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**Universal Mobile Telecommunications System (UMTS);
LTE;
3GPP System to Wireless Local Area Network (WLAN)
interworking Management Object (MO)
(3GPP TS 24.235 version 12.1.0 Release 12)**



Reference

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Foreword

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1 Scope

This document defines the 3GPP System to Wireless Local Area Network interworking Management Object (MO) for I-WLAN PLMN selection as specified in 3GPP TS 24.234 [3]. The management object is compatible with OMA Device Management protocol specifications, version 1.2 and upwards, and is defined using the OMA DM Device Description Framework as described in the Enabler Release Definition OMA-ERELED_DM-V1_2 [2].

The 3GPP System to Wireless Local Area Network interworking Management Object consists of relevant parameters that can be managed for WLAN UE as specified in 3GPP TS 24.234 [3].

The Access Network Discovery and Selection Function MO as specified in 3GPP TS 24.312 [13] supersedes the Wireless Local Area Network interworking MO for I-WLAN PLMN selection from Rel-12 onwards.

No further changes to this specification are intended. If any future evolution of the procedures in this specification is necessary, it should be documented in other specifications.

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] OMA-ERELED-DM-V1_2: "Enabler Release Definition for OMA Device Management".
- [3] 3GPP TS 24.234: "3GPP System to Wireless Local Area Network (WLAN) interworking; WLAN User Equipment (WLAN UE) to network protocols".
- [4] Void.
- [5] Void.
- [6] 3GPP TS 31.102: "Characteristics of the USIM application".
- [7] "Unicode 5.1.0, Unicode Standard Annex #15; Unicode Normalization Forms", March 2008.
<http://www.unicode.org>
- [8] IETF RFC 4282: "The Network Access Identifier".
- [9] 3GPP TS 23.003: "Numbering, addressing and identification".
- [10] 3GPP TS 23.002: "Network architecture".
- [11] IETF RFC 3629: "UTF-8, a transformation format of ISO 10646".
- [12] 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".
- [13] 3GPP TS 24.312: "Access Network Discovery and Selection Function (ANDSF) Management Object (MO)".

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.

For the purposes of the present document, the following term given in 3GPP TS 23.002 [10] applies:

WLAN UE

3.2 Abbreviations

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

ACL	Access Control List
DDF	Device Description Framework
DM	Device Management
HPLMN	Home PLMN
I-WLAN	Interworking Wireless Local Area Network
MCC	Mobile Country Code
MNC	Mobile Network Code
MO	Management Object
OMA	Open Mobile Alliance
PLMN	Public Land Mobile Network
SSID	Service Set ID
UE	User Equipment

4 I-WLAN Management Object

The 3GPP System to Wireless Local Area Network interworking Management Object (MO) is used to configure WLAN UE behavior for 3GPP System to Wireless Local Area Network as specified in 3GPP TS 24.234 [3].

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

Protocol compatibility: This MO is compatible with OMA DM 1.2.

The OMA DM Access Control List (ACL) property mechanism (see OMA-ERELED-DM-V1_2 [2]) may be used to grant or deny access rights to OMA DM servers in order to modify nodes and leaf objects of the I-WLAN MO.

The following nodes and leaf objects are possible under the I-WLAN node as described in figure 4-1:

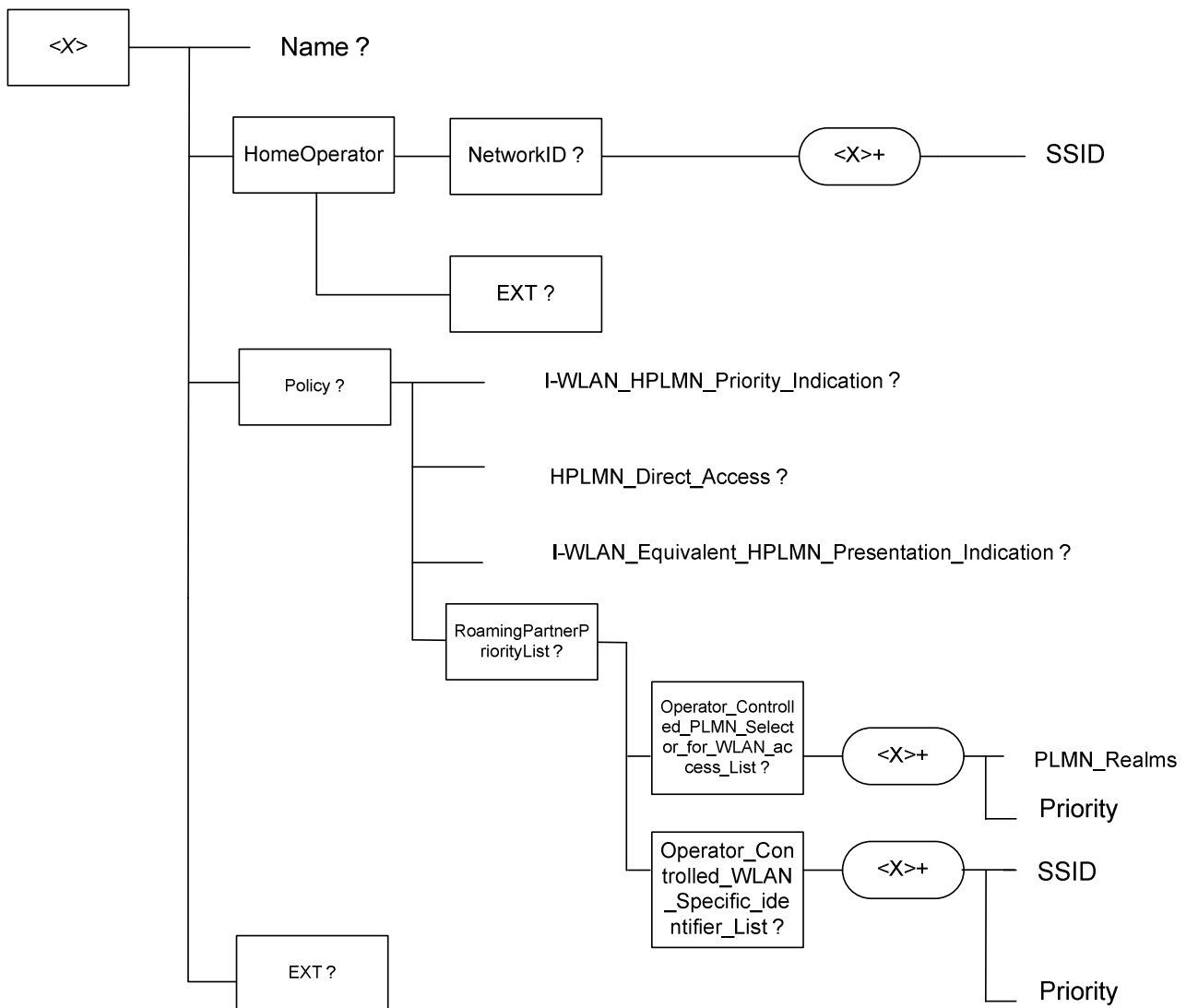


Figure 4-1: The 3GPP system to WLAN interworking Management Object

5 Management Object parameters

5.1 General

This clause describes the parameters for the 3GPP system to WLAN interworking MO. The parameters identified in this section correspond to those operator specific files defined in 3GPP TS 24.234 [3] clause 7. This section defines only how the parameters are structured and obtained by means of OMA DM.

5.2 Node: /<X>

This interior node acts as a placeholder for a fixed node.

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

- Values: N/A

5.3 <X>/Name

The Name leaf is a name for the 3GPP system to WLAN interworking 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 [7].

5.4 /<X>/HomeOperator/

The HomeOperator interior node is used to allow a reference to information required by the WLAN UE to identify and access the home network.

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

5.5 /<X>/HomeOperator/NetworkID

The NetworkID interior node is used to allow a reference to a list of SSIDs that identify WLANs that have a direct relationship with the Home PLMN (HPLMN).

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

5.6 /<X>/HomeOperator/NetworkID/<X>

This run-time node acts as a placeholder for one or more SSIDs.

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

5.7 /<X>/HomeOperator/NetworkID/<X>/SSID

The SSID leaf identifies the SSID for a particular preferred WLAN network as defined in 3GPP TS 24.234 [3] subclause 7.6b.

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

The format of the SSID is defined by IEEE Std 802.11™-2007 [12].

5.8 /<X>/HomeOperator/Ext/

The Ext is an interior node for where the vendor specific information about the 3GPP System to Wireless Local Area Network 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 identified is not defined and can therefore include one or more un-standardized sub-trees.

