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Technical Specification

3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Access Network Discovery and Selection Function (ANDSF) Management Object (MO) (Release 11)



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Keywords

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Foreword

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1 Scope

The present document defines management objects that can be used by the Access Network Discovery and Selection Function (ANDSF) and the UE.

The Management Object (MO) is compatible with the OMA Device Management (DM) protocol specifications, version 1.2 and upwards, and is defined using the OMA DM Device Description Framework (DDF) as described in the Enabler Release Definition OMA-ERELD-DM-V1_2 [5].

The MO consists of relevant parameters for intersystem mobility policy- and access network discovery information that can be managed by the ANDSF.

The service requirements and the functional requirements for the access network discovery and selection are described in 3GPP TS 22.278 [2] and in 3GPP TS 23.402 [4] respectively.

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 22.278: "Service requirements for the Evolved Packet System (EPS)".
- [3] 3GPP TS 23.003: "Numbering, addressing and identification".
- [3A] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".
- [3AA] 3GPP TS 24.302: "Access to the 3GPP Evolved Packet Core (EPC) via non-3GPP access networks".
- [3AB] 3GPP TS 24.303: "Mobility management based on Dual-Stack Mobile IPv6".
- [3B] 3GPP TS 25.331: "Radio Resource Control (RRC); Protocol Specification".
- [3C] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA) Radio Resource Control (RRC); Protocol specification".
- [4] 3GPP TS 23.402: "Architecture enhancements for non-3GPP accesses".
- [4A] OMA-DDS-DM_ConnMO-V1_0-20081107-A: "Standardized Connectivity Management Objects", Approved Version 1.0 – 07 Nov 2008.
- [4B] OMA-DDS-DM_ConnMO_WLAN-V1_0-20081024-A: "Standardized Connectivity Management Objects WLAN Parameters", Approved Version 1.0 – 24 Oct 2008.
- [5] OMA-ERELD-DM-V1_2: "Enabler Release Definition for OMA Device Management".
- [5A] OMA-TS-DM_Protocol-V1_2: "OMA Device Management Protocol".
- [5B] OMA-TS-DM_TNDS-V1_2: "OMA Device Management Tree and Description Serialization".

- [6] WiMAX Forum Network Architecture Release 1.0 version 1.2.2 – Stage 2: "Architecture Tenets, Reference Model and Reference Points", May 2008.
- [7] WiMAX Forum Network Architecture Release 1.0 version 1.2.2 – Stage 3: "Detailed Protocols and Procedures", May 2008.
- [8] WiMAX Forum Mobile System Profile Release 1.0 Approved Specification Revision 1.4.0, April 2007.
- [9] IEEE Std 802.11™-2007: "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".
- [10] IEEE Std 802.16e-2005 and IEEE Std 802.16-2004/Cor1-2005: "IEEE Standard for Local and Metropolitan Area Networks, Part 16: Air Interface for Fixed and Mobile Broadband Wireless Access Systems Amendments 2 and Corrigendum 1", February 2006.
- [10A] IETF RFC 3260 (April 2002): "New Terminology and Clarifications for Diffserv".
- [11] IETF RFC 3629 (November 2003): "UTF-8, a transformation format of ISO 10646".
- [12] "Unicode 5.1.0, Unicode Standard Annex #15; Unicode Normalization Forms", March 2008. <http://www.unicode.org>
- [13] 3GPP2 C.S0005: "Upper Layer (Layer 3) Signaling Standard for cdma2000 Spread Spectrum Systems".
- [14] 3GPP2 C.S0016: "Over-the-Air Service Provisioning of Mobile Stations in Spread Spectrum Standards".
- [15] 3GPP2 C.S0024: "cdma2000 High Rate Packet Data Air Interface Specification".
- [16] ISO 8601:2004: "Data elements and interchange formats -- Information interchange -- Representation of dates and times".
- [17] IEEE 802.11u: "Draft Amendment to Standard for 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: Amendment 7: Interworking with External Networks".
- [18] IANA Assigned Internet Protocol Numbers (<http://www.iana.org/assignments/protocol-numbers/protocol-numbers.xml>).
- [19] IETF RFC 2181 (July 1997): "Clarifications to the DNS Specification".
- [20] IETF RFC 1035 (November 1987): "Domain Names - Implementation and Specification".
- [21] IETF RFC 1123 (October 1989): "Requirements for Internet Hosts -- Application and Support".
- [22] IETF RFC 4122 (July 2005): "A Universally Unique Identifier (UUID) URN Namespace".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] apply.

Empty node: A node which is present in the ANDSF MO with no internal node or leaf object(s) to it is present.

Inter-System Routing Policy rule: In the present document, Inter-System Routing Policy (ISRP) consists of one or more ISRP rules. ISRP rule is a single instance of <X>/ISRP/<X>. The ISRP rule consists of one or more flow distribution container.

Flow distribution container: In the present document, Flow distribution container denotes the node <X>/ISRP/<X>/ForFlowBased, <X>/ISRP/<X>/ForServiceBased or <X>/ISRP/<X>/ForNonSeamlessOffload/.

Flow distribution rule: In the present document, Flow distribution rule denotes a single instance of <X>/ISRP/<X>/ForFlowBased/<X>, <X>/ISRP/<X>/ForServiceBased/<X> or <X>/ISRP/<X>/ForNonSeamlessOffload/<X>.

Reserved: The value "reserved" is assigned to a code point to indicate that it is reserved for future use. The present document specifies no processing rules for handling of "reserved" value by the receiving entity.

Operating System (OS): collection of UE software that provides common services for applications.

Operating System Identifier (OSId): an identifier identifying the operating system.

OS specific Application Identifier (OSAppId): an identifier associated with a given application and uniquely identifying the application within the UE for a given operating system.

For the purpose of the present document, the terms and definitions given in 3GPP TS 24.302 [3AA] apply:

Home ANDSF
Visited ANDSF

For the purposes of the present document, the terms and definitions given in 3GPP TS 24.303 [3AB] apply:

Home Agent

3.3 Abbreviations

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

ANDSF	Access Network Discovery and Selection Function
DDF	Device Description Framework
DIDA	Data IDentification in ANDSF
DM	Device Management
DS	Differentiated Services
FQDN	Fully Qualified Domain Name
IFOM	IP Flow Mobility
ISMP	Inter-System Mobility Policy
ISRP	Inter-System Routing Policy
MAPCON	Multi Access PDN Connectivity
MO	Management Object
OMA	Open Mobile Alliance
OS	Operating System
OSAppId	Operating System specific Application Identifier
OSId	Operating System Identifier
RSSI	Receive Signal Strength Indicator
ToS	Type of Service
UE	User Equipment
UUID	Universally Unique IDentifier
WNDS	WiMAX Network Discovery and Selection

4 ANDSF MO

4.1 Descriptions

4.1.1 General

The ANDSF MO is used to manage Inter-System Mobility Policy (ISMP) and Inter-System Routing Policy (ISRP) as well as access network discovery information stored in a UE supporting provisioning of such information from an ANDSF.

The ANDSF may initiate the provision of information from the ANDSF to the UE as specified in 3GPP TS 24.302 [3AA].

If the UE wishes to provide the user location information to the ANDSF when sending the Package 1 (see OMA-TS-DM_Protocol-V1_2 [5A]), the UE shall include in the Package 1 a Generic Alert message (along with other commands) where the "Type" element is set to "urn:oma:at:ext-3gpp-andsf:1.0:ue_location" and the "Data" element is set to the information contained in the UE_Location node subtree (see subclause 5.6) encoded as XML formatted as specified by OMA-TS-DM_TNDS-V1_2 [5B].

If the UE wishes to provide the UE profile information to the ANDSF while sending Package 1 (see OMA-TS-DM_Protocol-V1_2 [5A]), the UE shall include in Package 1 a Generic Alert message (along with other commands) where the "Type" element is set to "urn:oma:at:ext-3gpp-andsf:1.0:ue_profile" and the "Data" element is set to the information contained in the UE_Profile node subtree (see subclause 5.7A) encoded as XML formatted as specified by OMA-TS-DM_TNDS-V1_2 [5B].

The UE may initiate the provision of all available information from the ANDSF, using a client-initiated session Alert message of code "Generic Alert" (see OMA-TS-DM_Protocol-V1_2 [5A]). When requesting all available information from ANDSF, the "Type" element of the OMA DM generic alert message shall be set to "urn:oma:at:ext-3gpp-andsf:1.0:provision".

The relation between ISMP, ISRP and DiscoveryInformation is that ISMP prioritize the access network when the UE is not capable to connect to the EPC through multiple accesses, ISRP indicate how to distribute traffic among available accesses when the UE is capable to connect to the EPC through multiple accesses (i.e. the UE is configured for IFOM, MAPCON, non-seamless WLAN offload or any combination of these capabilities), while DiscoveryInformation provide further information for the UE to access the access network defined in the ISMP or in the ISRP.

The MO defines validity areas, position of the UE and availability of access networks in terms of geographical coordinates. The way such coordinates are retrieved is implementation dependant (e.g. GPS receiver).

The UE is not required to switch on all UE's supported radios for deducing its location for ANDSF purposes or for evaluating the validity area condition of a policy or discovery information.

The Management Object Identifier is: urn:oma:mo:ext-3gpp-andsf:1.0.

The OMA DM Access Control List (ACL) property mechanism as standardized (see Enabler Release Definition OMA-ERELD-DM-V1_2 [5]) may be used to grant or deny access rights to OMA DM servers in order to modify nodes and leaf objects of the ANDSF MO.

The UE shall ignore any node which is a child of the ANDSF MO root node and is not supported by the UE. The ANDSF server shall ignore any node which is a child of the ANDSF MO root node and is not supported by the ANDSF server.

4.1.2 Policy (ISMP)

The Policy node represents ISMP and the information consists of a set of one or more ISMP rules. At any point in time there shall be at most one rule applied, that rule is referred to as the 'active' rule. There may hence be zero or one 'active' rule.

The rules have a number of validity conditions (e.g. current access technology and location) where one or more may be present and set to a value. The rules also have a number of results (e.g. preferred access technology and restricted access technology) to be used whenever a rule is 'active'. If there are no results for the 'active' rule, it is implementation dependent how UE performs network selection. Irrespective of whether any rule is 'active' or not, the UE shall periodically re-evaluate ANDSF policies. When ANDSF policy selection rules identify an available network, the highest priority rule becomes 'active' rule and network re-selection is performed.

While the rule remains 'active', UE shall keep considering higher priority networks, than currently selected, in the prioritized network list of the rule. In addition to conditions and results there is a rule-priority that shall be set for each rule in order for the UE to determine which rule, out of potentially several valid rules, it should consider as 'active'. The trigger for (re-)evaluating rules is that the 'active' rule becomes invalid (conditions no longer fulfilled), or some other manufacturer specific trigger.

The validity of the rule can be restricted by validity conditions. The validity of the rule takes into account ValidityArea, Roaming, and TimeOfDay, where each existing non-empty node must match in order to make the rule valid. The UE

does not make any evaluation on nodes which are present and empty. In addition, this rule is considered valid if none of the validity conditions exist.

The ANDSF server shall include at least one of the leaves (i.e. HESSID, SSID or BSSID) to be present in a single instance of WLAN_Location interior node of the ValidityArea of the Policy node.

The UE capable of any combinations of IFOM or MAPCON or non-seamless WLAN offload with all those combination of capabilities disabled, or a UE which is not IFOM capable and is not MAPCON capable and is not non-seamless WLAN offload capable, may initiate the provision of ISMP information from the ANDSF, using a client initiated session containing a generic alert. When requesting ISMP, the "Type" element of the OMA DM generic alert message shall be set to "urn:oma:at:ext-3gpp-andsf:1.0:provision-single-if".

The UE shall ignore any rule containing a node not supported by the UE.

4.1.3 Discovery information

The UE may initiate the provision of discovery information from the ANDSF using a client initiated session containing a generic alert. When requesting discovery information, the "Type" element of the OMA DM generic alert message shall be set to "urn:oma:at:ext-3gpp-andsf:1.0:provision-disc-info".

The ANDSF server shall include at least one of the leaves (i.e. HESSID, SSID or BSSID) to be present in a single instance of WLAN_Location interior node of the AccessNetworkArea of the DiscoveryInformation node.

The UE shall ignore any node which is a descendant of the DiscoveryInformation node and is not supported by the UE.

4.1.4 UE location

The MO has a node indicating the position of the UE. The trigger for updating the value of this node is that the location information it contains is no longer valid (i.e. the UE has changed its position) or some other manufacturer specific trigger. The update of the information contained in this node doesn't necessarily imply any interaction with the ANDSF server.

The ANDSF server shall ignore any node which is a descendant of the UE_Location node and is not supported by the ANDSF server.

4.1.5 ISRP

The ISRP information consists of a set of one or more ISRP rules. Each ISRP rule contains indication on traffic distribution for UEs that are configured for IFOM, MAPCON or non-seamless WLAN offload.

Each ISRP rule has a PLMN leaf and an optional Roaming leaf. Roaming and PLMN leaves are used by the UE to determine if an ISRP rule is applied. At any point in time there shall be at most one ISRP rule applied, that ISRP rule is referred to as the 'active' ISRP rule. When the UE is roaming, there can be multiple applicable ISRP rules: in this case the ISRP rule received from the Visited ANDSF takes precedence over the ISRP rule received from the Home ANDSF.

An ISRP rule can contain one or more flow distribution containers. These are ForFlowBased for IFOM service, ForServiceBased for MAPCON and ForNonSeamlessOffload for Non-seamless WLAN offload. A UE evaluates only the supported flow distribution containers of the 'active' ISRP rule. A flow distribution container can have one or more flow distribution rules.

A flow distribution rule can have a validity condition defined by the RoutingCriteria node. The validity of the flow distribution rule takes into account ValidityArea, TimeOfDay, and APN where each existing non-empty node must match in order to make the rule valid. In addition, this flow distribution rule without any validity conditions is considered valid, i.e. validity condition is fulfilled. A flow distribution rule is applied only if the validity condition is fulfilled and if the flow distribution rule is contained by the 'active' ISRP rule. A flow distribution rule has a number of results (e.g. preferred access technology and restricted access technology) defined in the RoutingRule node to be used whenever the flow distribution rule is applied. Each flow distribution rule has also a mandatory node identifying the data traffic (e.g. based on APN or IP flow description) to which the results contained in RoutingRule node apply.

The ANDSF server shall include at least one of the leaves (i.e. HESSID, SSID or BSSID) to be present in a single instance of WLAN_Location interior node of the ValidityArea of the RoutingCriteria node.

If there are no results for an 'active' ISRP rule, it is implementation dependent how UE performs network selection for the class of traffic to which the results apply. The UE shall periodically re-evaluate the flow distribution rules of the 'active' ISRP rule. The value of the periodic re-evaluation timer is implementation dependant.

In addition to conditions, results and traffic class, there is a rule-priority that shall be set for each flow distribution rule. The rule-priority enables the UE to determine which flow distribution rule, out of potentially several flow distribution rules, contained in every supported flow distribution container of the 'active' ISRP rule, it should apply to an IP flow matching the data traffic description of the multiple flow distribution rules. The ISRP rule consists of one or more flow distribution container. Each flow distribution container is applicable for either IFOM, MAPCON, or non-seamless WLAN offload. The scope of the RulePriority extends across all supported flow distribution containers belonging to the 'active' ISRP rule. If the same flow matches multiple flow distribution rules, then the flow distribution rule with the highest RulePriority is applied for the IP flow.

If a flow matches multiple flow distribution rules with the same highest priority, the selection of the flow distribution rule for routing of that flow is implementation dependent. If there are multiple applied flow distribution rules within the 'active' ISRP rule and they refer to the same access technology but different access networks and the UE is not able to have connection to all of them at the same time, the selection of the access network is implementation dependant.

The UE configured for IFOM or MAPCON or non-seamless WLAN offload or any combination of these capabilities, may initiate the provision of ISRP information from the ANDSF, using a client initiated session containing a generic alert. When requesting ISRP, the "Type" element of the OMA DM generic alert message shall be set to "urn:oma:at:ext-3gpp-andsf:1.0:provision-multiple-if".

If the UE indicated support for ISRP rules based on Application Identifiers (DIDA) in DevCapability, then when the ANDSF server provides an ISRP rule containing an App-ID interior node, the ANDSF server sets the OSId leaf contained in the App-ID interior node to the value of one of the OSId leaves contained in the UE_Profile interior node.

The UE shall ignore any node which is a child of the ISRP rule and is not supported by the UE.

The UE shall ignore any flow distribution rule containing a node not supported by the UE.

4.1.6 UE_Profile

The UE_Profile node contains information pertaining to the UE that can be used by the ANDSF server for information provisioning. This node is set by the UE prior to establishing a connection with the ANDSF server. The ANDSF server retrieves information in this node after UE establishes connection with the ANDSF server. The update of the information contained in this node doesn't necessarily imply any interaction with the ANDSF server.

The ANDSF server shall ignore any node which is a descendant of the UE_Profile node and is not supported by the ANDSF server.

4.2 Figures

The following nodes and leaf objects are possible under the ANDSF node as described in figure 4.2.1 through figure 4.2.8:

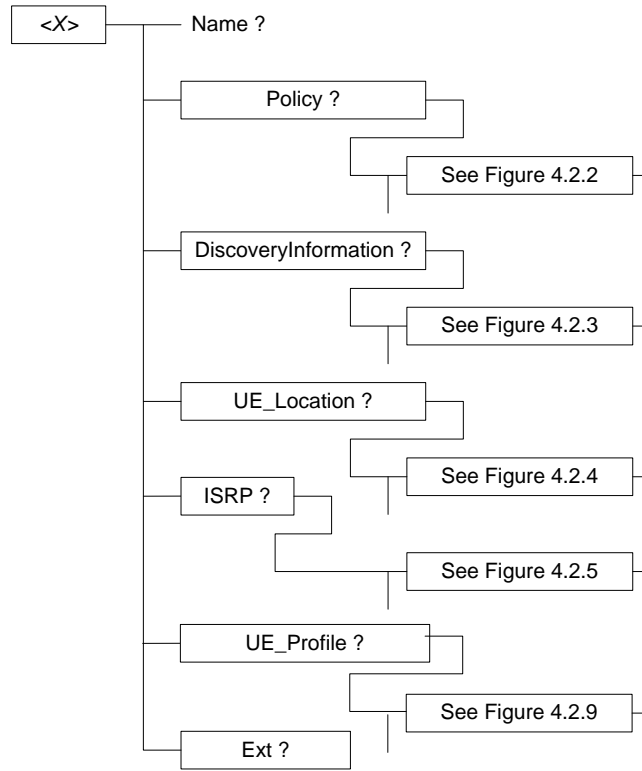


Figure 4.2.1: The ANDSF MO (1 of 9)

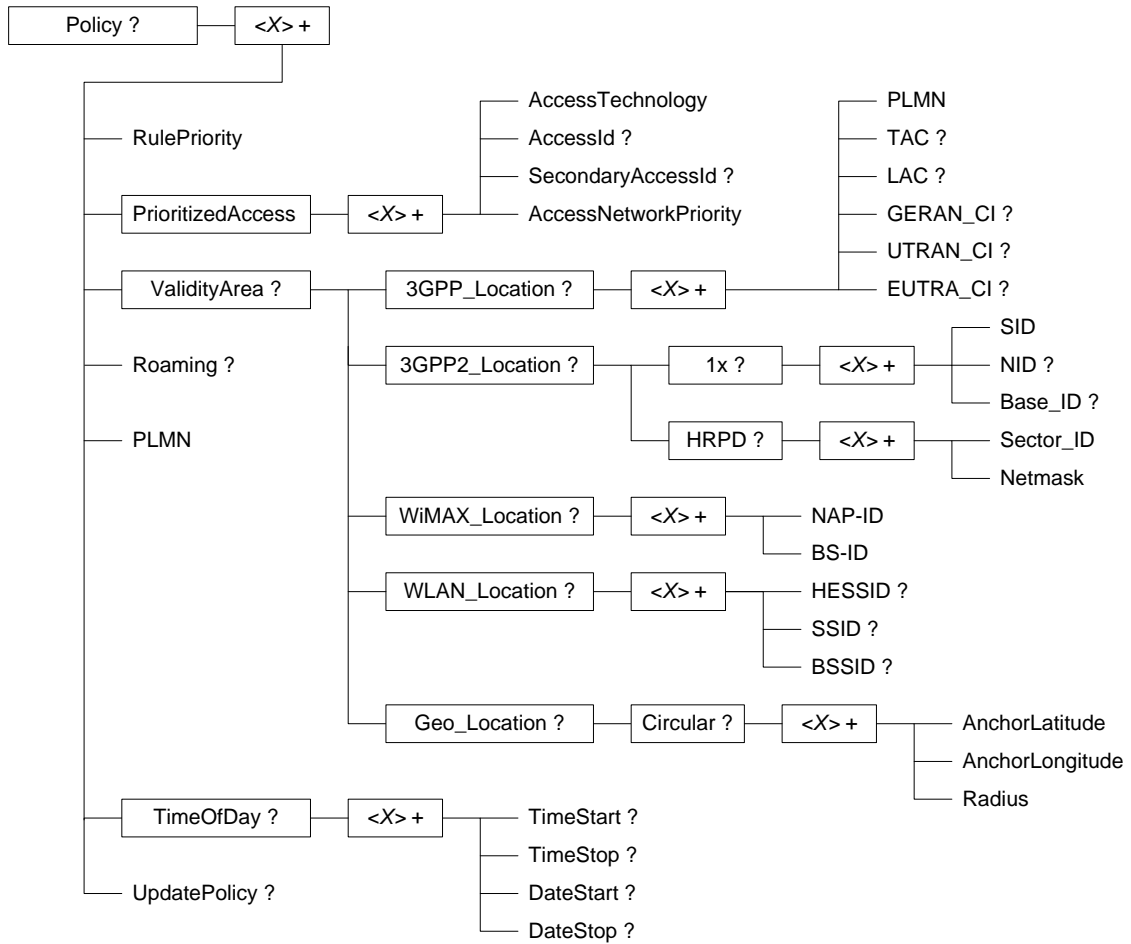


Figure 4.2.2: The ANDSF MO (2 of 9)

