IEEE 802.19.1a
Wireless Coexistence

|  |
| --- |
| Comment resolutions on CID1, CID2, and CID3 |
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|  |  |  |  |  |

Abstract

This document provides comment resolutions on CID1, CID2, and CID3 provided in WG letter ballot.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Comment ID** | **Page No.** | **Section** | **Line No.** | **Type (General, Editorial, Technical)** | **Comments** | **Proposed changes** |
| 1 | 212 | A.2 | 47 | Technical | Marge profile 1 and 3 to one data type (subclause) | Need text proposal |
| 2 | 248 | B.2 | 7 | Technical | Marge profile 1 and 3 to one primitive (subclause) | Need text proposal |
| 3 | 274 | C.2 | 31 | Technical | Marge profile 1 and 3 to one messege (subclause) | Need text proposal |

r1: Implemented ASN.1 in 19-17/0011r1, 19-17/0012r1, 19-17/0013r1 and 19-17/0014r1.

# **Proposed changes**

===== (Text starts below)

# **(normative) Data types**

## **Data Types for IEEE802.19.1a**

IEEE802191aDataType DEFINITIONS AUTOMATIC TAGS ::= BEGIN

-----------------------------------------------------------

--Exported data types

-----------------------------------------------------------

--Exported data types

EXPORTS

--Coexistence protocol entity type (Used in Profile 1 and 3)

CxType,

--Coexistence protocol entity ID (Used in Profile 1 and 3)

CxID,

--Status (Used in Profile 1 and 3)

Status,

--Cx Media status (Used in Profile 1 and 3)

CxMediaStatus,

--Subscribed service (Used in Profile 1)

SubscribedService,

--Coexistence service (Used in Profile 3)

CoexistenceService,

--Discovery information (Used in Profile 1)

DiscoveryInformation,

--Network technology (Used in Profile 1 and 3)

NetworkTechnology,

--Network type (Used in Profile 1 and 3)

NetworkType,

--Geolocation (Used in Profile 3)

Geolocation,

--Coverage area (Used in Profile 3)

CoverageArea,

--Installation parameters (Used in Profile 3)

InstallationParameters,

--Frequency range (Used in Profile 3)

FrequencyRange,

--List of available channel numbers (Used in Profile 1)

ListOfAvailableChNumbers,

--List of available frequencies (Used in Profile 3)

ListOfAvailableFrequencies,

--List of operating channel numbers (Used in Profile 1)

ListOfOperatingChNumbers,

--List of operating frequencies (Used in Profile 3)

ListOfOperatingFrequencies,

--List of supported frequencies (Used in Profile 3)

ListOfSupportedFrequencies,

--Required resource (Used in Profile 1 and 3)

RequiredResource,

--Channel priority (Used in Profile 1)

ChannelPriority,

--Operation code for registration (Used in Profile 1 and 3)

OperationCode,

--Measurement capability (Used in Profile 1 and 3)

MeasurementCapability,

--CM registration (Used in Profile 3)

CMRegistration,

--CE registration (Used in Profile 3)

CERegistration,

--Coexistence report (Used in Profile 1 and 3)

CoexistenceReport,

--List of coexistence reports (Used in Profile 3)

ListOfCoexistenceReports,

--Mobility Information (Used in Profile 3)

MobilityInformation,

--Entity profile (Used in Profile 3)

EntityProfile,

--List Of Accessible CMs (Used in Profile 3)

ListOfAccessibleCMs,

--List of master CM candidates (Used in Profile 3)

ListOfMasterCMCandidates,

--List of neighbor CMs (Used in Profile 1 and 3)

ListOfNeighborCMs,

--List of GCOs (Used in Profile 3)

ListOfGCOs,

--List of CEs (Used in Profile 3)

ListOfCEs,

--List of desired performances (Used in Profile 3)

ListOfDesiredPerformances,

--Transmission schedule (Used in Profile 1)

TxSchedule,

--Failed parameters (Used in Profile 1)

FailedParameters,

--Coordinates (Used in Profile 3)

Coordinates,

--Range (Used in Profile 3)

Range,

--Region (Used in Profile 3)

Region,

--Antenna Characteristics (Used in Profile 3)

AntennaCharacteristics,

--Type of frequency (Used in Profile 3)

TypeOfFrequency,

--GCO Descriptor (Used in Profile 3)

GCODescriptor,

--Receiver information (Used in Profile 3)

ReceiverInfo,

--Receiver type (Used in Profile 3)

ReceiverType,

--Modulation type (Used in Profile 3)

ModulationType,

--Filter characteristics (Used in Profile 3)

FilterCharacteristics,

--Energy detection information (Used in Profile 3)

EnergyDetectionInfo,

--Spectrum request modification (Used in Profile 3)

SpecRequestModification,

--Graph edge (Used in Profile 3)

GraphEdge,

--Interference relationship graph (Used in Profile 3)

InterferenceRelationshipGraph,

--Channel classification information (Used in Profile 1)

ChClassInfo,

--Channel classification information list (Used in Profile 1)

ChClassInfoList,

--Required information description (Used in Profile 1)

ReqInfoDescr,

-- Requested information value (Used in Profile 1)

ReqInfoValue,

--Event parameters (Used in Profile 1)

EventParams,

-- Negotiation status (Used in Profile 1)

NegotiationStatus,

-- Negotiation information (Used in Profile 1)

NegotiationInformation,

--Winner CM ID list (Used in Profile 1)

ListOfWinnerCMID,

-- Slot time position list (Used in Profile 1)

ListOfSlotTimePosition,

--Measurement description (Used in Profile 1)

MeasurementDescription,

--Measurement result (Used in Profile 1)

MeasurementResult,

--Spectrum allocation supporting information

SpecAllocationSupportingInfo,

--List of serving CM

ListOfCandidateServingCMs,

--List of moving GCOs

ListOfMovingGCOs,

--List of candidate served GCOs

ListOfCandidateServedGCOs,

--List of estimated available bandwidth

listOfEstimatedAvailableBandwidth;

-----------------------------------------------------------

--Coexistence protocol entity

-----------------------------------------------------------

--Coexistence protocol entity type (Used in Profile 1 and 3)

CxType ::= ENUMERATED {

--Coexistence enabler

ce,

--Coexistence manager

cm,

--Coexistence discovery and information server

cdis,

--Coordination enabler (Only in Profile 3)

coe

}

--Coexistence protocol entity ID (Used in Profile 1 and 3)

CxID ::= SEQUENCE {

--Entity type

type CxType,

--Entity ID

id OCTET STRING

}

-----------------------------------------------------------

--Status for response message

-----------------------------------------------------------

--Status (Used in Profile 1 and 3)

Status ::= ENUMERATED {

--Successfully processed

noError,

--Rejected due to security reasons

rejected,

--Different primitive/message is expected

invalidEntityStatus,

--Invalid values of parameters

invalidArgument,

--The process error in the receiving entity

processFailure,

--Connection error

networkFailure

}

--Coexistence media status (Used in Profile 1 and 3)

CxMediaStatus ::= ENUMERATED {

noErrorAccepted,

noErrorRejected,

errorInvalidEntityStatus,

errorInvalidArgument,

errorProcessFailure,

errorNetworkFailure,

errorUnknown

}

-----------------------------------------------------------

--Subscribed service

-----------------------------------------------------------

--Subscribed service (Used in Profile 1)

SubscribedService ::= ENUMERATED {

information,

management,

interCMCoexistenceSetElementsNeighbors,

allCoexistenceSetElementsNeighbors

}

-----------------------------------------------------------

--Coexistence service

-----------------------------------------------------------

--Coexistence service (Used in Profile 3)

CoexistenceService ::= ENUMERATED {

--Information service

information,

--Management service

management,

--No service

noService

}

-----------------------------------------------------------

-- List of accessible CMs

-----------------------------------------------------------

--List of accessible CMs (Used in Profile 3)

ListOfAccessibleCMs ::= SEQUENCE OF SEQUENCE {

--CM ID

cmID CxID OPTIONAL,

--IP address

ipAddress OCTET STRING OPTIONAL,

--Port number

portNumber INTEGER OPTIONAL,

--Server password

serverPassword IA5String OPTIONAL,

...

}

-----------------------------------------------------------

--Network technology

-----------------------------------------------------------

--Network technology indicator (Used in Profile 1 and 3)

NetworkTechnology ::= ENUMERATED {

--IEEE 802.11 technology except for .11af

ieee802dot11Technology,

--IEEE 802.11af

ieee802dot11af,

--IEEE 802.22

ieee802dot22,

--Radio microphone

radioMic,

--Area broadcast

areaBroadcast,

--ECMA 392

ecma392,

--3gpp Technology

technologyOf3gpp,

--MulteFire

multeFire,

...

}

-----------------------------------------------------------

--Network type

-----------------------------------------------------------

--Network type (Used in Profile 1 and 3)

NetworkType ::= ENUMERATED {

--For TVBD complied with FCC C.F.R Part 15

fixed,

mode1,

mode2,

--For WSD complied with ETSI EN 301 598

typeA,

typeB,

--For CBSD complied with FCC C.F.R Part 96

categoryA,

categoryB,

...

}

-----------------------------------------------------------

--Discovery information

-----------------------------------------------------------

-- Discovery Information (Used in Profile 1)

DiscoveryInformation ::= SEQUENCE {

coordinateX REAL,

coordinateY REAL,

coordinateZ REAL,

maxTxPower REAL,

rxSensitivity REAL,

antennaGain REAL,

minReqSNR REAL,

antennaHeight REAL,

...

}

-----------------------------------------------------------

--Location information

-----------------------------------------------------------

--Location (Used in Profile 3)

Geolocation ::= CHOICE {

--Place name or ID

placeID OCTET STRING,

--Coordinates of GCO

coordinates Coordinates

}

--Coordinates (Used in Profile 3)

Coordinates ::= SEQUENCE {

--Latitude [degree]

latitude REAL OPTIONAL,

--Longitude [degree]

longitude REAL OPTIONAL,

--Altitude [m]

altitude REAL OPTIONAL,

--Location uncertaingty

locationUncertainty REAL OPTIONAL

}

----------------------------------------------------------------------------

--Region information

----------------------------------------------------------------------------

--Region (Used in Profile 3)

Region ::= SEQUENCE{

--Sequence of geolocation. The size shall be more than 3.

geolocation SEQUENCE OF Geolocation

}

--Rectangular Region (Used in Profile 3)

RectangularRegion ::= SEQUENCE{

--Geolocation of the upper-left point of the rectangular

geolocationUpper Geolocation,

--Geolocation of the lower-right point of the rectangular

geolocationLower Geolocation

}

--Range (Used in Profile 3)

Range ::= CHOICE {

--Information of the bounded area defined by the multiple geolocations

multipointRegion Region,

--Rectangular area defined by the upper-left and lower right points

rectangularRegion RectangularRegion

}

-----------------------------------------------------------

--Installation parameters

-----------------------------------------------------------

--Installation parameters (Used in Profile 3)

InstallationParameters ::= SEQUENCE {

--Geolocation of GCO

geolocation Geolocation OPTIONAL,

--Antenna characteristics

antennaCharacteristics AntennaCharacteristics OPTIONAL,

-- EIRP capability [dBm]

eirpCapability REAL OPTIONAL,

--Adjacent channel leakage ratio of the GCO [dB]

aclr REAL OPTIONAL,

--Guaranteed QoS of backhaul connection of the GCO

guaranteedQoSOfBackhaulConnection GuaranteedQoSOfBackhaulConnection OPTIONAL,

--Receiver information

receiverInfo ReceiverInfo OPTIONAL,

--Management regional range of GCO

managementRange Range OPTIONAL,

--Indoor deployment

indoorDeployment BOOLEAN OPTIONAL,

...

