seamless non-3GPP offload indication type", the route selection descriptor component shall not include the route selection descriptor component value field. The "non-seamless non-3GPP offload indication type" route selection descriptor component shall not appear more than once in the route selection descriptor. If the "non-seamless non-3GPP offload indication type" route selection descriptor component is included in a route selection descriptor, there shall be no route selection descriptor component with a type other than "non-seamless non-3GPP offload indication type" in the route selection descriptor.

For "location criteria type", the route selection descriptor component value field may contain one or more types of location area and is encoded as shown in Figure 5.2.5 and Table 5.2.2.

For "time window type", the route selection descriptor component value field shall be encoded as a sequence of a Starttime field and a Stoptime field. The Starttime field is represented by the number of seconds since 00:00:00 on 1 January 1970 and is encoded as the 64-bit NTP timestamp format defined in IETF RFC 5905 [17], where binary encoding of the integer part is in the first 32 bits and binary encoding of the fraction part in the last 32 bits. The encoding of the Stoptime field is the same as the Starttime field.

For "5G ProSe layer-3 UE-to-network relay offload indication type", the route selection descriptor component shall not include the route selection descriptor component value field. The "5G ProSe layer-3 UE-to-network relay offload indication type" route selection descriptor component shall not appear more than once in the route selection descriptor. If the "5G ProSe layer-3 UE-to-network relay offload indication type" route selection descriptor component is included in a route selection descriptor, there shall be no route selection descriptor component with a type other than "5G ProSe layer-3 UE-to-network relay offload indication type" in the route selection descriptor. If "5G ProSe layer-3 UE-to-network relay offload indication type" is not present the traffic shall not be routed via a 5G ProSe layer-3 UE-to-network relay outside of a PDU Session.

For "PDU session pair ID type", the route selection descriptor component value field shall be encoded as a one octet PDU session pair ID field. The PDU session pair ID value shall be encoded as defined in clause 9.11.4.32 of 3GPP TS 24.501 [11].

For "RSN type", the route selection descriptor component value field shall be encoded as a one octet RSN field. The RSN value shall be encoded as the value part of the RSN information element defined in clause 9.11.4.33 of 3GPP TS 24.501 [11].

NOTE 1: For "OS Id + OS App Id type", the traffic descriptor component value field does not specify the OS version number or the version number of the application.

NOTE 2: The PCF does not include both the "preferred access type type" and the "multi-access preference type" route selection descriptor components in a single route selection descriptor. If there are both "preferred access type type" and "multi-access preference type" route selection descriptor components in a single route selection descriptor, the UE ignores the "preferred access type type" route selection descriptor component.

NOTE 3: The W-AGF acting on behalf of the FN-RG shall interpret the value as unknown.

NOTE 4: The traffic descriptor of a URSP rule cannot include more than one instance of this traffic component type.

NOTE 5: Redundant PDU session is not applicable over non-3GPP access. The UE ignores any route selection descriptor which includes "PDU session pair ID type" or "RSN type" route selection descriptor component and also includes a "preferred access type type" route selection descriptor component set to "non-3GPP access" or a "multi-access preference type" route selection descriptor component.

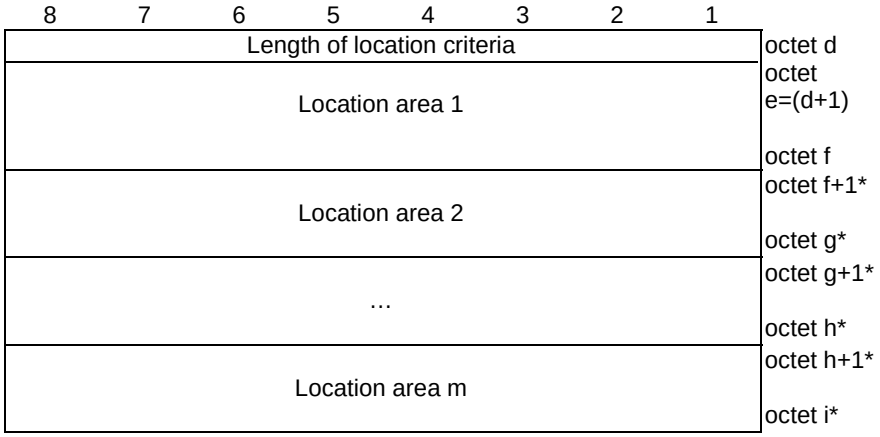

Figure 5.2.5: Location criteria

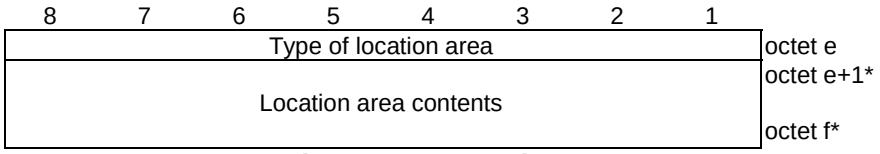

Figure 5.2.6: Location area

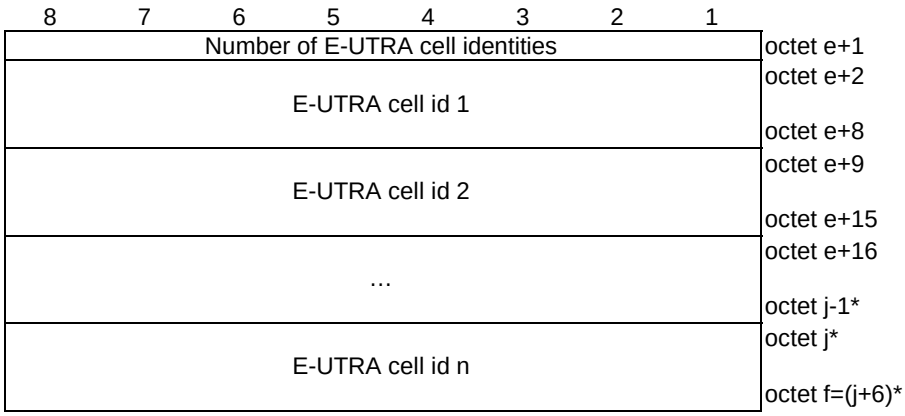

Figure 5.2.7: Location area contents {Type of location area = E-UTRA cell identities list}

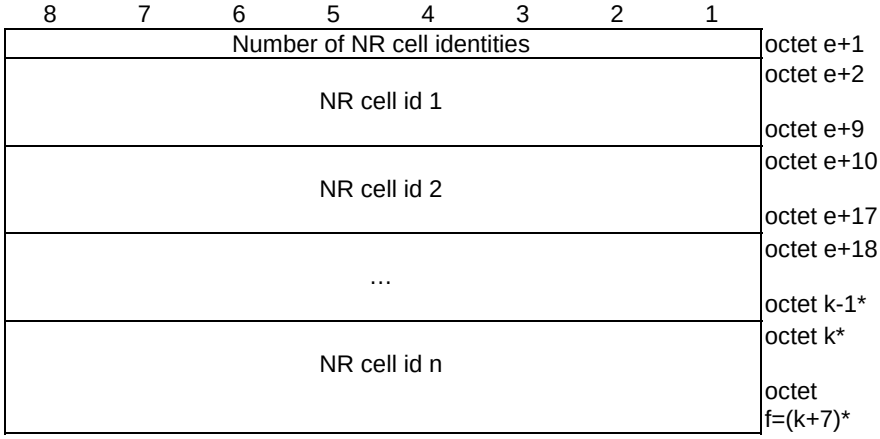

Figure 5.2.8: Location area contents {Type of location area = NR cell identities list}

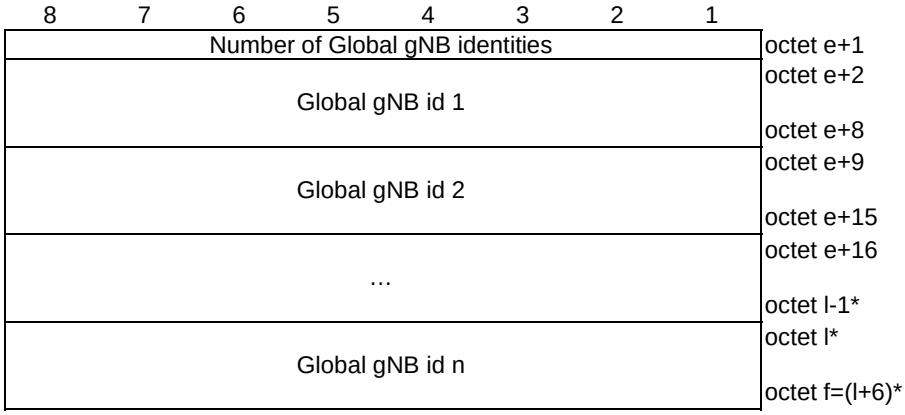

Figure 5.2.9: Location area contents {Type of location area = Global RAN node identities list}

Table 5.2.2: Location criteria

Length of location criteria (octect d)
This field indicates the length of the included Location criteria contents.

Type of location area is coded as follows.

8	7	6	5	4	3	2	1	
0	0	0	0	0	0	0	1	E-UTRA cell identities list
0	0	0	0	0	0	1	0	NR cell identities list
0	0	0	0	0	0	1	1	Global RAN node identities list
0	0	0	0	0	1	0	0	TAI list

All other values are spare.

When the type of location area is "E-UTRA cell identities list", the location area contents shall be encoded as in Figure 5.2.7. Each E-UTRA cell id field is of 7 octet size and shall be encoded as specified in clause 9.3.1.9 of 3GPP TS 38.413 [14].

When the type of location area is "NR cell identities list", the location area contents shall be encoded as in Figure 5.2.8. Each NR cell id field is of 8 octet size shall be encoded as specified in clause 9.3.1.7 of 3GPP TS 38.413 [14].

When the type of location area is "Global RAN node identities list", the location area contents shall be encoded as in Figure 5.2.8. Each Global gNB id field is of 7 octet size shall be encoded as specified in clause 9.3.1.6 of 3GPP TS 38.413 [14].

When the type of location area is "TAI list", the location area contents shall be encoded as the 5GS tracking area identity list information element (starting with octet 2) defined in clause 9.11.3.9 of 3GPP TS 24.501 [11].

5.3 Encoding of UE policy part type ANDSP

5.3.1 General

The purpose of the ANDSP is to indicate the WLAN Selection Policy (WLANSP) and non-3GPP access network (N3AN) node configuration information related to access network discovery and selection and N3AN node selection for non-3GPP access network.

The ANDSP is encoded as shown in figures 5.3.1.1 to 5.3.1.3 and table 5.3.1.1 according to UE policy part top level format (see Annex D of 3GPP TS 24.501 [11]).