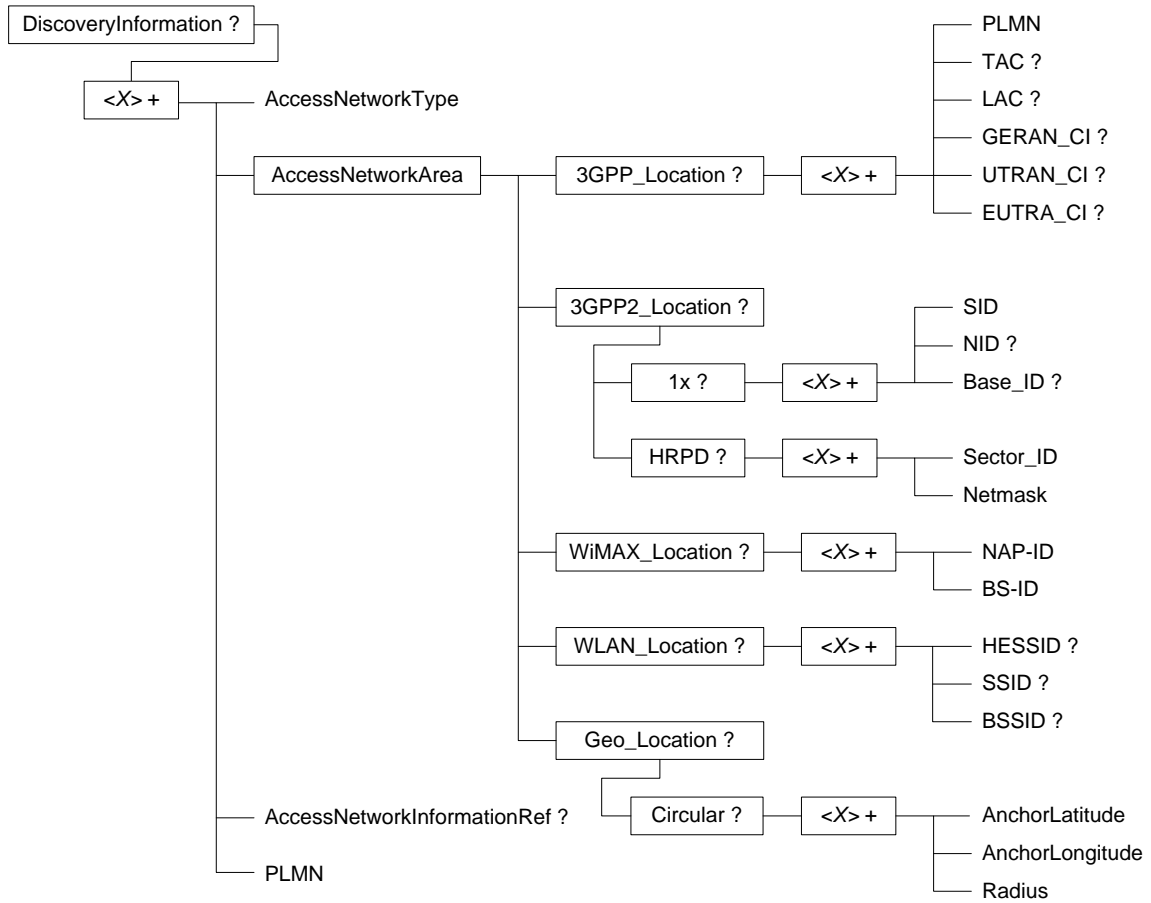


Figure 4.2.3: The ANDSF MO (3 of 9)

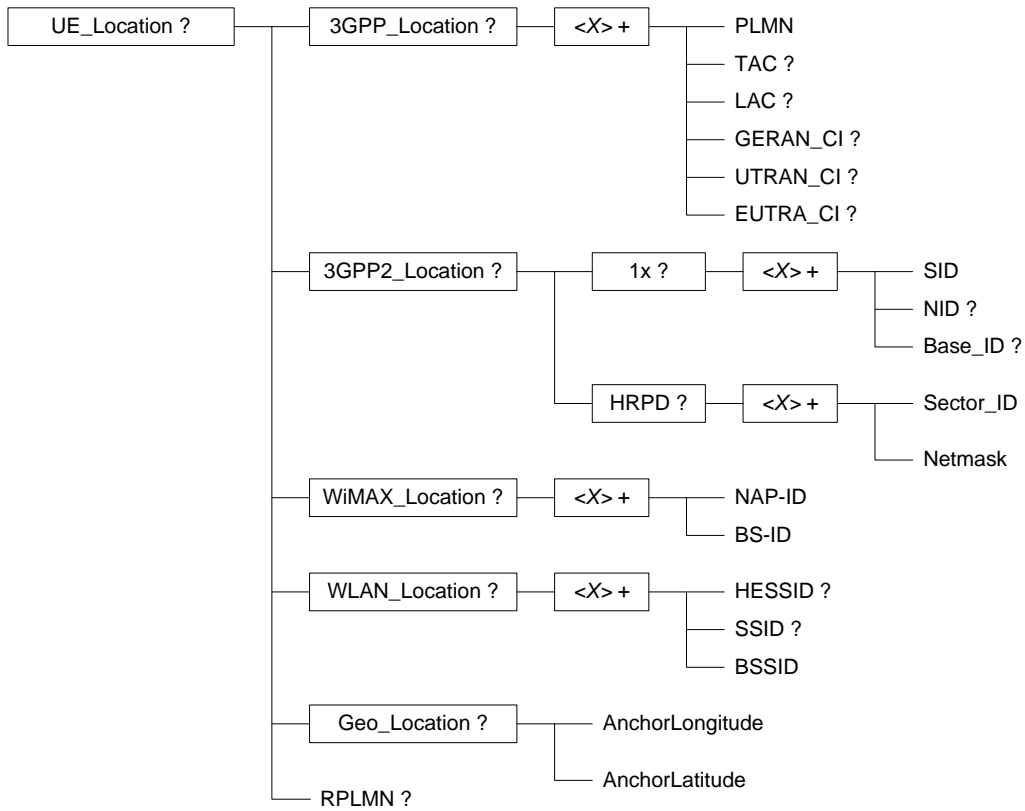


Figure 4.2.4: The ANDSF MO (4 of 9)

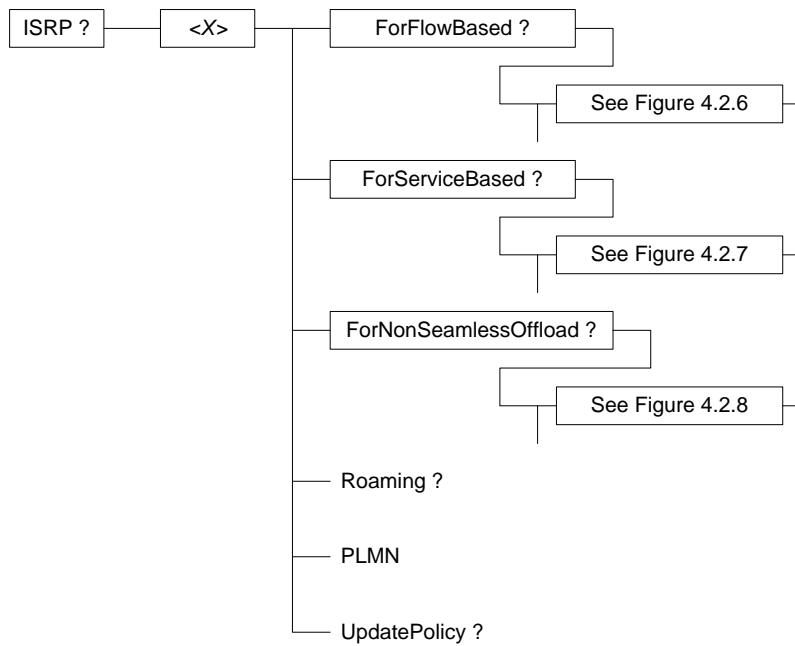


Figure 4.2.5: The ANDSF MO (part 5 of 9)

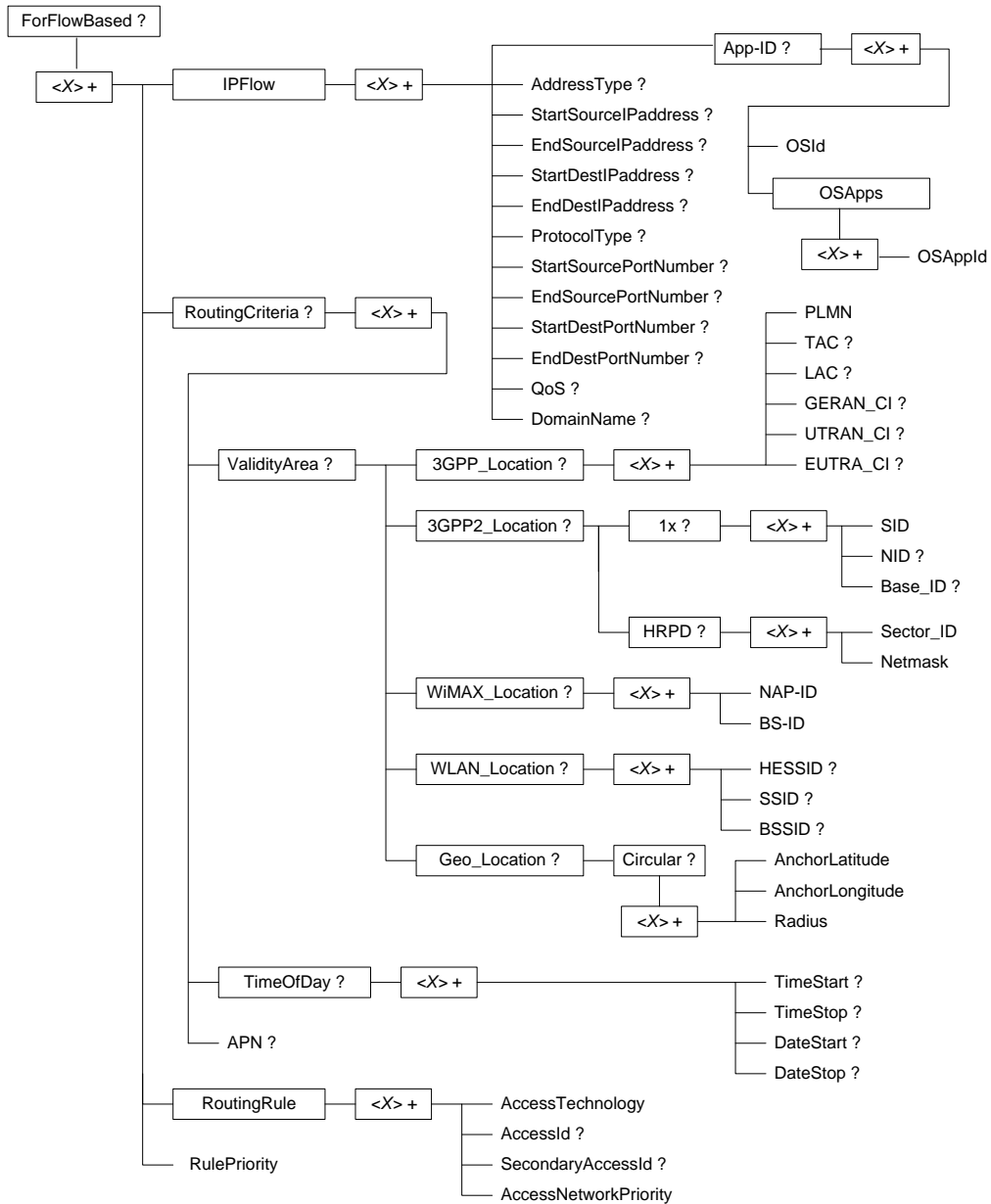


Figure 4.2.6: The ANDSF MO (part 6 of 9)

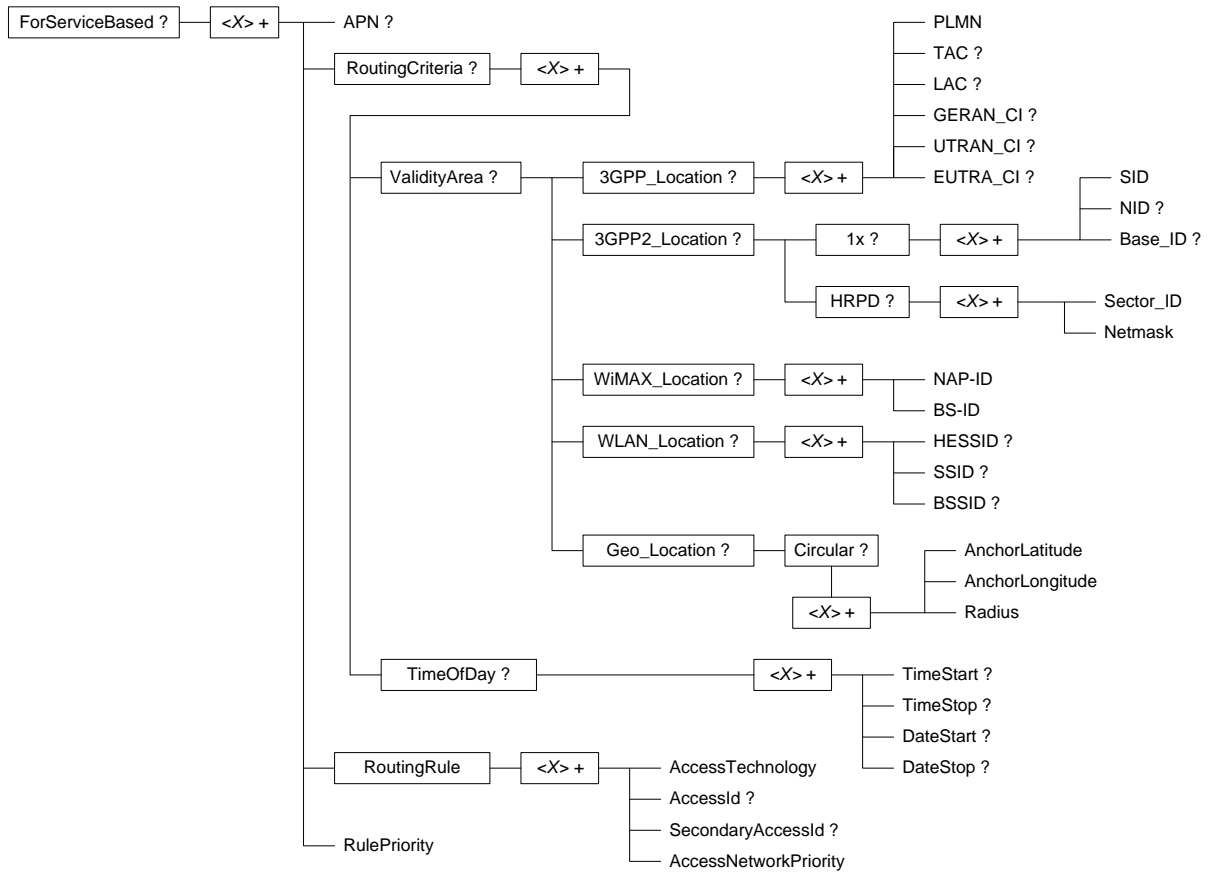


Figure 4.2.7: The ANDSF MO (part 7 of 9)

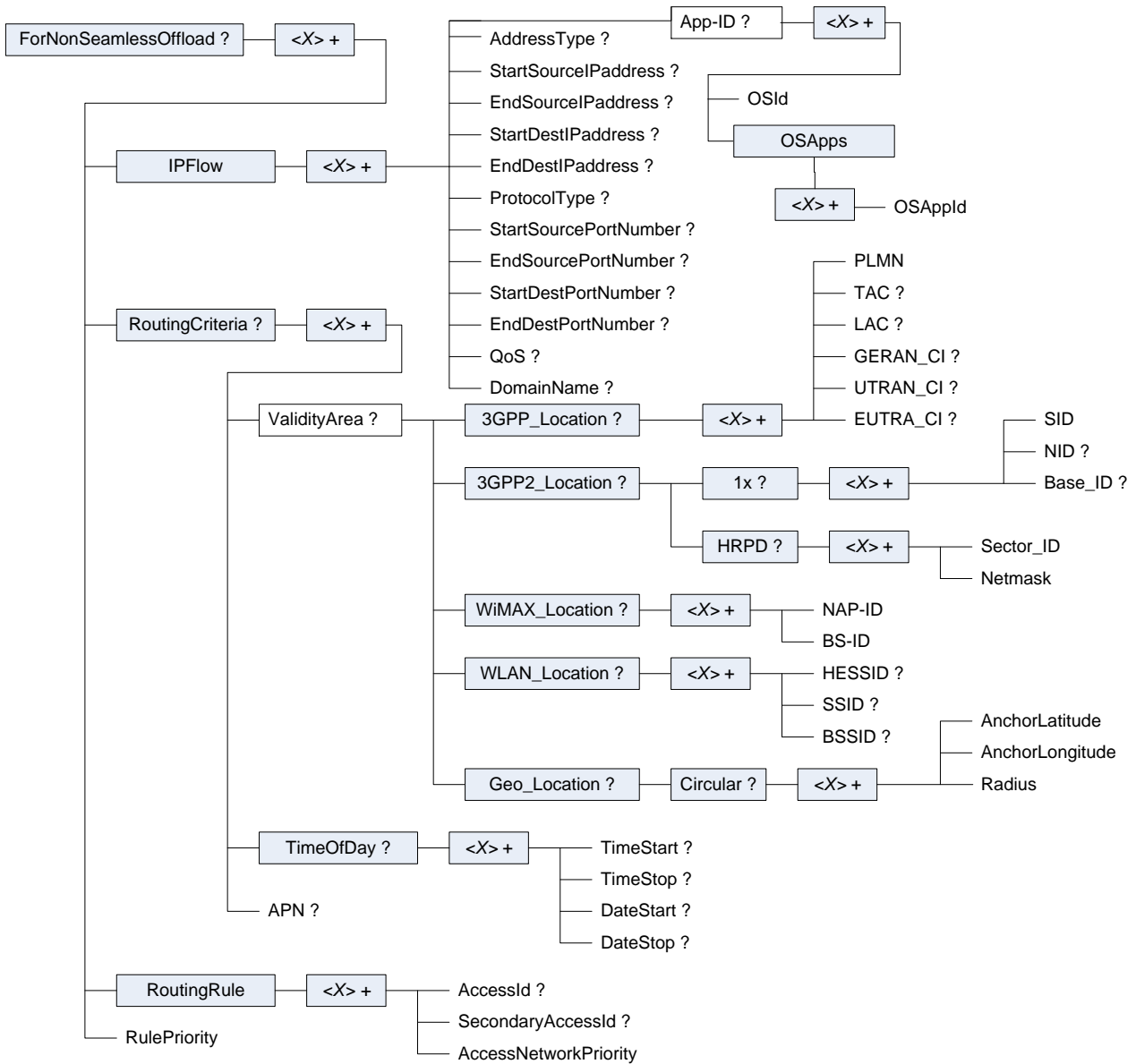


Figure 4.2.8: The ANDSF MO (part 8 of 9)

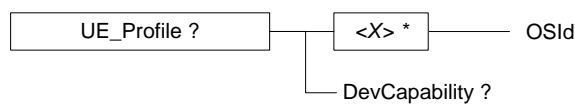


Figure 4.2.9: The ANDSF MO (part 9 of 9)

5 ANDSF MO parameters

5.1 General

This clause describes the parameters for the ANDSF MO.