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

5.9 /<X>/Policy/

The Policy interior node is used to reference to information required by the WLAN UE to access an I-WLAN and PLMN while roaming.

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

5.10 /<X>/Policy/I-WLAN_HPLMN_Priority_Indication

The I-WLAN_HPLMN_Priority_Indication leaf is defined in 3GPP TS 24.234 [3] subclause 7.10.

- Occurrence: ZeroOrOne
- Format: bin
- Access Types: Get, Replace
- Values:< I-WLAN_HPLMN_Priority_Indication >

The format and value of the I-WLAN_HPLMN_Priority_Indication is defined by 3GPP TS 31.102 [6] subclause 4.4.5.9.

5.11 /<X>/Policy/HPLMN_Direct_Access

The HPLMN_Direct_Access leaf corresponds to HPLMN Direct Access Indicator as defined in 3GPP TS 24.234 [3] subclause 7.11.

- Occurrence: ZeroOrOne
- Format: bin

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

The format and value of the HPLMN_Direct_Access is defined by 3GPP TS 31.102 [6] subclause 4.4.5.11.

5.12 /<X>/Policy/I-WLAN_Equivalent_HPLMN_Presentation_Indication

The I-WLAN_Equivalent_HPLMN_Presentation_Indication leaf is defined in 3GPP TS 24.234 [3] subclause 7.12.

- Occurrence: ZeroOrOne
- Format: bin
- Access Types: Get, Replace
- Values: <I-WLAN_Equivalent_HPLMN_Presentation_Indication >

The format and value of the I-WLAN_Equivalent_HPLMN_Presentation_Indication is defined by 3GPP TS 31.102 [6] subclause 4.4.5.8.

5.13 /<X>/Policy/RoamingPartnerPriorityList/

The RoamingPartnerPriorityList interior node is used to reference to information required by the WLAN UE to access an I-WLAN and PLMN while roaming.

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

5.14 /<X>/Policy/RoamingPartnerPriorityList/Operator_Controlled_PLMN_Selector_for_WLAN_access_List

The Operator_Controlled_PLMN_Selector_for_WLAN_access_List interior node is used to identify the roaming partner realms.

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

5.15 /<X>/Policy/RoamingPartnerPriorityList/Operator_Controlled_PLMN_Selector_for_WLAN_access_List/<X>

This run-time node acts as a placeholder for one or more PLMN_Realms.

- Occurrence: OneOrMore
- Format: node

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

5.16 /<X>/Policy/RoamingPartnerPriorityList/ Operator_Controlled_PLMN_Selector_for_WLAN_access_List/<X>/PLMN_Realms

The PLMN_Realms leaf defines a preferred roaming partner realm and corresponds to an entry of Operator Controlled PLMN Selector for I-WLAN access as defined in 3GPP TS 24.234 [3] subclause 7.5.

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

The PLMN_Realms contains a PLMN identifier (see 3GPP TS 23.003 [9]) that shall be in the form of an Internet domain name as defined by IETF RFC 4282 [8]. The syntax of the PLMN_Realms shall be as follows:

1. take the PLMN identifier (see 3GPP TS 23.003 [9]) and separate into MCC and MNC; if the MNC is 2 digits then a zero shall be added at the beginning;
2. use the MCC and MNC derived in step 1 to create the "mnc<MNC>.mcc<MCC>.3gppnetwork.org" domain name;
3. add the label "wlan." to the beginning of the domain name.

5.17 <X>/Policy/RoamingPartnerPriorityList/ Operator_Controlled_PLMN_Selector_for_WLAN_access_List/<X>Priority

The Priority leaf represents the priority given to one Operator_Controlled_PLMN_Selector_for_WLAN_access_List entry and is represented as a numerical value.

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

In case more than one valid entry in Operator_Controlled_PLMN_Selector_for_WLAN_access_List exists, the WLAN UE shall treat the Operator_Controlled_PLMN_Selector_for_WLAN_access_List entry with the lowest Priority value as the Operator_Controlled_PLMN_Selector_for_WLAN_access_List entry having the highest priority.

5.18 /<X>/Policy/RoamingPartnerPriorityList/ Operator_Controlled_WLAN_Specific_identifier_List

The Operator_Controlled_WLAN_Specific_identifier_List interior node is to identify the preferred SSIDs the WLAN UE should scan for.