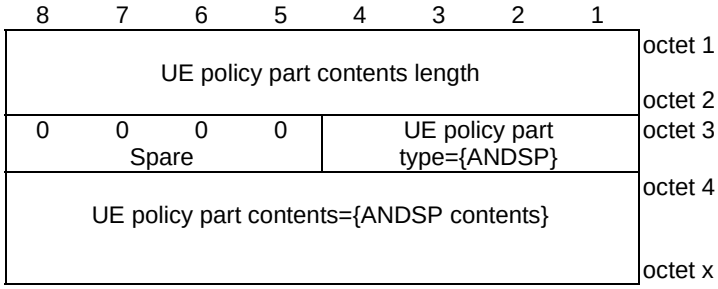

Figure 5.3.1.1: UE policy part when UE policy part type = {ANDSP}

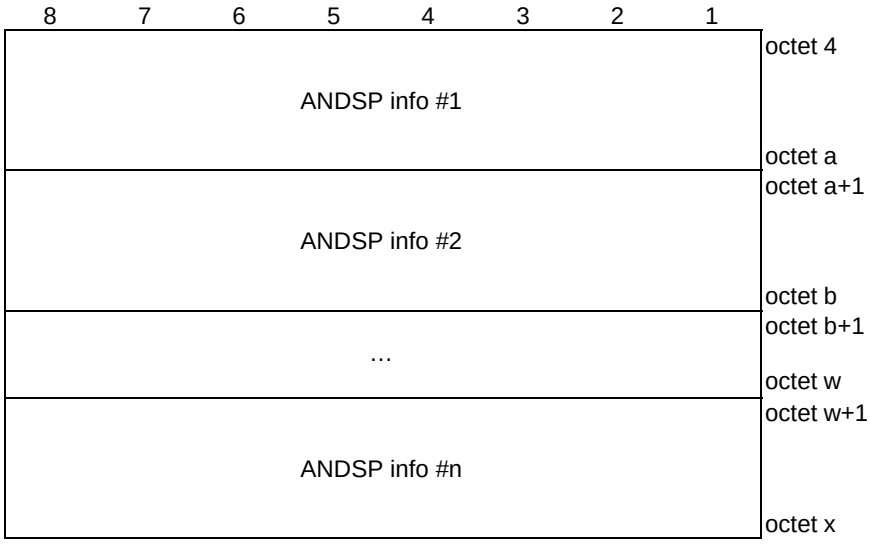

Figure 5.3.1.2: ANDSP contents

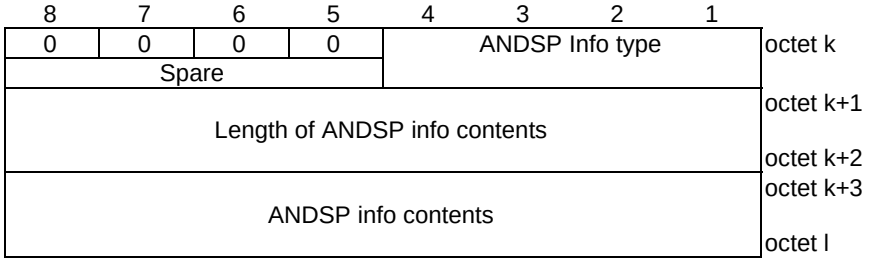

Figure 5.3.1.3: ANDSP Info

Table 5.3.1.1: ANDSP information format

UE policy part type field is set to '00000010' (=ANDSP) as specified in 3GPP TS 24.501 [4] Annex D. UE policy part contents length field indicate the length of the ANDSP contents in octets. ANDSP contents (octets 4 to x) ANDSP contents consist of 1 or more ANDSP info (see figure 5.3.1.2). ANDSP Info type (bit 1 to 4 of octet k) shall be set according to the following: Bits **4 3 2 1** 0 0 0 0 Reserved 0 0 0 1 WLANSP 0 0 1 0 N3AN node configuration information All other values are reserved. Bits 8 to 5 of octet k are spare and shall be encoded as zero. Length of ANDSP info contents (octets k+1 to k+2) indicates the length of the ANDSP info contents field. ANDSP info contents (octets k+3 to l) can be WLANSP (see clause 5.3.2) or N3AN node configuration information (see clause 5.3.3).

5.3.2 Encoding of WLANSP

The purpose of the WLANSP field is to indicate the rules related to selection and reselection of a WLAN.

The WLANSP field is encoded as shown in figures 5.3.2.1 to 5.3.2.20 and table 5.3.2.1.