5.2 Node: <X>

This interior node acts as a placeholder for zero or one accounts for a fixed node.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get
- Values: N/A

5.3 <X>/Name

The Name leaf is a name for the ANDSF MO settings.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get
- Values: <User displayable name>

The User displayable name shall be represented by Unicode characters encoded as UTF-8 as specified in IETF RFC 3629 [11] and formatted using Normalization Form KC (NFKC) as specified in Unicode Standard Annex#15; Unicode Normalization Forms [12].

5.4 Policy

5.4.1 <X>/Policy

The Policy node acts as a placeholder for ISMP information.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.4.2 <X>/Policy/<X>

This interior node acts as a placeholder for one or more ISMP rules.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.4.3 <X>/Policy/<X>/RulePriority

The RulePriority leaf represents the priority given to one particular rule and is represented as a numerical value.

- Occurrence: One
- Format: int

- Access Types: Get, Replace
- Values: <Rule priority>

In case more than one valid ISMP rule exists, the UE shall treat the rule with the lowest RulePriority value as the rule having the highest priority among the valid rules. If there are overlapping rules (e.g. by location, for example: rule by CGI, rule by PLMN), they should not have the same priority. If the UE finds multiple rules with the same priority, the choice of the rule is UE implementation specific. If there are no matching access networks according to the rule, other rules with the same priority shall be considered.

5.4.4 <X>/Policy/<X>/PrioritizedAccess

The PrioritizedAccess node indicates the preferred access for one particular rule.

- Occurrence: One
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.4.5 <X>/Policy/<X>/PrioritizedAccess/<X>

This interior node acts as a placeholder for one or more prioritized accesses.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.4.6 <X>/Policy/<X>/PrioritizedAccess/<X>/AccessTechnology

The AccessTechnology leaf indicates a prioritized access technology.

- Occurrence: One
- Format: int
- Access Types: Get, Replace
- Values: <Access technology>

Possible values for the Access technology are specified in table 5.4.6.1.

Table 5.4.6.1: Possible values for the AccessTechnology leaf

Value	Description
0	Reserved
1	3GPP
2	Reserved
3	WLAN
4	WiMAX
5-255	Reserved

5.4.7 <X>/Policy/<X>/PrioritizedAccess/<X>/AccessId

The AccessId leaf represents an access network identifier.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <Access id>

The AccessId contains an identifier for a specific radio access network. Only SSID for WLAN and NAP-ID for WiMAX radio access network are contained in this leaf. AccessIds in numerical format shall be encoded as character string. The AccessId be represented by Unicode characters encoded as UTF-8 as specified in IETF RFC 3629 [11] and formatted using Normalization Form KC (NFKC) as specified in Unicode Standard Annex #15; Unicode Normalization Forms [12].

The absence of this leaf indicates that the UE can consider any available radio access network of the defined access technology in the corresponding <X>/Policy/<X>/PrioritizedAccess/<X>/AccessTechnology leaf for the network selection.

5.4.8 <X>/Policy/<X>/PrioritizedAccess/<X>/SecondaryAccessId

The SecondaryAccessId leaf represents a secondary access network identifier.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <HESSID>

The SecondaryAccessId contains an identifier for a specific radio access network. Only HESSID for WLAN radio access network is contained in this leaf. The SecondaryAccessId leaf may only be present when the corresponding AccessId leaf for a WLAN radio access network is present. The format of the HESSID is defined by IEEE 802.11u [17].

5.4.9 <X>/Policy/<X>/PrioritizedAccess/<X>/AccessNetworkPriority

The AccessNetworkPriority leaf represents an access technology priority.

- Occurrence: One
- Format: int
- Access Types: Get, Replace
- Values: <Access network priority>

In case more than one valid PrioritizedAccess are available and if the value of the priority belongs to the range 1-250, the UE shall consider the access network (with the corresponding access identifier if present) with the lowest AccessNetworkPriority value as the access network (with the corresponding access identifier if present) having the highest priority, as defined in table 5.4.9.1. The AccessNetworkPriority value 'Restricted access' (254) indicates an access that should not be used by the UE. The AccessNetworkPriority value 'Forbidden' (255) indicates an access that shall not be used by the UE. The same AccessNetworkPriority value may be used for more than one AccessId and more than one Access Technology. If more than one AccessId or more than one Access Technology with the same value of the AccessNetworkPriority are available, the UE selects one of them in an implementation dependant way. If the UE is

not able to find an access network according to ANDSF policies, it is implementation dependent how to proceed with network selection.

Table 5.4.9.1: Values of AccessNetworkPriority leaf

Value	Description
0	Reserved
1-250	Priority value
251-253	Reserved
254	Restricted access. This access should be avoided if the current rule is active.
255	Forbidden. UE is not allowed to use this access if the current rule is active.

NOTE: It is implementation dependent if or when a restricted access is selected if there are no other accesses available.

5.4.10 <X>/Policy/<X>/ValidityArea

The ValidityArea node acts as a placeholder for location conditions for a particular rule.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

This is considered to be fulfilled if at least one of 3GPP_Location, or 3GPP2_Location or WiMAX_Location, or WLAN_Location, or Geo_Location is a match. If UE is not able to deduce its location by any means, only rules without Validity Area can be considered for active rule.

If the ValidityArea node is present and empty (i.e. none of the nodes 3GPP_Location, 3GPP2_Location, WiMAX_Location, WLAN_Location or Geo_Location exist), then the ValidityArea is not considered when evaluating the validity of the corresponding rule.

5.4.11 <X>/Policy/<X>/ValidityArea/3GPP_Location

The 3GPP_Location node acts as a placeholder for 3GPP location descriptions.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

If the UE is currently aware that it is located in the coverage area described by at least one instance of <X>/Policy/<X>/ValidityArea/3GPP_Location/<X> node, the UE shall consider the corresponding rule as valid. In case of overlapping validity domains of multiple policy rules, RulePriority leaf is used as discriminator.

5.4.12 <X>/Policy/<X>/ValidityArea/3GPP_Location/<X>

This interior node acts as a placeholder for one or more 3GPP location descriptions.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

If the location is indicated with more than one leaf (i.e. PLMN and at least one leaf out of TAC, LAC, GERAN_CI, UTRAN_CI or EUTRA_CI) within a single instance of <X>/Policy/<X>/ValidityArea/3GPP_Location/<X> node, then the UE shall consider 3GPP location validity condition for the particular rule to be fulfilled only if the present leaf values in the node match with the location of the UE in that radio access technology, and the UE shall ignore other existing values, if any.

5.4.13 <X>/Policy/<X>/ValidityArea/3GPP_Location/<X>/PLMN

The PLMN leaf indicates a PLMN code for one particular 3GPP location condition for the ISMP rule.

- Occurrence: One
- Format: chr
- Access Types: Get, Replace
- Values: <PLMN>

The format of the PLMN is defined by 3GPP TS 23.003 [3].

5.4.14 <X>/Policy/<X>/ValidityArea/3GPP_Location/<X>/TAC

The TAC leaf indicates a Tracking Area Code for one particular 3GPP location condition for the ISMP rule.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <Tracking area code>

The format of the TAC is defined by 3GPP TS 23.003 [3].

5.4.15 <X>/Policy/<X>/ValidityArea/3GPP_Location/<X>/LAC

The LAC leaf indicates a Location Area Code for one particular 3GPP location condition for the ISMP rule.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <Location area code>

The format of the LAC is defined by 3GPP TS 23.003 [3].

5.4.16 <X>/Policy/<X>/ValidityArea/3GPP_Location/<X>/GERAN_CI

The GERAN_CI leaf indicates a cell identity for one particular GERAN network related location description.

- Occurrence: ZeroOrOne
- Format: bin
- Access Types: Get, Replace
- Values: <GERAN Cell Identity>

The format of the Cell Global Identity, of which the Cell Identity is part, is defined in 3GPP TS 23.003 [3].

The GERAN_CI value is set to the Cell Identity, CI, obtained from lower layers of the UE. The CI is part of the Cell Global Identity as defined in 3GPP TS 23.003 [3]. The value of GERAN_CI is coded as a bit string with fixed length of 16 bits.

5.4.17 <X>/Policy/<X>/ValidityArea/3GPP_Location/ <X>/UTRAN_CI

The UTRAN_CI leaf indicates a cell identity for one particular UTRAN network related location description.

- Occurrence: ZeroOrOne
- Format: bin
- Access Types: Get, Replace
- Values: <UTRAN Cell Identity>

The UTRAN_CI value is set to the UTRAN Cell Identity as defined in 3GPP TS 25.331 [3B] and obtained from lower layers of the UE. The value of UTRAN_CI is coded as a bit string with fixed length of 28 bits.

5.4.18 <X>/Policy/<X>/ValidityArea/3GPP_Location/ <X>/EUTRA_CI

The EUTRA_CI leaf indicates a cell identity for one particular E-UTRA network related location description.

- Occurrence: ZeroOrOne
- Format: bin
- Access Types: Get, Replace
- Values: <E-UTRA Cell Identity>

The EUTRA_CI value is set to the cell identity part of the Evolved Cell Global Identifier, as described in 3GPP TS 36.331 [3C] and obtained from lower layers of the UE. The value of EUTRA_CI is coded as a bit string with fixed length of 28 bits.

5.4.19 <X>/Policy/<X>/ValidityArea/3GPP2_Location

This 3GPP2_Location node acts as a placeholder for 3GPP2 location descriptions.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

If the UE is currently aware that it is located in the coverage area described by <X>/Policy/<X>/ValidityArea/3GPP2_Location/1x or <X>/Policy/<X>/ValidityArea/3GPP2_Location/HRPD or both nodes, the UE shall consider the corresponding rule as valid. In case of overlapping validity domains of multiple policy rules, RulePriority leaf is used as discriminator.

If ANDSF provides 3GPP2_Location as a validity area, either the 1x or HRPD interior node, or both, shall be provided.

5.4.20 <X>/Policy/<X>/ValidityArea/3GPP2_Location/1x

This 1x node acts as a placeholder for 3GPP2 1x RAT location descriptions.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

If the UE is currently aware that it is located in the coverage area described by at least one instance of <X>/Policy/<X>/ValidityArea/3GPP2_Location/1x/<X> node, the UE shall consider the corresponding rule as valid.

5.4.21 <X>/Policy/<X>/ValidityArea/3GPP2_Location/1x/<X>

This interior node acts as a placeholder for one or more 3GPP2 1x RAT location descriptions.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

If the location is indicated with more than one leaf (i.e. SID and at least one leaf out of NID or Base_ID are present) within a single instance of <X>/Policy/<X>/ValidityArea/3GPP2_Location/1x/<X> node, the UE shall consider 3GPP2 location validity condition for the particular rule to be fulfilled only if all the present leaf values in the node match with the location of the UE.

5.4.22 <X>/Policy/<X>/ValidityArea/3GPP2_Location/1x/<X>/ SID

This SID leaf indicates a System Identification code for one particular 3GPP2 1x RAT location condition for the ISMP rule.

- Occurrence: One
- Format: chr
- Access Types: Get, Replace
- Values: <System Identification>

The format of the SID is defined by 3GPP2 C S0016 [14].

5.4.23 <X>/Policy/<X>/ValidityArea/3GPP2_Location/1x/<X>/ NID

This NID leaf indicates a Network Identification code for one particular 3GPP2 1x RAT location condition for the ISMP rule.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get
- Values: <Network Identification>

The format of the NID is defined by 3GPP2 C.S0016 [14].

5.4.24 <X>/Policy/<X>/ValidityArea/3GPP2_Location/1x/<X>/ Base_ID

This Base_ID leaf indicates a Base Station Identification code for one particular 3GPP2 1x RAT location condition for the ISMP rule.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <Base Station Identification>

The format of the Base_ID is defined by 3GPP2 C.S0005 [13].

5.4.25 <X>/Policy/<X>/ValidityArea/3GPP2_Location/HRPD

This HRPD node acts as a placeholder for 3GPP2 HRPD RAT location descriptions.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

If the UE is currently aware that it is located in the coverage area described by at least one instance of <X>/Policy/<X>/ValidityArea/3GPP2_Location/HRPD/<X> node, the UE shall consider the corresponding rule as valid.

5.4.26 <X>/Policy/<X>/ValidityArea/3GPP2_Location/HRPD/<X>

This interior node acts as a placeholder for one or more 3GPP2 HRPD RAT location descriptions.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

The UE shall consider 3GPP2 location validity condition for the particular rule to be fulfilled only if both the leaf values within a single instance of <X>/Policy/<X>/ValidityArea/3GPP2_Location/HRPD/<X> node (i.e. Sector_ID and Netmask) match with the location of the UE.

5.4.27 <X>/Policy/<X>/ValidityArea/3GPP2_Location/HRPD/<X>/Sector_ID

This Sector_ID leaf indicates a Sector Identification code for one particular 3GPP2 HRPD RAT location condition for the ISMP rule.

- Occurrence: One
- Format: bin
- Access Types: Get, Replace
- Values: <Sector_ID >

The format of the Sector_ID is defined by 3GPP2 C.S0024-0 [15]. The length of Sector ID contained in this node is 128 bits.

5.4.28 <X>/Policy/<X>/ValidityArea/3GPP2_Location/HRPD/<X>/Netmask

This Netmask leaf indicates a Netmask code for one particular 3GPP2 HRPD RAT location condition for the ISMP rule.

- Occurrence: One
- Format: bin
- Access Types: Get, Replace

- Values: <Netmask>

The format of Netmask is defined by 3GPP2 C.S0024-0 [15]. The length of Netmask contained in this node is 8 bits. The mask contained in this leaf shall be applied to the Sector_ID bit string contained in the correspondent leaf of interior node <X>/Policy/<X>/ValidityArea/3GPP2_Location/HRPD/<X>/Sector_ID.

5.4.29 <X>/Policy/<X>/ValidityArea/WiMAX_Location

The WiMAX_Location node acts as a placeholder for WiMAX location descriptions.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

If the UE is currently aware that it is located in the coverage area described by at least one instance of <X>/Policy/<X>/ValidityArea/WiMAX_Location/<X> node, the UE shall consider the corresponding rule as valid. In case of overlapping validity domains of multiple policy rules, RulePriority leaf is used as discriminator.

5.4.30 <X>/Policy/<X>/ValidityArea/WiMAX_Location/<X>

This interior node acts as a placeholder for one or more WiMAX location descriptions.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

The UE shall consider WiMAX location validity condition for the particular rule to be fulfilled only if both the leaf values within a single instance of <X>/Policy/<X>/ValidityArea/WiMAX_Location/<X> node (i.e. NAP-ID and BS-ID) match with the location of the UE.

5.4.31 <X>/Policy/<X>/ValidityArea/WiMAX_Location/<X>/NAP-ID

The NAP-ID leaf indicates the Network Access Provider for a particular WiMAX location condition for the ISMP rule.

- Occurrence: One
- Format: chr
- Access Types: Get, Replace
- Values: <NAP-ID>

The format of the NAP-ID is defined by the WiMAX Forum Network Architecture Release 1.0 version 1.2.2 – Stage 2 [6] and WiMAX Forum Network Architecture Release 1.0 version 1.2.2 – Stage 3 [7].

5.4.32 <X>/Policy/<X>/ValidityArea/WiMAX_Location/<X>/BS-ID

The BS-ID leaf indicates the BS identifier for a particular WiMAX location condition for the ISMP rule.

- Occurrence: One
- Format: chr
- Access Types: Get, Replace
- Values: <BS-ID>

The format of the BS-ID is defined by the IEEE Std 802.16e-2005 and IEEE Std 802.16-2004/Cor1-2005 [10].

5.4.33 <X>/Policy/<X>/ValidityArea/WLAN_Location

The WLAN_Location node acts as a placeholder for WLAN location descriptions.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

If the UE is currently aware that it is located in the coverage area described by at least one instance of <X>/Policy/<X>/ValidityArea/WLAN_Location/<X> node, the UE shall consider the corresponding rule as valid. In case of overlapping validity domains of multiple policy rules, RulePriority leaf is used as discriminator.

5.4.34 <X>/Policy/<X>/ValidityArea/WLAN_Location/<X>

This interior node acts as a placeholder for one or more WLAN location descriptions.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

If the location is indicated with at least one present leaf out of HESSID, SSID, or BSSID within a single instance of <X>/Policy/<X>/ValidityArea/WLAN_Location/<X> node, the UE shall consider WLAN location validity condition for the particular rule to be fulfilled only if all the present leaf values in the node match with the location of the UE.

5.4.35 <X>/Policy/<X>/ValidityArea/WLAN_Location/<X>/HESSID

The HESSID leaf indicates the HESSID for a particular WLAN location condition for the ISMP rule.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <HESSID>

The format of the HESSID is defined by IEEE 802.11u [17].

5.4.36 <X>/Policy/<X>/ValidityArea/WLAN_Location/<X>/SSID

The SSID leaf indicates the SSID for a particular WLAN location condition for the ISMP rule.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <SSID>

The format of the SSID is defined by IEEE Std 802.11™-2007 [9].

5.4.37 <X>/Policy/<X>/ValidityArea/WLAN_Location/<X>/BSSID

The BSSID leaf indicates the AP identifier for one particular WLAN location condition for the ISMP rule.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <BSSID>

The format of the BSSID is defined by IEEE Std 802.11™-2007 [9].

5.4.38 <X>/Policy/<X>/ValidityArea/Geo_Location

The Geo_Location node acts as a placeholder for Geographical location descriptions for one ISMP rule.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

If the UE is currently aware that it is located in the area described by at least one instance of <X>/Policy/<X>/ValidityArea/Geo_Location/Circular/<X> node, the UE shall consider the corresponding rule as valid. In case of overlapping validity domains of multiple policy rules, RulePriority leaf is used as discriminator.

If the <X>/Policy/<X>/ValidityArea/Geo_Location node is present and empty (i.e. the node Circular does not exist), then the Geo_Location node is not considered when evaluating the validity of the corresponding rule.

5.4.39 <X>/Policy/<X>/ValidityArea/Geo_Location/Circular

The Circular node acts as a placeholder for circular areas location descriptions for one ISMP rule.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.4.40 <X>/Policy/<X>/ValidityArea/Geo_Location/Circular/<X>

The interior node acts as a placeholder for one or more circular area location descriptions for one ISMP rule.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: <N/A >

The UE shall consider Geo location validity condition for the particular rule to be fulfilled only if all the leaf values within a single instance of <X>/Policy/<X>/ValidityArea/Geo_Location/Circular/<X> node (i.e. AnchorLatitude, AnchorLongitude and Radius) match with the location of the UE.

5.4.41 <X>/Policy/<X>/ValidityArea/Geo_Location/Circular/<X>/AnchorLatitude

The AnchorLatitude node acts as a placeholder for the latitude value of the center of the circular area.

- Occurrence: One
- Format: bin
- Access Types: Get, Replace
- Values: < Latitude>

The Latitude is defined in subclause 6.1 of 3GPP TS 23.032 [3A].

5.4.42 <X>/Policy/<X>/ValidityArea/Geo_Location/Circular/<X>/AnchorLongitude

The AnchorLongitude node acts as a placeholder for the longitude value of the centre of the circular area.

- Occurrence: One
- Format: bin
- Access Types: Get, Replace
- Values: < Longitude >

The Longitude is defined in subclause 6.1 of 3GPP TS 23.032 [3A].

5.4.43 <X>/Policy/<X>/ValidityArea/Geo_Location/Circular/<X>/ Radius

The Radius node acts as a placeholder for the radius value of the circular area.

- Occurrence: One
- Format: int
- Access Types: Get, Replace
- Values: < Radius>

The Radius is given in meters and is defined in subclause 6.6 of 3GPP TS 23.032 [3A].

5.4.44 <X>/Policy/<X>/Roaming

The Roaming leaf indicates the roaming condition for the ISMP rule.

- Occurrence: ZeroOrOne
 - Format: bool
 - Access Types: Get, Replace
 - Values: 0, 1
- 0 Indicates that the rule is only valid when the UE is not roaming.
- 1 Indicates that the rule is only valid when the UE is roaming.

The UE shall consider a rule with the Roaming leaf present as valid only if the current roaming state (roaming/not roaming) of the UE matches the one indicated in the Roaming value.

NOTE: When the UE is roaming, how it discovers and interacts with the ANDSF is not specified in the specification of this release.

5.4.45 <X>/Policy/<X>/PLMN

The PLMN leaf indicates a PLMN code of the operator, which created this policy.

- Occurrence: One
- Format: chr
- Access Types: Get, Replace
- Values: <PLMN>

The format of the PLMN is defined by 3GPP TS 23.003 [3].

5.4.46 <X>/Policy/<X>/TimeOfDay

The TimeOfDay node indicates the time of day condition for the ISMP rule.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

The UE shall consider a rule with the TimeOfDay present as valid only if the time of day in the current time zone, as indicated by the UE, matches at least one time interval indicated in the TimeOfDay node.

UE that does not support calendar or clock application does not need to interpret the TimeOfDay leaf.

If the <X>/Policy/<X>/TimeOfDay/<X> node is present and empty (i.e. none of the nodes TimeStart, TimeStop, DateStart or DateStop exist), then the TimeOfDay is not considered when evaluating the validity of the corresponding rule.

