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| Project | **IEEE 802.21a**  **<https://mentor.ieee.org/802.21>** |
| Title | **Revised Basic Schema with 802.21a** |
| DCN | 21-10-0082-01-0sec |
| Date Submitted |  |
| Source(s) | Yoshihiro Ohba (Toshiba) |
| Re: |  |
| Abstract | This document contains revised basic schema supporting 802.21a. The revised schema also refines non-802.21a related parts of the basic schema defined in 802.21-2008. The revised schema is validated by OWL validator http://owl.cs.manchester.ac.uk/validator/. |
| Purpose | Proposes changes in the current draft |
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# Proposal

Replace Annex H as follows.

**Annex H**

**(normative)**

**MIIS basic schema**

The following text defines the RDF vocabularies for MIIS.

(Editor’s Note: First, a new IEEE Registory for RDF schema needs to be created by IEEE Registration Authority. Then the MIIS basic schema needs to be registered with the IEEE Registory for RDF schema, with the text URL\_TO\_BE\_ASSIGNED in <!ENTITY mihbasic "URL\_TO\_BE\_ASSIGNED#"> replaced with the allocated URL. The content of the MIIS basic schema in Annex H will be replaced with a reference to the allocated URL.)

<?xml version="1.0"?>

<!DOCTYPE rdf:RDF [

<!ENTITY rdf "http://www.w3.org/1999/02/22-rdf-syntax-ns#">

<!ENTITY rdfs "http://www.w3.org/2000/01/rdf-schema#">

<!ENTITY mihbasic "URL\_TO\_BE\_ASSIGNED#">

<!ENTITY owl "http://www.w3.org/2002/07/owl#">

<!ENTITY xsd "http://www.w3.org/2001/XMLSchema#">

]>

<rdf:RDF xmlns:rdf="&rdf;" xmlns:rdfs="&rdfs;"

xmlns:mihbasic="&mihbasic;" xml:base="&mihbasic;"

xmlns:owl="&owl;" xmlns:xsd="&xsd;">

<owl:Ontology rdf:about="">

<rdfs:label>

Basic Schema for IEEE 802.21 Information Service

</rdfs:label>

<owl:versionInfo>1.0</owl:versionInfo>

</owl:Ontology>

<owl:DatatypeProperty rdf:ID="ie\_type\_identifier">

<rdfs:subPropertyOf rdf:resource="&rdfs;label"/>

<rdfs:range rdf:resource="&xsd;hexBinary"/>

<rdfs:comment>

A type identifier values for Information Elements.

</rdfs:comment>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="bit\_number">

<rdfs:range rdf:resource="&xsd;unsignedByte"/>

<rdfs:comment>

This property represents a bit number that has

the value as true.

</rdfs:comment>

</owl:DatatypeProperty>

<owl:ObjectProperty rdf:ID="ie\_container\_list\_of\_networks">

<mihbasic:ie\_type\_identifier>0x10000300</mihbasic:ie\_type\_identifier>

<rdfs:range rdf:resource="#LIST\_OF\_NETWORKS"/>

</owl:ObjectProperty>

<owl:Class rdf:ID="LIST\_OF\_NETWORKS">

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#ie\_container\_network"/>

<owl:minCardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:minCardinality>

</owl:Restriction>

</rdfs:subClassOf>

</owl:Class>

<owl:ObjectProperty rdf:ID="ie\_container\_network">

<mihbasic:ie\_type\_identifier>0x10000301</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#LIST\_OF\_NETWORKS"/>

<rdfs:range rdf:resource="#NETWORK"/>

<rdfs:comment>

This class contains General Information depicting and Access

Network Specific Information.