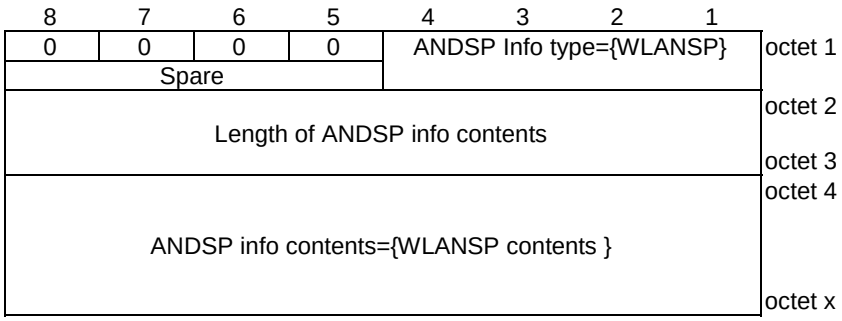

Figure 5.3.2.1: ANDSP Info = {WLANSP}

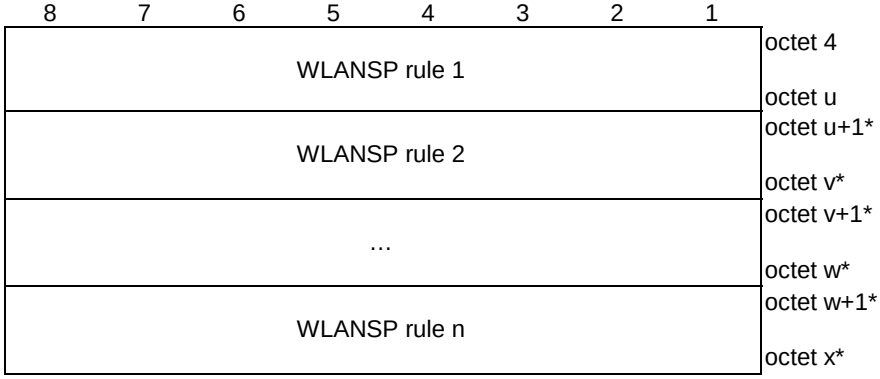

Figure 5.3.2.2: WLANSP contents

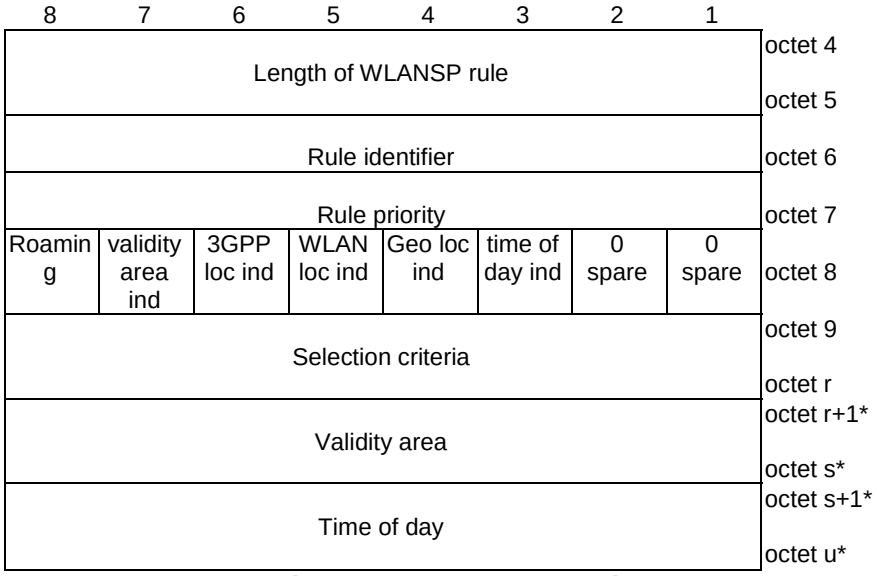

Figure 5.3.2.3: WLANSP rule

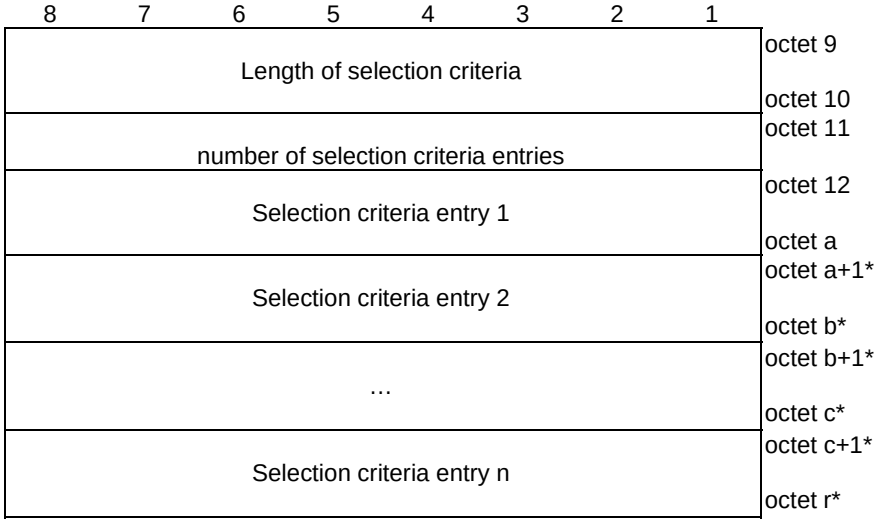

Figure 5.3.2.4: Selection criteria

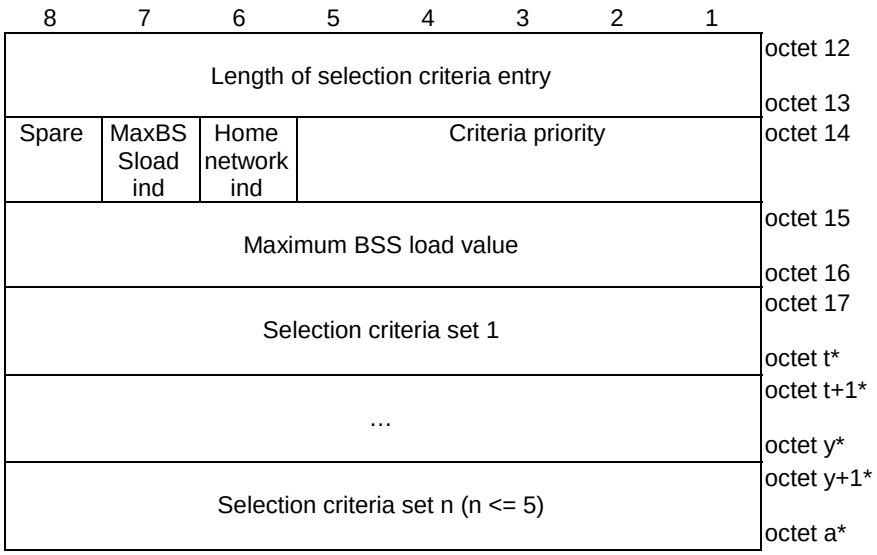

Figure 5.3.2.4a: Selection criteria entry

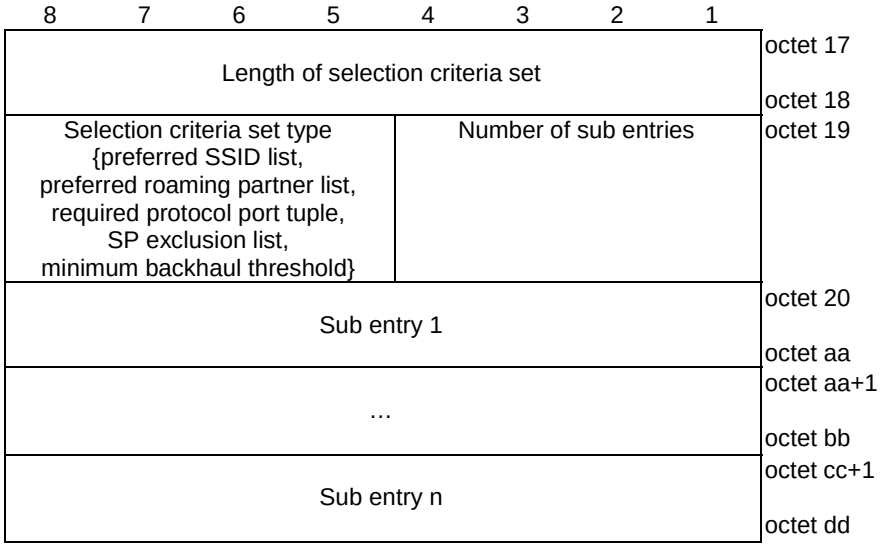

Figure 5.3.2.4b: Selection criteria set

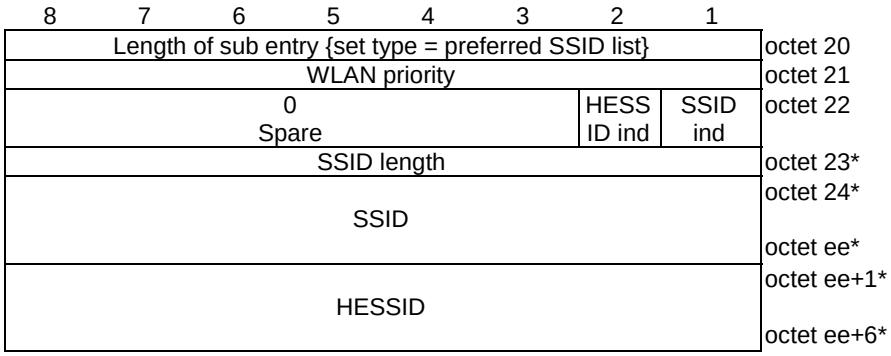

Figure 5.3.2.4c: Selection criteria sub entry {selection criteria set type = preferred SSID list}

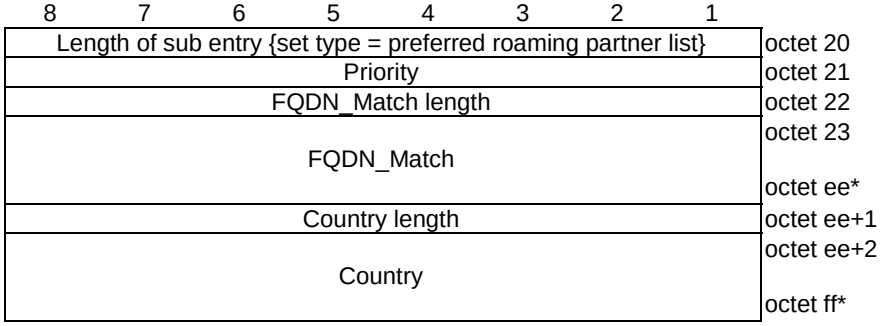

Figure 5.3.2.4d: Selection criteria sub entry {selection criteria set type = preferred roaming partner list}

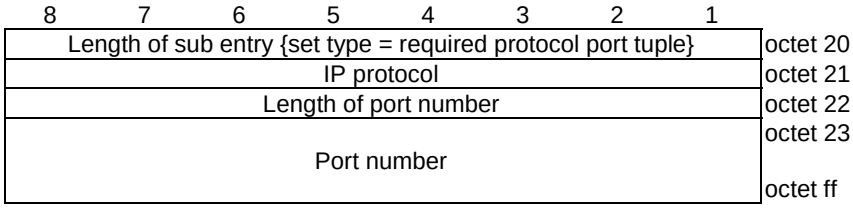

Figure 5.3.2.4e: Selection criteria sub entry {selection criteria set type = required protocol port tuple}

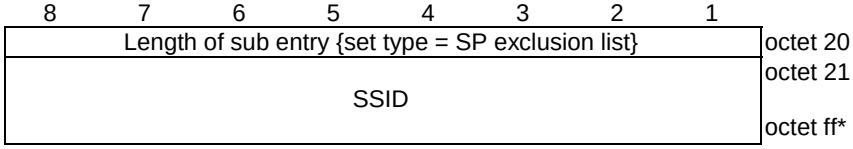

Figure 5.3.2.4f: Selection criteria sub entry {selection criteria set type = SP exclusion list}

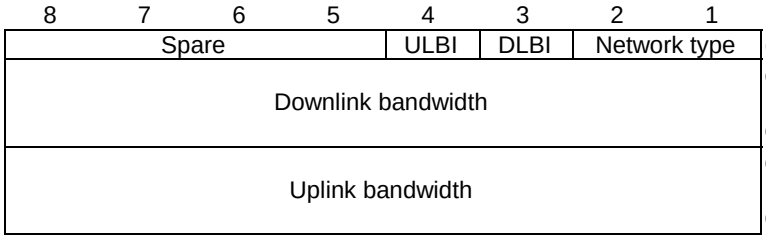

Figure 5.3.2.4g: Selection criteria sub entry {selection criteria set type = minimum backhaul threshold}