5.4.47 <X>/Policy/<X>/TimeOfDay/<X>

This interior node acts as a placeholder for one or more time of day condition for the ISMP rule.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

The UE shall interpret the TimeOfDay leaf values as related to the local time of the UE. The TimeOfDay conditions are evaluated as valid when the UE's current time and current date are within the date and time ranges specified in table 5.4.47.1 and table 5.4.47.2.

Table 5.4.47.1 also specifies TimeOfDay leaf combinations, which are not allowed. ANDSF shall not use such leaf combinations and UE processing of such combinations is UE implementation specific.

NOTE 1: TimeOfDay leaf combinations, where TimeStart, TimeStop, or both TimeStart and TimeStop are not included, define a single time period as specified in table 5.4.47.1.

NOTE 2: TimeOfDay leaf combinations, where both TimeStart and TimeStop are included define repetitious time periods as specified in table 5.4.47.2. The second half of table 5.4.47.2, where TimeStop is before TimeStart, specifies repetitious time periods that are applicable overnight.

Figure 5.4.47.1 shows an example of overnight TimeOfDay repetitious periods when both DateStart and DateStop leafs are included.

Table 5.4.47.1: Applicable TimeOfDay leaf combinations that define a single time period

TimeStart	TimeStop	DateStart	DateStop	Date and time ranges when the given condition is applicable
not included	not included	not included	not included	From current time and current day to infinite
not included	not included	not included	included	From the current time of the current day to 24:00 of the date indicated by DateStop
not included	not included	included	not included	From 00:00 of the date indicated by DateStart to infinite
not included	not included	included	included	From 00:00 of the date indicated by DateStart to 24:00 of the date indicated by DateStop
not included	included	not included	not included	Not allowed
not included	included	not included	included	From the current time of the current day to the time indicated by TimeStop of the date indicated by DateStop
not included	included	included	not included	Not allowed
not included	included	included	included	From 00:00 of the date indicated by DateStart to the time indicated by TimeStop of the date indicated by DateStop
included	not included	not included	not included	Not allowed
included	not included	not included	included	Not allowed
included	not included	included	not included	From the time indicated by TimeStart of the date indicated by DateStart to infinite
included	not included	included	included	From the time indicated by TimeStart of the date indicated by DateStart to 24:00 of the date indicated by DateStop

Table 5.4.47.2: Applicable TimeOfDay leaf combinations that define repetitious time periods

TimeStart	TimeStop	DateStart	DateStop	Date and time ranges when the given condition is applicable
included	included and not before TimeStart	not included	not included	Daily from the time indicated by TimeStart to the time indicated by Time-Stop, from current day to infinite
included	included and not before TimeStart	not included	included	Daily from the time indicated by TimeStart to the time indicated by TimeStop, from the current day until the date indicated by DateStop
included	included and not before TimeStart	included	not included	Daily from the time indicated by TimeStart to the time indicated by TimeStop, from the date indicated by DateStart to infinite
included	included and not before TimeStart	included	included	Daily from the time indicated by TimeStart to the time indicated by TimeStop, from the date indicated by DateStart to the date indicated by DateStop
included	included and before TimeStart	not included	not included	Daily from the time indicated by TimeStart to 24:00 and from 00:00 to the time indicated by TimeStop, from current day to infinite
included	included and before TimeStart	not included	included	Daily from the time indicated by TimeStart to 24:00 and from 00:00 to the time indicated by TimeStop, from the current day to the date indicated by DateStop
included	included and before TimeStart	included	not included	Daily from the time indicated by TimeStart to 24:00 and from 00:00 to the time indicated by TimeStop, from the date indicated by DateStart until infinite
included	included and before TimeStart	included	included	Daily from the time indicated by TimeStart to 24:00 and from 00:00 to the time indicated by TimeStop, from the date indicated by DateStart to the date indicated by DateStop

NOTE: A specific continuous time period, which includes times of day from two different dates, can be expressed using multiple TimeOfDay instances: one instance for the starting date, one instance for the ending date and one instance for all dates between the starting and ending date if any. For example, 2012-10-27, 22:00 – 2012-10-30, 02:00 is defined as:

TimeOfDay/1: 2012-10-27T22:00 - 2012-10-27T24:00,

TimeOfDay/2: 2012-10-28 - 2012-10-29 and

TimeOfDay/3: 2012-10-30T00:00 - 2012-10-30T02:00.

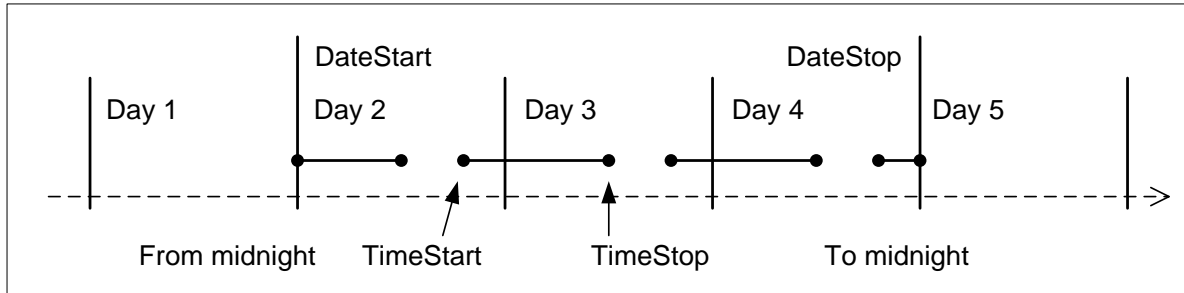


Figure 5.4.47.1: Example of overnight TimeOfDay repetitious periods

5.4.48 <X>/Policy/<X>/TimeOfDay/<X>/TimeStart

The TimeStart leaf acts as a place holder containing a time of day.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <time of day>

The value this leaf can assume is time of the day represented in string format, as defined in ISO 8601:2004 [16].

5.4.49 <X>/Policy/<X>/TimeOfDay/<X>/TimeStop

The TimeStop leaf node acts as a place holder containing a time of day.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <time of day>

The value this leaf can assume is time of the day represented in string format, as defined in ISO 8601:2004 [16].

5.4.50 <X>/Policy/<X>/TimeOfDay/<X>/DateStart

The DateStart leaf acts as a place holder containing a date.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace

- Values: <date>

The value this leaf can assume is a date represented in string format, as defined in ISO 8601:2004 [16]. The UE handling of semantical error where DateStart node indicates a date that does not exist is UE implementation specific.

5.4.51 <X>/Policy/<X>/TimeOfDay/<X>/DateStop

The DateStop leaf acts as a place holder containing a date.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <date>

The value this leaf can assume is a date represented in string format, as defined in ISO 8601:2004 [16].

The UE handling of semantical error where DateStop node indicates a date that does not exist is UE implementation specific.

5.4.52 <X>/Policy/<X>/UpdatePolicy

The UpdatePolicy leaf indicates the update policy for the ISMP rule.

- Occurrence: ZeroOrOne
- Format: bool
- Access Types: Get, Replace
- Values: 0, 1
 - 0 Indicates that the UE is not required to request an update of the rules.
 - 1 Indicates that the UE is required to request an update of the rules.

The UpdatePolicy value may be used by the UE to determine whether or not to request an update of its ISMP when the rule is no longer considered to be valid by the UE.

The default value 0 applies if this leaf is not provisioned.

5.5 Discovery information

5.5.1 <X>/DiscoveryInformation

The DiscoveryInformation node acts as a placeholder for access network discovery information.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

The operator may provide information on available access networks through the ANDSF. The UE may use the information as an aid in discovering other access networks.

5.5.2 <X>/DiscoveryInformation/<X>

This interior node acts as a placeholder for one or more access network information elements.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.5.3 <X>/DiscoveryInformation/<X>/AccessNetworkType

The AccessNetworkType leaf represents the type of an access network.

- Occurrence: One
- Format: int
- Access Types: Get, Replace
- Values: <Access network type>

The value of AccessNetworkType indicates the type of the network for which discovery assistance information is provided. Possible values are specified in table 5.5.3.1.

Table 5.5.3.1: Possible values for the AccessNetworkType leaf

Value	Description
0	Reserved
1	3GPP
2	Reserved
3	WLAN
4	WiMAX
5-255	Reserved

5.5.4 <X>/DiscoveryInformation/<X>/AccessNetworkArea

The AccessNetworkArea node acts as a placeholder for a description of the location where one particular access network is expected to be available.

- Occurrence: One
- Format: node
- Access Types: Get, Replace
- Values: N/A

If the UE is aware that it is located in at least one of the locations described under this node, the UE may assume the corresponding access network to be available.

5.5.5 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ 3GPP_Location

The 3GPP_Location node acts as a placeholder for 3GPP location descriptions.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

If the UE is currently aware that it is located in the coverage area described by this node, the networks described in the correspondent AccessNetworkInformationRef are expected to be available.

5.5.6 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ 3GPP_Location/<X>

This interior node acts as a placeholder for one or more 3GPP location descriptions.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.5.7 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ 3GPP_Location/<X>/PLMN

The PLMN leaf indicates a PLMN code for one particular 3GPP location description.

- Occurrence: One
- Format: chr
- Access Types: Get, Replace
- Values: <PLMN>

The format of the PLMN is defined by 3GPP TS 23.003 [3].

5.5.8 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ 3GPP_Location/<X>/TAC

This TAC leaf indicates a Tracking Area Code for one particular 3GPP location description.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <Tracking area code>

The format of the TAC is defined by 3GPP TS 23.003 [3].

5.5.9 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ 3GPP_Location/<X>/LAC

This LAC leaf indicates a Location Area Code for one particular 3GPP location description.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <Location area code>

The format of the LAC is defined by 3GPP TS 23.003 [3].

5.5.10 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ 3GPP_Location/<X>/GERAN_CI

The GERAN_CI leaf indicates a GERAN Cell Identity for one particular 3GPP network related location description.

- Occurrence: ZeroOrOne
- Format: bin
- Access Types: Get, Replace
- Values: <GERAN Cell Identity>

The leaf format and usage is defined in subclause 5.4.16.

5.5.11 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ 3GPP_Location/<X>/UTRAN_CI

The UTRAN_CI leaf indicates a UTRAN Cell Identity for one particular 3GPP network related location description.

- Occurrence: ZeroOrOne
- Format: bin
- Access Types: Get, Replace
- Values: <UTRAN Cell Identity>

The leaf format and usage is defined in subclause 5.4.17.

5.5.12 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ 3GPP_Location/<X>/EUTRA_CI

The EUTRA_CI leaf indicates an E-UTRA Cell Identity for one particular 3GPP network related location description.

- Occurrence: ZeroOrOne
- Format: bin
- Access Types: Get, Replace
- Values: <E-UTRA Cell Identity>

The leaf format and usage is defined in subclause 5.4.18.

5.5.13 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ 3GPP2_Location

This 3GPP2_Location node acts as a placeholder for 3GPP2 location description.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

If the UE is currently aware that it is located in the coverage area described by this 3GPP2_Location node, the networks described in the correspondent AccessNetworkInformationRef are expected to be available.

If ANDSF provides 3GPP2_Location in AccessNetworkArea interior node, either the 1x or HRPD interior node, or both, shall be provided.

5.5.14 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ 3GPP2_Location/1x

This 1x node acts as a placeholder for one or more 3GPP2 1x RAT location descriptions.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.5.15 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ 3GPP2_Location/1x/<X>

This interior node acts as a placeholder for one or more 3GPP2 1x RAT location descriptions.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.5.16 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ 3GPP2_Location/1x/<X>/SID

This SID leaf indicates a System Identification code for one particular 3GPP2 1x RAT location description.

- Occurrence: One
- Format: chr
- Access Types: Get, Replace
- Values: <System Identification>

The format of the SID is defined by 3GPP2 C.S0016 [14].

5.5.17 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ 3GPP2_Location/1x/<X>/NID

This NID leaf indicates a Network Identification code for one particular 3GPP2 1x RAT location description.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <Network Identification>

The format of the NID is defined by 3GPP2 C.S0016 [14].

5.5.18 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ 3GPP2_Location/1x/<X>/Base_ID

This Base_ID leaf indicates a Base Station Identification Code for one particular 3GPP2 1x RAT location description.

- Occurrence: ZeroOrOne

- Format: chr
- Access Types: Get, Replace
- Values: <Base Station Identification>

The format of the Base_ID is defined by 3GPP2 C.S0005 [13].

5.5.19 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ 3GPP2_Location/HRPD

This HRPD node acts as a placeholder for one or more 3GPP2 HRPD RAT location descriptions.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.5.20 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ 3GPP2_Location/HRPD/<X>

This interior node acts as a placeholder for one or more 3GPP2 HRPD RAT location descriptions.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.5.21 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ 3GPP2_Location/HRPD/<X>/Sector_ID

This Sector_ID leaf indicates a Sector Identification code for one particular 3GPP2 HRPD RAT location description.

- Occurrence: One
- Format: bin
- Access Types: Get, Replace
- Values: <Sector ID>

The format of the Sector ID is defined by 3GPP2 C.S0024-0 [15]. The length of Sector ID contained in this node is 128 bits.

5.5.22 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ 3GPP2_Location/HRPD/<X>/Netmask

This Netmask leaf indicates a Netmask code for one particular 3GPP2 HRPD RAT location description.

- Occurrence: One
- Format: bin
- Access Types: Get, Replace
- Values: <Netmask>

The format of Netmask is defined by 3GPP2 C.S0024-0 [15]. The length of Netmask contained in this node is 8 bits. The mask contained in this leaf shall be applied to the Sector_ID bit string contained in the correspondent leaf of interior node <X>/DiscoveryInformation/<X>/AccessNetworkArea/3GPP2_Location/HRPD/<X>.

5.5.23 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ WiMAX_Location

The WiMAX_Location node acts as a placeholder for WiMAX location descriptions.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

If the UE is currently aware that it is located in the coverage area described by this node, the networks described in the correspondent AccessNetworkInformationRef are expected to be available.

5.5.24 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ WiMAX_Location/<X>

This interior node acts as a placeholder for one or more WiMAX location descriptions.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.5.25 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ WiMAX_Location/<X>/NAP-ID

The NAP-ID leaf indicates the Network Access Provider for a particular WiMAX location description.

- Occurrence: One
- Format: chr
- Access Types: Get, Replace
- Values: <NAP-ID>

The format of the NAP-ID is defined by the WiMAX Forum Network Architecture version 1.2.2 – Stage 2 [6] and WiMAX Forum Network Architecture Release 1.0 version 1.2.2 – Stage 3 [7].

5.5.26 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ WiMAX_Location/<X>/BS-ID

The BS-ID leaf indicates the BS identifier for a particular WiMAX location description.

- Occurrence: One
- Format: chr
- Access Types: Get, Replace
- Values: <BS-ID>

The format of the BS-ID is defined by the IEEE Std 802.16e-2005 and IEEE Std 802.16-2004/Cor1-2005 [10].

5.5.27 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ WLAN_Location

The WLAN_Location node acts as a placeholder for WLAN location descriptions.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

If the UE is currently aware that it is located in the coverage area described by this node, the networks described in the correspondent AccessNetworkInformationRef are expected to be available.

5.5.28 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ WLAN_Location/<X>

This interior node acts as a placeholder for one or more WLAN location descriptions.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.5.29 <X>/DiscoveryInformation/<X>/AccessNetworkArea /WLAN_Location/<X>/HESSID

The HESSID leaf indicates the HESSID for a particular Home WLAN Specific Identifier location description.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <HESSID>

The format of the HESSID is defined by IEEE 802.11u [17].

5.5.30 <X>/DiscoveryInformation/<X>/AccessNetworkArea /WLAN_Location/<X>/SSID

The SSID leaf indicates the SSID for a particular WLAN location description.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <SSID>

The format of the SSID is defined by IEEE Std 802.11™-2007 [9].

5.5.31 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ WLAN_Location/<X>/BSSID

The BSSID leaf indicates the AP identifier for one particular WLAN location description.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <BSSID>

The format of the BSSID is defined by IEEE Std 802.11™-2007 [9].

5.5.32 <X>/DiscoveryInformation/<X>/AccessNetworkArea/ Geo_Location

This Geo_Location node acts as a placeholder for geographical location descriptions for location of one or more access networks.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

If the UE is currently aware that it is located in the area described by this Geo_Location node, the networks described in the correspondent AccessNetworkInformationRef are expected to be available.

5.5.33 <X>/DiscoveryInformation/<X>/ AccessNetworkArea /Geo_Location/Circular

The Circular node acts as a placeholder for circular areas location descriptions.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.5.34 <X>/DiscoveryInformation/<X>/ AccessNetworkArea /Geo_Location/Circular/<X>

The interior node acts as a placeholder for one or more circular area location descriptions.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: <N/A >

5.5.35 <X>/DiscoveryInformation/<X>/ AccessNetworkArea/Geo_Location/Circular/<X>/AnchorLatitude

The AnchorLatitude node acts as a placeholder for the latitude value of the center of the circular area.

- Occurrence: One
- Format: bin
- Access Types: Get, Replace
- Values: <Latitude>

The Latitude is defined in subclause 6.1 of 3GPP TS 23.032 [3A].

5.5.36 <X>/DiscoveryInformation/<X>/ AccessNetworkArea/Geo_Location/Circular/<X>/AnchorLongitude

The AnchorLongitude node acts as a placeholder for the longitude value of the center of the circular area.

- Occurrence: One
- Format: bin
- Access Types: Get, Replace
- Values: < Longitude>

The Longitude is defined in subclause 6.1 of 3GPP TS 23.032 [3A].

5.5.37 <X>/DiscoveryInformation/<X>/ AccessNetworkArea/Geo_Location/Circular/<X>/Radius

The Radius node acts as a placeholder for the radius value of the circular area.

- Occurrence: One
- Format: int
- Access Types: Get, Replace
- Values: < Radius>

The Radius is given in meters and is defined in subclause 6.6 of 3GPP TS 23.032 [3A].

5.5.38 <X>/DiscoveryInformation/<X>/ AccessNetworkInformationRef

The AccessNetworkInformationRef leaf represents a reference to an access network information object.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <An access network information object>

The value of AccessNetworkInformationRef is a reference to an object with access network type specific information. For example WLAN related values for the AccessNetworkInformationRef are defined in the OMA Connectivity Management Objects defined e.g. in OMA-DDS-DM_ConnMO-V1_0-20081107-A [4A] and OMA-DDS-DM_ConnMO_WLAN-V1_0-20081024-A [4B], and WiMAX related values for the AccessNetworkInformationRef are defined in the WiMAX MO in clause 6, etc.

5.5.39 <X>/DiscoveryInformation/<X>/PLMN

The PLMN leaf indicates a PLMN code of the operator which created this discovery information.

- Occurrence: One
- Format: chr
- Access Types: Get, Replace
- Values: <PLMN>

The format of the PLMN is defined by 3GPP TS 23.003 [3].

5.6 UE location

5.6.1 <X>/UE_Location

The UE_Location node acts as a placeholder for describing the current location of the UE.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get
- Values: N/A

5.6.2 <X>/UE_Location/3GPP_Location

The 3GPP_Location node acts as a placeholder for 3GPP location descriptions.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get
- Values: N/A

The UE should insert the parameters of all the 3GPP networks it has discovered when updating this node.

5.6.3 <X>/UE_Location/3GPP_Location/<X>

This interior node acts as a placeholder for one or more 3GPP location descriptions.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get
- Values: N/A

5.6.4 <X>/UE_Location/3GPP_Location/<X>/PLMN

The PLMN leaf indicates a PLMN code for one particular 3GPP network related location of the UE.

- Occurrence: One
- Format: chr
- Access Types: Get

- Values: <PLMN>

The format of the PLMN is defined by 3GPP TS 23.003 [3].

5.6.5 <X>/UE_Location/3GPP_Location/<X>/TAC

This TAC leaf indicates a Tracking Area Code for one particular 3GPP network related location of the UE.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get
- Values: <Tracking area code>

The format of the TAC is defined by 3GPP TS 23.003 [3].

5.6.6 <X>/UE_Location/3GPP_Location/<X>/LAC

This LAC leaf indicates a Location Area Code for one particular 3GPP network related location of the UE.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get
- Values: <Location area code>

The format of the LAC is defined by 3GPP TS 23.003 [3].

5.6.7 <X>/UE_Location/3GPP_Location/<X>/GERAN_CI

The GERAN_CI leaf indicates a GERAN Cell Identity for one particular 3GPP network related location description.

- Occurrence: ZeroOrOne
- Format: bin
- Access Types: Get
- Values: < GERAN Cell Identity >

The leaf format and usage is defined in subclause 5.4.16.

5.6.8 <X>/UE_Location/3GPP_Location/<X>/UTRAN_CI

The UTRAN_CI leaf indicates a UTRAN Cell Identity for one particular 3GPP network related location description.

- Occurrence: ZeroOrOne
- Format: bin
- Access Types: Get
- Values: <UTRAN Cell Identity>

The leaf format and usage is defined in subclause 5.4.17.