</rdfs:comment>

</owl:ObjectProperty>

<owl:Class rdf:ID="NETWORK">

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#ie\_network\_type"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#ie\_operator\_id"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

</owl:Class>

<owl:ObjectProperty rdf:ID="ie\_network\_type">

<mihbasic:ie\_type\_identifier>0x10000000</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#NETWORK"/>

<rdfs:range rdf:resource="#NETWORK\_TYPE"/>

</owl:ObjectProperty>

<owl:Class rdf:ID="NETWORK\_TYPE">

</owl:Class>

<owl:DatatypeProperty rdf:ID="link\_type">

<rdfs:domain rdf:resource="#NETWORK\_TYPE"/>

<rdfs:range rdf:resource="&xsd;unsignedInt"/>

<rdfs:comment>

Link type of a network. The following values are assigned:

1: Wireless - GSM

2: Wireless - GPRS

3: Wireless - EDGE

15: Ethernet

18: Wireless - Other

19: Wireless - IEEE 802.11

22: Wireless - CDMA2000

23: Wireless - UMTS

24: Wireless - cdma-2000-HRPD

27: Wireless - IEEE 802.16

28: Wireless - IEEE 802.20

29: Wireless - IEEE 802.22

</rdfs:comment>

</owl:DatatypeProperty>

<owl:ObjectProperty rdf:ID="revision">

<rdfs:subPropertyOf rdf:resource="#bit\_number"/>

<rdfs:domain rdf:resource="#NETWORK\_TYPE"/>

<rdfs:comment>

The range of #bit\_number is 0-63.

</rdfs:comment>

</owl:ObjectProperty>

<owl:DatatypeProperty rdf:ID="type\_ext">

<rdfs:domain rdf:resource="#NETWORK\_TYPE"/>

<rdfs:range rdf:resource="&xsd;string"/>

</owl:DatatypeProperty>

<owl:ObjectProperty rdf:ID="ie\_operator\_id">

<mihbasic:ie\_type\_identifier>0x10000001</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#NETWORK"/>

<rdfs:range rdf:resource="#OPERATOR\_ID"/>

</owl:ObjectProperty>

<owl:Class rdf:ID="OPERATOR\_ID">

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#op\_name"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#op\_namespace"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

</owl:Class>

<owl:DatatypeProperty rdf:ID="op\_name">

<rdfs:domain rdf:resource="#OPERATOR\_ID"/>

<rdfs:range rdf:resource="&xsd;string"/>

<rdfs:comment>

The value is a non NULL terminated

string whose length shall not exceed 253 octets.

</rdfs:comment>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="op\_namespace">

<rdfs:domain rdf:resource="#OPERATOR\_ID"/>

<rdfs:range rdf:resource="&xsd;unsignedByte"/>

<rdfs:comment>

A value of Operator Type:

0: GSM/UMTS

1: CDMA

2: REALM

3: ITU-T/TSB

</rdfs:comment>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="ie\_service\_provider\_id">

<mihbasic:ie\_type\_identifier>0x10000002</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#NETWORK"/>

<rdfs:range rdf:resource="&xsd;string"/>

<rdfs:comment>

A non-NULL terminated string whose length shall not exceed 253 octets.

</rdfs:comment>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="ie\_country\_code">

<mihbasic:ie\_type\_identifier>0x10000003</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#NETWORK"/>

<rdfs:range rdf:resource="&xsd;string"/>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="ie\_network\_id">

<mihbasic:ie\_type\_identifier>0x10000100</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#NETWORK"/>

<rdfs:range rdf:resource="&xsd;string"/>

<rdfs:comment>

A non-NULL terminated string whose length shall not exceed 253 octets.

</rdfs:comment>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="ie\_network\_aux\_id">

<mihbasic:ie\_type\_identifier>0x10000101</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#NETWORK"/>

<rdfs:range rdf:resource="&xsd;string"/>

<rdfs:comment>

It is SSID if network type is IEEE 802.11.