}

--Antenna Characteristics (Used in Profile 3)

AntennaCharacteristics ::= SEQUENCE {

--Antenna height [meter]

antennaHeight REAL OPTIONAL,

--Antenna height type

antennaHeightType HeightType OPTIONAL,

--Antenna gain [dB]

antennaGain REAL OPTIONAL,

--Antenna type

antennaType AntennaType OPTIONAL,

--Number of antenna

numberOfAntenna INTEGER OPTIONAL,

--MIMO type

mimoType MIMOType OPTIONAL,

--Multiple antenna processing capability

multiAntProCap MultiAntProCap OPTIONAL,

--Azimuth angle [deg]

azimuthAngle REAL OPTIONAL,

--Downtilt angle [deg]

downtiltAngle REAL OPTIONAL,

--beamwidth [deg]

beamwidth REAL OPTIONAL,

...

}

--Height type (Used in Profile 3)

HeightType ::= ENUMERATED {

--Above ground level

agl,

--Above sea level

asl

}

--Antenna type (Used in Profile 3)

AntennaType ::= ENUMERATED {

--Linear array

linear,

--Planar array

planar,

--Circular

circular,

...

}

--MIMO type (Used in Profile 3)

MIMOType ::= ENUMERATED {

--2D MIMO

twoDimentional,

--3D MIMO

threeDimentional

}

-- Multiple antenna processing capability (Used in Profile 3)

MultiAntProCap ::= ENUMERATED {

--Directional beam forming capability

beamforming,

--Multiple antenna precoding capability

precoding,

...

}

--Receiver information (Used in Profile 3)

ReceiverInfo ::= SEQUENCE {

--Receiver type

receiverType ReceiverType OPTIONAL,

-- Modulation Type

modulationType ModulationType OPTIONAL,

-- Filter Characteristics

filterCharacteristics FilterCharacteristics OPTIONAL,

--Tolerable interference level[dBm]

tolerableInterferenceLevel REAL OPTIONAL

}

--Receiver type (Used in Profile 3)

ReceiverType ::= ENUMERATED {

--Successive interference canceller

sic,

--Zero-forcing

zeroForcing,

...

}

--Modulation Type (Used in Profile 3)

ModulationType ::= ENUMERATED {

--OFDM

ofdm,

--FBMC

fbmc,

...

}

--Modulation parameters (Used in Profile 3)

ModulationParameters ::= SEQUENCE OF CHOICE{

ofdm BOOLEAN,

--The overlapping K factor for FBMC

fbmcoverlappingFactor INTEGER,

...

}

--Filter Characteristics (Used in Profile 3)

FilterCharacteristics ::= SEQUENCE {

--Adjacent channel selectivity of the GCO [dB]

acs REAL OPTIONAL,

--FBMC overlapping factor range as the maximum number

fbmcOverlappingFactor INTEGER OPTIONAL,

...

}

--SIC demodulation procedure (Used in Profile 3)

SICDemodulationProcedure ::= ENUMERATED{

--demodulate desired signal directly

procedure1,

--demodulate interference then desired signal

procedure2,

...

}

--Spectrum request modification (Used in Profile 3)

SpecRequestModification ::= SEQUENCE {

--Spectrum request grouping information. GCOs with the same group index request spectrum together.

groupIndex REAL OPTIONAL,

--Spectrum that GCO shall check with the spectrum management database regarding to the availability.

spectrumCheck FrequencyRange OPTIONAL

}

--List of spectrum usage information (Used in Profile 3)

ListOfSpecUsageInfo ::= SEQUENCE OF SEQUENCE{

-- Geolocation information of GCO

listOfGeolocation SEQUENCE OF Geolocation

}

----------------------------------------------------------

--Guaranteed QoS of backhaul connection related data types

----------------------------------------------------------

--Guaranteed QoS of backhaul connection (Used in Profile 3)

GuaranteedQoSOfBackhaulConnection ::= SEQUENCE{

--Backhaul type ID

backhaulTypeID BackhaulTypeID OPTIONAL,

--Guaranteed minimum bit rates of backhaul connection [Mb/s]

guaranteedMinimumBitRates REAL OPTIONAL,

--Guaranteed maximum latency [ms]

guaranteedMaximumLatency REAL OPTIONAL,

...

}

-----------------------------------------------------------

--Backhaul type ID

-----------------------------------------------------------

--Bakhaul Type identifier (Used in Profile 3)

BackhaulTypeID ::= ENUMERATED{

xDSL,

opticalFibre,

...

}

-----------------------------------------------------------

--Available channel numbers

-----------------------------------------------------------

--Constants of channel use ID (Used in Profile 1)

ConstOfChUseID ::= ENUMERATED {

regulationMaxTxPower,

regulationMaxAntGain,

regulationMaxAntHeight,

regulationSMDBUpdateTime,

outOfBandEmissionLimit,

...

}

--Constants of channel use value (Used in Profile 1)

ConstOfChUseValue ::= CHOICE {

regulationMaxTxPower [1] REAL,

regulationMaxAntMaxGain [2] REAL,

regulationAntMaxHeight [3] REAL,

regulationSMDBUpdateTime [4] REAL,

outOfBandEmissionLimit [5] REAL,

...

}

--Constants of channel uses (Used in Profile 1)

ConstOfChUses ::= SEQUENCE OF SEQUENCE {

constOfChUseID ConstOfChUseID,

constOfChUseValue ConstOfChUseValue

}

--List of available channel numbers (Used in Profile 1)

ListOfAvailableChNumbers ::= SEQUENCE OF SEQUENCE {

chNumber INTEGER,

availableStartTime GeneralizedTime,

availableDuration REAL,

constOfChUses ConstOfChUses

}

-----------------------------------------------------------

--Frequency range related data types

-----------------------------------------------------------

--Frequency range (Used in Profile 3)

FrequencyRange ::= SEQUENCE {

--Start frequency [MHz]

startFreq REAL OPTIONAL,

--Stop frequency [MHz]

stopFreq REAL OPTIONAL

}

--List of available frequencies (Used in Profile 3)

ListOfAvailableFrequencies ::= SEQUENCE OF SEQUENCE {

--Timestamp

timestamp GeneralizedTime OPTIONAL,

--Frequency range

frequencyRange FrequencyRange OPTIONAL,

--Transmission power limit [dBm]

txPowerLimit REAL OPTIONAL,

--Start time when this frequency range is available

availableStartTime GeneralizedTime OPTIONAL,

-- Stop time when this frequency range is available

availableStopTime REAL OPTIONAL,

--Maximum total bandwidth [Hz]

maxTotalBandwidth REAL OPTIONAL,

--Maximum contiguous bandwidth [Hz]

maxContiguousBandwidth REAL OPTIONAL,

--Resolution bandwidth [Hz]

resolutionBandwidth REAL OPTIONAL,

--Type of available frequency

typeOfAvailablefrequency TypeOfFrequency OPTIONAL,

--Location validity [meter]

locationValidity REAL OPTIONAL,

--Aggregated interference control parameters

aggInterfCtrlParam AggregatedInterferenceControlParameters OPTIONAL,

...

}

-- Types of frequency (Used in Profile 3)

TypeOfFrequency ::= ENUMERATED {

--“Specific” as specified in ETSI EN 301 598

specific,

--“Generic” as specified in ETSI EN 301 598

generic,

--“Priority Access License (PAL)” as specified in FCC C.F.R Part 96

pal,

--“General Authorized Access (GAA)” as specified in FCC C.F.R Part 96

gaa,

...

}

--Aggregated interference control parameters (Used in Profile 3)

AggregatedInterferenceControlParameters ::= SEQUENCE{

--Reference point ID to be protected

referencePointID INTEGER OPTIONAL,

--Installation parameters of reference point

installationParameters InstallationParameters OPTIONAL,

--Adjacent channel leakage ratio of the GCO [dB]

aclr REAL OPTIONAL,

--Protection ratio of the reception to be protected[dB]

protectionRatio REAL OPTIONAL,

...

}

--List of supported frequencies (Used in Profile 3)

ListOfSupportedFrequencies ::= SEQUENCE OF SEQUENCE {

-- The frequency borders of each possible sub band or channel

frequencyRange FrequencyRange OPTIONAL,

-- Extra channel configuration is supported or not

extraChannelizationIsSupported BOOLEAN OPTIONAL,

-- Extra channel configuration description

extraChannelizationDescription ExtraChannelizationDescription OPTIONAL

}

--Extra channelization descriptions (Used in Profile 3)

ExtraChannelizationDescription ::= SEQUENCE{

--Maximum number of channel that GCO can simultaneously use.

maxNumberOfSimultaneousUse INTEGER OPTIONAL,

--List of supported bandwidth

listOfSupportedBandwidth SEQUENCE OF REAL OPTIONAL,

...

}

--List of operating frequencies and related operational parameters(Used in Profile 3)

ListOfOperatingFrequencies ::= SEQUENCE OF SEQUENCE {

--Priority index of frequencyRange

freqRankIndex INTEGER OPTIONAL,

--Frequency range

frequencyRange FrequencyRange OPTIONAL,

-- Operating EIRP [dBm]

operatingEirp REAL OPTIONAL,

--Resolution bandwidth [Hz]

resolutionBandwidth REAL OPTIONAL,

--Type of operating frequency

typeOfOperatingFrequency TypeOfFrequency OPTIONAL,

--Occupancy if known [fractional value between 0 and 1]

occupancy REAL OPTIONAL,

--Energy detection information

energyDetectionInfo EnergyDetectionInfo OPTIONAL,

--Modulation parameters

modulationParameters ModulationParameters OPTIONAL,

--Demodulation procedure

sicDemodulationProcedure SICDemodulationProcedure OPTIONAL,

--Interference leakage weighting factor

intLeakageFactor REAL OPTIONAL,

--List of reference point locations.

listOfSpecUsageInfoOfRefPoints ListOfSpecUsageInfo OPTIONAL,

--List of co-channel neighbor GCOs location

listOfSpecUsageInfoOfNeightborGCOs ListOfSpecUsageInfo OPTIONAL,

--Co-channel GCO limit

coChGCOLimit CoChGCOLimit OPTIONAL,

--Frequency utilization pattern parameter

freqUtilizationPattern FreqUtilizationPattern OPTIONAL,

...

}

--Frequency utilization pattern

FreqUtilizationPattern ::= SEQUENCE {

-- Range of investigated frequency

frequencyRange FrequencyRange OPTIONAL,

-- Parameter type of frequency utilization pattern

parameterType ParameterType OPTIONAL,

-- Threshold of time duration for successful frequency usage

timeThresholdForSuccessfulUsage REAL OPTIONAL,

-- Window start time

windowStartTime GeneralizedTime OPTIONAL,

-- Window stop time

windowStopTime GeneralizedTime OPTIONAL,

-- Coverage area

coverageArea CoverageArea OPTIONAL,

-- Frequency utilization pattern value

parameterValue INTEGER OPTIONAL

}

--Parameter type of frequency utilization pattern

ParameterType ::= ENUMERATED{

-- Number of frequency usage per time unit

numberFrequencyUsagePerTimeUnit,

-- Number of successful usage per time unit

numberSuccessfulUsagePerTimeUnit,

-- Number of failed usage per time unit

numberFailedUsagePerTimeUnit,

-- Number of frequency usage per time unit and per area unit

numberFrequencyUsagePerTimeUnitPerAreaUnit,

-- Number of successful usage per time unit and per area unit

numberSuccessfulUsagePerTimeUnitPerAreaUnit,

-- Number of failed usage per time unit and per area unit

numberFailedUsagePerTimeUnitPerAreaUnit

}

-----------------------------------------------------------

--Operating channel numbers

-----------------------------------------------------------

--List of operating channel numbers (Used in Profile 1)

ListOfOperatingChNumbers ::= SEQUENCE OF SEQUENCCE {

chNumber INTEGER,

occupancy REAL

}

-----------------------------------------------------------

--Required resource

-----------------------------------------------------------

--Required resource (Used in Profiles 1 and 3)

RequiredResource ::= SEQUENCE OF SEQUENCE {

--Required bandwidth

requiredBandwidth REAL OPTIONAL,

--Expected occupancy if known [fractional value between 0 and 1]

occupancy REAL OPTIONAL

}

-----------------------------------------------------------

-- List of desired performances

-----------------------------------------------------------

--List of desired performances (Used in Profile 3)

ListOfDesiredPerformances ::= SEQUENCE OF SEQUENCE {

--Subject frequency range

frequencyRange FrequencyRange OPTIONAL,

--Desired energy detection successful rate in percentage [0 ~ 100]

desiredEnergyDectionSuccessRate REAL OPTIONAL,

--Percentage of activated cells of one operator [0 ~ 100]

desiredActivationRate REAL OPTIONAL,

...