5.6.9 <X>/UE_Location/3GPP_Location/<X>/EUTRA_CI

The EUTRA_CI leaf indicates an E-UTRA Cell Identity for one particular 3GPP network related location description.

- Occurrence: ZeroOrOne
- Format: bin
- Access Types: Get
- Values: <E-UTRA Cell Identity>

The leaf format and usage is defined in subclause 5.4.18.

5.6.10 <X>/UE_Location/3GPP2_Location

This 3GPP2_Location node acts as a placeholder for 3GPP2 network related location description of UE's position.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get
- Values: N/A

The UE should insert the parameters of all the 3GPP2 networks it has discovered when updating this node.

5.6.11 <X>/UE_Location/3GPP2_Location/1x

This 1x node acts as a placeholder for one or more 3GPP2 1x RAT network related location descriptions of UE's position.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get
- Values: N/A

5.6.12 <X>/UE_Location/3GPP2_Location/1x/<X>

This interior node acts as a placeholder for one or more 3GPP2 1x RAT location descriptions of UE position.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get
- Values: N/A

5.6.13 <X>/UE_Location/3GPP2_Location/1x/<X>/SID

This SID leaf indicates a System Identification code for one particular 3GPP2 1x RAT location used to indicate UE position.

- Occurrence: One
- Format: chr
- Access Types: Get
- Values: <SID>

The format of the SID is defined by 3GPP2 C.S0016 [14].

5.6.14 <X>/UE_Location/3GPP2_Location/1x/<X>/NID

This NID leaf indicates a Network Identification code for one particular 3GPP2 1x RAT location used to indicate UE position.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get
- Values: <NID>

The format of the NID is defined by 3GPP2 C.S0016 [14].

5.6.15 <X>/UE_Location/3GPP2_Location/1x/<X>/Base_ID

This Base_ID leaf indicates a Base Station Identification code for one particular 3GPP2 1x RAT location used to indicate UE position.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get
- Values: <Base_ID>

The format of the Base_ID is defined by 3GPP2 C.S0005 [13].

5.6.16 <X>/UE_Location/3GPP2_Location/HRPD

This HRPD node acts as a placeholder for one or more 3GPP2 HRPD RAT location descriptions of UE position.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get
- Values: N/A

5.6.17 <X>/UE_Location/3GPP2_Location/HRPD/<X>

This interior node acts as a placeholder for one or more 3GPP2 HRPD RAT location descriptions of UE position.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get
- Values: N/A

5.6.18 <X>/UE_Location/3GPP2_Location/HRPD/<X>/Sector_ID

This Sector_ID leaf indicates a Sector Identification code for one particular 3GPP2 HRPD RAT location used to indicate UE position.

- Occurrence: One
- Format: bin
- Access Types: Get

- Values: <Sector_ID>

The format of the Sector_ID is defined by 3GPP2 C.S0024-0 [15]. The length of Sector ID contained in this node is 128 bits.

5.6.19 <X>/UE_Location/3GPP2_Location/HRPD/<X>/Netmask

The Netmask leaf indicates a Netmask code for one particular 3GPP2 HRPD RAT location used to indicate UE position.

- Occurrence: One
- Format: bin
- Access Types: Get
- Values: <Netmask>

The format of Netmask is defined by 3GPP2 C.S0024-0 [15]. The length of Netmask contained in this node is 8 bits. The mask contained in this leaf shall be applied to the Sector_ID bit string contained in the correspondent leaf of interior node.

5.6.20 <X>/UE_Location/WiMAX_Location

The WiMAX_Location node acts as a placeholder for WiMAX location descriptions.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get
- Values: N/A

The UE should insert the parameters of all the WiMAX networks it has discovered when updating this node.

5.6.21 <X>/UE_Location/WiMAX_Location/<X>

This interior node acts as a placeholder for one or more WiMAX location descriptions.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get
- Values: N/A

5.6.22 <X>/UE_Location/WiMAX_Location/<X>/NAP-ID

The NAP-ID leaf indicates the Network Access Provider for a particular WiMAX network related location of the UE.

- Occurrence: One
- Format: chr
- Access Types: Get
- Values: <NAP-ID>

The format of the NAP-ID is defined by the WiMAX Forum Network Architecture version 1.2.2 – Stage 2 [6] and WiMAX Forum Network Architecture Release 1.0 version 1.2.2 – Stage 3 [7].

5.6.23 <X>/UE_Location/WiMAX_Location/<X>/BS-ID

The BS-ID leaf indicates the BS identifier for a particular WiMAX network related location of the UE.

- Occurrence: One
- Format: chr
- Access Types: Get
- Values: <BS-ID>

The format of the BS-ID is defined by the IEEE Std 802.16e-2005 and IEEE Std 802.16-2004/Cor1-2005 [10].

5.6.24 <X>/UE_Location/WLAN_Location

The WLAN_Location node acts as a placeholder for WLAN location descriptions.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get
- Values: N/A

The UE should insert the parameters of all the WLAN networks it has discovered when updating this node.

5.6.25 <X>/UE_Location/WLAN_Location/<X>

This interior node acts as a placeholder for one or more WLAN location descriptions.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get
- Values: N/A

5.6.26 <X>/UE_Location/WLAN_Location/<X>/HESSID

The HESSID leaf indicates the HESSID for a particular WLAN network related location of the UE.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get
- Values: <HESSID>

The format of the HESSID is defined by IEEE 802.11u [17].

5.6.27 <X>/UE_Location/WLAN_Location/<X>/SSID

The SSID leaf indicates the SSID for a particular WLAN network related location of the UE.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get
- Values: <SSID>

The format of the SSID is defined by IEEE Std 802.11™-2007 [9].

5.6.28 <X>/UE_Location/WLAN_Location/<X>/BSSID

The BSSID leaf indicates the AP identifier for one particular WLAN network related location of the UE.

- Occurrence: One
- Format: chr
- Access Types: Get
- Values: <BSSID>

The format of the BSSID is defined by IEEE Std 802.11™-2007 [9].

5.6.29 <X>/UE_Location/Geo_Location/

This node acts as a placeholder for one or more UE Geo_Location location descriptions.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get
- Values: <N/A >

If the UE is aware of its geographical position, it shall insert the coordinates of its position in this Geo_Location node.

5.6.30 <X>/UE_Location/Geo_Location/Latitude

The Latitude node acts as a placeholder for the latitude value of the position of the UE.

- Occurrence: One
- Format: bin
- Access Types: Get
- Values: <Latitude >

The Latitude is defined in subclause 6.1 of 3GPP TS 23.032 [3A].

5.6.31 <X>/UE_Location/Geo_Location/Longitude

The Longitude node acts as a placeholder for the longitude value of the position of the UE.

- Occurrence: One
- Format: bin
- Access Types: Get
- Values: < Longitude>

The Longitude is defined in subclause 6.1 of 3GPP TS 23.032 [3A].

5.6.32 <X>/UE_Location/RPLMN

The RPLMN leaf indicates a PLMN code of the registered PLMN the UE is connected to.

- Occurrence: ZeroOrOne

- Format: chr
- Access Types: Get
- Values: <PLMN>

The format of the PLMN is defined by 3GPP TS 23.003 [3].

5.7 ISRP

5.7.1 <X>/ISRP/

The ISRP node acts as a placeholder for policies for ISRP.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.7.2 <X>/ISRP/<X>

This interior node acts as a placeholder for one or more ISRP rules.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

An ISRP rule can contain one or more of the following nodes: ForFlowBased, ForServiceBased or ForNonSeamlessOffload.

5.7.3 <X>/ISRP/<X>/ForFlowBased

The ForFlowBased node represents flow distribution container indicating data distribution among accesses based on flow description.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

If this node is present, it implies that the Home Agents of the PLMN identified in the leaf <X>/ISRP/<X>/PLMN of the same rule support IFOM.

5.7.4 <X>/ISRP/<X>/ForFlowBased/<X>/

This interior node acts as a placeholder for one or more flow distribution rule.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace

- Values: N/A

5.7.5 <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow

The IPFlow node indicates the flow description for a particular flow distribution rule.

- Occurrence: One
- Format: node
- Access Types: Get, Replace
- Values: N/A

An empty IPFlow node indicates the match-all flow description.

If the flow distribution rule contains more than one instance of the <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X> node (i.e. flow description), the UE shall consider the flow distribution rule if at least one of the flow descriptions as described in subclause 5.7.6 matches the traffic.

5.7.6 <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/

This interior node acts as a placeholder for one or more flow description.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

If the flow description is defined with more than one interior node or leaf (i.e. App-ID, AddressType, etc.) within a single instance of the <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X> node, then UE shall consider the flow description matching the traffic only if all the present interior nodes and leaf values match the traffic.

5.7.6A <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/App-ID

This interior node acts as a placeholder for an IPFlow identification based on an applicationID.

An IP flow is evaluated as matching if the IP flow matches at least one child node.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

The absence of this node indicates that the application identifier is not examined when matching packets against the IP flow description of the rule.

5.7.6B <X>/ISRP/<X>/ForFlowBased /<X>/IPFlow/<X>/App-ID/<X>/

This interior node acts as a placeholder for one or more combinations of OSId and OSAppId values.

An IP flow is evaluated as matching if the IP flow is sent by an application:

- which uses services provided by an OS identified by the OS system identifier in the OSId leaf contained in this interior node; and
- associated with an OS specific application identifier in one of the OSAppId leaves contained in the OSApps interior node.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.7.6C Void

5.7.6D <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/App-ID/ <X>/OSId

The OSId leaf indicates an operating system identifier.

- Occurrence: One
- Format: chr
- Access Types: Get, Replace
- Values: <operating system identifier>

The format of the operating system identifier is a Universally Unique Identifier (UUID) as specified in IETF RFC 4122 [22].

5.7.6E <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/App-ID/ <X>/OSApps/

This interior node acts as a placeholder for the list of OS specific application identifiers.

- Occurrence: One
- Format: node
- Access Types: Get, Replace
- Values: <N/A>

5.7.6F <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/App-ID/ <X>/OSApps/<X>

This interior node acts as a placeholder for an OS specific application identifiers.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: <N/A>

5.7.6G <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/App-ID/ <X>/OSApps/<X>/OSAppId

The OSAppId leaf indicates an OS specific application identifier.

- Occurrence: One
- Format: chr
- Access Types: Get, Replace

- Values: <OS specific application identifier>

Further definition of the format of the OS specific application identifier is beyond the scope of this specification.

5.7.7 <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/AddressType

The AddressType leaf indicates the IP version of the addresses describing the IP flow.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: 'IPv4', 'IPv6'

The absence of this leaf indicates that the IP flow described by the rule can have both IPv4 and IPv6 addresses. This field is mandatory if StartSourceIPAddress leaf, or StartDestIPAddress leaf or both are present.

5.7.8 <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/StartSourceIPAddress

The StartSourceIPAddress leaf indicates the first IP source address of the IP address range of the IP flow description. The source address refers to the IP address of the data packets destined for the UE.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <an IPv4 address>, <an IPv6 address>.

The value of this leaf is an IPv4 address if the AddressType leaf value of the same rule is equal to IPv4. The value of this leaf is an IPv6 address if the AddressType leaf value of the same rule is equal to IPv6. If this leaf represents the first value of an IP source address range, the values of this leaf and the corresponding <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/EndSourceIPAddress leaf are set so that the IP address range can be represented in prefix notation.

EXAMPLE: IPv4 address range 192.0.2.0 - 192.0.2.255 is equal to 192.0.2.0/24 in prefix notation, and IPv6 address range 2001:db8::/128 - 2001:db8:ffff:ffff:ffff:ffff:ffff:ffff/128 equals 2001:db8::/32 in prefix notation.

The absence of this leaf indicates that source address field of the IP header is not examined when matching packets against the IP flow description of the rule.

The UE ignores an IPFlow instance with a StartSourceIPAddress leaf without a correspondent AddressType leaf. If the IPFlow instance is the only one contained in the flow distribution rule, the UE ignores the flow distribution rule.

When applying the rule to uplink traffic, the UE matches the addresses contained in the range between StartSourceIPAddress and EndSourceIPAddress against destination IP address field of the uplink traffic packets.

5.7.9 <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/EndSourceIPAddress

The EndSourceIPAddress leaf indicates the last IP source address of the IP source address range of the IP flow description. The source address refers to the IP address of the data packets destined for the UE.

- Occurrence: ZeroOrOne
- Format: chr

- Access Types: Get, Replace
- Values: <an IPv4 address>, <an IPv6 address>.

This leaf can be present only if the leaf <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/StartSourceIPAddress is present. The absence of this leaf indicates that the IP source address range of the IP flow described by the rule is equal to the address contained in <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/StartSourceIPAddress. When representing the IP source address range with more than one IP address, the values of this leaf and the corresponding <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/StartSourceIPAddress leaf are set as defined in subclause 5.7.8.

The value of this leaf is an IPv4 address if the AddressType leaf value of the same rule is equal to IPv4. The value of this leaf is an IPv6 address if the AddressType leaf value of the same rule is equal to IPv6.

The UE ignores an IPFlow instance with a EndSourceIPAddress leaf without a correspondent StartSourceIPAddress leaf. If the IPFlow instance is the only one contained in the flow distribution rule, the UE ignores the flow distribution rule.

5.7.10 <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/StartDestIPAddress

The StartDestIPAddress leaf indicates the first IP destination address of the IP destination address range of the IP flow description. The IP destination address is any one of the IP addresses allocated to the UE that the UE uses as source address when generating IP traffic.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <an IPv4 address>, <an IPv6 address>.

The value of this leaf is an IPv4 address if the AddressType leaf value of the same rule is equal to IPv4. The value of this leaf is an IPv6 address if the AddressType leaf value of the same rule is equal to IPv6. If this leaf represents the first value of an IP destination address range, the values of this leaf and the corresponding <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/EndDestIPAddress leaf are set so that the IP address range can be represented in prefix notation.

EXAMPLE: IPv4 address range 192.0.2.0 - 192.0.2.255 is equal to 192.0.2.0/24 in prefix notation, and IPv6 address range 2001:db8::/128 - 2001:db8:ffff:ffff:ffff:ffff:ffff:ffff/128 equals 2001:db8::/32 in prefix notation.

The absence of this leaf indicates that IP destination address field of the IP header is not examined when matching packets against the IP flow description of the rule.

The UE ignores an IPFlow instance with a StartDestIPAddress leaf without a correspondent AddressType leaf. If the IPFlow instance is the only one contained in the flow distribution rule, the UE ignores the flow distribution rule.

When applying the rule to uplink traffic, the UE matches the addresses contained in the range between StartDestIPAddress and EndDestIPAddress against source IP address field of the uplink traffic packets.

5.7.11 <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/EndDestIPAddress

The EndDestIPAddress leaf indicates the last IP destination address of the IP destination address range of the IP flow description. The IP destination address is any one of the IP addresses allocated to the UE that the UE uses as source address when generating IP traffic.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <an IPv4 address>, <an IPv6 address>

This leaf can be present only if the leaf `<X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/StartDestIPAddress` is present. The absence of this leaf indicates that the the IP destination address range of the IP flow described by the rule is equal to the address contained in `<X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/StartDestIPAddress`. When representing the IP destination address range with more than one IP address, the values of this leaf and the corresponding `<X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/StartDestIPAddress` leaf are set as defined in subclause 5.7.10.

The value of this leaf is an IPv4 address if the AddressType leaf value of the same rule is equal to IPv4. The value of this leaf is an IPv6 address if the AddressType leaf value of the same rule is equal to IPv6.

The UE ignores an IPFlow instance with a EndDestIPAddress leaf without a correspondent StartDestIPAddress leaf. If the IPFlow instance is the only one contained in the flow distribution rule, the UE ignores the flow distribution rule.

5.7.12 `<X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/ProtocolType`

The ProtocolType leaf indicates the protocol type in a flow description.

- Occurrence: ZeroOrOne
- Format: int
- Access Types: Get, Replace
- Values: <Protocol type>

The value of ProtocolType leaf is a value among the internet protocol numbers as defined in IANA Assigned Internet Protocol Numbers [18]. In case of IPv4 flow description, the value contained in this leaf is compared with the value of the last protocol type field. In case of IPv6 flow description, the value contained in this leaf is compared with the value of the last next header field. The UE ignores an IPFlow instance with a ProtocolType leaf indicating a protocol type not supported by the UE. If the IPFlow instance is the only one contained in the flow distribution rule, the UE ignores the flow distribution rule.

5.7.13 `<X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/StartSourcePortNumber`

The StartSourcePortNumber leaf indicates the first source port number of the source port numbers range of the IP flow description. The source port refers to the source port of the data packets destined for the UE.

- Occurrence: ZeroOrOne
- Format: int
- Access Types: Get, Replace
- Values: any value in the range 1-65535.

The absence of this leaf indicates that source port field of the transport protocol header is not examined when matching packets against the IP flow description of the rule.

When applying the rule to uplink traffic, the UE matches the port numbers contained in the range between StartSourcePortNumber and EndSourcePortNumber against destination port field of the uplink traffic packets.

5.7.14 `<X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/EndSourcePortNumber`

The EndSourcePortNumber leaf indicates the last source port number of the source port numbers range of the IP flow description. The source port refers to the source port of the data packets destined for the UE.

- Occurrence: ZeroOrOne
- Format: int

- Access Types: Get, Replace
- Values: any value in the range 1-65535.

This leaf can be present only if the leaf `<X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/StartSourcePortNumber` is present. The absence of this leaf indicates that the source port number range of the IP flow described by the rule is equal to the source port number contained in `<X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/StartSourcePortNumber`.

The UE ignores an IPFlow instance with a `EndSourcePortNumber` leaf without a correspondent `StartSourcePortNumber` leaf. If the IPFlow instance is the only one contained in the flow distribution rule, the UE ignores the flow distribution rule.

5.7.15 `<X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/StartDestPortNumber`

The `StartDestPortNumber` leaf indicates the first destination port number of the destination port numbers range of the IP flow description. The destination port refers to the destination port of the data packets sent by the corresponding node.

- Occurrence: ZeroOrOne
- Format: int
- Access Types: Get, Replace
- Values: any value in the range 1-65535.

The absence of this leaf indicates that destination port field of the transport protocol header is not examined when matching packets against the IP flow description of the rule.

When applying the rule to uplink traffic, the UE matches the port numbers contained in the range between `StartDestPortNumber` and `EndDestPortNumber` against source port field of the uplink traffic packets.

5.7.16 `<X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/EndDestPortNumber`

The `EndDestPortNumber` leaf indicates the last destination port number of the destination port numbers range of the IP flow description. The destination port refers to the destination port of the data packets sent by the corresponding node.

- Occurrence: ZeroOrOne
- Format: int
- Access Types: Get, Replace
- Values: any value in the range 1-65535.

This leaf can be present only if the leaf `<X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/StartDestPortNumber` is present. The absence of this leaf indicates that the destination port number range of the IP flow described by the rule is equal to the port number contained in `<X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/StartDestPortNumber`.

The UE ignores an IPFlow instance with a `EndDestPortNumber` leaf without a correspondent `StartDestPortNumber` leaf. If the IPFlow instance is the only one contained in the flow distribution rule, the UE ignores the flow distribution rule.

5.7.17 `<X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/QoS`

The QoS leaf indicates the DS or ToS values parameters in a flow description.

- Occurrence: ZeroOrOne
- Format: bin
- Access Types: Get, Replace

- Values: any value in the range 0-63 expressed in a binary form

The DS and ToS values are defined in IETF RFC 3260 [10A].

5.7.17A <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/DomainName

The DomainName leaf indicates the destination domain name of the IP Flow description.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <FQDN>

The value of FQDN is Fully Qualified Domain Name (e.g. www.example.com) that was resolved into the destination IP address. The FQDN format is defined in IETF RFC 2181 [19], IETF RFC 1035 [20] and IETF RFC 1123 [21].

The absence of this leaf indicates that the domain name is not examined when matching packets against the IP flow description of the rule.

5.7.18 <X>/ISRP/<X>/ForFlowBased/<X>/RoutingCriteria

The RoutingCriteria node acts as a placeholder for validity conditions for a particular flow distribution rule.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

If at least one instance of <X>/ISRP/<X>/ForFlowBased/<X>/RoutingCriteria/<X> node indicates matching validity condition, the UE shall consider the corresponding flow distribution rule as valid.

If the <X>/ISRP/<X>/ForFlowBased/<X>/RoutingCriteria/<X> node is present and empty (i.e. none of the nodes ValidityArea, TimeOfDay or APN exist), the <X>/ISRP/<X>/ForFlowBased/<X>/RoutingCriteria/<X> node is not considered when evaluating the validity of the corresponding flow distribution rule.

5.7.19 <X>/ISRP/<X>/ForFlowBased/<X>/RoutingCriteria/<X>/

This internal node acts as a placeholder for one or more validity conditions for a particular flow distribution rule.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

The UE shall consider the corresponding flow distribution rule as valid only if all the present interior nodes (ValidityArea, TimeOfDay and APN) within a single instance of <X>/ISRP/<X>/ForFlowBased/<X>/RoutingCriteria/<X> node indicate matching validity condition.