</rdfs:comment>

</owl:DatatypeProperty>

<owl:ObjectProperty rdf:ID="ie\_roaming\_partner">

<mihbasic:ie\_type\_identifier>0x10000102</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#NETWORK"/>

<rdfs:range rdf:resource="#OPERATOR\_ID"/>

</owl:ObjectProperty>

<owl:ObjectProperty rdf:ID="ie\_cost">

<mihbasic:ie\_type\_identifier>0x10000103</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#NETWORK"/>

<rdfs:range rdf:resource="#COST"/>

</owl:ObjectProperty>

<owl:Class rdf:ID="COST">

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#cost\_unit"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#cost\_value"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#cost\_curr"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

</owl:Class>

<owl:DatatypeProperty rdf:ID="cost\_unit">

<rdfs:domain rdf:resource="#COST"/>

<rdfs:range rdf:resource="&xsd;unsignedByte"/>

<rdfs:comment>

The unit of the cost:

0: second

1: minute

2: hours

3: day

4: week

5: month

6: year

7: free

8: flat rate

9-255: Reserved

</rdfs:comment>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="cost\_value">

<rdfs:domain rdf:resource="#COST"/>

<rdfs:range rdf:resource="&xsd;double"/>

<rdfs:comment>

The cost value in Currency/Unit

</rdfs:comment>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="cost\_curr">

<rdfs:domain rdf:resource="#COST"/>

<rdfs:range rdf:resource="&xsd;string"/>

<rdfs:comment>

A three-letter currency code(e.g. "USD") specified by

ISO 4217.

</rdfs:comment>

</owl:DatatypeProperty>

<owl:ObjectProperty rdf:ID="ie\_network\_qos">

<mihbasic:ie\_type\_identifier>0x10000105</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#NETWORK"/>

<rdfs:range rdf:resource="#QOS\_LIST"/>

</owl:ObjectProperty>

<owl:Class rdf:ID="QOS\_LIST">

</owl:Class>

<owl:DatatypeProperty rdf:ID="num\_qos\_types">

<rdfs:domain rdf:resource="#QOS\_LIST"/>

<rdfs:range rdf:resource="&xsd;unsignedByte"/>

</owl:DatatypeProperty>

<owl:Class rdf:ID="COS">

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#cos\_id"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#cos\_value"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

</owl:Class>

<owl:DatatypeProperty rdf:ID="cos\_id">

<rdfs:domain rdf:resource="#COS"/>

<rdfs:range rdf:resource="&xsd;unsignedByte"/>

<rdfs:comment>

A type to represent a class of service identifier.

</rdfs:comment>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="cos\_value">

<rdfs:domain rdf:resource="#COS"/>

<rdfs:range rdf:resource="&xsd;unsignedShort"/>

</owl:DatatypeProperty>

<owl:ObjectProperty rdf:ID="min\_pk\_tx\_delay">

<rdfs:domain rdf:resource="#QOS\_LIST"/>

<rdfs:range rdf:resource="#COS"/>

</owl:ObjectProperty>

<owl:ObjectProperty rdf:ID="avg\_pk\_tx\_delay">

<rdfs:domain rdf:resource="#QOS\_LIST"/>

<rdfs:range rdf:resource="#COS"/>

</owl:ObjectProperty>

<owl:ObjectProperty rdf:ID="max\_pk\_tx\_delay">

<rdfs:domain rdf:resource="#QOS\_LIST"/>

<rdfs:range rdf:resource="#COS"/>

</owl:ObjectProperty>

<owl:ObjectProperty rdf:ID="pk\_delay\_jitter">

<rdfs:domain rdf:resource="#QOS\_LIST"/>

<rdfs:range rdf:resource="#COS"/>

</owl:ObjectProperty>

<owl:ObjectProperty rdf:ID="pk\_loss\_rate">

<rdfs:domain rdf:resource="#QOS\_LIST"/>

<rdfs:range rdf:resource="#COS"/>

</owl:ObjectProperty>

<owl:DatatypeProperty rdf:ID="ie\_network\_data\_rate">

<mihbasic:ie\_type\_identifier>0x10000106</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#NETWORK"/>

<rdfs:range rdf:resource="&xsd;unsignedInt"/>

</owl:DatatypeProperty>

<owl:ObjectProperty rdf:ID="ie\_net\_channel\_range">

<mihbasic:ie\_type\_identifier>0x10000107</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#NETWORK"/>

<rdfs:range rdf:resource="#CH\_RANGE"/>

</owl:ObjectProperty>

<owl:ObjectProperty rdf:ID="ie\_net\_ip\_cfg\_methods">

<mihbasic:ie\_type\_identifier>0x10000108</mihbasic:ie\_type\_identifier>

<rdfs:subPropertyOf rdf:resource="#bit\_number"/>

<rdfs:domain rdf:resource="#NETWORK"/>

<rdfs:comment>

The range of #bit\_number is 0-31.