}

-----------------------------------------------------------

--Operation code for registration

-----------------------------------------------------------

--Operation code for registration (Used in Profiles 1 and 3)

OperationCode ::= ENUMERATED {

--New registration

new,

--Modification of registration information (Only in Profile 1)

modify,

--Update of registration information (Only in Profile 3)

update,

--Remove (Only in Profile 1)

remove,

--Deregistration (Only in Profile 3)

delete,

--Inform the spectrum usage release (Only in Profile 3)

release

}

-----------------------------------------------------------

--Measurement capability

-----------------------------------------------------------

-- Measurement Capability (Used in Profiles 1 and 3)

MeasurementCapability ::= ENUMERATED {

energyDetection,

featureDetection,

...

}

-----------------------------------------------------------

--Coverage area

-----------------------------------------------------------

--Coverage area

CoverageArea ::= SEQUENCE {

--Radius

radius REAL OPTIONAL,

...

}

-----------------------------------------------------------

--CM registration

-----------------------------------------------------------

--CM registration (Used in Profile 3)

CMRegistration ::= SEQUENCE {

--CM IP address

ipAddress OCTET STRING OPTIONAL,

--CM port number

portNumber INTEGER OPTIONAL

}

--List of GCOs for registration (Used in Profile 3)

ListOfGCORegistrations ::= SEQUENCE OF SEQUENCE {

--New registration, registration update or deregistration

operationCode OperationCode OPTIONAL,

--GCO ID

gcoID OCTET STRING OPTIONAL,

--Network ID

networkID OCTET STRING OPTIONAL,

--GCO Descriptor

gcoDescriptor GCODescriptor OPTIONAL,

--Coverage area

coverageArea CoverageArea OPTIONAL,

--Installation parameters

installationParameters InstallationParameters OPTIONAL,

--List of available frequencies

listOfAvailableFrequencies ListOfAvailableFrequencies OPTIONAL,

-- List of operating frequencies

listOfOperatingFrequencies ListOfOperatingFrequencies OPTIONAL,

-- operation region

operationRegion Range OPTIONAL,

--Spectrum transition capability

spectrumTransitionCapability BOOLEAN OPTIONAL,

--Maximum number of controllable GCO

maximumNumberOfControllableGCO INTEGER OPTIONAL,

--List of desired performance

listOfDesiredPerformances ListOfDesiredPerformances OPTIONAL,

--GCO IDs that are included in interference set

interferenceSet SEQUENCE OF OCTET STRING OPTIONAL,

--Graph information to represent interference relationship

interferenceGraph InterferenceRelationshipGraph OPTIONAL,

...

}

--GCO Descriptor (Used in Profile 3)

GCODescriptor ::= SEQUENCE {

--Network type

networkType NetworkType OPTIONAL,

--Emission class

emissionClass EmissionClass OPTIONAL,

--GCO type

gcoType GCOType OPTIONAL,

--Network technology

networkTechnology NetworkTechnology OPTIONAL,

--Additional network technologies of GCO

addNetworkTechnologies SEQUENCE OF NetworkTechnology OPTIONAL,

--Regulatory ID of GCO

gcoRegulatoryID OCTET STRING OPTIONAL,

--Call sign

callSign OCTET STRING OPTIONAL,

--Sensing capability

sensingCapability BOOLEAN OPTIONAL,

...

}

--GCO number limit (Used in Profile 3)

CoChGCOLimit ::= SEQUENCE {

--Management area

operationRange Range OPTIONAL,

--Maximum number of GCOs given by the coexistence management service

maxNumCoChGCOs INTEGER OPTIONAL

}

--GCO device type (Used in Profile 3)

GCOType ::= ENUMERATED {

--“AP” (Access Point)

wlanAP,

--“STA” (Station)

wlanSTA,

--eNB

eNodeB,

--UE

ue,

--“Master” for TVBD/WSD

master,

--“Slave” for TVBD/WSD

slave,

--“CBSD” (Citizens Broadband Radio Service Device)

cbsd,

--“EUD” (End User Device)

eud,

...

}

--Emission class (Used in Profile 3)

EmissionClass ::= ENUMERATED {

--“Class 1” as specified in ETSI EN 301 598

class1,

--“Class 2” as specified in ETSI EN 301 598

class2,

--“Class 3” as specified in ETSI EN 301 598

class3,

--“Class 4” as specified in ETSI EN 301 598

class4,

--“Class 5” as specified in ETSI EN 301 598

class5,

...

}

--CE registration (Used in Profile 3)

CERegistration ::= SEQUENCE OF SEQUENCE{

--CE ID

ceID CxID OPTIONAL,

-- List of GCO registration

listOfGCORegistrations ListOfGCORegistrations OPTIONAL

}

-----------------------------------------------------------

--Coexistence report

-----------------------------------------------------------

--Coexistence report (Used in Profiles 1 and 3)

CoexistenceReport ::= SEQUENCE OF SEQUENCE {

--Network ID

networkID OCTET STRING OPTIONAL,

--GCO ID (Only in Profile 3)

gcoID OCTET STRING OPTIONAL,

--Network technology (Only in Profile 1)

networkTechnology NetworkTechnology OPTIONAL,

--List of operating channel numbers (Only in Profile 1)

listOfOperatingChNumbers ListOfOperatingChNumbers OPTIONAL,

--List of recommended operation frequencies (Only in Profile 3)

listOfRecommendedOperationFrequencies

ListOfRecommendedOperationFrequencies OPTIONAL

}

--Channel priority information (Used in Profile 1)

ChannelPriority ::= SEQUENCE OF SEQUENCE {

channelNumber INTEGER,

priority INTEGER

}

-----------------------------------------------------------

--Coexistence set information

-----------------------------------------------------------

--List of coexistence set element (Used in Profile 1)

ListOfCoexSetElement ::= SEQUENCE OF SEQUENCE {

networkID OCTET STRING,

networkTechnology NetworkTechnology

}

--List of neighbor CMs (Used in Profiles 1 and 3)

ListOfNeighborCMs ::= SEQUENCE OF SEQUENCE {

--Neighbor CM ID

cmID CxID OPTIONAL,

--List of neighbor Ces (Only in Profile 3)

listOfNeighborCEs ListOfNeighborCEs OPTIONAL,

--List of coexistence set element (Only in Profile 1)

listOfCoexSetElement ListOfCoexSetElement OPTIONAL

}

-----------------------------------------------------------

--List of Coexistence reports

-----------------------------------------------------------

--List of coexistence reports (Used in Profile 3)

ListOfCoexistenceReports ::= SEQUENCE OF SEQUENCE {

--Region information that the coexistence report is valid.

region Region OPTIONAL,

--List of operating frequencies

listOfOperatingFrequencies ListOfOperatingFrequencies OPTIONAL,

--List of recommended information on operation frequencies

listOfRecommendedOperationFrequencies ListOfRecommendedOperationFrequencies OPTIONAL

}

--Network geometry class (Used in Profile 3)

NetworkGeometryClass ::= ENUMERATED {

--Class#1 network geometry

class1,

--Class#2 network geometry

class2,

--Class#3 network geometry

class3,

--Class#4 network geometry

class4

}

--List of neighbor GCOs (Used in Profile 3)

ListOfNeighborGCOs ::= SEQUENCE OF SEQUENCE {

--Neighbor GCO ID

gcoID OCTET STRING OPTIONAL,

--GCO descriptor

gcoDescriptor GCODescriptor OPTIONAL,

--Network geometry classification

networkGeometryClass NetworkGeometryClass OPTIONAL,

--List of operating frequencies

listOfOperatingFrequencies ListOfOperatingFrequencies OPTIONAL,

--List of available frequencies

listOfAvailableFrequencies ListOfAvailableFrequencies OPTIONAL

}

--List of master CM candidates (Used in Profile 3)

ListOfMasterCMCandidates ::= SEQUENCE OF SEQUENCE {

cmID CxID OPTIONAL,

ipAddress OCTET STRING OPTIONAL,

portNumber INTEGER OPTIONAL

}

--List of neighbor CEs (Used in Profile 3)

ListOfNeighborCEs ::= SEQUENCE OF SEQUENCE {

--Neighbor CE ID

ceID CxID OPTIONAL,

--List of neighbor GCOs

listOfNeighborGCOs ListOfNeighborGCOs OPTIONAL

}

--List of CEs (Used in Profile 3)

ListOfCEs ::= SEQUENCE OF CxID

--List of GCOs (Used in Profile 3)

ListOfGCOs ::= SEQUENCE {

--GCO ID

gcoID OCTET STRING OPTIONAL,

--GCO descriptor

gcoDescriptor GCODescriptor OPTIONAL

}

-- List of recommended operation frequencies (Used in Profile 3)

ListOfRecommendedOperationFrequencies ::= SEQUENCE OF SEQUENCE {

--Range of recommended operation frequency

frequencyRange FrequencyRange OPTIONAL,

--Recommended maximum EIRP [dBm]

recommendedMaxEirp REAL OPTIONAL,

--Start time

availableStartTime GeneralizedTime OPTIONAL,

--Stop time

availableStopTime GeneralizedTime OPTIONAL,

--Resolution bandwidth [Hz]

resolutionBandwidth REAL OPTIONAL,

--location validity [meter]

locationValidity REAL OPTIONAL,

...

}

-----------------------------------------------------------

--Transmission schedule

-----------------------------------------------------------

--Transmission schedule (Used in Profile 1)

TxSchedule ::= SEQUENCE OF SEQUENCE{

scheduleStartTime GeneralizedTime,

scheduleDuration REAL,

numberOfScheduleRepetitions INTEGER,

transmissionStartTime REAL,

transmissionDuration REAL

}

-----------------------------------------------------------

--Channel classification

-----------------------------------------------------------

--Operating channel information (Used in Profile 1)

OperatingChannelInfo ::= SEQUENCE {

operatingChannelNumber INTEGER,

listOfNetworkID SEQUENCE OF OCTET STRING,

...

}

--Channel classification information (Used in Profile 1)

ChClassInfo ::= SEQUENCE {

availableChannelList SEQUENCE OF INTEGER,

restrictedChannelList SEQUENCE OF INTEGER,

protectedChannelList SEQUENCE OF INTEGER,

unclassifiedChannelList SEQUENCE OF INTEGER,

operatingChannelList SEQUENCE OF OperatingChannelInfo,

coexistenceChannelList SEQUENCE OF OperatingChannelInfo,

...

}

--Channel classification information list (Used in Profile 1)

ChClassInfoList ::= SEQUENCE OF SEQUENCE {

networkID OCTET STRING,

chClassInfo ChClassInfo

}

-----------------------------------------------------------

--Energy detection information

-----------------------------------------------------------

--Energy detection information (Used in Profile 3)

EnergyDetectionInfo ::= SEQUENCE {

-- Energy detection threshold [dBm]

energyDetectionTh REAL OPTIONAL,

-- Energy detection successful rate

energyDetectionSuccessfulRate REAL OPTIONAL,

-- Percentage of activated cells within one operator over the management region

activationRate REAL OPTIONAL,

...