5.7.20 <X>/ISRP/<X>/ForFlowBased/<X>/RoutingCriteria/<X>/ ValidityArea

The ValidityArea node acts as a placeholder for location conditions for a particular flow distribution rule.

- Occurrence: ZeroOrOne

- Format: node
- Access Types: Get, Replace
- Values: N/A

This node and its descendants are the same as defined in `<X>/Policy/<X>/ValidityArea`.

5.7.21 `<X>/ISRP/<X>/ForFlowBased/<X>/RoutingCriteria/<X>/TimeOfDay`

The `TimeOfDay` node acts as a placeholder for day condition for a particular flow distribution rule.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

This node and its descendants are the same as defined in `<X>/Policy/<X>/TimeOfDay`.

5.7.22 `<X>/ISRP/<X>/ForFlowBased/<X>/RoutingCriteria/<X>/APN`

The APN leaf indicates the APN for which a particular flow distribution rule is valid.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: `<APN>`

The APN format is defined in 3GPP TS 23.003 [3]. If this node is omitted, the flow description applies to any APN.

NOTE: If the APN leaf is omitted, this flow description will override flow descriptions of specific APNs whose Rule priority is not higher than the Rule priority of this flow description.

5.7.23 `<X>/ISRP/<X>/ForFlowBased/<X>/RoutingRule`

The `RoutingRule` node indicates the preferred access for a flow distribution rule.

- Occurrence: One
- Format: node
- Access Types: Get, Replace
- Values: N/A

This node and its descendants are the same as defined in `<X>/Policy/<X>/PrioritizedAccess` unless explicitly specified.

5.7.23A `<X>/ISRP/<X>/ForFlowBased/<X>/RoutingRule/<X>/AccessTechnology`

The `AccessTechnology` leaf indicates a prioritized access technology.

- Occurrence: One
- Format: int

- Access Types: Get, Replace
- Values: <Access technology>

Possible values for the Access technology are specified in table 5.7.23A.1.

Table 5.7.23A.1: Possible values for the AccessTechnology leaf

Value	Description
0	Reserved
1	3GPP
2	Reserved
3	WLAN
4-255	Reserved

5.7.24 <X>/ISRP/<X>/ForFlowBased/<X>/RulePriority

The RulePriority leaf represents the priority given to one particular flow distribution rule and is represented as a numerical value.

- Occurrence: One
- Format: int
- Access Types: Get, Replace
- Values: <Rule priority>

RulePriority leaf is used to establish to which flow description rule a data traffic matching multiple flow distribution rules apply. The data traffic matching multiple flow distribution rules applies to the flow description rule with the highest priority. The UE shall treat the rule with the lowest RulePriority value as the rule having the highest priority. If the UE finds multiple rules with the same priority, the choice of the rule is UE implementation specific. If there are no matching access networks according to the rule, other rules with the same priority may be considered. If there are no matching access networks according to any rule with a certain priority, rules with lower priority may be considered.

5.7.25 <X>/ISRP/<X>/ForServiceBased

The ForServiceBased node represents flow distribution container indicating data distribution among accesses based on APN.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.7.26 <X>/ISRP/<X>/ForServiceBased/<X>/

This interior node acts as a placeholder for one or more flow distribution rules indicating data distribution among accesses based on APN.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.7.27 <X>/ISRP/<X>/ForServiceBased/<X>/APN

The APN leaf indicates the APN for which a particular flow distribution rule is valid.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <APN>

The APN format is defined in 3GPP TS 23.003 [3]. If this node is omitted, the flow description applies to any APN.

NOTE: If the APN leaf is omitted, this flow description will override flow descriptions of specific APNs whose Rule priority is not higher than the Rule priority of this flow description.

5.7.28 <X>/ISRP/<X>/ForServiceBased/<X>/RoutingCriteria

The RoutingCriteria node acts as a placeholder for validity conditions for a particular flow distribution rule.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

If at least one instance of <X>/ISRP/<X>/ForServiceBased/<X>/RoutingCriteria/<X> node indicates matching validity condition, the UE shall consider the corresponding flow distribution rule as valid.

If the <X>/ISRP/<X>/ForServiceBased/<X>/RoutingCriteria/<X> node is present and empty (i.e. none of the nodes ValidityArea or TimeOfDay exist), the <X>/ISRP/<X>/ForServiceBased/<X>/RoutingCriteria/<X> node is not considered when evaluating the validity of the corresponding flow distribution rule.

5.7.29 <X>/ISRP/<X>/ForServiceBased/<X>/RoutingCriteria/<X>/

This internal node acts as a placeholder for one or more validity conditions for a particular flow distribution rule.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

The UE shall consider the corresponding flow distribution rule as valid only if all the present interior nodes (ValidityArea and TimeOfDay) within a single instance of <X>/ISRP/<X>/ForServiceBased/<X>/RoutingCriteria/<X> node indicate matching validity condition.

5.7.30 <X>/ISRP/<X>/ForServiceBased/<X>/RoutingCriteria/<X>/ ValidityArea

The ValidityArea node acts as a placeholder for location conditions for a particular flow distribution rule.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

This node and its descendants are the same as defined in <X>/Policy/<X>/ValidityArea.

5.7.31 <X>/ISRP/<X>/ForServiceBased/<X>/RoutingCriteria/<X>/TimeOfDay

The TimeOfDay node acts as a placeholder for day condition for a particular flow distribution rule.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

This node and its descendants are the same as defined in <X>/Policy/<X>/TimeOfDay.

5.7.32 <X>/ISRP/<X>/ForServiceBased/<X>/RoutingRule

The RoutingRule node indicates the preferred access for a flow distribution rule.

- Occurrence: One
- Format: node
- Access Types: Get, Replace
- Values: N/A

This node and its descendants are the same as defined in <X>/Policy/<X>/PrioritizedAccess.

5.7.33 <X>/ISRP/<X>/ForServiceBased/<X>/RulePriority

The RulePriority leaf represents the priority given to a particular flow distribution rule and is represented as a numerical value.

- Occurrence: One
- Format: int
- Access Types: Get, Replace
- Values: <Rule priority>

RulePriority leaf is used to establish to which flow description rule a data traffic matching multiple flow distribution rules apply. The data traffic matching multiple flow distribution rules applies to the flow description rule with the highest priority. The UE shall treat the rule with the lowest RulePriority value as the rule having the highest priority. If the UE finds multiple rules with the same priority, the choice of the rule is UE implementation specific. If there are no matching access networks according to the rule, other rules with the same priority may be considered. If there are no matching access networks according to any rule with a certain priority, rules with lower priority may be considered.

5.7.34 <X>/ISRP/<X>/ForNonSeamlessOffload/

The ForNonSeamlessOffload node represents a flow distribution container indicating data permissible for non-seamless WLAN offload routing based on flow description.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.7.35 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/

This interior node acts as a placeholder for one or more flow distribution rules indicating data distribution among accesses based on flow description.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.7.36 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow

The IPFlow node indicates the flow description for a particular flow distribution rule.

- Occurrence: One
- Format: node
- Access Types: Get, Replace
- Values: N/A

An empty IPFlow node indicates the match-all flow description.

If the flow distribution rule contains more than one instance of the <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X> node (i.e. flow description), the UE shall consider the flow distribution rule if at least one of the flow descriptions as described in subclause 5.7.37 matches the traffic.

5.7.37 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/ IPFlow/<X>

This interior node acts as a placeholder for one or more flow description.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

If the flow description is defined with more than one interior node or leaf (i.e. App-ID, AddressType, etc.) within a single instance of the <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X> node, then UE shall consider the flow description matching the traffic only if all the present interior nodes and leaf values match the traffic.

5.7.37A <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/ IPFlow/<X>/App-ID

This interior node acts as a placeholder for an IPFlow identification based on an applicationID.

An IP flow is evaluated as matching if the IP flow matches at least one child node.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

The absence of this leaf indicates that the application identifier is not examined when matching packets against the IP flow description of the rule.

5.7.37B <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/ IPFlow/<X>/App-ID/<X>/

This interior node acts as a placeholder for one or more combinations of OSId and OSAppId values.

An IP flow is evaluated as matching if the IP flow is sent by an application:

- which uses services provided by an OS identified by the OS system identifier in the OSId leaf contained in this interior node; and
- associated with an OS specific application identifier in one of the OSAppId leaves contained in the OSApps interior node.
- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.7.37C Void

5.7.37D <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/ IPFlow/<X>/App-ID/<X>/OSId

The OSId leaf indicates an operating system identifier.

- Occurrence: One
- Format: chr
- Access Types: Get, Replace
- Values: <operating system identifier>

The format of the operating system identifier is a Universally Unique Identifier (UUID) as specified in IETF RFC 4122 [22].

5.7.37E <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/App-ID/ <X>/OSApps/

This interior node acts as a placeholder for the list of OS specific application identifiers.

- Occurrence: One
- Format: node
- Access Types: Get, Replace
- Values: <N/A>

5.7.37F <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/App-ID/ <X>/OSApps/<X>

This interior node acts as a placeholder for an OS specific application identifiers.

- Occurrence: OneOrMore

- Format: node
- Access Types: Get, Replace
- Values: <N/A>

5.7.37G <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/ App-ID/ <X>/OSApps/<X>/OSAppId

The OSAppId leaf indicates an OS specific application identifier.

- Occurrence: One
- Format: chr
- Access Types: Get, Replace
- Values: <OS specific application identifier>

Further definition of the format of the OS specific application identifier is beyond the scope of this specification.

5.7.38 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/ AddressType

The AddressType leaf indicates the IP version of the addresses describing the IP flow.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: 'IPv4', 'IPv6'

The absence of this leaf indicates that the IP flow described by the rule can have both IPv4 and IPv6 addresses. This field is mandatory if StartSourceIPAddress leaf, or StartDestIPAddress leaf or both are present.

5.7.39 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/ StartSourceIPAddress

The StartSourceIPAddress leaf indicates the first IP source address of the IP address range of the IP flow description. The source address refers to the IP address of the data packets destined for the UE.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <an IPv4 address>, <an IPv6 address>.

The value of this leaf is an IPv4 address if the AddressType leaf value of the same rule is equal to IPv4. The value of this leaf is an IPv6 address if the AddressType leaf value of the same rule is equal to IPv6. If this leaf represents the first value of an IP source address range, the values of this leaf and the corresponding <X>/ISRP/<X>/ForNonSeamlessOffload /<X>/IPFlow/<X>/EndSourceIPAddress leaf are set so that the IP address range can be represented in prefix notation.

EXAMPLE: IPv4 address range 192.0.2.0 - 192.0.2.255 is equal to 192.0.2.0/24 in prefix notation, and IPv6 address range 2001:db8::/128 - 2001:db8:ffff:ffff:ffff:ffff:ffff:ffff/128 equals 2001:db8::/32 in prefix notation.

The absence of this leaf indicates that source address field of the IP header is not examined when matching packets against the IP flow description of the rule.

The UE ignores an IPFlow instance with a StartSourceIPAddress leaf without a correspondent AddressType leaf. If the IPFlow instance is the only one contained in the flow distribution rule, the UE ignores the flow distribution rule.

When applying the rule to uplink traffic, the UE matches the addresses contained in the range between StartSourceIPAddress and EndSourceIPAddress against destination IP address field of the uplink traffic packets.

5.7.40 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/EndSourceIPAddress

The EndSourceIPAddress leaf indicates the last IP source address of the IP source address range of the IP flow description. The source address refers to the IP address of the data packets destined for the UE.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <an IPv4 address>, <an IPv6 address>.

This leaf can be present only if the leaf <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/StartSourceIPAddress is present. The absence of this leaf indicates that the IP source address range of the IP flow described by the rule is equal to the address contained in <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/StartSourceIPAddress. When representing the IP source address range with more than one IP address, the values of this leaf and the corresponding <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/StartSourceIPAddress leaf are set as defined in subclause 5.7.39.

The value of this leaf is an IPv4 address if the AddressType leaf value of the same rule is equal to IPv4. The value of this leaf is an IPv6 address if the AddressType leaf value of the same rule is equal to IPv6.

The UE ignores an IPFlow instance with a EndSourceIPAddress leaf without a correspondent StartSourceIPAddress leaf. If the IPFlow instance is the only one contained in the flow distribution rule, the UE ignores the flow distribution rule.

5.7.41 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/StartDestIPAddress

The StartDestIPAddress leaf indicates the first IP destination address of the IP destination address range of the IP flow description. The IP destination address is any one of the IP addresses allocated to the UE that the UE uses as source address when generating IP traffic.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <an IPv4 address>, <an IPv6 address>.

The value of this leaf is an IPv4 address if the AddressType leaf value of the same rule is equal to IPv4. The value of this leaf is an IPv6 address if the AddressType leaf value of the same rule is equal to IPv6. If this leaf represents the first value of an IP destination address range, the values of this leaf and the corresponding <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/EndDestIPAddress leaf are set so that the IP address range can be represented in prefix notation.

EXAMPLE: IPv4 address range 192.0.2.0 - 192.0.2.255 is equal to 192.0.2.0/24 in prefix notation, and IPv6 address range 2001:db8::/128 - 2001:db8:ffff:ffff:ffff:ffff:ffff:ffff/128 equals 2001:db8::/32 in prefix notation.

The absence of this leaf indicates that IP destination address field of the IP header is not examined when matching packets against the IP flow description of the rule.

The UE ignores an IPFlow instance with a StartDestIPAddress leaf without a correspondent AddressType leaf. If the IPFlow instance is the only one contained in the flow distribution rule, the UE ignores the flow distribution rule.

When applying the rule to uplink traffic, the UE matches the addresses contained in the range between StartDestIPAddress and EndDestIPAddress against source IP address field of the uplink traffic packets.

5.7.42 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/ EndDestIPAddress

The StartDestIPAddress leaf indicates the last IP destination address of the IP destination address range of the IP flow description. The IP destination address is any one of the IP addresses allocated to the UE that the UE uses as source address when generating IP traffic.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <an IPv4 address>, <an IPv6 address>.

This leaf can be present only if the leaf

<X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/StartDestIPAddress is present. The absence of this leaf indicates that the the IP destination address range of the IP flow described by the rule is equal to the address contained in <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/StartDestIPAddress. When representing the IP destination address range with more than one IP address, the values of this leaf and the corresponding <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/StartDestIPAddress leaf are set as defined in subclause 5.7.41.

The value of this leaf is an IPv4 address if the AddressType leaf value of the same rule is equal to IPv4. The value of this leaf is an IPv6 address if the AddressType leaf value of the same rule is equal to IPv6.

The UE ignores an IPFlow instance with a EndDestIPAddress leaf without a correspondent StartDestIPAddress leaf. If the IPFlow instance is the only one contained in the flow distribution rule, the UE ignores the flow distribution rule.

5.7.43 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/ ProtocolType

The ProtocolType leaf indicates the protocol type in a flow description.

- Occurrence: ZeroOrOne
- Format: int
- Access Types: Get, Replace
- Values: <Protocol type>

The value of ProtocolType leaf is a value among the internet protocol numbers as defined in IANA Assigned Internet Protocol Numbers [18]. In case of IPv4 flow description, the value contained in this leaf is compared with the value of the last protocol type field. In case of IPv6 flow description, the value contained in this leaf is compared with the value of the last next header field. The UE ignores an IPFlow instance with a ProtocolType leaf indicating a protocol type not supported by the UE. If the IPFlow instance is the only one contained in the flow distribution rule, the UE ignores the flow distribution rule.

5.7.44 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/ StartSourcePortNumber

The StartSourcePortNumber leaf indicates the first source port number of the source port numbers range of the IP flow description. The source port refers to the source port of the data packets destined for the UE.

- Occurrence: ZeroOrOne
- Format: int

- Access Types: Get, Replace
- Values: any value in the range 1-65535.

The absence of this leaf indicates that source port field of the transport protocol header is not examined when matching packets against the IP flow description of the rule.

When applying the rule to uplink traffic, the UE matches the port numbers contained in the range between StartSourcePortNumber and EndSourcePortNumber against destination port field of the uplink traffic packets.

5.7.45 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/EndSourcePortNumber

The EndSourcePortNumber leaf indicates the last source port number of the source port numbers range of the IP flow description. The source port refers to the source port of the data packets destined for the UE.

- Occurrence: ZeroOrOne
- Format: int
- Access Types: Get, Replace
- Values: any value in the range 1-65535.

This leaf can be present only if the leaf <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/StartSourcePortNumber is present. The absence of this leaf indicates that the source port number range of the IP flow described by the rule is equal to the source port number contained in <X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/StartSourcePortNumber.

The UE ignores an IPFlow instance with a EndSourcePortNumber leaf without a correspondent StartSourcePortNumber leaf. If the IPFlow instance is the only one contained in the flow distribution rule, the UE ignores the flow distribution rule.

5.7.46 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/StartDestPortNumber

The StartDestPortNumber leaf indicates the first destination port number of the destination port numbers range of the IP flow description. The destination port refers to the destination port of the data packets sent by the corresponding node.

- Occurrence: ZeroOrOne
- Format: int
- Access Types: Get, Replace
- Values: any value in the range 1-65535.

The absence of this leaf indicates that destination port field of the transport protocol header is not examined when matching packets against the IP flow description of the rule.

When applying the rule to uplink traffic, the UE matches the port numbers contained in the range between StartDestPortNumber and EndDestPortNumber against source port field of the uplink traffic packets.

5.7.47 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/EndDestPortNumber

The EndDestPortNumber leaf indicates the last destination port number of the destination port numbers range of the IP flow description. The destination port refers to the destination port of the data packets sent by the corresponding node.

- Occurrence: ZeroOrOne
- Format: int
- Access Types: Get, Replace

- Values: any value in the range 1-65535.

This leaf can be present only if the leaf `<X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/StartDestPortNumber` is present. The absence of this leaf indicates that the destination port number range of the IP flow described by the rule is equal to the port number contained in `<X>/ISRP/<X>/ForFlowBased/<X>/IPFlow/<X>/StartDestPortNumber`.

The UE ignores an IPFlow instance with a `EndDestPortNumber` leaf without a correspondent `StartDestPortNumber` leaf. If the IPFlow instance is the only one contained in the flow distribution rule, the UE ignores the flow distribution rule.

5.7.48 `<X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/QoS`

The QoS leaf indicates the DS or ToS values parameters in a flow description.

- Occurrence: ZeroOrOne
- Format: bin
- Access Types: Get, Replace
- Values: any value in the range from 0 up to and including 63 in a binary form.

The DS and ToS values are defined in IETF RFC 3260 [10A].

5.7.48A `<X>/ISRP/<X>/ForNonSeamlessOffload/<X>/IPFlow/<X>/DomainName`

The DomainName leaf indicates the destination domain name of the IP Flow description.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: `<FQDN>`

The value of FQDN is Fully Qualified Domain Name (e.g. `www.example.com`) that was resolved into the destination IP address. The FQDN format is defined in IETF RFC 2181 [19], IETF RFC 1035 [20] and IETF RFC 1123 [21].

The absence of this leaf indicates that the domain name is not examined when matching packets against the IP flow description of the rule.

5.7.49 `<X>/ISRP/<X>/ForNonSeamlessOffload/<X>/RoutingCriteria`

The RoutingCriteria node acts as a placeholder for validity conditions for a particular flow distribution rule.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

If at least one instance of `<X>/ISRP/<X>/ForNonSeamlessOffload/<X>/RoutingCriteria/<X>` node indicates matching validity condition, the UE shall consider the corresponding flow distribution rule as valid.

If the `<X>/ISRP/<X>/ForNonSeamlessOffload/<X>/RoutingCriteria/<X>` node is present and empty (i.e. none of the nodes `ValidityArea`, `TimeOfDay` or `APN` exist), the `<X>/ISRP/<X>/ForNonSeamlessOffload/<X>/RoutingCriteria/<X>` node is not considered when evaluating the validity of the corresponding flow distribution rule.

5.7.50 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/RoutingCriteria/<X>/

This internal node acts as a placeholder for one or more validity conditions for a particular flow distribution rule .

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

The UE shall consider the corresponding flow distribution rule as valid only if all the present interior nodes (ValidityArea, TimeOfDay and APN) within a single instance of <X>/ISRP/<X>/ ForNonSeamlessOffload /<X>/RoutingCriteria/<X> node indicate matching validity condition.

5.7.51 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/RoutingCriteria/<X>/ValidityArea

The ValidityArea node acts as a placeholder for location conditions for a particular flow distribution rule.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

This node and its descendants are the same as defined in <X>/Policy/<X>/ValidityArea.

5.7.52 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/RoutingCriteria/<X>/TimeOfDay

The TimeOfDay node acts as a placeholder for day condition for a particular flow distribution rule.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: N/A

This node and its descendants are the same as defined in <X>/Policy/<X>/TimeOfDay.