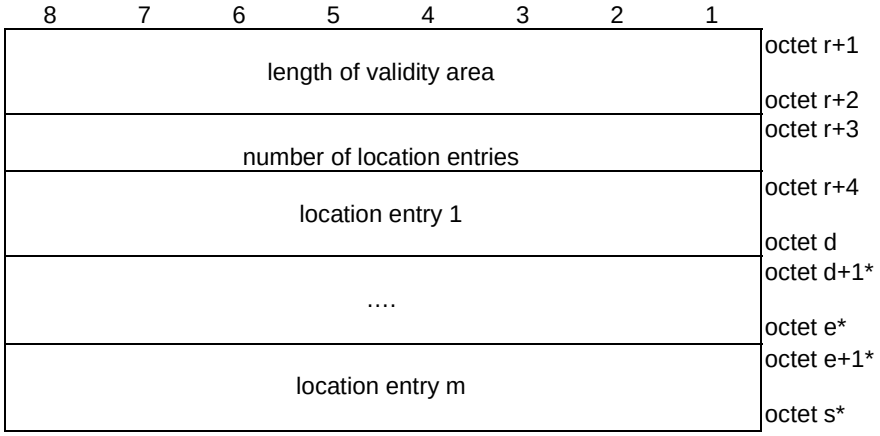

Figure 5.3.2.5: Validity area

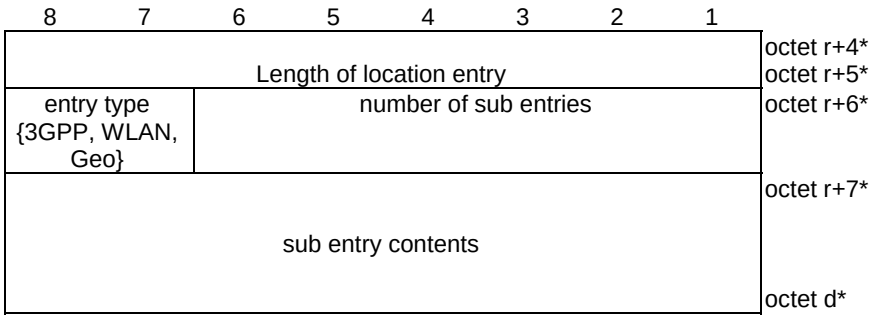

Figure 5.3.2.6: Location entry

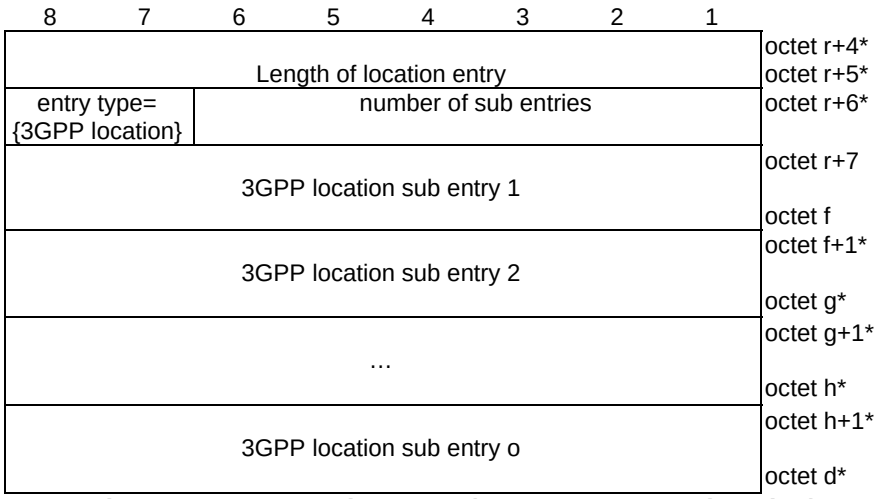

Figure 5.3.2.7: Location entry {entry type =3GPP location}

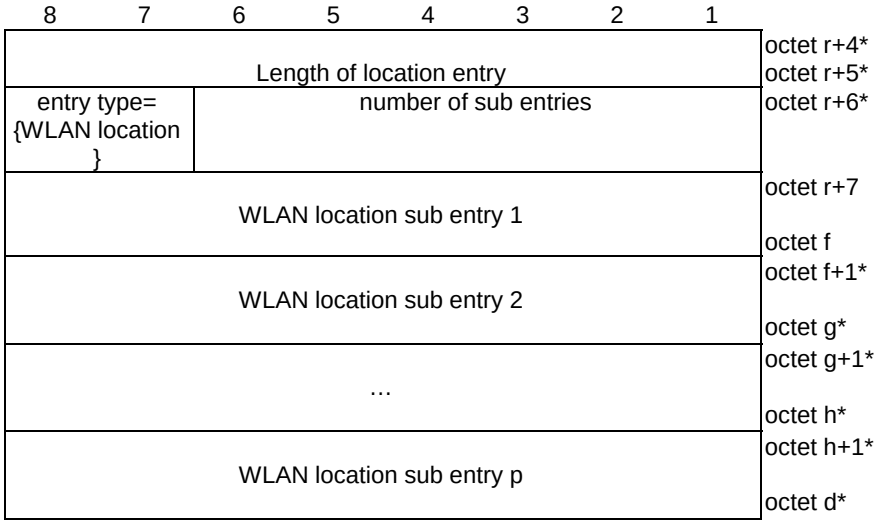

Figure 5.3.2.8: Location entry {entry type =WLAN location}

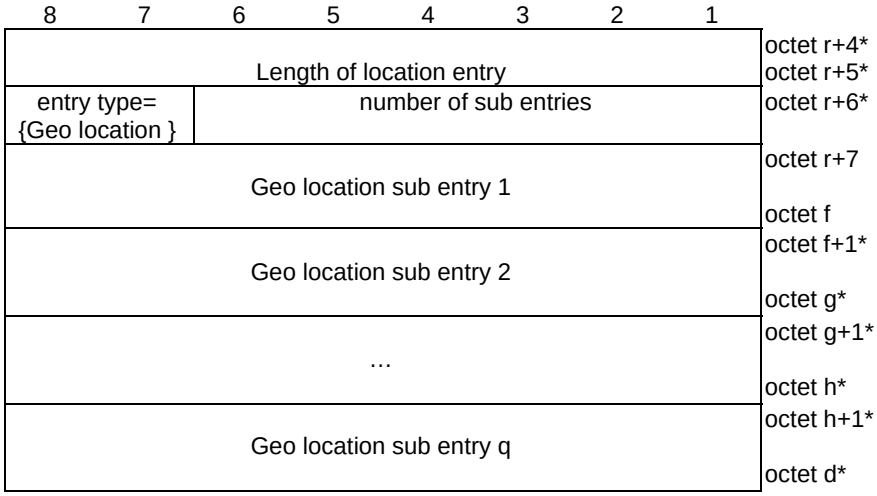

Figure 5.3.2.9: Location entry {entry type =Geo location}

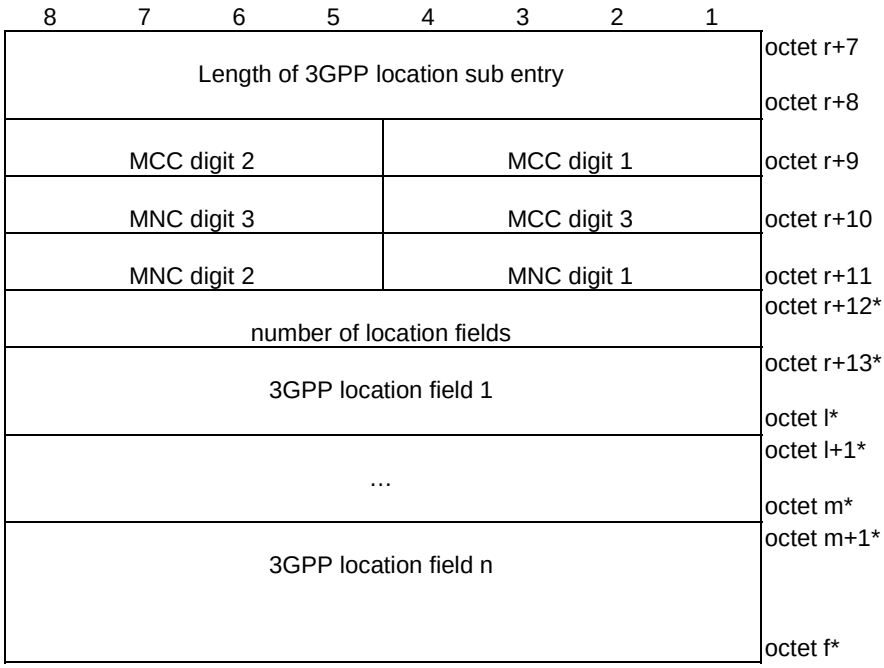

Figure 5.3.2.10: Location sub entry {entry type= 3GPP location}

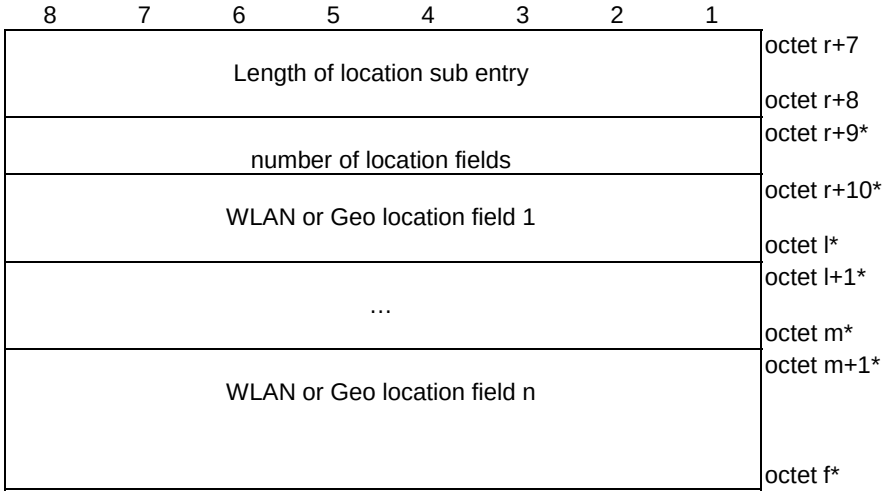

Figure 5.3.2.10a: Location sub entry {entry type= WLAN location or Geo location}

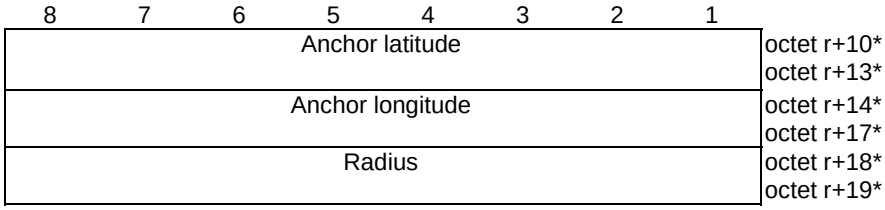

Figure 5.3.2.11a: Location field {entry type= Geo location}

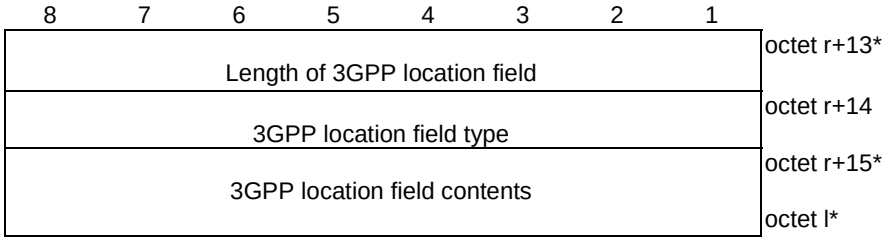

Figure 5.3.2.11b: Location field {entry type= 3GPP location}

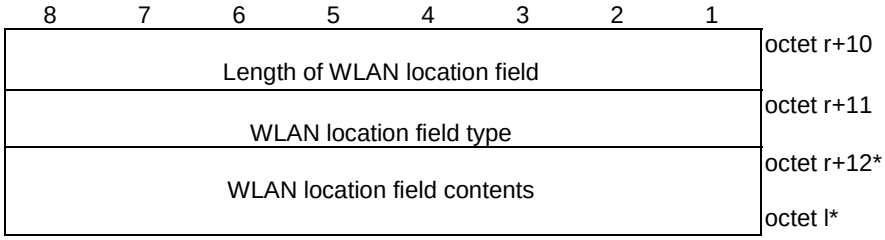

Figure 5.3.2.11c: Location field {entry type= WLAN location}

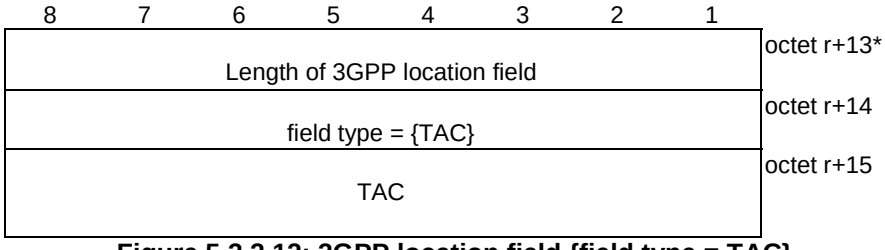

Figure 5.3.2.12: 3GPP location field {field type = TAC}

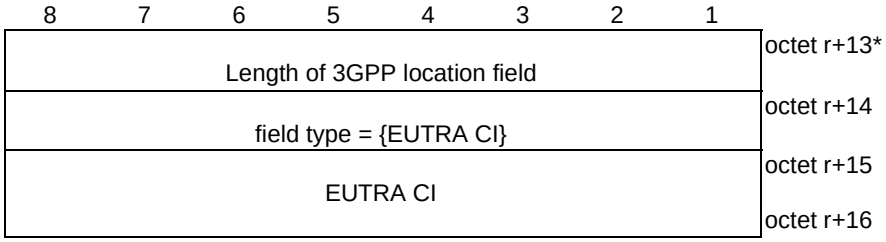

Figure 5.3.2.13: 3GPP location field {field type = EUTRA CI}

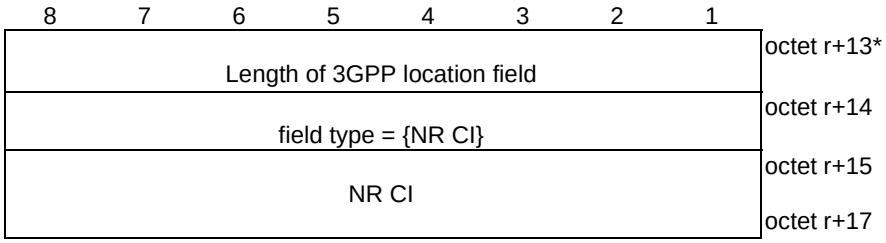

Figure 5.3.2.14: 3GPP location field {field type = NR CI}

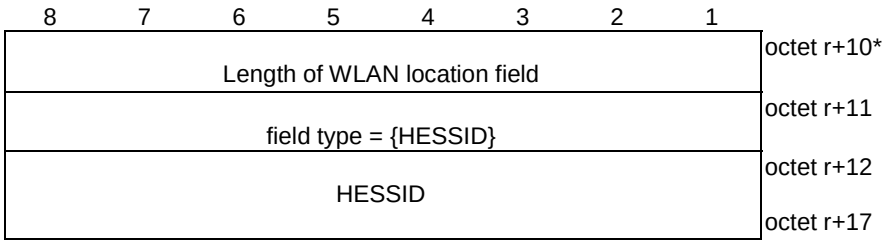

Figure 5.3.2.14a: WLAN location field {field type = HESSID}

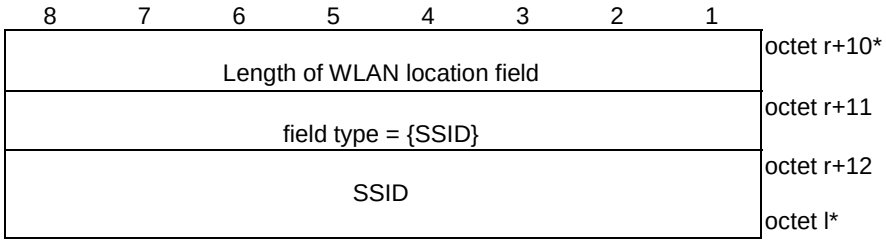

Figure 5.3.2.14b: WLAN location field {field type = SSID}

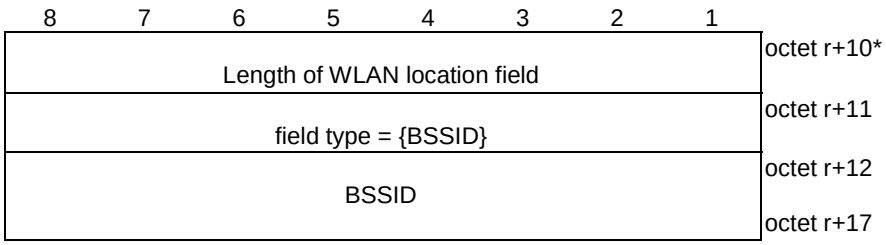

Figure 5.3.2.14c: WLAN location field {field type = BSSID}

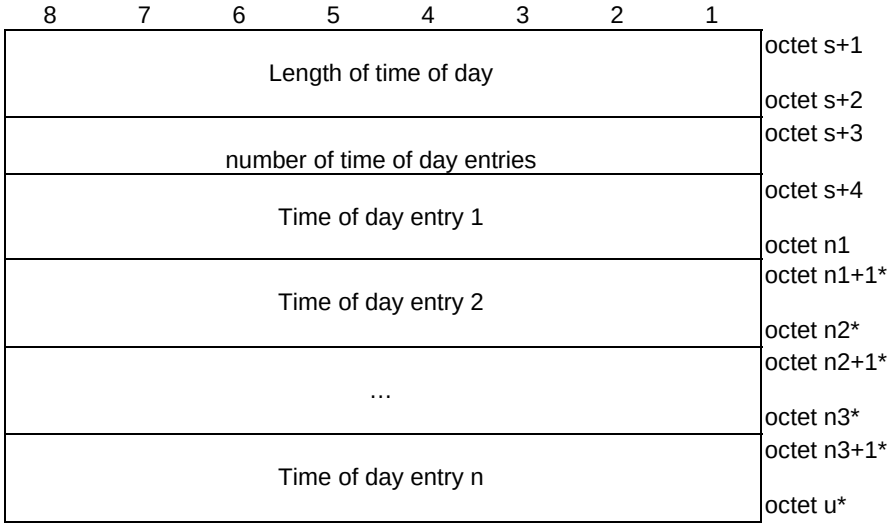

Figure 5.3.2.15: Time of day

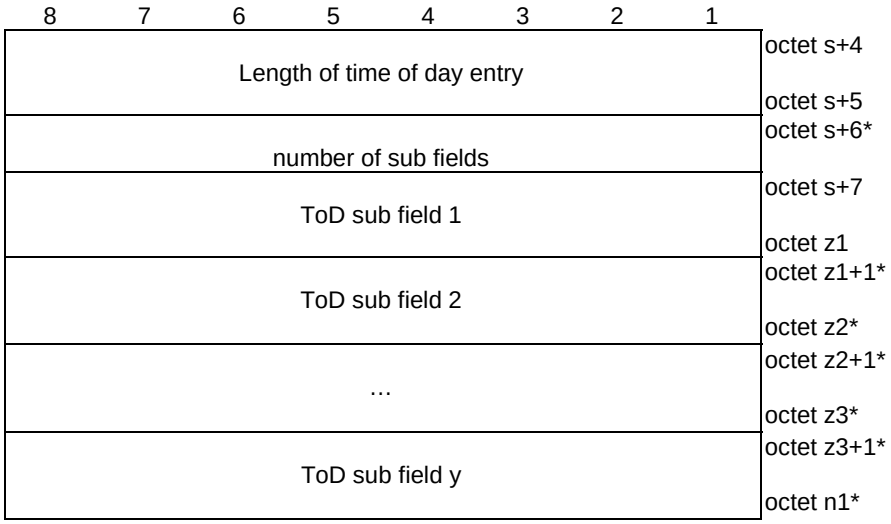

Figure 5.3.2.16: Time of day sub field

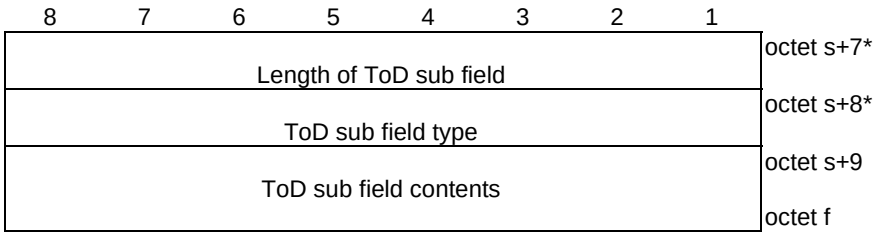

Figure 5.3.2.17: ToD sub field

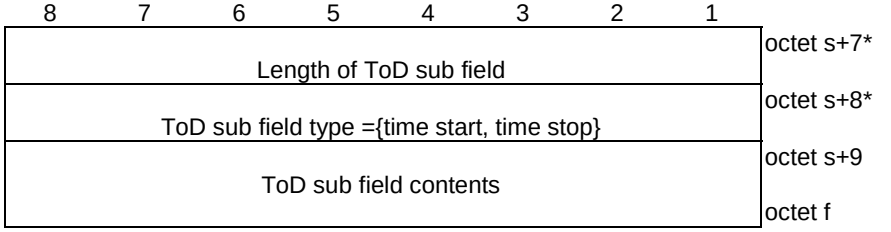

Figure 5.3.2.18: ToD sub field {field type = "time start" or "time stop"}

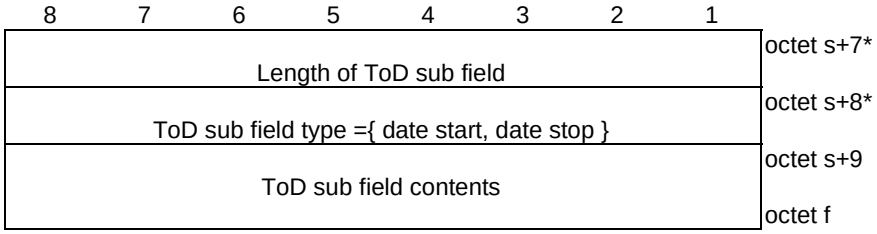

Figure 5.3.2.19: ToD sub field {field type = "date start" or "date stop"}

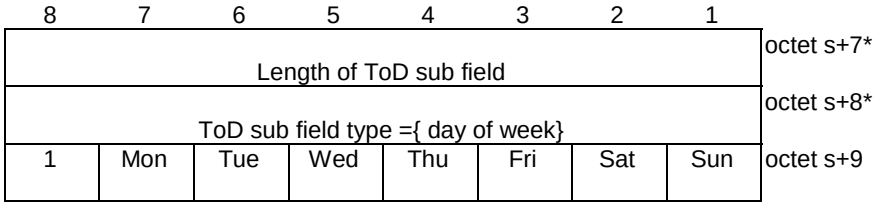

Figure 5.3.2.20: ToD sub field {field type = "day of the week"}

Table 5.3.2.1: WLANSP information element

Value part of the WLANSP information element (octets 4 to x)

ANDSP Info type (bit 1 to 4 of octet 1) shall be set to "0001" (WLANSP)

Bits 8 to 5 of octet 1 are spare and shall be encoded as zero.

Length of WLANSP contents (octets 2 to 3)

Length of WLANSP rule (octets 4 to 5)

Rule Identifier (octet 6)

This field contains the binary encoding of the WLANSP rule identifier

Rule priority (octet 7)

This field contains the binary encoding of the WLANSP rule priority

Spare bits and shall be encoded as zero (bits 1 to 2 of octet 8)

Time of day index (bit 3 of octet 8)
Bit
3
0 WLANSP rule does not include time of day information
1 WLANSP rule includes time of day information

Geo location index (bit 4 of octet 8)
Bit
4
0 WLANSP rule does not include Geo location information
1 WLANSP rule includes Geo location information

WLAN location index (bit 5 of octet 8)
Bit
5
0 WLANSP rule is not for WLAN location
1 WLANSP rule is for WLAN location

3GPP location index (bit 6 of octet 8)
Bit
6
0 WLANSP rule is not for 3GPP location
1 WLANSP rule is for 3GPP location

Validity area index (bit 7 of octet 8)
Bit
7
0 WLANSP rule is not for validity area
1 WLANSP rule is for validity area

Roaming (bit 8 of octet 8) (NOTE 1)
Bit
8
0 WLANSP rule is only valid when the UE is not roaming
1 WLANSP rule is only valid when the UE is roaming

Selection criteria (octets 9 to r)

This field contains the binary encoding of the selection criteria for a particular WLANSP rule.