}

-----------------------------------------------------------

--Failed parameters

-----------------------------------------------------------

--Failed parameter ID (Used in Profile 1)

FailedParameterID ::= ENUMERATED {

listOfoperatingChNumber,

txPowerLimit,

channelIsShared,

txSchedule

}

--Failed parameter value (Used in Profile 1)

FailedParameterValue ::= CHOICE {

listOfoperatingChNumber SEQUENCE OF INTEGER,

txPowerLimit REAL,

channelIsShared BOOLEAN,

txSchedule TxSchedule

}

--Failed parameter(Used in Profile 1)

FailedParameters ::= SEQUENCE OF SEQUENCE {

failedParameterID FailedParameterID,

failedParameterValue FailedParameterValue

}

-----------------------------------------------------------

--Event indication

-----------------------------------------------------------

--Event descriptor (Used in Profile 1)

EventDescr ::= ENUMERATED{

sinrThresholdReached,

qosDegradation,

...

}

--Event parameters (Used in Profile 1)

EventParams ::= SEQUENCE {

eventDescr EventDescr

}

-----------------------------------------------------------

--Information Acquiring

-----------------------------------------------------------

--Request information description (Used in Profile 1)

ReqInfoDescr ::= SEQUENCE OF ENUMERATED {

sinr,

desiredBandwidth,

desiredOccupancy,

desiredQoS,

desiredCoverage,

channelNumber,

subscribedService,

interferenceLevel,

fairness,

threshold,

...

}

--Request information value (Used in Profile 1)

ReqInfoValue ::= SEQUENCE OF SEQUENCE {

reqInfoDescr ReqInfoDescr,

reqInfoValue CHOICE {

sinrValue [1] REAL,

desiredBandwidthValue [2] REAL,

desiredOccupancyValue [3] REAL,

desiredQoSValue [4] REAL,

desiredCoverageValue [5] REAL,

channelNumberValue [6] REAL,

subscribedServiceValue SubscribedService,

interferenceLevelValue [7] REAL,

fairnessValue [8] REAL,

thresholdValue [9] REAL,

...

}

}

-----------------------------------------------------------

--Negotiation

-----------------------------------------------------------

--Negotiation status (Used in Profile 1)

NegotiationStatus ::= SEQUENCE {

negotiationSuccess BOOLEAN,

negotiationFailure BOOLEAN,

underNegotiation BOOLEAN,

...

}

--Start and end time (Used in Profile 1)

StartEndTime ::= SEQUENCE {

startTime REAL,

endTime REAL

}

--Time sharing unit information (Used in Profile 1)

TimeSharingUnitInfo ::= SEQUENCE {

referenceTime REAL,

windowTime StartEndTime,

slotTime StartEndTime,

...

}

--Negotiation information

NegotiationInformation ::= SEQUENCE {

mode BOOLEAN,

listOfChNumber SEQUENCE OF INTEGER,

timeSharingUnitInfo TimeSharingUnitInfo,

slotTimePosition StartEndTime,

numberOfSlots INTEGER,

disallowedSlotTimePosition StartEndTime,

listOfContentionNumbers SEQUENCE OF REAL,

...

}

--List of winner CM ID (Used in Profile 1)

ListOfWinnerCMID ::= SEQUENCE OF CxID

--List of slot time position (Used in Profile 1)

ListOfSlotTimePosition ::= SEQUENCE OF REAL

-----------------------------------------------------------

--Mobility Information

-----------------------------------------------------------

--Mobility information (Used in Profile 3)

MobilityInformation ::= CHOICE {

--Maximum speed [km/h]

maxSpeed REAL,

--Speed information

speedInformation SpeedInformation,

--Route information

routeInformation RouteInformation

}

--Speed information (Used in Profile 3)

SpeedInformation ::= SEQUENCE {

--GCO speed [km/h]

gcoSpeed REAL OPTIONAL,

--GCO direction [degree]

gcoDirection REAL OPTIONAL

}

--Route information (Used in Profile 3)

RouteInformation ::= SEQUENCE {

plannedRoute SEQUENCE OF Geolocation OPTIONAL,

plannedTime SEQUENCE OF GeneralizedTime OPTIONAL

}

-----------------------------------------------------------

--Entity profile

-----------------------------------------------------------

--Entity profile (Used in Profile 3)

EntityProfile ::= ENUMERATED {

--Profile 1

profile1,

--Profile 2

profile2,

--Profile 3

profile3

}

-----------------------------------------------------------

--GraphEdge

-----------------------------------------------------------

--GraphEdge parameters (Used in Profile 3)

GraphEdge ::= SEQUENCE {

--Head vertex of edge

head OCTET STRING,

--tail vertex of edge

tail OCTET STRING,

--weight of the edge

weight REAL

}

-----------------------------------------------------------

--Graph of interference relationship

-----------------------------------------------------------

--Graph representation of interference relationship among GCOs (Used in Profile 3)

InterferenceRelationshipGraph ::= SEQUENCE {

--GraphEdge

edge GraphEdge,

...

}

-----------------------------------------------------------

--Measurement

-----------------------------------------------------------

--Measurement schedule (Used in Profile 1)

MeasurementSchedule ::= SEQUENCE {

measStartTime REAL,

numberOfMeasurements INTEGER,

timeBetweenMeasurements REAL

}

--Measurement frequency (Used in Profile 1)

MeasurementFreq ::= SEQUENCE OF INTEGER

--Measurement type (Used in Profile 1)

MeasurementType ::= ENUMERATED {

interferenceLevel

}

--Measurement description (Used in Profile 1)

MeasurementDescription ::= SEQUENCE {

measType MeasurementType,

measSchedule MeasurementSchedule,

measFreq MeasurementFreq

}

--Measurement report (Used in Profile 1)

MeasurementReport ::= CHOICE {

interferenceLevelValue REAL,

...

}

--Measurement result (Used in Profile 1)

MeasurementResult ::= SEQUENCE OF SEQUENCE {

measurementDescription MeasurementDescription,

measurementReport MeasurementReport

}

-----------------------------------------------------------

--Spectrum allocation Supporting Information

-----------------------------------------------------------

--Spectrum allocation supporting information

SpecAllocationSupportingInfo ::= SEQUENCE {

--Spectrum allocation coefficient indicates the interference aggregation effect of a pair of a target GCO and an existing GCO

spectrumAllocationCoefficient REAL,

--existing GCO spectrum allocation information gives the spectrum allocation of the GCO as in a given pair

gcoSpecAllocation ListOfOperatingFrequencies

}

----------------------------------------------------------

--Candidate serving CM information for Moving GCO

----------------------------------------------------------

--List of serving CM

ListOfCandidateServingCMs ::= SEQUENCE OF SEQUENCE{

-- CM ID

cmID CxID OPTIONAL,

-- Estimated arrival time

arrivalTime GeneralizedTime OPTIONAL,

-- Estimated residence duration [s]

residenceDuration REAL OPTIONAL,

-- Resource serving priority

selectionPriorityLevel INTEGER OPTIONAL

}

--List of moving GCOs

ListOfMovingGCOs ::= SEQUENCE OF SEQUENCE{

-- GCO ID

gcoID OCTET STRING OPTIONAL,

-- Estimated arrival time

arrivalTime GeneralizedTime OPTIONAL,

-- Estimated residence duration [s]

residenceDuration REAL OPTIONAL,

-- Desired Bandwidth [MHz]

desiredBandwidth REAL OPTIONAL

}

--List of candidate served GCOs

ListOfCandidateServedGCOs ::= SEQUENCE OF SEQUENCE{

-- GCO ID

gcoID OCTET STRING OPTIONAL,

-- Mobility information

mobilityInformation MobilityInformation OPTIONAL,

-- Desired Bandwidth [MHz]

desiredBandwidth REAL OPTIONAL

}

--List of estimated available bandwidth

listOfEstimatedAvailableBandwidth ::= SEQUENCE OF SEQUENCE{

-- GCO ID

gcoID OCTET STRING OPTIONAL,

-- Estimated Available Bandwidth [MHz]

estimatedAvailableBandwidth REAL OPTIONAL

}

END

# **(normative) Primitives**

## **Primitives for IEEE 802.19.1a**

### **Transport SAP**

IEEE802191aTRSAPPrimitive DEFINITIONS AUTOMATIC TAGS::= BEGIN

-----------------------------------------------------------

--Imported data types

-----------------------------------------------------------

--Imported data types

IMPORTS

--Coexistence protocol entity ID

CxID,

--Status

Status

FROM IEEE802191aDataType;

-----------------------------------------------------------

--Transport service configuration

-----------------------------------------------------------

--Transport service configuration request

TrConfigurationRequest ::= SEQUENCE {

--Source ID

sourceID CxID OPTIONAL,

--Destination ID

destinationID CxID OPTIONAL,

--Destination IP address

destinationIPAddress OCTET STRING OPTIONAL,

--Destination port number

destinationPortNumber INTEGER OPTIONAL

}

--Transport service configuration response

TrConfigurationResponse ::= SEQUENCE {

--Destination ID

destinationID CxID OPTIONAL,

--Configuration status

status Status OPTIONAL

}

-----------------------------------------------------------

--Connection establishment

-----------------------------------------------------------

--Request for connection

TrConnectionRequest ::= SEQUENCE {

--Source ID

sourceID CxID OPTIONAL,

--Destination ID

destinationID CxID OPTIONAL,

--Keep alive interval

keepAliveInterval INTEGER OPTIONAL

}

--Indication of the received connection request

TrConnectionIndication ::= SEQUENCE {

--Source ID

sourceID CxID OPTIONAL

}

--Response to the received connection request

TrConnectionResponse ::= SEQUENCE {

--Destination ID

destinationID CxID OPTIONAL,

--Connection status

status Status OPTIONAL

}

--Confirmation to the connection request

TrConnectionConfirm ::= SEQUENCE {

--Source ID

sourceID CxID OPTIONAL,

--Connection status

status Status OPTIONAL

}

-----------------------------------------------------------

--Connection termination

-----------------------------------------------------------

--Connection termination request

TrDisconnectionRequest ::= SEQUENCE {

--Destination ID

destinationID CxID OPTIONAL

}

--Connection termination indication

TrDisconnectionIndication ::= SEQUENCE {

--Source ID

sourceID CxID OPTIONAL

}

-----------------------------------------------------------

--Sending a coexistence protocol message

-----------------------------------------------------------

--Request to send coexistence protocol message

TrSendRequest ::= SEQUENCE {

--Destination ID

destinationID CxID OPTIONAL,

--Encoded coexistence protocol message

cxMessage OCTET STRING OPTIONAL

}

--Confirmation of sending coexistence protocol message

TrSendConfirm ::= SEQUENCE {

--Destination ID

destinationID CxID OPTIONAL,

--Status of sending coexistence protocol message

status Status OPTIONAL

}

-----------------------------------------------------------

--Receiving a coexistence protocol message

-----------------------------------------------------------

--Indication of received coexistence protocol message

TrReceiveIndication ::= SEQUENCE {

--Source ID

sourceID CxID OPTIONAL,

--Encoded coexistence protocol message

cxMessage OCTET STRING OPTIONAL

}

END

### **Coexistence Media SAP**

IEEE802191aMEDIASAPPrimitive DEFINITIONS AUTOMATIC TAGS::= BEGIN

-----------------------------------------------------------

--Imported data types

-----------------------------------------------------------

--Imported data types

IMPORTS

--CxMedia status (Used in Profiles 1 and 3)

CxMediaStatus,

--Subscribed service (Used in Profile 1)

SubscribedService,

--Coexistence service (Used in Profile 3)

CoexistenceService,

--Network technology (Used in Profiles 1 and 3)