5.7.53 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/RoutingCriteria/<X>/APN

The APN leaf indicates the APN for which a particular flow distribution rule is valid.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <APN>

The APN format is defined in 3GPP TS 23.003 [3]. If this node is omitted, the flow description applies to any APN.

NOTE: If the APN leaf is omitted, this flow description will override flow descriptions of specific APNs whose Rule priority is not higher than the Rule priority of this flow description.

5.7.54 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/ RoutingRule

The RoutingRule node indicates the preferred access for a flow distribution rule.

- Occurrence: One
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.7.55 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/ RoutingRule/<X>/

This interior node acts as a placeholder for one or more prioritized accesses.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: N/A

5.7.56 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/ RoutingRule/AccessID

The AccessId leaf represents an access network identifier.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <SSID>

The format of the SSID is defined by IEEE Std 802.11™-2007 [9].

The absence of this leaf indicates that the UE can consider any available WLAN access network for the network selection.

5.7.57 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/ RoutingRule/SecondaryAccessID

The SecondaryAccessId leaf represents a secondary access network identifier.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <HESSID>

This node is the same as defined in <X>/Policy/<X>/PrioritizedAccess/<X>/SecondaryAccessID.

5.7.58 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/RoutingRule/AccessNetworkPriority

The AccessNetworkPriority leaf represents an access technology priority.

- Occurrence: One
- Format: int
- Access Types: Get, Replace
- Values: <Access network priority>

This node is the same as defined in <X>/Policy/<X>/PrioritizedAccess/<X>/AccessNetworkPriority.

5.7.59 <X>/ISRP/<X>/ForNonSeamlessOffload/<X>/RulePriority

The RulePriority leaf represents the priority given to one particular flow distribution rule and is represented as a numerical value.

- Occurrence: One
- Format: int
- Access Types: Get, Replace
- Values: <Rule priority>

RulePriority leaf is used to establish to which flow description rule a data traffic matching multiple flow distribution rules apply. The data traffic matching multiple flow distribution rules applies to the flow description rule with the highest priority. The UE shall treat the rule with the lowest RulePriority value as the rule having the highest priority. If the UE finds multiple rules with the same priority, the choice of the rule is UE implementation specific. If there are no matching access networks according to the rule, other rules with the same priority may be considered. If there are no matching access networks according to any rule with a certain priority, rules with lower priority may be considered.

5.7.60 <X>/ISRP/<X>/Roaming

The Roaming leaf indicates the roaming condition for the ISRP rule.

- Occurrence: ZeroOrOne
- Format: bool
- Access Types: Get, Replace
- Values: 0, 1
 - 0 Indicates that the rule is only valid when the UE is not roaming.
 - 1 Indicates that the rule is only valid when the UE is roaming.

The UE shall consider a rule with the Roaming leaf present as valid only if the current roaming state (roaming/not roaming) of the UE matches the one indicated in the Roaming value.

The default value 0 applies if this leaf is not provisioned. The node is not used by the UE when the ISRP rule is provided by the V-ANDSF.

5.7.61 <X>/ISRP/<X>/PLMN

The PLMN leaf indicates a PLMN code of the operator, which created this ISRP rule.

- Occurrence: One
- Format: chr
- Access Types: Get, Replace
- Values: <PLMN>

The format of the PLMN is defined in 3GPP TS 23.003 [3].

When evaluating the PLMN leaf the following applies:

- if the value contained in this leaf is equal to the HPLMN (or an equivalent HPLMN) of the UE and the UE is not roaming, the ISRP rule is applicable;
- if the value contained in this leaf is equal to the HPLMN (or an equivalent HPLMN) of the UE, the value contained in the Roaming leaf of the ISRP rule is set to 1 and the UE is roaming, the ISRP rule is applicable;
- if the value contained in this leaf is equal to a VPLMN (or an equivalent VPLMN) of the UE, and the UE is roaming in that VPLMN, the ISRP rule is applicable independently from the Roaming leaf;
- if there are multiple ISRP rules with the same value in the PLMN leaf and the PLMN value is not the HPLMN or an equivalent HPLMN, only one ISRP rule is applied. The choice of the ISRP rule to apply is implementation dependant; and
- if there are multiple ISRP rules with the same value in the PLMN leaf, the same value in the Roaming leaf and the PLMN value is the HPLMN or an equivalent HPLMN, only one ISRP rule is applied. The choice of the ISRP rule to apply is implementation dependant.

5.7.62 <X>/ISRP/<X>/UpdatePolicy

The UpdatePolicy leaf indicates the update policy for the ISRP.

- Occurrence: ZeroOrOne
 - Format: bool
 - Access Types: Get, Replace
 - Values: 0, 1
- 0 Indicates that the UE is not required to request an update of the rules.
- 1 Indicates that the UE is required to request an update of the rules.

The UpdatePolicy value may be used by the UE to determine whether or not to request an update of its ISRP when the rule is no longer considered to be valid by the UE.

The default value 0 applies if this leaf is not provisioned.

5.7A UE_Profile

5.7A.1 <X>/UE_Profile/

The UE_Profile node acts as a placeholder for describing the information characterizing the UE.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get
- Values: N/A

5.7A.2 <X>/UE_Profile/<X>

This interior node acts as a placeholder for one or more profile aspects of the UE

- Occurrence: ZeroOrMore
- Format: node
- Access Types: Get
- Values: N/A

NOTE: A UE can have multiple concurrently active operating systems.

If the UE supports ISRP flow distribution rules (see subclause 5.7A.4) containing an OS specific application identifier, one <X> interior node with OSId leaf is included for each supported OS in the <X>/UE_Profile node.

5.7A.3 <X>/UE_Profile/<X>/OSId

TheOSId leaf indicates the operating system identifier of the UE.

- Occurrence: One
- Format: chr
- Access Types: Get
- Values: <operating system identifier>

The format of the operating system identifier is a Universally Unique Identifier (UUID) as specified in IETF RFC 4122 [22].

5.7A.4 <X>/UE_Profile/DevCapability

The DevCapability leaf indicates the device capability of the UE and ANDSF can use this information to adapt the ANDSF MO information to the capabilities of the UE. The value of this leaf is a sequence of '1' and '0' characters, where the character value '1' denotes support and '0' denotes no support for a feature.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get
- Values: <Device Capability>

The first character of the leaf value indicates support for ISRP rules based on Application Identifiers (DIDA). If the UE supports ISRP rules based on Application Identifiers, the UE sets the first character of the leaf value to '1'.

If this node is not present or the value is null string, the UE does not support any feature indicated with the node.

If there are additional characters in the leaf value and the ANDSF server does not understand them, these additional characters are ignored by the ANDSF server.

If a character is not '1', the ANDSF server treats the value as '0'.

5.8 <X>/Ext

The Ext is an interior node for where the vendor specific information about the ANDSF MO is being placed (vendor meaning application vendor, device vendor etc.). Usually the vendor extension is identified by vendor specific name under the ext node. The tree structure under the vendor identifier is not defined and can therefore include one or more un-standardized sub-trees.

- Occurrence: ZeroOrOne

- Format: node
- Access Types: Get
- Values: N/A

6 MO for WiMAX

6.1 Introduction

This section defines the WiMAX Network Discovery and Selection (WNDS) MO and the corresponding behaviour of the UE with regard to discovering and selecting WiMAX access networks in the home operator network. The service requirements for the WiMAX network discovery and selection function are described in 3GPP TS 23.402 [4].

The WNDS MO is compatible with the OMA Device Management (DM) protocol specifications, version 1.2 and upwards, and is defined using the OMA DM Device Description Framework (DDF) as described in the Enabler Release Definition OMA-ERELED-DM-V1_2 [5].

6.2 WNDS MO

The WNDS MO is used to manage WiMAX network discovery and selection information stored in the UE and supports provisioning of such information from the ANDSF.

The ANDSF may initiate the provisioning of WiMAX specific information using a server initiated session alert message. The UE may initiate the provision of information from the ANDSF using a client initiated session alert message.

The Management Object Identifier is: urn:oma:mo:ext-3gpp-wnds:1.0.

The OMA DM Access Control List (ACL) property mechanism as standardized (see Enabler Release Definition OMA-ERELED-DM-V1_2 [5]) may be used to grant or deny access rights to OMA DM servers in order to modify nodes and leaf objects of the WNDS MO.

The following nodes and leaf objects are possible under the WiMAX Network Discovery and Selection node as described in figure 6.2.1:

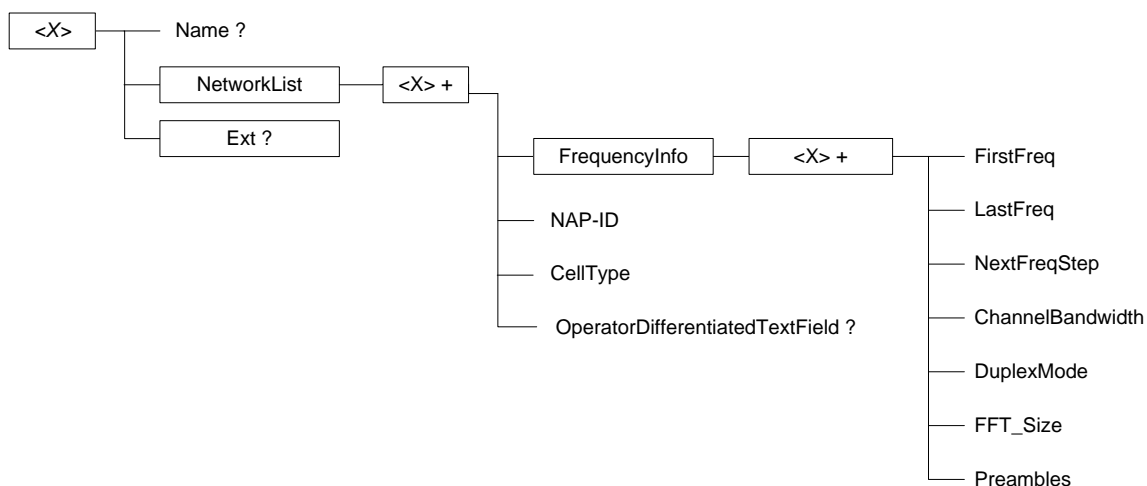


Figure 6.2.1: WNDS MO

6.3 WNDS MO parameters

6.3.1 General

This clause describes the parameters for the WNDS MO.

6.3.2 Node: <X>

This interior node acts as a placeholder for zero or one accounts for a fixed node.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get
- Values: N/A

6.3.3 <X>/Name

The Name leaf is a name for the WNDS MO settings.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get
- Values: <User displayable name>

6.3.4 <X>/NetworkList

This interior node acts as a placeholder for available WiMAX Network.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get, Replace
- Values: < N/A >

6.3.5 <X>/NetworkList/<X>

This interior node acts as a placeholder for properties of one or more WiMAX Network.

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: <N/A>

6.3.6 <X>/NetworkList/<X>/FrequencyInfo

The FrequencyInfo node contains WiMAX operating frequency related information.

- Occurrence: One
- Format: node

- Access Types: Get, Replace
- Values: <N/A>

6.3.7 <X>/NetworkList/<X>/FrequencyInfo/<X>

This interior node acts as a placeholder for one or more FrequencyInfo node properties..

- Occurrence: OneOrMore
- Format: node
- Access Types: Get, Replace
- Values: <N/A>

6.3.8 <X>/NetworkList/<X>/FrequencyInfo/<X>FirstFreq

The FirstFreq leaf specifies the first center frequency in KHz for this channel.

- Occurrence: One
- Format: int
- Access Types: Get, Replace
- Values: <FirstFreq>

6.3.9 <X>/NetworkList/<X>/FrequencyInfo/<X>LastFreq

The LastFreq leaf specifies the last center frequency in KHz for this channel. If this value equals to the FirstFreq or the leaf node is omitted, then this entry refers to a single channel rather than a channel range. If this field is present then NextFreqStep shall be present as well.

- Occurrence: One
- Format: int
- Access Types: Get, Replace
- Values: <LastFreq>

6.3.10 <X>/NetworkList/<X>/FrequencyInfo/<X>NextFreqStep

The NextFreqStep leaf defines the frequency step in KHz to reach the next central frequency when defining the frequency range using FirstFreq and LastFreq.

- Occurrence: One
- Format: int
- Access Types: Get, Replace
- Values: <NextFreqStep>

When this leaf node is omitted there is only one central frequency (i.e FirstFreq). If this field is present LastFreq shall be present as well. The formula to calculate the next central frequency is:

CurrentFreq = FirstFreq

While (CurrentFreq <= LastFreq) CurrentFreq = CurrentFreq + NextFreqStep

6.3.11 <X>/NetworkList/<X>/ FrequencyInfo/<X>ChannelBandwidth

The ChannelBandwidth leaf is the system bandwidth in KHz that is supported by the WiMAX network.

- Occurrence: One
- Format: int
- Access Types: Get, Replace
- Values: <ChannelBandwidth>

6.3.12 <X>/NetworkList/<X>/ FrequencyInfo/<X>DuplexMode

The DuplexMode leaf is the duplex mode supported by the network. The DuplexMode can be TDD, FDD or hybrid FDD (HFDD)

- Occurrence: One
- Format: int
- Access Types: Get, Replace
- Values: <Duplex mode>

The value of the DuplexMode shall be used as specified in Table 6.3.15.1.

Table 6.3.15.1: Values of DuplexMode

Value	Description
0	Reserved
1	TDD
2	FDD
3	HFDD
4-255	Reserved

6.3.13 <X>/NetworkList/<X>/ FrequencyInfo/<X>FFT_Size

The FFT_Size leaf specifies the channel's FFT.

- Occurrence: One
- Format: int
- Access Types: Get, Replace
- Values: <FFT size>

6.3.14 <X>/NetworkList/<X>/ FrequencyInfo/<X>Preambles

The Preambles leaf specifies the valid preambles for each channel in the channel range.

- Occurrence: One
- Format: chr
- Access Types: Get, Replace
- Values: <Preambles>

The value is a hexadecimal string which is 29 digits long. The two MSB are zeroed and the LSB indicates channel 0.

6.3.15 <X>/NetworkList/<X>/NAP-ID

The NAP-ID leaf is the identifier of the WiMAX radio access infrastructure provider. For further details on Network Access Provider please refer to the WiMAX Forum Network Architecture version 1.2.2 – Stage 2 [6] and WiMAX Forum Network Architecture Release 1.0 version 1.2.2 – Stage 3 [7].

- Occurrence: One
- Format: int
- Access Types: Get, Replace
- Values: <NAP-ID>

6.3.16 <X>/NetworkList/<X>/CellType

The CellType leaf represents the type of cell. The cell type can be femto, pico, micro or macro.

- Occurrence: One
- Format: chr
- Access Types: Get, Replace
- Values: <Cell type>

6.3.17 <X>/NetworkList/<X>/OperatorDifferentiatedTextField

The OperatorDifferentiatedTextField leaf represents textual information that the operator wants to associate with the access technology.

- Occurrence: ZeroOrOne
- Format: chr
- Access Types: Get, Replace
- Values: <Text field>

The text field contains alphanumeric characters.

6.3.18 <X>/Ext

The Ext is an interior node for where the vendor specific information about the WND5 MO is placed (vendor can be application vendor, device vendor etc.). Usually the vendor extension is identified by vendor specific name under the ext node. The tree structure under the vendor identifier is not defined and can therefore include one or more un-standardized sub-trees.

- Occurrence: ZeroOrOne
- Format: node
- Access Types: Get
- Values: N/A

Annex A (informative): ANDSF MO DDF

This DDF is the standardized minimal set. A vendor can define its own DDF for the complete device. This DDF can include more features than this minimal standardized version.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE MgmtTree PUBLIC "-//OMA//DTD-DM-DDF 1.2//EN"
"http://www.openmobilealliance.org/tech/DTD/dm_ddf-v1_2.dtd">

<MgmtTree>
  <VerDTD>1.2</VerDTD>
  <Man>--The device manufacturer--</Man>
  <Mod>--The device model--</Mod>

  <Node>
    <NodeName>ANDSF</NodeName>
    <DFProperties>
      <AccessType>
        <Get/>
      </AccessType>
      <Description>ANDSF settings</Description>
      <DFFormat>
        <node/>
      </DFFormat>
      <Occurrence>
        <ZeroOrOne/>
      </Occurrence>
      <DFTitle>The ANDSF Management Object.</DFTitle>
      <DFType>
        <DDFName/>
      </DFType>
    </DFProperties>

    <Node>
      <NodeName>Name</NodeName>
      <DFProperties>
        <AccessType>
          <Get/>
        </AccessType>
        <DFFormat>
          <chr/>
        </DFFormat>
        <Occurrence>
          <ZeroOrOne/>
        </Occurrence>
        <DFTitle>User displayable name for the node.</DFTitle>
        <DFType>
          <MIME>text/plain</MIME>
        </DFType>
      </DFProperties>
    </Node>

    <Node>
      <NodeName>Policy</NodeName>
      <!-- The Policy node starts here. -->
      <DFProperties>
        <AccessType>
          <Get/>
          <Replace/>
        </AccessType>
        <DFFormat>
          <node/>
        </DFFormat>
        <Occurrence>
          <ZeroOrOne/>
        </Occurrence>
        <DFTitle>Policies for access network selection.</DFTitle>
        <DFType>
          <DDFName/>
        </DFType>
      </DFProperties>
    </Node>
  </MgmtTree>

```

```

<Node>
  <NodeName></NodeName>
  <DFProperties>
    <AccessType>
      <Get/>
      <Replace/>
    </AccessType>
    <DFFormat>
      <node/>
    </DFFormat>
    <Occurrence>
      <OneOrMore/>
    </Occurrence>
    <DFType>
      <DDFName></DDFName>
    </DFType>
  </DFProperties>

  <Node>
    <NodeName>RulePriority</NodeName>
    <DFProperties>
      <AccessType>
        <Get/>
        <Replace/>
      </AccessType>
      <DFFormat>
        <int/>
      </DFFormat>
      <Occurrence>
        <One/>
      </Occurrence>
      <DFTitle>Rule priority.</DFTitle>
      <DFType>
        <MIME>text/plain</MIME>
      </DFType>
    </DFProperties>
  </Node>

  <Node>
    <NodeName>PrioritizedAccess</NodeName>
    <DFProperties>
      <AccessType>
        <Get/>
        <Replace/>
      </AccessType>
      <DFFormat>
        <node/>
      </DFFormat>
      <Occurrence>
        <One/>
      </Occurrence>
      <DFTitle>Prioritized access.</DFTitle>
      <DFType>
        <DDFName/>
      </DFType>
    </DFProperties>

  <Node>
    <NodeName></NodeName>
    <DFProperties>
      <AccessType>
        <Get/>
        <Replace/>
      </AccessType>
      <DFFormat>
        <node/>
      </DFFormat>
      <Occurrence>
        <OneOrMore/>
      </Occurrence>
      <DFType>
        <DDFName></DDFName>
      </DFType>
    </DFProperties>

  <Node>
    <NodeName>AccessTechnology</NodeName>
    <DFProperties>

```

```

        <AccessType>
          <Get/>
          <Replace/>
        </AccessType>
        <DFFormat>
          <int/>
        </DFFormat>
        <Occurrence>
          <One/>
        </Occurrence>
        <DFTitle>Access technology.</DFTitle>
        <DFType>
          <MIME>text/plain</MIME>
        </DFType>
      </DFProperties>
    </Node>

    <Node>
      <NodeName>Access Id</NodeName>
      <DFProperties>
        <AccessType>
          <Get/>
          <Replace/>
        </AccessType>
        <DFFormat>
          <chr/>
        </DFFormat>
        <Occurrence>
          <ZeroOrOne/>
        </Occurrence>
        <DFTitle>Access identity.</DFTitle>
        <DFType>
          <MIME>text/plain</MIME>
        </DFType>
      </DFProperties>
    </Node>

    <Node>
      <NodeName>SecondaryAccess Id</NodeName>
      <DFProperties>
        <AccessType>
          <Get/>
          <Replace/>
        </AccessType>
        <DFFormat>
          <chr/>
        </DFFormat>
        <Occurrence>
          <ZeroOrOne/>
        </Occurrence>
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    <Node>
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</Node>

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    </DFFormat>
    <Occurrence>
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    </Occurrence>
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    </DFType>
  </DFProperties>

  <Node>
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        <Replace/>
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      </DFType>
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      <NodeName></NodeName>
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          <Get/>
          <Replace/>
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        <DFFormat>
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        </DFFormat>
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        <Occurrence>
          <One/>
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  </AccessType>
  <DFFormat>
    <chr/>
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  <Occurrence>
    <ZeroOrOne/>
  </Occurrence>
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<Node>
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      <chr/>
    </DFFormat>
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<Node>
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</Node>
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    </Occurrence>
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</Node>

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  </DFProperties>

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        <Replace />
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      </DFFormat>
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  <Node>
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        <Replace />
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        <chr />
      </DFFormat>
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  </Node>