Selection criteria entry (octets 12 to a) (NOTE 2)
Length of selection criteria entry (octets 12 to 13) indicates length of subsequent fields in the selection criteria entry.

Criteria priority (bits 1-5 of octet 14): the lower value indicates the selection criteria having the higher priority among the selection criteria in the WLANSP rule.

Home network ind (bit 6 of octet 14): (NOTE 3)
Bit
6
0 all WLANs could match this selection criteria entry.
1 only the WLANs that are operated by the home operator could match this selection criteria entry.

MaxBSSload ind (bit 7 of octet 14):
Bit
7
0 maximum BSS load value (octets 15 to 16) not present
1 maximum BSS load value (octets 15 to 16) present

Maximum BSS load value (octets 15 to 16) is as the node PerProviderSubscription/<X+>/Policy/MaximumBSSLoadValue defined in Hotspot 2.0 (Release 2) Technical Specification [9].

Selection criteria set (octets 17 to dd) contains the contents of a specific criteria set. In this release of specification there can be 5 types of criteria sets.

Selection criteria set type (bits 5-8 of octet 19) is coded as follows.
Bits
8 7 6 5
0 0 0 1 preferred SSID list (NOTE 4)
0 0 1 0 preferred roaming partner list (NOTE 5)
0 0 1 1 required protocol port tuple
0 1 0 0 SP exclusion list
0 1 0 1 minimum backhaul threshold
All other values are reserved.

Selection criteria sub entry (octets 20 to ee+6) when set type is "*preferred SSID list*" is coded as follows.
Length of sub entry (octet 20) indicates length of subsequent fields in the selection criteria sub entry.

WLAN priority (octet 21): the lower WLAN priority value indicates the WLAN having the higher priority among the WLANs in the preferred SSID list.

SSID ind (bit 1 of octet 22):
Bit
5
0 SSID field (octets 24 to ee) is not present.
1 SSID field (octets 24 to ee) is present.

HESSID ind (bit 2 of octet 22):
Bit
6
0 HESSID field (octets ee+1 to ee+6) is not present.
1 HESSID field (octet ee+1 to ee+6) is present.

SSID length (octet 23) indicates the length of the SSID field.
SSID field (octets 24 to ee) is an Octet String which shall have a maximum length of 32 octets (see IEEE Std 802.11 [8]).

HESSID field (octets ee+1 to ee+6) is a 6 octet MAC address that identifies the homogeneous ESS (see IEEE Std 802.11 [8]).

Selection criteria sub entry (octets 20 to ff) when set type is "*preferred roaming partner list*" is coded as follows.
Length of sub entry (octet 20) indicates length of subsequent fields in the selection criteria sub entry.

Priority (octet 21): the lower priority value indicates the higher priority in the preferred roaming partner list.

FQDN_Match length (octet 22) indicates the length of the FQDN_Match field.
FQDN_Match field (octets 23 to ee) is as the node PerProviderSubscription/<X+>/Policy/PreferredRoamingPartnerList/<X+>/FQDN_Match defined in Hotspot 2.0 (Release 2) Technical Specification [9].

Country length (octet ee+1) indicates the length of the country field.
Country field (octets ee+2 to ff) is as the node PerProviderSubscription/<X+>/Policy/PreferredRoamingPartnerList/<X+>/Country defined in Hotspot 2.0 (Release 2) Technical Specification [9].

Selection criteria sub entry (octets 20 to ff) when set type is "*required protocol port tuple*" is coded as follows.
Length of sub entry (octet 20) indicates length of subsequent fields in the selection criteria sub entry.

IP protocol field (octet 21) shall be present in the sub entry and refers to IP protocol field in IPv4 packets or the next header field in IPv6 packets. It is required by operator-supported application(s) on UE as specified in Hotspot 2.0 (Release 2) Technical Specification [9].