NetworkTechnology,

--Network type (Used in Profiles 1 and 3)

NetworkType,

--GCO Descriptor (Used in Profile 3)

GCODescriptor,

--Geolocation (Used in Profile 3)

Geolocation,

--Coverage area (Used in Profile 3)

CoverageArea,

--Discovery information (Used in Profile 1)

DiscoveryInformation,

--Installation parameters (Used in Profile 3)

InstallationParameters,

--List of available channel numbers (Used in Profile 1)

ListOfAvailableChNumbers,

--List of available frequencies (Used in Profile 3)

ListOfAvailableFrequencies,

--List of operating channel numbers (Used in Profile 1)

ListOfOperatingChNumbers,

--List of operating frequencies (Used in Profile 3)

ListOfOperatingFrequencies,

--List of supported frequencies (Used in Profile 3)

ListOfSupportedFrequencies,

--Required resource (Used in Profiles 1 and 3)

RequiredResource,

--Transmission schedule (Used in Profiles 1 and 3)

TxSchedule,

--Coexistence protocol entity ID (Used in Profiles 1 and 3)

CxID,

--Frequency range (Used in Profile 3)

FrequencyRange,

--Coexistence report (Used in Profiles 1 and 3)

CoexistenceReport,

--Channel priority (Used in Profile 1)

ChannelPriority,

--List of coexistence reports (Used in Profile 3)

ListOfCoexistenceReports,

--Measurement capability (Used in Profiles 1 and 3)

MeasurementCapability,

-- Operation code (Used in Profiles 1 and 3)

OperationCode,

--Mobility Information (Used in Profile 3)

MobilityInformation,

--Entity profile (Used in Profile 3)

EntityProfile,

--List of recommended operation Frequencies (Used in Profile 3)

ListOfRecommendedOperationFrequencies,

--List of desired performances (Used in Profile 3)

ListOfDesiredPerformances,

--Spectrum request modification (Used in Profile 3)

SpecRequestModification,

--Failed parameters (Used in Profile 1)

FailedParameters,

--Range (Used in Profile 3)

Range,

--Channel classification information (Used in Profile 1)

ChClassInfo,

--Channel classification information list (Used in Profile 1)

ChClassInfoList,

--Event parameters (Used in Profile 1)

EventParams,

--Measurement description (Used in Profile 1)

MeasurementDescription,

--Measurement result (Used in Profile 1)

MeasurementResult,

--List of candidate serving CMs

listOfCandidateServingCMs

FROM IEEE802191aDataType;

-----------------------------------------------------------

--GCO subscription

-----------------------------------------------------------

--Request for subscription information (Used in Profile 1)

GetServiceSubscriptionRequest ::= SEQUENCE {}

--Subscription information (Used in Profile 1)

GetServiceSubscriptionResponse ::= SEQUENCE {

--Coexistence service to which GCO is subscribed

subscribedService SubscribedService,

-- CxMediaStatus

cxMediaStatus CxMediaStatus

}

--Confirm for subscription (Used in Profile 1)

GetServiceSubscriptionConfirm ::= SEQUENCE {

--CxMediaStatus

cxMediaStatus CxMediaStatus

}

--Request for subscription information (Used in Profile 3)

CxMediaSubscriptionRequest ::= SEQUENCE {}

--Subscription information (Used in Profile 3)

CxMediaSubscriptionResponse ::= SEQUENCE {

--GCO subscription ID

clientID IA5String OPTIONAL,

--GCO subscription password

clientPassword IA5String OPTIONAL,

--Coexistence service to which GCO is subscribed

coexistenceService CoexistenceService OPTIONAL

}

--Request to change subscription (Used in Profile 3)

CxMediaSubscriptionIndication ::= SEQUENCE {

--Coexistence service to which GCO is subscribed

coexistenceService CoexistenceService OPTIONAL

}

--Subscription status (Used in Profile 3)

CxMediaSubscriptionConfirm ::= SEQUENCE {

--Subscription status

cxMediaStatus CxMediaStatus OPTIONAL

}

-----------------------------------------------------------

--GCO subscription update

-----------------------------------------------------------

--Request to update subscription (Used in Profile 1)

NewServiceSubscriptionIndication ::= SEQUENCE {

--Coexistence service to which GCO is subscribed

subscribedService SubscribedService

}

--Confirm for subscription update (Used in Profile 1)

GetServiceSubscriptionConfirm ::= SEQUENCE {

--CxMediaStatus

cxMediaStatus CxMediaStatus

}

-----------------------------------------------------------

--GCO subscription change

-----------------------------------------------------------

--Request to change subscription (Used in Profile 1)

ChangeSubscriptionRequest ::= SEQUENCE {

--Coexistence service to which GCO is subscribed

subscribedService SubscribedService

}

--Response for subscription change (Used in Profile 1)

ChangeSubscriptionResponse ::= SEQUENCE {

--CxMediaStatus

cxMediaStatus CxMediaStatus

}

--Request to change subscription (Used in Profile 3)

CxMediaChangeSubscriptionRequest ::= SEQUENCE {

--Coexistence service to be changed

coexistenceService CoexistenceService OPTIONAL

}

--Response for subscription change (Used in Profile 3)

CxMediaChangeSubscriptionResponse ::= SEQUENCE {

--Status

cxMediaStatus CxMediaStatus OPTIONAL

}

-----------------------------------------------------------

--GCO registration

-----------------------------------------------------------

--Request for registration information (Used in Profile 1)

GetRegInfoRequest ::= SEQUENCE {}

--Registration information (Used in Profile 1)

GetRegInfoResponse ::= SEQUENCE {

--Network ID

networkID OCTET STRING,

--Network technology

networkTechnology NetworkTechnology,

--Network type

networkType NetworkType,

--Discovery information

discoveryInformation DiscoveryInformation,

--Transmission schedule is supported or not

txScheduleSupported BOOLEAN,

--List of available channel number

listOfAvailableChNumbers ListOfAvailableChNumbers,

--List of supported channel number

listOfSupportedChNumbers SEQUENCE OF INTEGER,

--List of operating channel number

listOfOperatingChNumbers ListOfOperatingChNumbers,

--Required resource

requiredResource RequiredResource,

--Measurement capability

measurementCapability MeasurementCapability

}

--Confirm for registration (Used in Profile 1)

GetRegInfoConfirm ::= SEQUENCE {

--CxMediaStatus

cxMediaStatus CxMediaStatus

}

--Request for registration information (Used in Profile 3)

CxMediaRegistrationRequest ::= SEQUENCE {}

--Registration information (Used in Profile 3)

CxMediaRegistrationResponse ::= SEQUENCE OF SEQUENCE {

--GCO ID

gcoID OCTET STRING OPTIONAL,

--Network ID

networkID OCTET STRING OPTIONAL,

--GCO descriptor

gcoDescriptor GCODescriptor OPTIONAL,

--Installation parameters

installationParameters InstallationParameters OPTIONAL,

--List of available frequencies

listOfAvailableFrequencies ListOfAvailableFrequencies OPTIONAL,

--List of operating frequencies

listOfOperatingFrequencies ListOfOperatingFrequencies OPTIONAL,

-- List of supported frequencies

listOfSuppFrequencies ListOfSupportedFrequencies OPTIONAL,

--Transmission schedule is supported or not

txScheduleSupported BOOLEAN OPTIONAL,

--Measurement capability

measurementCapability MeasurementCapability OPTIONAL,

--Required resource

requiredResource RequiredResource OPTIONAL,

--Mobility Information

mobilityInformation MobilityInformation OPTIONAL,

--List of desired performance

listOfDesiredPerformances ListOfDesiredPerformances OPTIONAL,

--Spectrum transition capability

spectrumTransitionCapability BOOLEAN OPTIONAL,

--Operation region

operationRegion Range OPTIONAL

}

--Updated registration information (Used in Profile 3)

CxMediaRegistrationIndication ::= SEQUENCE OF SEQUENCE {

--GCO ID

gcoID OCTET STRING OPTIONAL,

--Network ID

networkID OCTET STRING OPTIONAL,

--List of available frequencies

listOfAvailableFrequencies ListOfAvailableFrequencies OPTIONAL,

--List of operating frequencies

listOfOperatingFrequencies ListOfOperatingFrequencies OPTIONAL,

--Required resource

requiredResource RequiredResource OPTIONAL,

--Transmission schedule is supported or not

txScheduleSupported BOOLEAN OPTIONAL,

-- List of supported frequencies

listOfSuppFrequencies ListOfSupportedFrequencies OPTIONAL,

--Measurement capability

measurementCapability MeasurementCapability OPTIONAL,

--Mobility information

mobilityInformation MobilityInformation OPTIONAL,

--List of desired performance

listOfDesiredPerformances ListOfDesiredPerformances OPTIONAL,

--Spectrum transition capability

spectrumTransitionCapability BOOLEAN OPTIONAL,

--Operation region

operationRegion Range OPTIONAL

}

--Registration confirmation (Used in Profile 3)

CxMediaRegistrationConfirm ::= SEQUENCE {

--CxMedis status

cxMediaStatus CxMediaStatus OPTIONAL,

--Registration update duration [s]

registrationUpdateDuration REAL OPTIONAL,

--List of candidate serving CMs

listOfCandidateServingCMs ListOfCandidateServingCMs OPTIONAL

}

-----------------------------------------------------------

--GCO registration update

-----------------------------------------------------------

--Updated registration information (Used in Profile 1)

NewRegInfoIndication ::= SEQUENCE {

--Network ID

networkID OCTET STRING,

--Network technology

networkTechnology NetworkTechnology,

--Network type

networkType NetworkType,

--Discovery information

discoveryInformation DiscoveryInformation,

--Transmission schedule is supported or not

txScheduleSupported BOOLEAN,

--List of available channel number

listOfAvailableChNumbers ListOfAvailableChNumbers,

--List of supported channel number

listOfSupportedChNumbers SEQUENCE OF INTEGER,

--List of operating channel number

listOfOperatingChNumbers ListOfOperatingChNumbers,

--Required resource

requiredResource RequiredResource,

--Measurement capability

measurementCapability MeasurementCapability

}

--Confirm for registration (Used in Profile 1)

NewRegInfoConfirm ::= SEQUENCE {

--CxMediaStatus

cxMediaStatus CxMediaStatus

}

-----------------------------------------------------------

--GCO reconfiguration for management service

-----------------------------------------------------------

--Reconfiguration request (Used in Profile 1)

PerformReconfigurationRequest ::= SEQUENCE {

--List of operating channel number

listOfOperatingChNumber SEQUENCE OF INTEGER,

--Transmission power limitation

txPowerLimit SEQUENCE OF REAL,

--Indication whether the channel is shared

channelIsShared SEQUENCE OF BOOLEAN,

--Transmission schedule

txSchedule TxSchedule,

-- Channel classification information

chClassInfo ChClassInfo

}

--Reconfiguration response (Used in Profile 1)

PerformReconfigurationResponse ::= SEQUENCE {

--CxMediaStatus

cxMediaStatus CxMediaStatus,

--Failed parameters

failedParameters FailedParameters

}

--Reconfiguration request (Used in Profile 3)

CxMediaReconfigurationRequest ::= SEQUENCE OF SEQUENCE {

--GCO ID

gcoID OCTET STRING OPTIONAL,

--List of operating frequencies

listOfOperatingFrequencies ListOfOperatingFrequencies OPTIONAL,

--Network technology to be configured

newNetworkTechnology NetworkTechnology OPTIONAL,

--Spectrum request modification

specRequestModification SpecRequestModification OPTIONAL

}

-----------------------------------------------------------

--Coexistence report for information service

-----------------------------------------------------------

--Request for coexistence report (Used in Profile 1)

CoexistenceReportRequest ::= SEQUENCE {}

--Response for coexistence report (Used in Profile 1)