  <Node>
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        <Replace />
      </AccessType>
      <DFFormat>
        <chr />
      </DFFormat>
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        <ZeroOrOne />
      </Occurrence>

```

```

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</Node>
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        </Occurrence>
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            <DDFName/>
        </DFType>
    </DFProperties>
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                <Replace/>
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                <node/>
            </DFFormat>
            <Occurrence>
                <ZeroOrOne/>
            </Occurrence>
            <DFTitle>Circular location descripton.</DFTitle>
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                <DDFName/>
            </DFType>
        </DFProperties>
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                <Replace/>
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                <OneOrMore/>
            </Occurrence>
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            </DFType>
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                <Replace/>
            </AccessType>
            <DFFormat>
                <chr/>
            </DFFormat>
            <Occurrence>
                <One/>
            </Occurrence>

```

```

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        </DFType>
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</Node>

<Node>
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            <Replace/>
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        </Occurrence>
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</Node>

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            <Replace/>
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        <Occurrence>
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        </Occurrence>
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</Node>
</Node>
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        </DFFormat>
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            <ZeroOrOne/>
        </Occurrence>
        <DFTitle>Rule priority.</DFTitle>
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        </DFType>
    </DFProperties>
</Node>

<Node>
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    <DFProperties>
        <AccessType>
            <Get/>
            <Replace/>
        </AccessType>

```

```

    <DFFormat>
      <chr/>
    </DFFormat>
    <Occurrence>
      <One/>
    </Occurrence>
    <DFTitle>PLMN which created the policy.</DFTitle>
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    </DFType>
  </DFProperties>
</Node>

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      <Replace/>
    </AccessType>
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    </DFFormat>
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    </DFType>
  </DFProperties>

  <Node>
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        <Replace/>
      </AccessType>
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        <node/>
      </DFFormat>
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        <OneOrMore/>
      </Occurrence>
      <DFType>
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      </DFType>
    </DFProperties>

    <Node>
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          <Replace/>
        </AccessType>
        <DFFormat>
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        </DFFormat>
        <Occurrence>
          <ZeroOrOne/>
        </Occurrence>
        <DFTitle>Start condition for time of rule.</DFTitle>
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        </DFType>
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    <Node>
      <NodeName>TimeStop</NodeName>
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        <DFFormat>

```

```

        <int/>
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    </Occurrence>
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    </DFType>
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<Node>
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      <Replace/>
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    </DFFormat>
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    </DFFormat>
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    </Occurrence>
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  </DFProperties>
</Node>
</Node>

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    </Occurrence>
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</Node>

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<!-- The DiscoveryInformation node starts here. -->
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  </DFFormat>
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  </Occurrence>
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    <DDFName/>
  </DFType>
</DFProperties>

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    </DFType>
  </DFProperties>

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```

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```

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</Node>

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    </DFProperties>

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      <OneOrMore/>
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    </DFType>
  </DFProperties>
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      <Get/>
      <Replace/>
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    </DFFormat>
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  </DFProperties>
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</Node>

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    </Occurrence>
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    </DFType>
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</Node>

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    </DFFormat>
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    </DFType>
  </DFProperties>

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        <Replace/>
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      </DFFormat>
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        <OneOrMore/>
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    </DFProperties>

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        <ZeroOrOne/>
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  </Node>

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    </DFProperties>
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      <One/>
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      <DDFName/>
    </DFType>
  </DFProperties>

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          <ZeroOrOne/>
        </Occurrence>
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    <Node>
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```

```

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      </Occurrence>
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    </DFProperties>
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      <DFFormat>
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        <One/>
      </Occurrence>
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</Node>

  <Node>
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</Node>

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```

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        <Replace/>
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  <Node>
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        <ZeroOrOne/>
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</Node>

<Node>
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  <!-- The UE_Profile node starts here. -->
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    </Occurrence>
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        <One/>
      </Occurrence>
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    </DFProperties>
  </Node>
</Node>
</Node>

<Node>
  <NodeName>Ext</NodeName>
  <!-- The Extension node starts here. -->
  <DFProperties>
    <AccessType>
      <Get/>
    </AccessType>
    <DFFormat>
      <node/>
    </DFFormat>
    <Occurrence>
      <ZeroOrOne/>
    </Occurrence>
    <DFTitle>A collection of all Extension objects</DFTitle>
    <DFType>
      <DDFName/>
    </DFType>
  </DFProperties>
</Node>
</Node>
</MgmtTree>

```

Annex B (informative): WNDS MO DDF

This DDF is the standardized minimal set. A vendor can define its own DDF for the complete device. This DDF can include more features than this minimal standardized version.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE MgmtTree PUBLIC "-//OMA//DTD-DM-DDF 1.2//EN"
"http://www.openmobilealliance.org/tech/DTD/dm_ddf-v1_2.dtd">

<MgmtTree>
  <VerDTD>1.2</VerDTD>
  <Man>--The device manufacturer--</Man>
  <Mod>--The device model--</Mod>

  <Node>
    <NodeName>WiMAX_NDS</NodeName>
    <DFProperties>
      <AccessType>
        <Get/>
      </AccessType>
      <Description>WiMAX NDS settings</Description>
      <DFFormat>
        <node/>
      </DFFormat>
      <Occurrence>
        <ZeroOrOne/>
      </Occurrence>
      <DFTitle>The WiMAX NDS Management Object.</DFTitle>
      <DFType>
        <DDFName/>
      </DFType>
    </DFProperties>

    <Node>
      <NodeName>Name</NodeName>
      <DFProperties>
        <AccessType>
          <Get/>
        </AccessType>
        <DFFormat>
          <chr/>
        </DFFormat>
        <Occurrence>
          <ZeroOrOne/>
        </Occurrence>
        <DFTitle>User displayable name for the node.</DFTitle>
        <DFType>
          <MIME>text/plain</MIME>
        </DFType>
      </DFProperties>
    </Node>

    <Node>
      <NodeName>NetworkList</NodeName>
      <!-- The NetworkList node starts here. -->
      <DFProperties>
        <AccessType>
          <Get/>
          <Replace/>
        </AccessType>
        <DFFormat>
          <node/>
        </DFFormat>
        <Occurrence>
          <ZeroOrOne/>
        </Occurrence>
        <DFTitle>Properties for each of the network in NetworkList.</DFTitle>
        <DFType>
          <DDFName/>
        </DFType>
      </DFProperties>
    </Node>
  </MgmtTree>

```

```

<Node>
  <NodeName/>
  <DFProperties>
    <AccessType>
      <Get/>
      <Replace/>
    </AccessType>
    <DFFormat>
      <node/>
    </DFFormat>
    <Occurrence>
      <OneOrMore/>
    </Occurrence>
    <DFTitle>The "name" node for properties of NetworkList.</DFTitle>
    <DFType>
      <DDFName/>
    </DFType>
  </DFProperties>

<Node>
  <NodeName>FrequencyInfo</NodeName>
  <!-- The FrequencyInfo node starts here. -->
  <DFProperties>
    <AccessType>
      <Get/>
    </AccessType>
    <DFFormat>
      <node/>
    </DFFormat>
    <Occurrence>
      <One/>
    </Occurrence>
    <DFTitle>Frequency Information for the network.</DFTitle>
    <DFType>
      <DDFName/>
    </DFType>
  </DFProperties>

  <Node>
    <NodeName/>
    <DFProperties>
      <AccessType>
        <Get/>
      </AccessType>
      <DFFormat>
        <node/>
      </DFFormat>
      <Occurrence>
        <OneOrMore/>
      </Occurrence>
      <DFTitle>The "name" node for frequency Information of network.</DFTitle>
      <DFType>
        <DDFName/>
      </DFType>
    </DFProperties>

  <Node>
    <NodeName>FirstFreq</NodeName>
    <DFProperties>
      <AccessType>
        <Get/>
        <Replace/>
      </AccessType>
      <DFFormat>
        <int/>
      </DFFormat>
      <Occurrence>
        <One/>
      </Occurrence>
      <DFTitle>The First Center Frequency.</DFTitle>
      <DFType>
        <MIME>text/plain</MIME>
      </DFType>
    </DFProperties>
  </Node>

<Node>

```



```

<NodeName>LastFreq</NodeName>
<DFProperties>
  <AccessType>
    <Get/>
    <Replace/>
  </AccessType>
  <DFFormat>
    <int/>
  </DFFormat>
  <Occurrence>
    <One/>
  </Occurrence>
  <DFTitle>The Last Center Frequency.</DFTitle>
  <DFType>
    <MIME>text/plain</MIME>
  </DFType>
</DFProperties>
</Node>

<Node>
  <NodeName>NextFreqStep</NodeName>
  <DFProperties>
    <AccessType>
      <Get/>
      <Replace/>
    </AccessType>
    <DFFormat>
      <int/>
    </DFFormat>
    <Occurrence>
      <One/>
    </Occurrence>
    <DFTitle>The frequency step for next central frequency.</DFTitle>
    <DFType>
      <MIME>text/plain</MIME>
    </DFType>
  </DFProperties>
</Node>

<Node>
  <NodeName>ChannelBandwidth</NodeName>
  <DFProperties>
    <AccessType>
      <Get/>
      <Replace/>
    </AccessType>
    <DFFormat>
      <int/>
    </DFFormat>
    <Occurrence>
      <One/>
    </Occurrence>
    <DFTitle>The channel bandwidth in KHz.</DFTitle>
    <DFType>
      <MIME>text/plain</MIME>
    </DFType>
  </DFProperties>
</Node>

<Node>
  <NodeName>DuplexMode</NodeName>
  <DFProperties>
    <AccessType>
      <Get/>
      <Replace/>
    </AccessType>
    <DFFormat>
      <int/>
    </DFFormat>
    <Occurrence>
      <One/>
    </Occurrence>
    <DFTitle>The duplex mode for this channel.</DFTitle>
    <DFType>
      <MIME>text/plain</MIME>
    </DFType>
  </DFProperties>
</Node>

```

```

<Node>
  <NodeName>FFTSize</NodeName>
  <DFProperties>
    <AccessType>
      <Get/>
      <Replace/>
    </AccessType>
    <DFFormat>
      <int/>
    </DFFormat>
    <Occurrence>
      <One/>
    </Occurrence>
    <DFTitle>The FFT size for this channel.</DFTitle>
    <DFType>
      <MIME>text/plain</MIME>
    </DFType>
  </DFProperties>
</Node>

<Node>
  <NodeName>Preambles</NodeName>
  <DFProperties>
    <AccessType>
      <Get/>
      <Replace/>
    </AccessType>
    <DFFormat>
      <chr/>
    </DFFormat>
    <Occurrence>
      <One/>
    </Occurrence>
    <DFTitle>The Preambles for this channel.</DFTitle>
    <DFType>
      <MIME>text/plain</MIME>
    </DFType>
  </DFProperties>
</Node>
</Node>
</Node>

<Node>
  <NodeName>CellType</NodeName>
  <DFProperties>
    <AccessType>
      <Get/>
      <Replace/>
    </AccessType>
    <DFFormat>
      <int/>
    </DFFormat>
    <Occurrence>
      <One/>
    </Occurrence>
    <DFTitle>The Cell Type.</DFTitle>
    <DFType>
      <MIME>text/plain</MIME>
    </DFType>
  </DFProperties>
</Node>

<Node>
  <NodeName>NAP-ID</NodeName>
  <DFProperties>
    <AccessType>
      <Get/>
      <Replace/>
    </AccessType>
    <DFFormat>
      <int/>
    </DFFormat>
    <Occurrence>
      <One/>
    </Occurrence>
    <DFTitle>The Network Access Provider Identifier.</DFTitle>

```

```
        <DFType>
          <MIME>text/plain</MIME>
        </DFType>
      </DFProperties>
    </Node>
  </Node>
</Node>

  <Node>
    <NodeName>OperatorDifferentiatedTextField</NodeName>
    <DFProperties>
      <AccessType>
        <Get/>
        <Replace/>
      </AccessType>
      <DFFormat>
        <chr/>
      </DFFormat>
      <Occurrence>
        <ZeroOrOne/>
      </Occurrence>
      <DFTitle>The differentiated operator text field for this cell.</DFTitle>
      <DFType>
        <MIME>text/plain</MIME>
      </DFType>
    </DFProperties>
  </Node>

<Node>
  <NodeName>Ext</NodeName>
  <!-- The Extension node starts here. -->
  <DFProperties>
    <AccessType>
      <Get/>
    </AccessType>
    <DFFormat>
      <node/>
    </DFFormat>
    <Occurrence>
      <ZeroOrOne/>
    </Occurrence>
    <DFTitle>A collection of all Extension objects.</DFTitle>
    <DFType>
      <DDFName/>
    </DFType>
  </DFProperties>
</Node>
</Node>
</MgmtTree>
```

Annex C (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2008-10	CT1#55 bis				Includes the following contributions agreed by CT1: C1-084148, C1-084151, C1-084557, C1-084451, C1-084452, C1-084558, C1-084559, C1-084560		0.1.0
2008-11	CT1#56				Includes the following contributions agreed by CT1: C1-084830, C1-085155, C1-085346, C1-085535, C1-085554, C1-085343, C1-085536, C1-085347, C1-085339 Alignments and cleanups by the rapporteur	0.1.0	0.2.0
2008-11					Version 1.0.0 created for presentation to CT#42 for information and approval	0.2.0	1.0.0
2008-12	CT#42				Version 8.0.0 created after approval in CT#42	1.0.0	8.0.0
2009-03	CT#43	CP-090125	0001	4	Adding ConnMO reference and Correct the Alert Type	8.0.0	8.1.0
2009-03	CT#43	CP-090131	0005		urn for the ANDSF MO registered by OMNA	8.0.0	8.1.0
2009-03	CT#43	CP-090130	0007	1	TimeOfDay Modification	8.0.0	8.1.0
2009-03	CT#43	CP-090128	0012	2	Geo_location identifiers	8.0.0	8.1.0
2009-03	CT#43	CP-090127	0016	2	Corrections and cleanups of the ANDSF MO	8.0.0	8.1.0
2009-03	CT#43	CP-090127	0017	2	Creating the DDF for the ANDSF MO	8.0.0	8.1.0
2009-03	CT#43	CP-090129	0019	1	Removal of editor's notes	8.0.0	8.1.0
2009-06	CT#44	CP-090413	0008	3	Additional 3GPP cell identities in ANDSF MO	8.1.0	8.2.0
2009-06	CT#44	CP-090413	0020	1	urn for the WNDS MO registered by OMNA and minor corrections	8.1.0	8.2.0
2009-06	CT#44	CP-090413	0021	2	Clarifications and clean-ups	8.1.0	8.2.0
2009-06	CT#44	CP-090413	0024	2	Updates and corrections to the the WNDS MO	8.1.0	8.2.0
2009-09	CT#45	CP-090655	0028	4	Correction of ANDSF initiated provisioning	8.2.0	8.3.0
2009-09	CT#45	CP-090655	0029	1	Format type correction	8.2.0	8.3.0
2009-09	CT#45	CP-090655	0030	1	Corrections to ANDSF MO to align with HESSID of 802.11	8.2.0	8.3.0
2009-12	CT#46	CP-090901	0034	2	Aligning ANDSF MO to request from IEEE 802.11 and to refer to IEEE 802.11u	8.3.0	8.4.0
2009-12	CT#46	CP-090901	0036		Naming of ANDSF MO tree	8.3.0	8.4.0
2009-12	CT#46	CP-090937	0033	3	PLMN information to ANDSF for roaming UE	8.4.0	9.0.0
2010-03	CT#47	CP-100107	0038	1	Usage of AccessNetworkArea in DiscoveryInformation node	9.0.0	9.1.0
2010-03	CT#47	CP-100134	0042		Correcting requirement on UEs detection of networks and reserved values for AccessNetwork	9.0.0	9.1.0
2010-09	CT#49	CP-100513	0045	1	24.312 changes for Inter System Routing Policies (ISRP)	9.1.0	10.0.0
2010-12	CT#50	CP-100754	0046	1	Definition and extension of ISRP	10.0.0	10.1.0
2011-03	CT#51	CP-110197	0049		XML representation of leaf and node names starting with a digit	10.1.0	10.2.0
2011-03	CT#51	CP-110185	0051	2	IFOM capability discovery through ISRP – ANDSF	10.1.0	10.2.0
2011-03	CT#51	CP-110185	0054	2	ISRP trigger	10.1.0	10.2.0
2011-03	CT#51	CP-110185	0055	1	ISRP XML file	10.1.0	10.2.0
2011-03	CT#51	CP-110185	0056	1	Usage of ISRP and conflicts resolution	10.1.0	10.2.0
2011-03	CT#51	CP-110185	0050	3	ANDSF MO support for Non-seamless WLAN Offload	10.1.0	10.2.0
2011-03	CT#51	CP-110185	0057	1	ISRP - definition of coding for IP parameters ISRP	10.1.0	10.2.0
2011-03	CT#51	CP-110185	0058	3	ISRP – definition of coding for protocol type	10.1.0	10.2.0
2011-03	CT#51	CP-110185	0059	1	ISRP – definition of coding for QoS	10.1.0	10.2.0
2011-03	CT#51	CP-110185	0060	1	Clarification of source and destination IP addresses and port usage	10.1.0	10.2.0
2011-04					Correction of style in clause 2	10.2.0	10.2.1
2011-06	CT#52	CP-110478	0063	1	IP address representation clarification for IP address nodes	10.2.1	10.3.0
2011-06	CT#52	CP-110478	0062	1	New subclause structure and cleanups	10.2.1	10.3.0
2011-09	CT#53	CP-110676	0066	1	Incomplete non-seamless WLAN offload feature name	10.3.0	10.4.0
2011-09	CT#53	CP-110668	0074	2	Clarification of ANDSF file to use	10.3.0	10.4.0
2011-09	CT#53	CP-110695	0064		Correction of the unused value in Prioritized Access Technology for ISMP	10.4.0	11.0.0
2011-09	CT#53	CP-110695	0065	1	Definition of reserved code point	10.4.0	11.0.0
2011-09	CT#53	CP-110695	0067	1	Clarification for non-seamless WLAN offload IP address leaves	10.4.0	11.0.0
2011-09	CT#53	CP-110695	0070	1	Correction of occurrences of ISRP RoutingRule node	10.4.0	11.0.0
2011-09	CT#53	CP-110694	0072	1	Clarification on usage of policy node without AccessId definition	10.4.0	11.0.0
2011-12	CT#54	CP-110882	0076	4	Handling ForServiceBased ISRP where APN leaf is absent	11.0.0	11.1.0
2011-12	CT#54	CP-110882	0079	1	Correction of the scope of RulePriority	11.0.0	11.1.0
2011-12	CT#54	CP-110882	0080	1	Access technologies for IFOM	11.0.0	11.1.0
2012-03	CT#55	CP-120127	0083	1	Adding domain name to ISRPs	11.1.0	11.2.0
2012-03	CT#55	CP-120108	0085	1	Correction of a terminology in EndDestIPaddress leaf	11.1.0	11.2.0
2012-06	CT#56	CP-120309	0087	1	APN leaf usage	11.2.0	11.3.0
2012-06	CT#56	CP-120294	0088	3	Correction of WLAN_Location	11.2.0	11.3.0
2012-06	CT#56	CP-120309	0089	3	Correction to the validity constraint within ISMP	11.2.0	11.3.0
2012-06	CT#56	CP-120309	0090	3	Correction to the validity constraint within ISRP	11.2.0	11.3.0

2012-09	CT#57	CP-120584	0096	1	Type of generic alert	11.3.0	11.4.0
2012-09	CT#57	CP-120602	0098	3	Application-ID	11.3.0	11.4.0
2012-12	CT#58	CP-120811	0101		Forward compatibility rules	11.4.0	11.5.0
2012-12	CT#58	CP-120794	0103	5	Clarification of TimeStop and DateStop	11.4.0	11.5.0
2012-12	CT#58	CP-120794	0105		Clarification of the QoS leaf in ISRP	11.4.0	11.5.0
2012-12	CT#58	CP-120794	0106	1	Clarification of UE behaviour when the ISMP rule leaf is not provisioned	11.4.0	11.5.0
2012-12	CT#58	CP-120811	0108	6	Operating System definition for DIDA	11.4.0	11.5.0
2012-12	CT#58	CP-120811	0109	1	DDF in support of DIDA functionality	11.4.0	11.5.0
2012-12	CT#58	CP-120794	0110		DDF corrections	11.4.0	11.5.0
2012-12	CT#58	CP-120794	0112	3	UE location info in alert message	11.4.0	11.5.0
2013-03	CT#59	CP-130115	0115	1	Sending UE_Profile in Generic Alert	11.5.0	11.6.0
2013-03	CT#59	CP-130115	0116	1	ISRP policy matching when multiple flow descriptions exist	11.5.0	11.6.0
2013-03	CT#59	CP-130115	0117		Ignoring information element	11.5.0	11.6.0
2013-03	CT#59	CP-130118	0119	1	Correction to OSId leaf in UE_Profile	11.5.0	11.6.0