- Occurrence: ZeroOrOne
- Format: node

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

5.19 /<X>/Policy/RoamingPartnerPriorityList/ Operator_Controlled_WLAN_Specific_identifier_List/<X>

This run-time node acts as a placeholder for one or more SSID.

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

5.20 /<X>/Policy/RoamingPartnerPriorityList/ Operator_Controlled_WLAN_Specific_identifier_List /<X>/SSID

The SSID leaf defines the SSID for a particular preferred WLAN network as defined in 3GPP TS 24.234 [3] subclause 7.6a.

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

The format of the SSID is defined by IEEE Std 802.11™-2007 [12].

5.21 <X>/Policy/RoamingPartnerPriorityList/ Operator_Controlled_WLAN_Specific_identifier_List /<X>Priority

The Priority leaf represents the priority given to one Operator_Controlled_WLAN_Specific_identifier_List entry and is represented as a numerical value.

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

In case more than one valid entry in Operator_Controlled_WLAN_Specific_identifier_List exists, the WLAN UE shall treat the Operator_Controlled_WLAN_Specific_identifier_List entry with the lowest Priority value as the Operator_Controlled_WLAN_Specific_identifier_List entry having the highest priority.

5.22 /<X>/Ext/

The Ext is an interior node for where the vendor specific information about the 3GPP System to Wireless Local Area Network interworking 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 identified is not defined and can therefore include one or more un-standardized sub-trees.

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

Annex A (informative): Management Object 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>
  <Node>
    <NodeName>IWLAN</NodeName>
    <DFProperties>
      <AccessType>
        <Get/>
      </AccessType>
      <Description> IWLAN settings</Description>
      <DFFormat>
        <node/>
      </DFFormat>
      <Occurrence>
        <OneOrMore/>
      </Occurrence>
      <DFTitle>The IWLAN Management Object.</DFTitle>
      <DFType>
        <DDFName/>
      </DFType>
    </Node>
    <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>
    <NodeName>HomeOperator</NodeName>
    <DFProperties>
      <AccessType>
        <Get/>
        <Replace/>
      </AccessType>
      <DFFormat>
        <node/>
      </DFFormat>
      <Occurrence>
        <ZeroOrOne/>
      </Occurrence>
      <DFTitle>HomeOperator Policy.</DFTitle>
      <DFType>
        <DDFName/>
      </DFType>
    </DFProperties>
    <Node>
      <NodeName>Network_ID</NodeName>
      <DFProperties>
        <AccessType>
          <Get/>
          <Replace/>
        </AccessType>
      </DFProperties>
    </Node>
  </MgmtTree>

```

```

    <DFFormat>
      <node/>
    </DFFormat>
  </DFProperties>
  <Occurrence>
    <ZeroOrOne/>
  </Occurrence>
  <DFTitle>Home Network IDs.</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>SSID</NodeName>
    <DFProperties>
      <AccessType>
        <Get/>
        <Replace/>
      </AccessType>
      <DFFormat>
        <chr/>
      </DFFormat>
      <Occurrence>
        <One/>
      </Occurrence>
      <DFTitle>SSID Reference</DFTitle>
      <DFType>
        <MIME>text/plain</MIME>
      </DFType>
    </DFProperties>
  </Node>
</Node>

<Node>
  <NodeName>Ext</NodeName>
  <!-- The Extension node starts here. -->
  <DFProperties>
    <AccessType>
      <Get/>
      <Replace/>
    </AccessType>
    <DFFormat>
      <node/>
    </DFFormat>
    <Occurrence>
      <ZeroOrOne/>
    </Occurrence>
    <DFTitle>A collection of all Extension objects.</DFTitle>
    <DFType>
      <DDFName/>
    </DFType>
  </DFProperties>
</Node>
<Node>

  <NodeName>Policy</NodeName>
  <DFProperties>
    <AccessType>
      <Get/>

```



```

    <Replace/>
  </AccessType>
  <DFFormat>
    <node/>
  </DFFormat>
  <Occurrence>
    <ZeroOrOne/>
  </Occurrence>
  <DFTitle>Policy Information.</DFTitle>
  <DFType>
    <DDFName/>
  </DFType>
</DFProperties>