</rdfs:comment>

</owl:ObjectProperty>

<owl:ObjectProperty rdf:ID="ie\_net\_capabilities">

<mihbasic:ie\_type\_identifier>0x10000109</mihbasic:ie\_type\_identifier>

<rdfs:subPropertyOf rdf:resource="#bit\_number"/>

<rdfs:domain rdf:resource="#NETWORK"/>

<rdfs:comment>

The range of #bit\_number is 0-31.

</rdfs:comment>

</owl:ObjectProperty>

<owl:DatatypeProperty rdf:ID="ie\_net\_supported\_lcp">

<mihbasic:ie\_type\_identifier>0x1000010A</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#NETWORK"/>

<rdfs:range rdf:resource="&xsd;unsignedByte"/>

</owl:DatatypeProperty>

<owl:ObjectProperty rdf:ID="ie\_net\_mob\_mgmt\_prot">

<mihbasic:ie\_type\_identifier>0x1000010B</mihbasic:ie\_type\_identifier>

<rdfs:subPropertyOf rdf:resource="#bit\_number"/>

<rdfs:domain rdf:resource="#NETWORK"/>

<rdfs:comment>

The range of #bit\_number is 0-15.

</rdfs:comment>

</owl:ObjectProperty>

<owl:ObjectProperty rdf:ID="ie\_net\_emserv\_proxy">

<mihbasic:ie\_type\_identifier>0x1000010C</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#NETWORK"/>

<rdfs:range rdf:resource="#PROXY\_ADDR"/>

</owl:ObjectProperty>

<owl:Class rdf:ID="PROXY\_ADDR">

</owl:Class>

<owl:DatatypeProperty rdf:ID="proxy\_addr\_ip">

<rdfs:domain rdf:resource="#PROXY\_ADDR"/>

<rdfs:range rdf:resource="#TRANSPORT\_ADDR"/>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="proxy\_addr\_fqdn">

<rdfs:domain rdf:resource="#PROXY\_ADDR"/>

<rdfs:range rdf:resource="&xsd;String"/>

</owl:DatatypeProperty>

<owl:ObjectProperty rdf:ID="ie\_net\_ims\_proxy\_cscf">

<mihbasic:ie\_type\_identifier>0x1000010D</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#NETWORK"/>

<rdfs:range rdf:resource="#PROXY\_ADDR"/>

</owl:ObjectProperty>

<owl:ObjectProperty rdf:ID="ie\_container\_poa">

<mihbasic:ie\_type\_identifier>0x10000302</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#NETWORK"/>

<rdfs:range rdf:resource="#POA"/>

</owl:ObjectProperty>

<owl:Class rdf:ID="POA">

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#ie\_poa\_mac\_addr"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#ie\_poa\_location"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#ie\_poa\_channel\_range"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#ie\_poa\_system\_info"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#ie\_poa\_subnet\_info"/>

<owl:minCardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:minCardinality>

</owl:Restriction>

</rdfs:subClassOf>

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#ie\_poa\_ip\_addr"/>

<owl:minCardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:minCardinality>

</owl:Restriction>

</rdfs:subClassOf>

<!--- begin 802.21a -->

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#ie\_authenticator\_link\_addr"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#ie\_authenticator\_ip\_addr"/>

<owl:minCardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:minCardinality>

</owl:Restriction>

</rdfs:subClassOf>

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#ie\_pos\_ip\_addr"/>

<owl:minCardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:minCardinality>

</owl:Restriction>

</rdfs:subClassOf>

<!--- end 802.21a -->

<rdfs:comment>

This class contains all the information depicting a PoA.