Length of port number (octet 22) indicates the length of port number field.
Port number field (octets 23 to ff) is as the node PerProviderSubscription/<X+>/Policy/RequiredProtoPortTuple/<X+>/PortNumber defined in Hotspot 2.0 (Release 2) Technical Specification [9].

Selection criteria sub entry (octets 20 to ff) when set type is "*SP exclusion list*" is coded as follows.
Length of sub entry (octet 20) indicates length of subsequent fields in the selection criteria sub entry, i.e. the length of SSID field.

SSID field (octets 21 to ff) is as the node PerProviderSubscription/<X+>/Policy/SPExclusionList/<X+>SSID defined in Hotspot 2.0 (Release 2) Technical Specification [9].

Selection criteria sub entry (octets 20 to 28) when set type is "*minmum backhaul threshold*" is coded as follows.

Network type (bit 1-2 of octet 20) is coded as follows according to the definition of the node PerProviderSubscription/<X+>/Policy/MinBackhaulThreshold/<X+>/NetworkType in Hotspot 2.0 (Release 2) Technical Specification [9].

Bits	
2	**1**
0	0 home
0	1 roaming

All other values are reserved.

DLBI (bit 3 of octet 20):

Bit	
3	
0	Downlink bandwidth field (octets 21 to 24) is not present.
1	Downlink bandwidth field (octets 21 to 24) is present.

ULBI (bit 4 of octet 20):

Bit	
4	
0	Uplink bandwidth field (octets 25 to 28) is not present.
1	Uplink bandwidth field (octets 25 to 28) is present.

Downlink bandwidth field (octets 21 to 24) is as the node PerProviderSubscription/<X+>/Policy/MinBackhaulThreshold/<X+>/DLBandwidth defined in Hotspot 2.0 (Release 2) Technical Specification [9].

Uplink bandwidth field (octets 25 to 28) is as the node PerProviderSubscription/<X+>/Policy/MinBackhaulThreshold/<X+>/ULBandwidth defined in Hotspot 2.0 (Release 2) Technical Specification [9].

Validity area (octets r+1 to s)

This field contains the binary encoding of the validity area for a particular WLANSP rule.

Entry type (bits 7-8 of octet r+6) is coded as follows:

Bits		
8	**7**	
0	1	3GPP location
1	0	WLAN location
1	1	Geo location

All other values are reserved.

Length of 3GPP location sub entry (octets r+7 to r+8)

This field contains the length of the location entry when the WLANSP rule is for validity area of a 3GPP location.

MCC, Mobile country code (octet r+9, and bits 4 to 1 of octet r+10)

The MCC field is coded as in ITU-T Recommendation E.212 [10], annex A.

MNC, Mobile network code (bits 8 to 5 of octet r+10, and octet r+11)

The encoding of this field is the responsibility of each administration but BCD encoding shall be used. The MNC shall consist of 2 or 3 digits. If a network operator may decide to use only two digits in the MNC over the radio interface, MNC digit 3 shall be encoded as "1111".

When the location entry type is "geo location", the location field in this entry has fixed length as shown in figure 5.3.2.11a.
Anchor latitude (octets r+10 to r+13) is defined in clause 6.1 of 3GPP TS 23.032 [7].
Anchor longitude (octets r+14 to r+17) is defined in clause 6.1 of 3GPP TS 23.032 [7].
Radius (octets r+18 to r+19) is given in meters and is defined in clause 6.6 of 3GPP TS 23.032 [7].

Location field type (octet r+14) when entry type is 3GPP location, or
Location field type (octet r+11) when entry type is WLAN location.
This field indicates the type of location field.

Bits
8 7 6 5 4 3 2 1
0 0 0 0 0 0 0 1 TAC
0 0 0 0 0 0 1 0 EUTRA CI
0 0 0 0 0 1 0 0 NR CI
1 0 0 0 0 0 0 1 HESSID
1 0 0 0 0 0 1 0 SSID
1 0 0 0 0 1 0 0 BSSID
All other values are reserved.

When 3GPP location field type is set to "TAC", the TAC field is as defined in 3GPP TS 23.003 [4].

When 3GPP location field type is set to "EUTRA CI", the EUTRA CI field is set to the cell identity part of the Evolved Cell Global Identifier, as described in 3GPP TS 36.331 [6].

When 3GPP location field type is set to "NR CI", the NR CI field is set to the NR cell identity part of the NR Cell Global Identifier as defined in 3GPP TS 38.413 [14].

When WLAN location field type is set to "HESSID", the HESSID field is set to a 6 octet MAC address that identifies the homogeneous ESS (see IEEE Std 802.11 [8]).

When WLAN location field type is set to "SSID", the SSID field is set to an Octet String which shall have a maximum length of 32 octets (see IEEE Std 802.11 [8]).

When WLAN location field type is set to "BSSID", the BSSID field is set to an Octet String which shall be 6 octets long (see IEEE Std 802.11 [8]).

Time of day (octets s+1 to u)

This field contains the binary encoding of the time of day condition for a particular WLANSP rule.

ToD sub field type ={time start, time stop, date start, date stop, day of week} (octet s+8)

Bits
8 7 6 5 4 3 2 1
0 0 0 0 0 0 0 1 time start
0 0 0 0 0 0 1 0 time stop
0 0 0 0 0 1 0 0 date start
0 0 0 0 1 0 0 0 date stop
0 0 0 1 0 0 0 0 day of the week
All other values are reserved.

when field type is set to "time start" or "time stop", the value of this ToD sub field contents is time of the day represented in string format, as defined in ISO 8601:2004 [13]

When field type is set to "date start" or "date stop", the value of this ToD sub field contents is a date represented in string format, as defined in ISO 8601:2004 [13].

When field type is set to "day of the week", the value of this ToD sub field contents is an 8-bit integer formatted as a bitmap representing days of the week. The most significant bit is set to one. The remaining bits represent days of the week.

NOTE 1: The value of roaming is valid only if the WLANSP rule is provided by the H-PCF. NOTE 2: The group of selection criteria as described in clause 4.3.2.1 is encoded as selection criteria entry. NOTE 3: The home network indication shall not be set by V-PCF. NOTE 4: If the home network indication bit is set to "1", the preferred SSID list shall not be present. NOTE 5: If the home network indication bit is set to "1", the preferred roaming partner list shall not be present. The preferred roaming partner list is provided by H-PCF only.

5.3.3 Encoding of N3AN node configuration information

5.3.3.1 General

The purpose of the N3AN node configuration information is to indicate the non-3GPP access network (N3AN) node configuration information to the UE for selection of either N3IWF or ePDG for accessing 5GCN or EPC respectively via non-3GPP access.

The N3AN node configuration information is encoded as shown in figure 5.3.3.1.1, table 5.3.3.1.1, figure 5.3.3.1.2, table 5.3.3.1.2.

8	7	6	5	4	3	2	1	
0	0	0	0	ANDSP Info type={N3AN-node-configuration-information}				octet x
Spare								
Length of ANDSP info contents								octet x+1 octet x+2
ANDSP info contents={N3AN node configuration information contents}								octet x+3 octet z

Figure 5.3.3.1.1: ANDSP info containing N3AN node configuration information, where x=k

Table 5.3.3.1.1: N3AN node configuration information

ANDSP Info type (bit 1 to 4 of octet x) shall be set to "0010" (N3AN node configuration information)
Bits 8 to 5 of octet x are spare and shall be encoded as zero.
Length of ANDSP info contents (octets x+1 to x+2) indicates the length of the N3AN node configuration information contents.

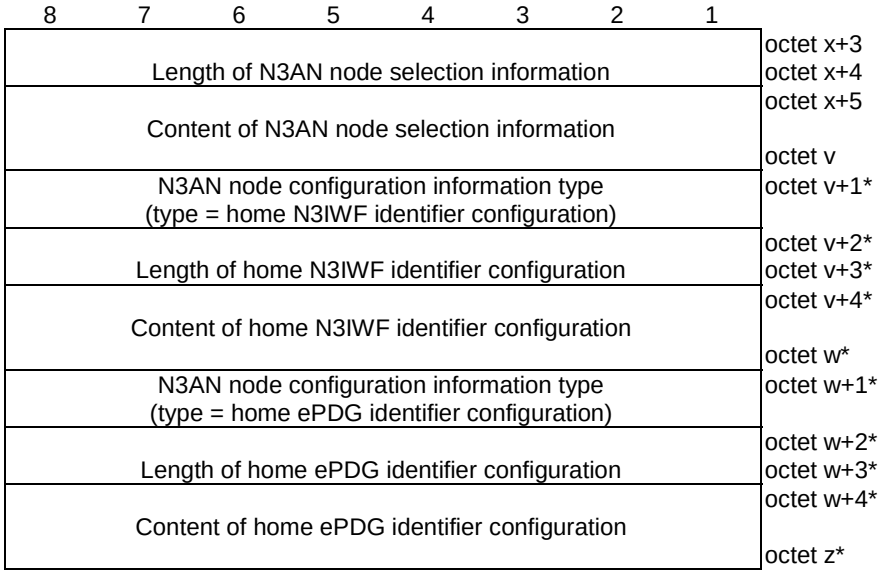

Figure 5.3.3.1.2: N3AN node configuration information contents

Table 5.3.3.1.2: Content of N3AN node configuration information

N3AN node configuration information type is coded as follows.

8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	
0	0	0	0	0	0	0	1	Home N3IWF identifier configuration
0	0	0	0	0	0	1	0	Home ePDG identifier configuration

All other values are reserved.

N3AN node selection information field (octet x+5 to v) shall be present and the content is as encoded in clause 5.3.3.2.

Home N3IWF identifier configuration field (octet v+1 to w) may be present and the content is as encoded in clause 5.3.3.3.

Home ePDG identifier configuration field (octet w+1 to z) may be present and the content is is as encoded in clause 5.3.3.4.

5.3.3.2 N3AN node selection information

The content of N3AN node selection information contains a sequence of the N3AN node selection information entries. Each N3AN node selection information entry contains a PLMN ID and information for the PLMN ID. The content of N3AN node selection information contains at least an N3AN node selection information entry with information for the HPLMN and an N3AN node selection information entry for "any_PLMN".

NOTE: If N3AN node selection information does not contain at least:

- an N3AN node selection information entry with information for the HPLMN; and
- an N3AN node selection information entry for "any_PLMN";

the N3AN node selection information is handled as a syntactically incorrect IE according to 3GPP TS 24.501 [11].

The content is encoded according to figure 5.3.3.2.1, figure 5.3.3.2.2 and table 5.3.3.2.1.