<Node>
  <NodeName>I-WLAN_HPLMN_Priority_Indication</NodeName>
  <DFProperties>
    <AccessType>
      <Get/>
      <Replace/>
    </AccessType>
    <DFFormat>
      <bin/>
    </DFFormat>
    <Occurrence>
      <ZeroOrOne/>
    </Occurrence>
    <DFTitle> I-WLAN_HPLMN_Priority_Indication.</DFTitle>
    <DFType>
      <MIME>text/plain</MIME>
    </DFType>
  </DFProperties>
</Node>

<Node>
  <NodeName>HPLMN_Direct_Access</NodeName>
  <DFProperties>
    <AccessType>
      <Get/>
      <Replace/>
    </AccessType>
    <DFFormat>
      <bin/>
    </DFFormat>
    <Occurrence>
      <ZeroOrOne/>
    </Occurrence>
    <DFTitle> HPLMN_Direct_Access.</DFTitle>
    <DFType>
      <MIME>text/plain</MIME>
    </DFType>
  </DFProperties>
</Node>

<Node>
  <NodeName>I-WLAN_Equivalent_HPLMN_Presentation_Indication</NodeName>
  <DFProperties>
    <AccessType>
      <Get/>
      <Replace/>
    </AccessType>
    <DFFormat>
      <bin/>
    </DFFormat>
    <Occurrence>
      <ZeroOrOne/>
    </Occurrence>
    <DFTitle>Access identity.</DFTitle>
    <DFType>
      <MIME>text/plain</MIME>
    </DFType>
  </DFProperties>
</Node>

<Node>
  <NodeName>RoamingPartnerPriorityList</NodeName>
  <DFProperties>
    <AccessType>

```

```

        <Get/>
        <Replace/>
    </AccessType>
    <DFFormat>
        <node/>
    </DFFormat>
    <Occurrence>
        <ZeroOrOne/>
    </Occurrence>
    <DFTitle> RoamingPartnerPriorityLists.</DFTitle>
    <DFType>
        <DDFName/>
    </DFType>
</DFProperties>

<Node>
    <NodeName>Operator_Controlled_PLMN_Selector</NodeName>
    <DFProperties>
        <AccessType>
            <Get/>
            <Replace/>
        </AccessType>
        <DFFormat>
            <node/>
        </DFFormat>
        <Occurrence>
            <ZeroOrOne/>
        </Occurrence>
        <DFTitle> Realm Roaming Partners.</DFTitle>
        <DFType>
            <DDFName/>
        </DFType>
    </DFProperties>

    <Node>
        <NodeName></NodeName>
        <DFProperties>
            <AccessType>
                <Get/>
                <Replace/>
            </AccessType>
            <DFFormat>
                <node/>
            </DFFormat>
            <Occurrence>
                <OneOrMore/>
            </Occurrence>
            <DFType>
                <DDFName></DDFName>
            </DFType>
        </DFProperties>

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Annex B (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2011-01					Version 0.0.1: Preliminary proposal, contained in C1-110880		0.0.1
2011-02					Contained in C1-111199 Updated to include the following: Right clip on the front page Change scope to include PLMN selection Identity that the leafs only cover the operator configurable files in 3GPP TS 24.234 Dereference the OMA WLAN MO Add priority leaf in for SSID and PLMN realm	0.0.1	0.0.2
2011-02					Contained in C1-111491	0.0.2	0.0.3
2011-03	CT-51	CP-110150			Version 1.0.0 created for presentation to CT-51 for information and approval	0.0.3	1.0.0
2011-03	CT-51				Correction of styles Introduce missing abbreviations	1.0.0	1.0.1
2011-03	CT-51				Introduction of the TS-number	1.0.1	1.0.2
2011-03	CT-51				Version 10.0.0 created after approval at CT-51	1.0.2	10.0.0
2011-06	CT-52	CP-110473	0001		MO identifier registered by OMNA	10.0.0	10.1.0
2011-09	CT-53	CP-110694	0002		Correction to terminology and editorials	10.1.0	11.0.0
2012-06	CT-56	CP-120326	0003	1	Corrections and editorial cleanup	11.0.0	11.1.0
2014-09	CT-65				Upgrade to Rel-12	11.1.0	12.0.0
2014-12	CT-6	CP-140836	0004	3	I-WLAN maintenanc	12.0.0	12.1.0

History

Document history		
V12.0.0	October 2014	Publication
V12.1.0	January 2015	Publication