</rdfs:comment>

</owl:Class>

<owl:ObjectProperty rdf:ID="ie\_poa\_mac\_addr">

<mihbasic:ie\_type\_identifier>0x10000200</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#POA"/>

<rdfs:range rdf:resource="#TRANSPORT\_ADDR"/>

</owl:ObjectProperty>

<owl:ObjectProperty rdf:ID="ie\_poa\_location">

<mihbasic:ie\_type\_identifier>0x10000201</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#POA"/>

<rdfs:range rdf:resource="#LOCATION"/>

</owl:ObjectProperty>

<owl:Class rdf:ID="LOCATION">

</owl:Class>

<owl:Class rdf:ID="BIN\_GEO\_LOC">

<rdfs:subClassOf rdf:resource="#LOCATION"/>

<rdfs:comment>

This class has properties that represent geographic coordinate.

The format is based on the Location Configuration Information (LCI)

defined in RFC 3825.

</rdfs:comment>

</owl:Class>

<owl:DatatypeProperty rdf:ID="la\_res">

<rdfs:domain rdf:resource="#BIN\_GEO\_LOC"/>

<rdfs:range rdf:resource="&xsd;unsignedByte"/>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="latitude">

<rdfs:domain rdf:resource="#BIN\_GEO\_LOC"/>

<rdfs:range rdf:resource="&xsd;double"/>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="lo\_res">

<rdfs:domain rdf:resource="#BIN\_GEO\_LOC"/>

<rdfs:range rdf:resource="&xsd;unsignedByte"/>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="longitude">

<rdfs:domain rdf:resource="#BIN\_GEO\_LOC"/>

<rdfs:range rdf:resource="&xsd;double"/>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="at">

<rdfs:domain rdf:resource="#BIN\_GEO\_LOC"/>

<rdfs:range rdf:resource="&xsd;unsignedByte"/>

<rdfs:comment>

Following codes are defined:

1: Meters: in 2s-complement fixed-point 22-bit integer part with

8-bit fraction. If AT = 1, an AltRes value 0.0 would indicate

unknown altitude. The most precise Altitude would have an AltRes

value of 30. Many values of AltRes would obscure any variation

due to vertical datum differences.

2: Floors: in 2s-complement fixed-point 22-bit integer part with

8-bit fraction. AT = 2 for Floors enables representing altitude in

a form more relevant in buildings which have different

floor-to-floor dimensions.

</rdfs:comment>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="alt\_res">

<rdfs:domain rdf:resource="#BIN\_GEO\_LOC"/>

<rdfs:range rdf:resource="&xsd;unsignedByte"/>

<rdfs:comment>

Altitude resolution. 6 bits indicating the number of valid bits

in the altitude. Values above 30 (decimal) are undefined and

reserved.

</rdfs:comment>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="altitude">

<rdfs:domain rdf:resource="#BIN\_GEO\_LOC"/>

<rdfs:range rdf:resource="&xsd;double"/>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="datum">

<rdfs:domain rdf:resource="#BIN\_GEO\_LOC"/>

<rdfs:range rdf:resource="&xsd;unsignedByte"/>

<rdfs:comment>

Following codes are defined:

1: WGS

2: NAD 83 (with associated vertical datum for North American

vertical datum for 1998)

3: NAD 83 (with associated vertical datum for Mean Lower Low Water

(MLLW))

</rdfs:comment>

</owl:DatatypeProperty>

<owl:Class rdf:ID="XML\_GEO\_LOC">

<rdfs:subClassOf rdf:resource="#LOCATION"/>

</owl:Class>

<owl:DatatypeProperty rdf:ID="xml\_geo\_location">

<rdfs:domain rdf:resource="#XML\_GEO\_LOC"/>

<rdfs:range rdf:resource="&xsd;string"/>

<rdfs:comment>

Geo address elements as described in RFC4119.

</rdfs:comment>

</owl:DatatypeProperty>

<owl:Class rdf:ID="BIN\_CIVIC\_LOC">

<rdfs:subClassOf rdf:resource="#LOCATION"/>

<rdfs:comment>

This class has properties that represent civic address.