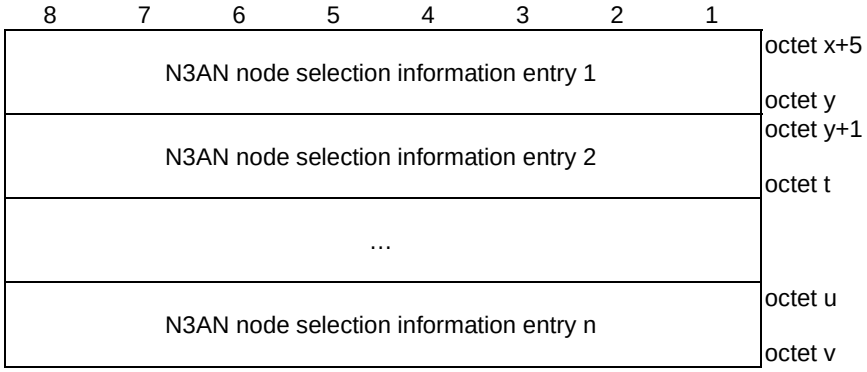

Figure 5.3.3.2.1: Content of N3AN node selection information

8	7	6	5	4	3	2	1	
Length of N3AN node selection information entry								octet x+5
MCC digit 2				MCC digit 1				octet x+6
MNC digit 3				MCC digit 3				octet x+7
MNC digit 2				MNC digit 1				octet x+8
FQDN format		Preference		Priority				octet x+9

Figure 5.3.3.2.2: N3AN node selection information entry

Table 5.3.3.2.1: N3AN node selection information

Length of N3AN node selection information entry (octet x+5) contains length of subsequent fields in the N3AN node selection information entry.

PLMN ID (octet x+6 to x+8) field shall be set to zero if it indicates "any_PLMN". Otherwise,

MCC, Mobile country code (octet x+6, and bits 4 to 1 of octet x+7)

The MCC field is encoded as in ITU-T Recommendation E.212 [10], annex A.

MNC, Mobile network code (bits 8 to 5 of octet x+7, and octet x+8)
The encoding of this field is the responsibility of each administration but BCD coding shall be used. The MNC shall consist of 2 or 3 digits. If a network operator decides to use only two digits in the MNC, MNC digit 3 shall be encoded as "1111".

Priority (bits 5 to 1 of octet x+9) indicates the preference order given to N3AN nodes of a PLMN. The lower value indicates higher priority. If the PLMN is the UE's HPLMN or the PLMN ID indicates "any_PLMN", this priority filed shall be ignored.

Preference (bit 6 of octet x+9) indicates which N3AN node type is preferred in this PLMN and is encoded as follows.

6

0 N3IWF is preferred

1 ePDG is preferred

FQDN format (bits 8 to 7 of octet x+9) indicates format to be used when the FQDN is constructed by the UE. This field is encoded as follows.

8 7

0 0 Operator identifier based ePDG FQDN format or operator identifier based N3IWF FQDN.

0 1 Tracking/location area identity based ePDG FQDN format or tracking area identity based N3IWF FQDN format.

All other values are reserved.

5.3.3.3 Home N3IWF identifier configuration

The content of home N3IWF identifier configuration contains a list of home N3IWF identifier entries.

The content of home N3IWF identifier configuration is encoded according to figure 5.3.3.3.1.

The content of each home N3IWF identifier entry is coded according to figure 5.3.3.3.2, table 5.3.3.3.1, figure 5.3.3.3.3 and table 5.3.3.3.2.

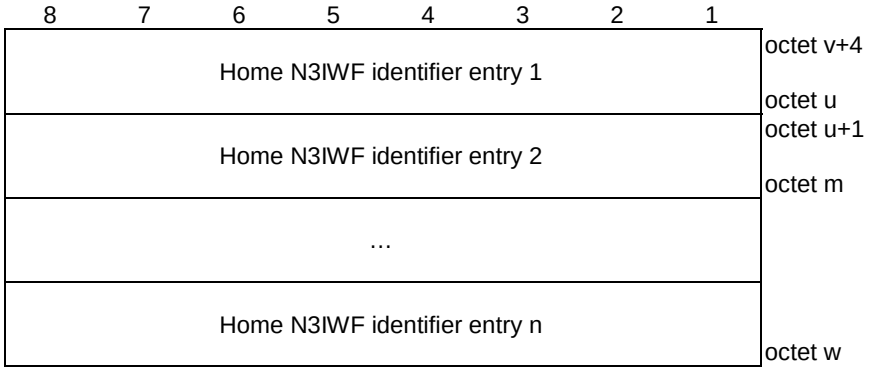

Figure 5.3.3.3.1: Content of home N3IWF identifier configuration

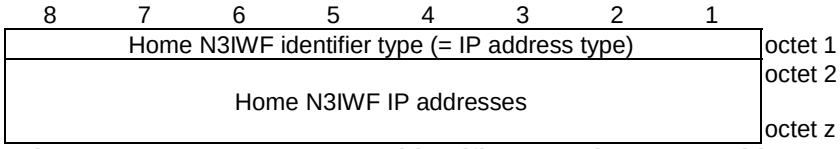

Figure 5.3.3.3.2: Home N3IWF identifier entry (type = IP address type)

Table 5.3.3.3.1: Home N3IWF identifier entry (type = IP address type)

Home N3IWF identifier type (octet 1) is set as follows when the type is IP address.

8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	
0	0	0	0	0	0	0	1	IPv4
0	0	0	0	0	0	1	0	IPv6
0	0	0	0	0	0	1	1	IPv4IPv6

If the home N3IWF identifier type indicates IPv4, then the home N3IWF IP addresses field contains an IPv4 address in octet 2 to octet 5.

If the home N3IWF identifier type indicates IPv6, then the home N3IWF IP addresses field contains an IPv6 address in octet 2 to octet 17.

If the home N3IWF identifier type indicates IPv4IPv6, then the home N3IWF IP addresses field contains two IP addresses. The first IP address is an IPv4 address in octet 2 to octet 5. The second IP address is an IPv6 address in octet 6 to octet 21.

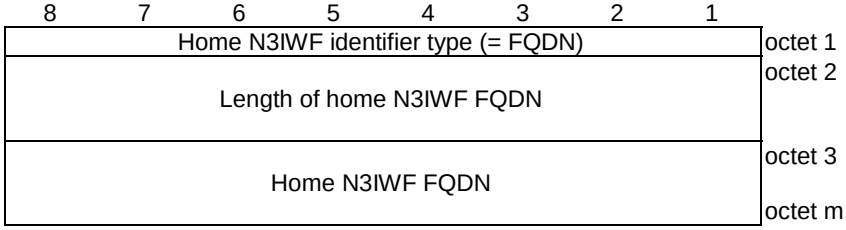

Figure 5.3.3.3.3: Home N3IWF identifier entry (type = FQDN)

Table 5.3.3.3.2: Home N3IWF identifier entry (type = FQDN)

Home N3IWF identifier type (octet 1) is set as follows when the type is FQDN. **8 7 6 5 4 3 2 1** 0 0 0 0 0 1 0 0 FQDN Length of home N3IWF FQDN field (octet 2) indicates the length of home N3IWF FQDN. Home N3IWF FQDN field (octet 3 to octet m) is encoded as defined in clause 28.3.2.2.2 in 3GPP TS 23.003 [4].

5.3.3.4 Home ePDG identifier configuration

The content of home ePDG identifier configuration contains a list of home ePDG identifier entries.

The content of home ePDG identifier configuration is encoded according to figure 5.3.3.4.1.

The content of each home ePDG identifier entry is encoded according to figure 5.3.3.4.2, table 5.3.3.4.1, figure 5.3.3.4.3 and table 5.3.3.4.2.

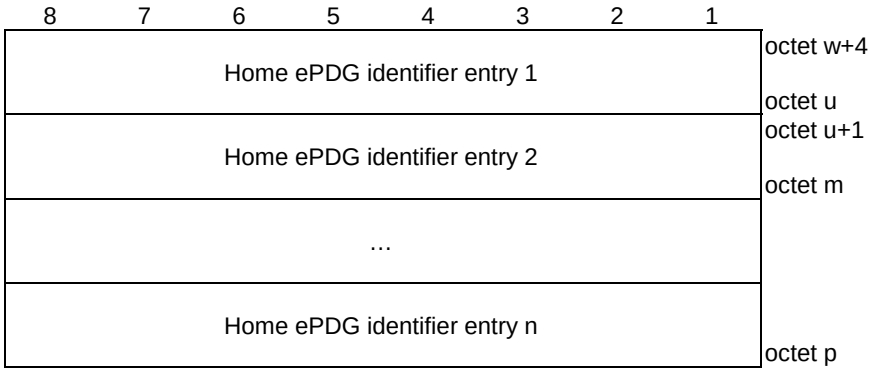

Figure 5.3.3.4.1: Content of home ePDG identifier configuration

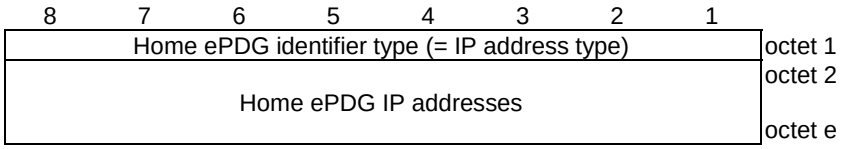

Figure 5.3.3.4.2: Home ePDG identifier entry (type = IP address type)

Table 5.3.3.4.1: Home ePDG identifier entry (type = IP address type)

Home ePDG identifier type (octet 1) is set as follows when the type is IP address.

8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	
0	0	0	0	0	0	0	1	IPv4
0	0	0	0	0	0	1	0	IPv6
0	0	0	0	0	0	1	1	IPv4IPv6

If the home ePDG identifier type indicates IPv4, then the home ePDG IP addresses field contains an IPv4 address in octet 2 to octet 5.

If the home ePDG identifier type indicates IPv6, then the home ePDG IP addresses field contains an IPv6 address in octet 2 to octet 17.

If the home ePDG identifier type indicates IPv4IPv6, then the home ePDG IP addresses field contains two IP addresses. The first IP address is an IPv4 address in octet 2 to octet 5. The second IP address is an IPv6 address in octet 6 to octet 21.

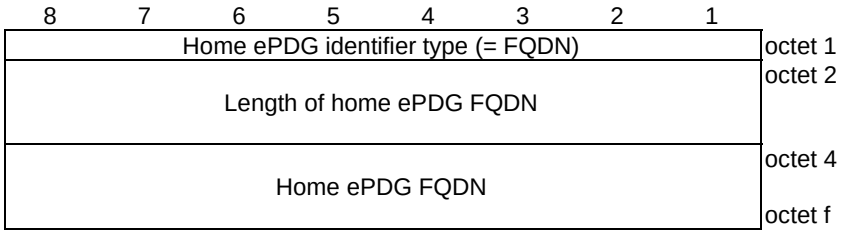

Figure 5.3.3.4.3: Home ePDG identifier entry (type = FQDN)

Table 5.3.3.4.2: Home ePDG identifier entry (type = FQDN)

Home ePDG identifier type (octet 1) is set as follows when the type is FQDN.

8	**7**	**6**	**5**	**4**	**3**	**2**	**1**	
0	0	0	0	0	1	0	0	FQDN

Length of home ePDG FQDN field (octet 2) indicates the length of home ePDG FQDN.

Home ePDG FQDN field (octet 3 to octet f) is encoded as defined in clause 19.4.2.9.2 in 3GPP TS 23.003 [4].