CoexistenceReportResponse ::= SEQUENCE {

--Coexistence report information

coexistenceReport CoexistenceReport,

--Channel priority information

channelPriority ChannelPriority

}

--Request for coexistence report (Used in Profile 3)

CxMediaCoexistenceReportRequest ::= SEQUENCE {}

--Response for coexistence report (Used in Profile 3)

CxMediaCoexistenceReportResponse ::= SEQUENCE {

--Coexistence report information

coexistenceReport CoexistenceReport OPTIONAL,

--List of coexistence reports

listOfCoexistenceReports ListOfCoexistenceReports OPTIONAL

}

-----------------------------------------------------------

--Channel classification requested by CE

-----------------------------------------------------------

--Channel classification request (Used in Profile 1)

ChannelClassificationRequest ::= SEQUENCE {

-- List of network ID

listOfNetworkID SEQUENCE OF OCTET STRING

}

-- Channel classification response (Used in Profile 1)

ChannelClassificationResponse ::= SEQUENCE {

--List of channel classification information

chClassInfoList ChClassInfoList

}

-----------------------------------------------------------

--Channel classification update

-----------------------------------------------------------

--Channel classification update (Used in Profile 1)

ChannelClassificationIndication ::= SEQUENCE {

--List of channel classification information

chClassInfoList ChClassInfoList

}

-----------------------------------------------------------

--Available channel list from GCO

-----------------------------------------------------------

-- Available channel List request (Used in Profile 1)

AvailableChannelListRequest ::= SEQUENCE {}

-- Available channel list response (Used in Profile 1)

AvailableChannelListResponse ::= SEQUENCE {

--Available channel list information

listOfAvailableChNumbers ListOfAvailableChNumbers

}

-----------------------------------------------------------

--Event indication

-----------------------------------------------------------

-- Event indication (Used in Profile 1)

EventIndication ::= SEQUENCE {

-- Event indication information

eventParams EventParams

}

-----------------------------------------------------------

--Measurement Request

-----------------------------------------------------------

-- Measurement request (Used in Profile 1)

GetMeasurementRequest ::= SEQUENCE {

-- Measurement request information

measurementDescription MeasurementDescription

}

-----------------------------------------------------------

-- Measurement results

-----------------------------------------------------------

-- Measurement response (Used in Profile 1)

GetMeasurementResponse ::= SEQUENCE OF SEQUENCE{

-- Measurement results

measurementResult MeasurementResult

}

-----------------------------------------------------------

-- GCO Deregistration

-----------------------------------------------------------

--Deregistration request (Used in Profile 1)

PerformDeregistrationRequest ::= SEQUENCE {}

-- Deregistration response (Used in Profile 1)

PerformReconfigurationResponse ::= SEQUENCE {

--Status

status Status

}

END

# **(normative) Messages**

## **Messages for IEEE 802.19.1a**

IEEE802191aMessage DEFINITIONS AUTOMATIC TAGS ::= BEGIN

-----------------------------------------------------------

--Imported data types

-----------------------------------------------------------

--Imported data types

IMPORTS

--Coexistence protocol entity ID (Used in Profile 1 and 3)

CxID,

--Status (Used in Profile 1 and 3)

Status,

--Cx Media status (Used in Profile 1 and 3)

CxMediaStatus,

--Subscribed service (Used in Profile 1)

SubscribedService,

--Coexistence service (Used in Profile 3)

CoexistenceService,

--Discovery information (Used in Profile 1)

DiscoveryInformation,

--Network technology (Used in Profile 1 and 3)

NetworkTechnology,

--Network type (Used in Profile 1 and 3)

NetworkType,

--Geolocation (Used in Profile 3)

Geolocation,

--Coverage area (Used in Profile 3)

CoverageArea,

--Installation parameters (Used in Profile 3)

InstallationParameters,

--Frequency range (Used in Profile 3)

FrequencyRange,

--List of available channel numbers (Used in Profile 1)

ListOfAvailableChNumbers,

--List of available frequencies (Used in Profile 3)

ListOfAvailableFrequencies,

--List of operating channel numbers (Used in Profile 1)

ListOfOperatingChNumbers,

--List of operating frequencies (Used in Profile 3)

ListOfOperatingFrequencies,

--List of supported frequencies (Used in Profile 3)

ListOfSupportedFrequencies,

--Required resource (Used in Profile 1 and 3)

RequiredResource,

--Channel priority (Used in Profile 1)

ChannelPriority,

--Operation code for registration (Used in Profile 1 and 3)

OperationCode,

--Measurement capability (Used in Profile 1 and 3)

MeasurementCapability,

--CM registration (Used in Profile 3)

CMRegistration,

--CE registration (Used in Profile 3)

CERegistration,

--Coexistence report (Used in Profile 1 and 3)

CoexistenceReport,

--List of coexistence reports (Used in Profile 3)

ListOfCoexistenceReports,

--Mobility Information (Used in Profile 3)

MobilityInformation,

--Entity profile (Used in Profile 3)

EntityProfile,

--List Of Accessible CMs (Used in Profile 3)

ListOfAccessibleCMs,

--List of master CM candidates (Used in Profile 3)

ListOfMasterCMCandidates,

--List of neighbor CMs (Used in Profile 1 and 3)

ListOfNeighborCMs,

--List Of CEs (Used in Profile 3)

ListOfCEs,

--List of GCOs (Used in Profile 3)

ListOfGCOs,

--List of desired performances (Used in Profile 3)

ListOfDesiredPerformances,

--Transmission schedule (Used in Profile 1)

TxSchedule,

--Failed parameters (Used in Profile 1)

FailedParameters,

--Coordinates (Used in Profile 3)

Coordinates,

--Range (Used in Profile 3)

Range,

--Region (Used in Profile 3)

Region,

--Antenna Characteristics (Used in Profile 3)

AntennaCharacteristics,

--Type of frequency (Used in Profile 3)

TypeOfFrequency,

--GCO Descriptor (Used in Profile 3)

GCODescriptor,

--Receiver information (Used in Profile 3)

ReceiverInfo,

--Receiver type (Used in Profile 3)

ReceiverType,

--Modulation type (Used in Profile 3)

ModulationType,

--Filter characteristics (Used in Profile 3)

FilterCharacteristics,

--Energy detection information (Used in Profile 3)

EnergyDetectionInfo,

--Spectrum request modification (Used in Profile 3)

SpecRequestModification,

--Graph edge (Used in Profile 3)

GraphEdge,

--Interference relationship graph (Used in Profile 3)

InterferenceRelationshipGraph,

--Channel classification information (Used in Profile 1)

ChClassInfo,

--Channel classification information list (Used in Profile 1)

ChClassInfoList,

--Required information description (Used in Profile 1)

ReqInfoDescr,

-- Requested information value (Used in Profile 1)

ReqInfoValue,

--Event parameters (Used in Profile 1)

EventParams,

-- Negotiation status (Used in Profile 1)

NegotiationStatus,

-- Negotiation information (Used in Profile 1)

NegotiationInformation,

--Winner CM ID list (Used in Profile 1)

ListOfWinnerCMID,

-- Slot time position list (Used in Profile 1)

ListOfSlotTimePosition,

--Measurement description (Used in Profile 1)

MeasurementDescription,

--Measurement result (Used in Profile 1)

MeasurementResult,

--Spectrum allocation supporting information

SpecAllocationSupportingInfo,

--Spectrum allocation supporting information

SpecAllocationSupportingInfo,

--List of serving CM

ListOfCandidateServingCMs,

--List of moving GCOs

ListOfMovingGCOs,

--List of candidate served GCOs

ListOfCandidateServedGCOs,

--List of estimated available bandwidth

listOfEstimatedAvailableBandwidth

FROM IEEE802191aDataType;

-----------------------------------------------------------

--Message structure, header structure, and payload types

-----------------------------------------------------------

--Message structure (Used in Profiles 1 and 3)

CxMessage ::= SEQUENCE {

-- Message header

header CxHeader,

-- Message payload

payload CxPayload

}

--Header (Used in Profiles 1 and 3)

CxHeader ::= CHOICE {

--For announcement

none NULL,

--For request or single response

requestID INTEGER (0..2147483647),

--For multiple responses

multipleResponse SEQUENCE {

--Original request ID

requestID INTEGER(0..2147483647),

--Response number

sequenceNumber INTEGER(0..2147483647),

--True is the response is last

isLastResponse BOOLEAN

}

}

--Payload types (Used in Profiles 1 and 3)

CxPayload ::= CHOICE {

--CM association request (Used in Profile 3)

cmAssociationRequest CMAssociationRequest,

--CM association response (Used in Profile 3)

cmAssociationResponse CMAssociationResponse,

--GCO subscription request (Used in Profiles 1 and 3)

subscriptionRequest SubscriptionRequest,

--GCO subscription response (Used in Profiles 1 and 3)

subscriptionResponse SubscriptionResponse,

--GCO subscription change request (Used in Profiles 1 and 3)

subscriptionChangeRequest SubscriptionChangeRequest,

--GCO subscription change response (Used in Profiles 1 and 3)

subscriptionChangeResponse SubscriptionChangeResponse,

--CE registration request (Used in Profile 3)

ceRegistrationRequest CERegistrationRequest,

--Registration response (Used in Profiles 1 and 3)

registrationResponse RegistrationResponse,

--Deregistration request (Used in Profile 1)

deregistrationRequest DeregistrationRequest,

-- Deregistration response (Used in Profile 1)

deregistrationResponse DeregistrationResponse,

-- Event indication (Used in Profile 1)

eventIndication EventIndication,

-- Event confirm (Used in Profile 1)

eventConfirm EventConfirm,

--Available channel list request from GCO (Used in Profile 1)

availableChannelsRequest AvailableChannelsRequest,

-- Available channel list response from GCO (Used in Profile 1)

availableChannelsResponse AvailableChannelsResponse,

--GCO channel classification request (Used in Profile 1)

channelClassificationRequest ChannelClassificationRequest,

--GCO channel classification response (Used in Profile 1)

channelClassificationResponse ChannelClassificationResponse,

--GCO channel classification announcement (Used in Profile 1)

channelClassificationAnnouncement ChannelClassificationAnnouncement,

--CM channel classification request (Used in Profile 1)

cmChannelClassificationRequest CMChannelClassificationRequest,

--CM channel classification response (Used in Profile 1)

cmChannelClassificationResponse CMChannelClassificationResponse,

--GCO measurement request (Used in Profile 1)

measurementRequest MeasurementRequest,

--GCO measurement response (Used in Profile 1)

measurementResponse MeasurementResponse,

--GCO measurement confirm (Used in Profile 1)

measurementConfirm MeasurementConfirm,

--Information acquiring request (Used in Profile 1)

infoAcquiringRequest InforAcquiringRequest,

--Information acquiring response (Used in Profile 1)

infoAcquiringResponse InforAcquiringResponse,

--Negotiation request (Used in Profile 1)

negotiationRequest NegotiationRequest,

--Negotiation announcement (Used in Profile 1)

negotiationAnnouncement NegotiationAnnouncement,

--Reconfiguration request (Used in Profiles 1 and 3)

reconfigurationRequest ReconfigurationRequest,

--Reconfiguration response (Used in Profiles 1 and 3)

reconfigurationResponse ReconfigurationResponse,

--Coexistence report request (Used in Profiles 1 and 3)

coexistenceReportRequest CoexistenceReportRequest,

--Coexistence report response (Used in Profiles 1 and 3)

coexistenceReportResponse CoexistenceReportResponse,

--CM registration request (Used in Profiles 1 and 3)

cmRegistrationRequest CMRegistrationRequest,

--Coexistence set information request (Used in Profiles 1 and 3)

coexistenceSetInformationRequest CoexistenceSetInformationRequest,

--Coexistence set information response (Used in Profiles 1 and 3)