The format is defined in IETF RFC 4676.

</rdfs:comment>

</owl:Class>

<owl:DatatypeProperty rdf:ID="civic\_cntry\_code">

<rdfs:domain rdf:resource="#BIN\_CIVIC\_LOC"/>

<rdfs:range rdf:resource="&xsd;string"/>

<rdfs:comment>

Two-letter ISO 3166 country code in capital ASCII letters.

</rdfs:comment>

</owl:DatatypeProperty>

<owl:ObjectProperty rdf:ID="civic\_addr">

<rdfs:domain rdf:resource="#BIN\_CIVIC\_LOC"/>

<rdfs:range rdf:resource="#CIVIC\_ADDR"/>

<rdfs:comment>

This property contains the civic address elements.

The format of the civic address elements is described

in Section 3.4 of IETF RFC 4676 with a TLV pair

(whereby the Type and Length fields are one octet long).

</rdfs:comment>

</owl:ObjectProperty>

<owl:Class rdf:ID="CIVIC\_ADDR">

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#catype"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#cavalue"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

</owl:Class>

<owl:DatatypeProperty rdf:ID="catype">

<rdfs:domain rdf:resource="#CIVIC\_ADDR"/>

<rdfs:range rdf:resource="&xsd;unsignedByte"/>

<rdfs:comment>

A one-octet descriptor of the data civic address value.

</rdfs:comment>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="cavalue">

<rdfs:domain rdf:resource="#CIVIC\_ADDR"/>

<rdfs:range rdf:resource="&xsd;string"/>

<rdfs:comment>

The civic address value.

</rdfs:comment>

</owl:DatatypeProperty>

<owl:Class rdf:ID="XML\_CIVIC\_LOC">

<rdfs:subClassOf rdf:resource="#LOCATION"/>

</owl:Class>

<owl:DatatypeProperty rdf:ID="xml\_civic\_location">

<rdfs:domain rdf:resource="#XML\_CIVIC\_LOC"/>

<rdfs:range rdf:resource="&xsd;string"/>

<rdfs:comment>

Geo address elements as described in RFC4119.

</rdfs:comment>

</owl:DatatypeProperty>

<owl:Class rdf:ID="LOCATION\_CELL\_ID">

<rdfs:subClassOf rdf:resource="#LOCATION"/>

</owl:Class>

<owl:DatatypeProperty rdf:ID="location\_cell\_id">

<rdfs:domain rdf:resource="#LOCATION\_CELL\_ID"/>

<rdfs:range rdf:resource="&xsd;unsignedInt"/>

</owl:DatatypeProperty>

<owl:ObjectProperty rdf:ID="ie\_poa\_channel\_range">

<mihbasic:ie\_type\_identifier>0x10000202</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#POA"/>

<rdfs:range rdf:resource="#CH\_RANGE"/>

</owl:ObjectProperty>

<owl:Class rdf:ID="CH\_RANGE">

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#low\_ch\_range"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#high\_ch\_range"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

</owl:Class>

<owl:DatatypeProperty rdf:ID="low\_ch\_range">

<rdfs:domain rdf:resource="#CH\_RANGE"/>

<rdfs:range rdf:resource="&xsd;unsignedInt"/>

<rdfs:comment>

Lowest channel frequency in MHz

</rdfs:comment>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="high\_ch\_range">

<rdfs:domain rdf:resource="#CH\_RANGE"/>

<rdfs:range rdf:resource="&xsd;unsignedInt"/>

<rdfs:comment>

Highest channel frequency in MHz

</rdfs:comment>

</owl:DatatypeProperty>

<owl:ObjectProperty rdf:ID="ie\_poa\_system\_info">

<mihbasic:ie\_type\_identifier>0x10000203</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#POA"/>