Annex A (informative): Change history

Change history							
Date	**Meeting**	**TDoc**	**CR**	**Rev**	**Cat**	**Subject/Comment**	**New version**
2018-04	CT1#110					TS skeleton is provided by C1-182823. C1-182793, C1-182795, C1-182798, C1-182821, C1-182822 are implemented as Annex A.	0.0.0
2018-05	CT1#111					Includes the following contributions agreed by CT1 at CT#111: C1-183550, C1-183551, C1-183552, C1-183553, C1-183555, C1-183556, C1-183862, C1-183863.	0.1.0
2018-06	CT-80					version 1.0.0 created for presentation for information	1.0.0
2018-07	CT1#111 bis					Includes the following contributions agreed by CT1 at CT#111bis: C1-184345, C1-184627, C1-184691, C1-184859, C1-184927, C1-184945, C1-184948.	1.1.0
2018-08	CT1#112					Includes the following contributions agreed by CT1 at CT#112: C1-185149, C1-185630, C1-185636, C1-185641, C1-185679.	1.2.0
2018-09	CT-81	CP-182112				version 2.0.0 created for presentation for approval	2.0.0
2018-09	CT-81					version 15.0.0 created after approval	15.0.0
2018-12	CT-82	CP-183043	0001	2	F	Modifications to ANDSP	15.1.0
2018-12	CT-82	CP-183043	0002	2	F	Aligning the clauses and correcting the reference and requirements	15.1.0
2018-12	CT-82	CP-183043	0003	2	B	Adding connection capabilities in URSP rules	15.1.0
2018-12	CT-82	CP-183043	0004	2	F	Editorial and other changes	15.1.0
2018-12	CT-82	CP-183043	0005	1	B	Coding of WLAN selection criteria entry	15.1.0
2018-12	CT-82	CP-183043	0006	2	B	Complete location entry definition	15.1.0
2018-12	CT-82	CP-183043	0011	2	F	Clarification on PDU session selection	15.1.0
2018-12	CT-82	CP-183043	0013	2	F	Clarification on URSP traffic descriptor and SSC mode	15.1.0
2018-12	CT-82	CP-183043	0015	2	F	OS App Id with a variable length	15.1.0
2019-03	CT-83	CP-190090	0012	7	F	Clarification on UE local configuration and URSP preference	15.2.0
2019-03	CT-83	CP-190210	0016	6	F	PCF does not send OS Id to UE	15.2.0
2019-03	CT-83	CP-190090	0017	1	F	The formats of OS Id	15.2.0
2019-03	CT-83	CP-190090	0018	2	F	Add destination FQDN as additional traffic descriptor	15.2.0
2019-03	CT-83	CP-190090	0019	1	D	Update abbreviations	15.2.0
2019-03	CT-83	CP-190090	0020	3	F	Correcting the name of ITU-T Recommendation E.212	15.2.0
2019-03	CT-83	CP-190090	0021	2	F	Correction on WLANSP rules description	15.2.0
2019-03	CT-83	CP-190090	0022	2	F	Correction to Length of URSP rule and Length of route selection descriptor	15.2.0
2019-03	CT-83	CP-190090	0024	1	F	Clarification on OS Id + OS App Id field of URSP	15.2.0
2019-03	CT-83	CP-190211	0026	2	F	UE with multiple OS Ids	15.2.0
2019-03	CT-83	CP-190090	0027	1	F	Correction to length of location sub entry in WLANSP rule	15.2.0
2019-03	CT-83	CP-190090	0028	2	F	Unknown or unexpected URSP rules	15.2.0
2019-06	CT-84	CP-191125	0030		F	Update of association between application and existing PDU session	15.3.0
2019-06	CT-84	CP-191125	0034	2	F	Correction to Encoding of WLANSP	15.3.0
2019-06	CT-84	CP-191125	0039	2	F	Correction to UE Policy evaluation	15.3.0
2019-06	CT-84	CP-191138	0029	1	B	Multi-access access type preference	16.0.0
2019-06	CT-84	CP-191131	0031		F	Handling of unsupported PDU session type in route selection descriptor	16.0.0
2019-06	CT-84	CP-191131	0032	1	F	Changing "user preferences" to "UE local configuration"	16.0.0
2019-06	CT-84	CP-191131	0033	1	F	Handling of PDU session type	16.0.0
2019-06	CT-84	CP-191131	0036	2	F	Correction on coding of "all other values are spare"	16.0.0
2019-06	CT-84	CP-191136	0037	1	F	Correction to Encoding of WLANSP	16.0.0
2019-06	CT-84	CP-191136	0038	2	F	Reference to IEEE Std 802.11	16.0.0
2019-06	CT-84	CP-191131	0041	1	D	Correction on the route selection descriptor component type identifier of URSP	16.0.0
2019-09	CT-85	CP-192059	0042	1		5G-RG usage of ANDSP	16.1.0
2019-09	CT-85	CP-192074	0043	1	B	Introduction of background data transfer policy information in URSP	16.1.0
2019-09	CT-85	CP-192055	0045		F	Clarification on application information matching	16.1.0
2019-09	CT-85	CP-192055	0046	1	F	Clarification on PDU session association	16.1.0
2019-09	CT-85	CP-192071	0047	3	F	Use of the URSP rules in EPS	16.1.0
2019-09	CT-85	CP-192059	0051	2	F	URSP and ANDP information for wireline 5G access network	16.1.0
2019-09	CT-85	CP-192063	0052	1	B	Specifying and adding reference for V2X Policy	16.1.0
2019-09	CT-85	CP-192060	0053	1	F	Usage of access type preference	16.1.0
2019-09	CT-85	CP-192060	0054	1	F	Occurrence of Preferred access type and Multi-access preference	16.1.0
2019-09	CT-85	CP-192055	0055		F	Handling of S-NSSAI in RSD descriptor but not in the allowed NSSAI	16.1.0
2019-12	CT-86	CP-193092	0056	1	F	Handling of unsupported SSC mode in route selection descriptor	16.2.0
2019-12	CT-86	CP-193092	0057	1	F	Clarification on the DNN in the route selection descriptor	16.2.0
2019-12	CT-86	CP-193092	0058	2	F	Correction on using URSP in EPS	16.2.0
2019-12	CT-86	CP-193092	0059	3	F	Clarification for URSP evaluation	16.2.0
2019-12	CT-86	CP-193092	0061	1	F	Correction to association between an application and an existing PDU session	16.2.0
2019-12	CT-86	CP-193101	0063		F	Correct the reference of access type IE	16.2.0
2019-12	CT-86	CP-193100	0065	1	B	5G-RG and W-AGF acting on behalf of FN-RG usage of URSP	16.2.0
2019-12	CT-86	CP-193092	0066		F	Correction to S-NSSAI RSD component encoding	16.2.0
2019-12	CT-86	CP-193092	0067	1	F	Pre-configured URSP rules in USIM	16.2.0

2020-03	CT-87e	CP-200110	0069	1	F	Matching of SSC mode for association between an application and a PDU session	16.3.0
2020-03	CT-87e	CP-200113	0070		F	LADN service does not apply for RG connected to 5GC via wireline access	16.3.0
2020-06	CT-88e	CP-201101	0071		F	Reference correction in URSP encoding	16.4.0
2020-06	CT-88e	CP-201101	0073	1	F	Clarification on URSP in EPS	16.4.0
2020-06	CT-88e	CP-201101	0075	1	F	Allowed SSC mode for association between an application and a PDU session	16.4.0
2020-06	CT-88e	CP-201101	0077	1	F	Correction to the URSP encoding	16.4.0
2020-06	CT-88e	CP-201101	0079	2	F	Specify UE behavior when pre-configured policy is syntactically incorrect	16.4.0
2020-06	CT-88e	CP-201101	0081	1	F	Domain descriptors in URSP	16.4.0
2020-06	CT-88e	CP-201108	0082	1	D	URSP for RGs editorial fix	16.4.0
2020-06	CT-88e	CP-201101	0084	1	F	Corrections to UE policies specification	16.4.0
2020-09	CT-89e	CP-202149	0087r1	1	F	Removal of Editor's Notes for URSP related capability indications	16.5.0
2020-09	CT-89e	CP-202174	0085r1	1	F	Optimization of handling unknown or unexpected URSP rules	17.0.0
2020-12	CT-90e	CP-203177	0091		A	Correction on association between an application and a PDU session for RG	17.1.0
2020-12	CT-90e	CP-203175	0092	1	F	Clarification on traffic descriptor component type of VLAN tag control information	17.1.0
2020-12	CT-90e	CP-203167	0094	1	A	EN resolution on domain descriptors in URSP	17.1.0
2020-12	CT-90e	CP-203175	0095	1	F	The correction on the process of URSP handling	17.1.0
2020-12	CT-90e	CP-203175	0097	1	F	Optional fields of N3AN node configuration information	17.1.0
2020-12	CT-90e	CP-203176	0100	1	A	Lack of bit encoding of the location entry type in the WLANSP IE	17.1.0
2020-12	CT-90e	CP-203175	0102	1	F	UE behaviour on SNPN URSP stored in ME	17.1.0
2020-12	CT-90e	CP-203205	0103	1	F	DNN setting in the upper layers for PAP/CHAP	17.1.0
2020-12	CT-90e	CP-203175	0105	1	F	Referring to TS 23.003 for FQDN format	17.1.0
2021-03	CT-91e	CP-210116	0108	1	F	Re-use of existing connection to WLAN access when applying URSP	17.2.0
2021-03	CT-91e	CP-210116	0110		F	Avoid unnecessary new PDU session with the same attributes	17.2.0
2021-03	CT-91e	CP-210244	0111	3	A	Encoding of Location Criteria Type	17.2.0
2021-03	CT-91e	CP-210116	0112	1	F	Clarifications on PLMN and SNPN URSP storage - 24.526 part	17.2.0
2021-03	CT-91e	CP-210116	0113	1	F	Clarifications on PLMN URSP stored in USIM	17.2.0
2021-06	CT-92e	CP-211142	0115	2	B	UE policies for 5G ProSe policy	17.3.0
2021-06	CT-92e	CP-211145	0118	-	F	Correction on term SNPN access mode	17.3.0
2021-06	CT-92e	CP-211145	0120	-	F	URSP evaluation upon configured NSSAI update	17.3.0
2021-06	CT-92e	CP-211146	0117	1	F	PDU session type for URSP association	17.3.0
2021-09	CT-93e	CP-212154	0121	1	F	Introduction of MAC address range traffic descriptor component type in URSP rule	17.4.0
2021-09	CT-93e	CP-212134	0122	2	B	Adding the 5G ProSe UE-to-network relay support to the URSP	17.4.0
2021-09	CT-93e	CP-212134	0123	1	B	Mapping of 5G ProSe Layer-3 UE-to-Network Relay offload when moving from N1 mode to S1 mode	17.4.0
2021-12	CT-94e	CP-213045	0128	1	F	5G ProSe Layer-3 UE-to-Network Relay Offload indication for the UEs capable to act as Remote UEs	17.5.0
2021-12	CT-94e	CP-213048	0131	1	F	DNN in URSP traffic descriptor and route selection descriptor	17.5.0
2021-12	CT-94e	CP-213054	0127	1	B	URSP amendment for redundant PDU session	17.5.0
2022-03	CT-95e	CP-220245	0136	1	F	Alignment of ProSe Policy and V2X Policy	17.6.0
2022-03	CT-95e	CP-220247	0137	-	F	Correction on description of preferred access type and multi-access preference	17.6.0
2022-03	CT-95e	CP-220249	0139	1	F	Add support of operator-specific connection capabilities	17.6.0
2022-03	CT-95e	CP-220258	0133	-	F	Inclusion of PDU session pair ID and/or RSN in PDU session establishment request	17.6.0
2022-03	CT-95e	CP-220258	0138	-	D	Referenced clause numbers for PDU session pair and RSN	17.6.0

History

Document history		
V17.6.0	May 2022	Publication