coexistenceSetInformationResponse CoexistenceSetInformationResponse,

--CM Reconfiguration request (Used in Profiles 1 and 3)

cmReconfigurationRequest CMReconfigurationRequest,

--CM Reconfiguration response (Used in Profiles 1 and 3)

cmReconfigurationResponse CMReconfigurationResponse,

--Master/Slave CM request (Used in Profile 1)

masterCMRequest MasterCMRequest,

--Master/Slave CM response (Used in Profile 1)

masterCMResponse MasterCMResponse,

--Master/Slave CM configuration request(Used in Profiles 1 and 3)

masterSlaveCMConfigurationRequest MasterSlaveCMConfigurationRequest,

--Master/Slave CM configuration response(Used in Profiles 1 and 3)

masterSlaveCMConfigurationResponse MasterSlaveCMConfigurationResponse,

-- CE Proxy Coexistence Service Request (Used in Profile 3)

ceProxyCoexistenceServiceRequest CEProxyCoexistenceServiceRequest,

-- CM Proxy Coexistence Service Request (Used in Profile 3)

cmProxyCoexistenceServiceRequest CMProxyCoexistenceServiceRequest,

--Inter-CM association request (Used in Profile 3)

interCMAssociationRequest InterCMAssociationRequest,

--Inter-CM association response (Used in Profile 3)

interCMAssociationResponse InterCMAssociationResponse,

--Inter-COE association request (Used in Profile 3)

interCOEAssociationRequest InterCOEAssociationRequest,

--Inter-COE association response (Used in Profile 3)

interCOEAssociationResponse InterCOEAssociationResponse,

--Operating frequency information request (Used in Profile 3)

operatingFreqInformationRequest OperatingFreqInformationRequest,

--Operating frequency information response (Used in Profile 3)

operatingFreqInformationResponse OperatingFreqInformationResponse,

--Inter-COE operating frequency information request (Used in Profile 3)

interCOEOperatingFreqInformationRequest InterCOEOperatingFreqInformationRequest,

--Inter-COE operating frequency information request (Used in Profile 3)

interCOEOperatingFreqInformationResponse InterCOEOperatingFreqInformationResponse,

...

}

-----------------------------------------------------------

--CM Association

-----------------------------------------------------------

**--**CM association request (Used in Profile 3)

CMAssociationRequest ::= SEQUENCE {

--GCO subscription ID

clientID IA5String OPTIONAL,

...

}

--CM association response (Used in Profile 3)

CMAssociationResponse ::= SEQUENCE {

--Status

status Status OPTIONAL,

...

}

-----------------------------------------------------------

--GCO and CM subscription

-----------------------------------------------------------

--GCO subscription request (Used in Profiles 1 and 3)

SubscriptionRequest ::= SEQUENCE {

--GCO ID (Only in Profile 3)

gcoID OCTET STRING OPTIONAL,

--GCO subscription ID (Only in Profile 3)

clientID IA5String OPTIONAL,

--GCO subscription password (Only in Profile 3)

clientPassword IA5String OPTIONAL,

--Coexistence service to which GCO is subscribed (Only in Profile 3)

coexistenceService CoexistenceService OPTIONAL,

--Coexistence service to which GCO is subscribed (Only in Profile 1)

subscribedService SubscribedService OPTIONAL

}

--GCO subscription response (Used in Profiles 1 and 3)

SubscriptionResponse ::= SEQUENCE {

--CM subscription ID (Only in Profile 3)

serverID IA5String OPTIONAL,

--CM subscription password (Only in Profile 3)

serverPassword IA5String OPTIONAL,

--Subscription status

status Status OPTIONAL

}

-----------------------------------------------------------

--GCO subscription change

-----------------------------------------------------------

--Request to change subscription (Used in Profiles 1 and 3)

SubscriptionChangeRequest ::= SEQUENCE {

--GCO ID (Only in Profile 3)

gcoID OCTET STRING OPTIONAL,

--GCO subscription ID (Only in Profile 3)

clientID IA5String OPTIONAL,

--Coexistence service to which GCO is subscribed (Only in Profile 3)

coexistenceService CoexistenceService OPTIONAL,

--Coexistence service to which GCO is subscribed (Only in Profile 1)

subscribedService SubscribedService OPTIONAL

}

--Response for subscription change (Used in Profiles 1 and 3)

SubscriptionChangeResponse :: = SEQUENCE {

--GCO ID (Only in Profile 3)

gcoID OCTET STRING OPTIONAL,

--GCO subscription ID (Only in Profile 3)

clientID IA5String OPTIONAL,

--Status

cxMediaStatus CxMediaStatus OPTIONAL

}

-----------------------------------------------------------

--GCO registration

-----------------------------------------------------------

--CE registration request (Used in Profiles 1 and 3)

CERegistrationRequest ::= SEQUENCE OF SEQUENCE {

--Operation code

operationCode OperationCode OPTIONAL,

--GCO ID (Only in Profile 3)

gcoID OCTET STRING OPTIONAL,

--Network ID

networkID OCTET STRING OPTIONAL,

--Network technology (Only in Profile 1)

networkTechnology NetworkTechnology OPTIONAL,

--Network type (Only in Profile 1)

networkType NetworkType OPTIONAL,

--Discovery information (Only in Profile 1)

discoveryInformation DiscoveryInformation OPTIONAL,

--GCO Descriptor (Only in Profile 3)

gcoDescriptor GCODescriptor OPTIONAL,

-- Mobility information (Only in Profile 3)

mobilityInformation MobilityInformation OPTIONAL,

--Installation parameters (Only in Profile 3)

installationParameters InstallationParameters OPTIONAL,

--List of available channel number (Only in Profile 1)

listOfAvailableChNumbers ListOfAvailableChNumbers OPTIONAL,

--List of available frequencies (Only in Profile 3)

listOfAvailableFrequencies ListOfAvailableFrequencies OPTIONAL,

--Transmission schedule is supported or not

txScheduleSupported BOOLEAN OPTIONAL,

--List of operating channel number (Only in Profile 1)

listOfOperatingChNumbers ListOfOperatingChNumbers OPTIONAL,

--List of operating frequencies (Only in Profile 3)

listOfOperatingFrequencies ListOfOperatingFrequencies OPTIONAL,

--List of supported channel number (Only in Profile 1)

listOfSupportedChNumbers SEQUENCE OF INTEGER OPTIONAL,

-- List of supported frequencies (Only in Profile 3)

listOfSuppFrequencies ListOfSupportedFrequencies OPTIONAL,

--Required resource

requiredResource RequiredResource OPTIONAL,

--Measurement capability

measurementCapability MeasurementCapability OPTIONAL,

--List of desired performance (Only in Profile 3)

listOfDesiredPerformances ListOfDesiredPerformances OPTIONAL,

--Spectrum transition capability (Only in Profile 3)

spectrumTransitionCapability BOOLEAN OPTIONAL,

--Operation region (Only in Profile 3)

operationRegion Range OPTIONAL

}

--Registration response (Used in Profiles 1 and 3)

RegistrationResponse ::= SEQUENCE {

--Registration status(Only in Profile 3)

status Status OPTIONAL,

--Registration update duration [s] (Only in Profile 3)

registrationUpdateDuration REAL OPTIONAL,

--List of candidate serving CMs

listOfCandidateServingCMs ListOfCandidateServingCMs OPTIONAL

}

-----------------------------------------------------------

--CM registration

-----------------------------------------------------------

--CM registration request (Used in Profiles 1 and 3)

CMRegistrationRequest ::= SEQUENCE {

--CM profile (Only in Profile 3)

cmProfile EntityProfile OPTIONAL,

--CM registration (Only in Profile 3)

cmRegistration CMRegistration OPTIONAL,

--CE registration (Only in Profile 3)

ceRegistration CERegistration OPTIONAL,

--Operation code

operationCode OperationCode OPTIONAL,

--CE ID(Only in Profile 1)

ceID CxID OPTIONAL,

--CM ID(Only in Profile 3)

cmID CxID OPTIONAL,

--Maximum number of controllable GCO (Only in Profile 3)

maximumNumberOfControllableGCO INTEGER OPTIONAL,

--Network ID (Only in Profile 1)

networkID OCTET STRING OPTIONAL,

--Network technology (Only in Profile 1)

networkTechnology NetworkTechnology OPTIONAL,

--Network type (Only in Profile 1)

networkType NetworkType OPTIONAL,

--Discovery information (Only in Profile 1)

discoveryInformation DiscoveryInformation OPTIONAL,

--List of supported channel number (Only in Profile 1)

listOfSupportedChNumbers SEQUENCE OF INTEGER OPTIONAL

}

-----------------------------------------------------------

--Coexistence set information

-----------------------------------------------------------

--Request for coexistence set information (Used in Profiles 1 and 3)

CoexistenceSetInformationRequest ::= SEQUENCE {

--List of network IDs

listOfNetworkIDs SEQUENCE OF OCTET STRING OPTIONAL,

--Operation code (Only in Profile 3)

operationCode OperationCode OPTIONAL

}

--Response for coexistence set information (Used in Profiles 1 and 3)

CoexistenceSetInformationResponse ::= SEQUENCE {

--Network ID

networkID OCTET STRING OPTIONAL,

--List of neighbor CMs

listOfNeighborCMs ListOfNeighborCMs OPTIONAL,

--List of master CM candidates (Only in Profile 3)

listOfMasterCMCandidates ListOfMasterCMCandidates OPTIONAL

}

-----------------------------------------------------------

--Coexistence report

-----------------------------------------------------------

--Request for coexistence report (Used in Profile 1)

CoexistenceReportRequest ::= SEQUENCE {}

--Response for coexistence report (Used in Profiles 1 and 3)

CoexistenceReportResponse ::= SEQUENCE {

--Coexistence report information

coexistenceReport CoexistenceReport OPTIONAL,

--Channel priority information (Only in Profile 1)

channelPriority ChannelPriority OPTIONAL,

--List of coexistence report (Only in Profile 3)

listOfCoexistenceReports ListOfCoexistenceReports OPTIONAL

}

-----------------------------------------------------------

--GCO reconfiguration

-----------------------------------------------------------

--Reconfiguration request (Used in Profiles 1 and 3)

ReconfigurationRequest ::= SEQUENCE OF SEQUENCE {

--List of operating channel number (Only in Profile 1)

listOfOperatingChNumber SEQUENCE OF INTEGER OPTIONAL,

--Transmission power limitation (Only in Profile 1)

txPowerLimit SEQUENCE OF REAL OPTIONAL,

--Indication whether the channel is shared (Only in Profile 1)

channelIsShared SEQUENCE OF BOOLEAN OPTIONAL,

--Transmission schedule (Only in Profile 1)

txSchedule TxSchedule OPTIONAL,

-- Channel classification information (Only in Profile 1)

chClassInfo ChClassInfo OPTIONAL,

--GCO ID (Only in Profile 3)

gcoID OCTET STRING OPTIONAL,

--List of operating frequencies and related parameters to be configured (Only in Profile 3)

listOfOperatingFrequencies ListOfOperatingFrequencies OPTIONAL,

--Network technology to be configured (Only in Profile 3)

netNetworkTechnology NetworkTechnology OPTIONAL,

--Spectrum request modification (Only in Profile 3)

specRequestModification SpecRequestModification OPTIONAL

}

--Reconfiguration response (Used in Profiles 1 and 3)

ReconfigurationResponse ::= SEQUENCE OF SEQUENCE {

--GCO ID (Only in Profile 3)

gcoID OCTET STRING OPTIONAL,

--Reconfiguration status

status Status OPTIONAL,

--list of available frequencies (Only in Profile 3)

listOfAvailableFrequencies ListOfAvailableFrequencies OPTIONAL,

--Failed parameters (Only in Profile 1)

failedParameters FailedParameters OPTIONAL

}

-----------------------------------------------------------

--GCO reconfiguration for another CM

-----------------------------------------------------------

--CM Reconfiguration request (Used in Profiles 1 and 3)