<rdfs:range rdf:resource="#SYSTEM\_INFO"/>

</owl:ObjectProperty>

<owl:Class rdf:ID="SYSTEM\_INFO">

</owl:Class>

<owl:ObjectProperty rdf:ID="system\_info\_network\_type">

<rdfs:domain rdf:resource="#SYSTEM\_INFO"/>

<rdfs:range rdf:resource="#NETWORK\_TYPE"/>

</owl:ObjectProperty>

<owl:ObjectProperty rdf:ID="system\_info\_mac\_address">

<rdfs:domain rdf:resource="#SYSTEM\_INFO"/>

<rdfs:range rdf:resource="#TARNSPORT\_ADDR"/>

</owl:ObjectProperty>

<owl:ObjectProperty rdf:ID="system\_info\_parameters">

<rdfs:domain rdf:resource="#SYSTEM\_INFO"/>

<rdfs:range rdf:resource="#PARAMETERS"/>

</owl:ObjectProperty>

<owl:Class rdf:ID="PARAMETERS">

</owl:Class>

<owl:Class rdf:ID="DCD\_UCD">

<rdfs:subClassOf rdf:resource="#PARAMETERS"/>

</owl:Class>

<owl:DatatypeProperty rdf:ID="dcd\_ucd\_base\_id">

<rdfs:domain rdf:resource="#DCD\_UCD"/>

<rdfs:range rdf:resource="&xsd;unsignedShort"/>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="bandwidth">

<rdfs:domain rdf:resource="#DCD\_UCD"/>

<rdfs:range rdf:resource="&xsd;unsignedByte"/>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="du\_ctr\_frequency">

<rdfs:domain rdf:resource="#DCD\_UCD"/>

<rdfs:range rdf:resource="&xsd;unsignedInt"/>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="eirp">

<rdfs:domain rdf:resource="#DCD\_UCD"/>

<rdfs:range rdf:resource="&xsd;unsignedByte"/>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="ttg">

<rdfs:domain rdf:resource="#DCD\_UCD"/>

<rdfs:range rdf:resource="&xsd;unsignedShort"/>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="rtg">

<rdfs:domain rdf:resource="#DCD\_UCD"/>

<rdfs:range rdf:resource="&xsd;unsignedByte"/>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="down\_burst\_profile">

<rdfs:subPropertyOf rdf:resource="#bit\_number"/>

<rdfs:domain rdf:resource="#DCD\_UCD"/>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="up\_burst\_profile">

<rdfs:subPropertyOf rdf:resource="#bit\_number"/>

<rdfs:domain rdf:resource="#DCD\_UCD"/>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="initial\_code">

<rdfs:domain rdf:resource="#DCD\_UCD"/>

<rdfs:range rdf:resource="&xsd;unsignedByte"/>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="ho\_code">

<rdfs:domain rdf:resource="#DCD\_UCD"/>

<rdfs:range rdf:resource="&xsd;unsignedByte"/>

</owl:DatatypeProperty>

<owl:Class rdf:ID="SIB">

<rdfs:subClassOf rdf:resource="#PARAMETERS"/>

</owl:Class>

<owl:DatatypeProperty rdf:ID="cell\_id">

<rdfs:domain rdf:resource="#SIB"/>

<rdfs:range rdf:resource="&xsd;unsignedInt"/>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="fq\_code\_num">

<rdfs:domain rdf:resource="#SIB"/>

<rdfs:range rdf:resource="&xsd;unsignedShort"/>

</owl:DatatypeProperty>

<owl:Class rdf:ID="SYS\_PARAMS">

<rdfs:subClassOf rdf:resource="#PARAMETERS"/>

</owl:Class>

<owl:DatatypeProperty rdf:ID="base\_id">

<rdfs:domain rdf:resource="#SYS\_PARAMS"/>

<rdfs:range rdf:resource="&xsd;unsignedShort"/>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="pilot\_pn">

<rdfs:domain rdf:resource="#SYS\_PARAMS"/>

<rdfs:range rdf:resource="&xsd;unsignedShort"/>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="freq\_id">

<rdfs:domain rdf:resource="#SYS\_PARAMS"/>

<rdfs:range rdf:resource="&xsd;unsignedShort"/>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="band\_class">

<rdfs:domain rdf:resource="#SYS\_PARAMS"/>

<rdfs:range rdf:resource="&xsd;unsignedByte"/>

</owl:DatatypeProperty>

<owl:ObjectProperty rdf:ID="ie\_poa\_subnet\_info">

<mihbasic:ie\_type\_identifier>0x10000204</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#POA"/>

<rdfs:range rdf:resource="#IP\_SUBNET\_INFO"/>

</owl:ObjectProperty>

<owl:Class rdf:ID="IP\_SUBNET\_INFO">

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#ip\_prefix\_len"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#subnet\_address"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

</owl:Class>

<owl:DatatypeProperty rdf:ID="ip\_prefix\_len">

<rdfs:domain rdf:resource="#IP\_SUBNET\_INFO"/>

<rdfs:range rdf:resource="&xsd;unsignedByte"/>

<rdfs:comment>

The bit length of the prefix of the subnet to which subnet\_address

property belongs. The prefix\_length is less than or equal to 32

for IPv4 subnet and less than or equal to 128 for IPv6 subnet.

</rdfs:comment>

</owl:DatatypeProperty>

<owl:ObjectProperty rdf:ID="subnet\_address">

<rdfs:domain rdf:resource="#IP\_SUBNET\_INFO"/>

<rdfs:range rdf:resource="#TRANSPORT\_ADDR"/>

<rdfs:comment>

An IP address of the PoA encoded as Address base type defined in

RFC3588. The first 2-octet contains AddressType, which may be

either 1 (IPv4) or 2 (IPv6). If AddressType==1, the subnet\_address

property contains a 4-octet IPv4 address. If AddressType==2, the

subnet\_address property contains a 16-octet IPv6 address.

</rdfs:comment>

</owl:ObjectProperty>

<owl:ObjectProperty rdf:ID="ie\_poa\_ip\_addr">

<mihbasic:ie\_type\_identifier>0x10000205</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#POA"/>

<rdfs:range rdf:resource="#TRANSPORT\_ADDR"/>

</owl:ObjectProperty>

<owl:Class rdf:ID="TRANSPORT\_ADDR">

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#address\_type"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

<rdfs:subClassOf>

<owl:Restriction>

<owl:onProperty rdf:resource="#address\_value"/>

<owl:cardinality rdf:datatype="&xsd;nonNegativeInteger">1

</owl:cardinality>

</owl:Restriction>

</rdfs:subClassOf>

</owl:Class>

<owl:DatatypeProperty rdf:ID="address\_type">

<rdfs:domain rdf:resource="#TRANSPORT\_ADDR"/>

<rdfs:range rdf:resource="&xsd;unsignedShort"/>

<rdfs:comment>

An Address Family defined in

http://www.iana.org/assignments/address-family-numbers.

</rdfs:comment>

</owl:DatatypeProperty>

<owl:DatatypeProperty rdf:ID="address\_value">

<rdfs:domain rdf:resource="#TRANSPORT\_ADDR"/>

<rdfs:range rdf:resource="&xsd;hexBinary"/>

<rdfs:comment>

An address value specific to address\_type.

</rdfs:comment>

</owl:DatatypeProperty>

<!-- Begin 802.21a -->

<owl:ObjectProperty rdf:ID="ie\_authenticator\_link\_addr">

<mihbasic:ie\_type\_identifier>0x10000206</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#POA"/>

<rdfs:range rdf:resource="#TRANSPORT\_ADDR"/>

</owl:ObjectProperty>

<owl:ObjectProperty rdf:ID="ie\_authenticator\_ip\_addr">

<mihbasic:ie\_type\_identifier>0x10000207</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#POA"/>

<rdfs:range rdf:resource="#TRANSPORT\_ADDR"/>

</owl:ObjectProperty>

<owl:ObjectProperty rdf:ID="ie\_pos\_ip\_addr">

<mihbasic:ie\_type\_identifier>0x10000208</mihbasic:ie\_type\_identifier>

<rdfs:domain rdf:resource="#POA"/>

<rdfs:range rdf:resource="#TRANSPORT\_ADDR"/>

</owl:ObjectProperty>

<!-- End 802.21a -->

</rdf:RDF>