CMReconfigurationRequest ::= SEQUENCE {

--Indication for CE to be reconfigured (Only in Profile 1)

reconfigTarget CxID OPTIONAL,

--List of operating channel number (Only in Profile 1)

listOfOperatingChNumber SEQUENCE OF INTEGER OPTIONAL,

--Transmission power limitation (Only in Profile 1)

txPowerLimit SEQUENCE OF REAL OPTIONAL,

--Indication whether the channel is shared

channelIsShared SEQUENCE OF BOOLEAN OPTIONAL,

--Transmission schedule

txSchedule TxSchedule OPTIONAL,

-- Channel classification information

chClassInfo ChClassInfo OPTIONAL,

--Network technology to be configured (Only in Profile 3)

newNetworkTechnology NetworkTechnology OPTIONAL,

--GCO ID (Only in Profile 3)

gcoID OCTET STRING OPTIONAL,

--Target CE ID (Only in Profile 3)

ceID CxID OPTIONAL,

--List of operating frequencies and related parameters to be configured (Only in Profile 3)

listOfOperatingFrequencies ListOfOperatingFrequencies OPTIONAL

}

--CM Reconfiguration response (Used in Profiles 1 and 3)

CMReconfigurationResponse ::= SEQUENCE {

--Indication for CE to be reconfigured(Only in Profile 1)

reconfigTarget CxID OPTIONAL,

--Status

status Status OPTIONAL,

--Failed parameters (Only in Profile 1)

failedParameters FailedParameters OPTIONAL

}

-----------------------------------------------------------

--Channel classification

-----------------------------------------------------------

--Channel classification request (Used in Profile 1)

ChannelClassificationRequest ::= SEQUENCE {

-- List of network ID

listOfNetworkID SEQUENCE OF OCTET STRING

}

-- Channel classification response (Used in Profile 1)

ChannelClassificationResponse ::= SEQUENCE OF SEQUENCE{

-- Network ID

networkID OCTET STRING,

--Channel classification information

chClassInfo ChClassInfo

}

--CM Channel classification request (Used in Profile 1)

CMChannelClassificationRequest ::= SEQUENCE {

-- List of network ID

listOfNetworkID SEQUENCE OF OCTET STRING

}

-- CM Channel classification response (Used in Profile 1)

CMChannelClassificationResponse ::= SEQUENCE OF SEQUENCE{

-- Network ID

networkID OCTET STRING,

--Channel classification information

chClassInfo ChClassInfo

}

-----------------------------------------------------------

--Channel classification update

-----------------------------------------------------------

--Channel classification update (Used in Profile 1)

ChannelClassificationAnnouncement ::= SEQUENCE OF SEQUENCE {

-- Network ID

networkID OCTET STRING,

--Channel classification information

chClassInfo ChClassInfo

}

-----------------------------------------------------------

--Information acquiring from another CM

-----------------------------------------------------------

-- Information acquiring request(Used in Profile 1)

InfoAcquringRequest ::= SEQUENCE {

ceID CxID,

listOfReqInfoDescr SEQUENCE OF ReqInfoDescr

}

-- Information acquiring response (Used in Profile 1)

InfoAcquringResponse ::= SEQUENCE {

ceID CxID,

reqInfoValue ReqInfoValue

}

-----------------------------------------------------------

--Available channel list from GCO

-----------------------------------------------------------

-- Available channel request(Used in Profile 1)

AvailableChannelsRequest ::= SEQUENCE {}

-- Available channel response(Used in Profile 1)

AvailableChannelsResponse ::= SEQUENCE {

--Available channel list information

listOfAvailableChNumbers ListOfAvailableChNumbers

}

-----------------------------------------------------------

--Event indication

-----------------------------------------------------------

-- Event indication(Used in Profile 1)

EventIndication ::= SEQUENCE {

-- Event indication information

eventParams EventParams

}

-- Event confirm(Used in Profile 1)

EventConfirm ::= SEQUENCE {}

-----------------------------------------------------------

--Measurement Request

-----------------------------------------------------------

-- Measurement request(Used in Profile 1)

MeasurementRequest ::= SEQUENCE {

-- Measurement request information

measurementDescription MeasurementDescription

}

-----------------------------------------------------------

-- Measurement results

-----------------------------------------------------------

-- Measurement response(Used in Profile 1)

MeasurementResponse ::= SEQUENCE OF SEQUENCE{

-- Measurement results

measurementResult MeasurementResult

}

--Measurement confirm(Used in Profile 1)

MeasurementConfirm ::= SEQUENCE {}

-----------------------------------------------------------

-- Negotiation

-----------------------------------------------------------

-- Negotiation request (Used in Profile 1)

NegotiationRequest ::= SEQUENCE {

-- Negotiation status

negotiationStatus NegotiationStatus,

-- Negotiation information

negotiationInformation NegotiationInformation

}

-- Negotiation announcement (Used in Profile 1)

NegotiationAnnouncement ::= SEQUENCE {

-- Winner CM ID list

listOfWinnerCMID ListOfWinnerCMID,

-- Slot time position list

listOfSlotTimePosition ListOfSlotTimePosition

}

-----------------------------------------------------------

--Master/Slave CM selection

-----------------------------------------------------------

--Master/Slave CM selection request (Used in Profile 1)

MasterCMRequest ::= SEQUENCE {

--List of CEs managed by CM that intends to become slave CM

listOfCEs SEQUENCE OF CxID

}

-- Master/Slave CM selection response (Used in Profile 1)

MasterCMResponse ::= SEQUENCE {

--Status

status Status

}

-----------------------------------------------------------

--Master/Slave CM configuration

-----------------------------------------------------------

--Master/Slave CM configuration request (Used in Profiles 1 and 3)

MasterSlaveCMConfigurationRequest ::= SEQUENCE {

-- List of CEs managed by CM (Only in Profile 1)

listOfCEs SEQUENCE OF CxID OPTIONAL,

--CM ID (Only in Profile 3)

cmID CxID OPTIONAL,

--Operation code (Only in Profile 3)

operationCode OperationCode OPTIONAL,

--CM profile (Only in Profile 3)

cmProfile EntityProfile OPTIONAL,

--CE registration information (Only in Profile 3)

ceRegistration CERegistration OPTIONAL

}

--Master/Slave CM configuration response (Used in Profiles 1 and 3)

MasterSlaveCMConfigurationResponse ::= SEQUENCE {

--Operationg code (Only in Profile 1)

operationCode OperationCode OPTIONAL,

--Slave CE ID (Only in Profile 1)

slaveCeID CxID OPTIONAL,

--Network ID (Only in Profile 1)

networkID OCTET STRING OPTIONAL,

--Network technology (Only in Profile 1)

networkTechnology NetworkTechnology OPTIONAL,

--Network type (Only in Profile 1)

networkType NetworkType OPTIONAL,

--Discovery information (Only in Profile 1)

discoveryInformation DiscoveryInformation OPTIONAL,

--Transmission schedule is supported or not (Only in Profile 1)

txScheduleSupported BOOLEAN OPTIONAL,

--List of available channel number (Only in Profile 1)

listOfAvailableChNumbers ListOfAvailableChNumbers OPTIONAL,

--List of supported channel number (Only in Profile 1)

listOfSupportedChNumbers SEQUENCE OF INTEGER OPTIONAL,

--List of operating channel number (Only in Profile 1)

listOfOperatingChNumbers ListOfOperatingChNumbers OPTIONAL,

--Required resource (Only in Profile 1)

requiredResource RequiredResource OPTIONAL,

--Measurement capability (Only in Profile 1)

measurementCapability MeasurementCapability OPTIONAL,

--Status (Only in Profile 3)

status Status OPTIONAL

}

-----------------------------------------------------------

--GCO deregistration

-----------------------------------------------------------

--Deregistration request (Used in Profile 1)

DeregistrationRequest ::= SEQUENCE {

--Flag of GCO deregistration

gcoDeregistration BOOLEAN,

}

--Deregistration response (Used in Profile 1)

DeregistrationResponse ::= SEQUENCE {

--Status

status Status

}

-----------------------------------------------------------

--Information acquiring

-----------------------------------------------------------

--Information acquiring request (Used in Profile 1)

InforAcquiringRequest ::= SEQUENCE {

--CE ID

ceID CxID,

--List of requested information description

listOfReqInfoDescr SEQUENCE OF ReqInfoDescr

}

-- Information acquiring response (Used in Profile 1)

InforAcquiringResponse ::= SEQUENCE {

--CE ID

ceID CxID,

--Requested information description

reqInfoValue ReqInfoDescr

}

-----------------------------------------------------------

--Proxy coexistence service

-----------------------------------------------------------

--CE Proxy Coexistence Service Request (Used in Profile 3)

CEProxyCoexistenceServiceRequest ::= SEQUENCE {

--CE ID

ceID CxID OPTIONAL,

--List of GCOs

listOfGCOs ListOfGCOs OPTIONAL,

...

}

--CM Proxy Coexistence Service Request (Used in Profile 3)

CMProxyCoexistenceServiceRequest ::= SEQUENCE {

--CM ID

cmID CxID OPTIONAL,

--List of CEs

listOfCEs ListOfCEs OPTIONAL,

...

}

--Inter CM Association Request (Used in Profile 3)

InterCMAssociationRequest ::= SEQUENCE {

--CM ID

cmID CxID,

--Management region of the CM

managementRegion Region OPTIONAL,

--List of moving GCOs

listOfMovingGCOs ListOfMovingGCOs OPTIONAL,

--List of candidate served GCOs

listOfCandidateServedGCOs ListOfCandidateServedGCOs OPTIONAL

}

--Inter CM Association Response (Used in Profile 3)

InterCMAssociationResponse ::= SEQUENCE {

--status of request processing

status Status,

--List of accessible CMs

listOfAccessibleCMs ListOfAccessibleCMs OPTIONAL,

--List of estimated available bandwidth

listOfEstimatedAvailableBandwidth ListOfEstimatedAvailableBandwidth OPTIONAL

}

-- Operating Frequency Information Request (Used in Profile 3)

OperatingFreqInformationRequest ::= SEQUENCE {

--CM ID

cmID CxID,

--region information

region Region,

--target GCO for spectrum allocation

targetGCOForSpectrumAllocation GCODescriptor OPTIONAL,

--Reference point information including location and spectrum

listOfSpecUsageInfoOfRefPoints ListOfSpecUsageInfo OPTIONAL

}

-- Operating Frequency Information Response (Used in Profile 3)

OperatingFreqInformationResponse ::= SEQUENCE {

--Status of request processing

status Status,

--List of coexistence reports

listOfCoexistenceReports ListOfCoexistenceReports,

--Supporting information for spectrum allocation

specAllocationSupportingInfo SpecAllocationSupportingInfo

}

-- Inter-COE Association Request (Used in Profile 3)

InterCOEAssociationRequest ::= SEQUENCE {

--COE ID

coeID CxID,

--InterCMAssociationRequest

interCMAssociationRequest InterCMAssociationRequest

}

-- Inter-COE Association Response (Used in Profile 3)

InterCOEAssociationResponse ::= SEQUENCE {

--Status

status Status

}

-- Inter-COE Operating Frequency Information Request (Used in Profile 3)

InterCOEOperatingFreqInformationRequest ::= SEQUENCE {

--COE ID

coeID CxID,

--OperatingFreqInformationRequest

operatingFreqInformationRequest OperatingFreqInformationRequest

}

-- Inter-COE Operating Frequency Information Response (Used in Profile 3)

InterCOEOperatingFreqInformationResponse ::= SEQUENCE {

--COE ID

coeID CxID,

--OperatingFreqInformationResponse

operatingFreqInformationResponse OperatingFreqInformationResponse

}

END