IEEE P802.19
Wireless Coexistence

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| --- |
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Abstract

This document is a submission to IEEE 802.19 TG1 that contains a description for Annex A, B and C.

**Notice:** This document has been prepared to assist IEEE 802.19. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.

# (normative) Data types

IEEE802191DataType DEFINITIONS AUTOMATIC TAGS ::= BEGIN

**-----------------------------------------------------------**

**--Exported data types**

**-----------------------------------------------------------**

--Exported data types

EXPORTS

 --Coexistence protocol entity ID

 CxID,

 --Status

 Status,

 --CxMedia status

 CxMediaStatus,

 --Coexistence service

 CoexistenceService,

 --Subscribed service

 SubscribedService,

 --Network technology

 NetworkTechnology,

 --Network type

 NetworkType,

 --Discovery information

 DiscoveryInformation,

 --Geolocation

 Geolocation,

 --Coverage area

 CoverageArea,

 --Installation parameters

 InstallationParameters,

 --Frequency range

 FrequencyRange,

 --List of available frequencies

 ListOfAvailableFrequencies,

 --List of operating frequencies

 ListOfOperatingFrequencies,

 --List of available channel numbers

 ListOfAvailableChNumbers,

 --List of operating channel numbers

 ListOfOperatingChNumbers,

 --List of supported frequencies

ListOfSupportedFrequencies,

 --Required resource RequiredResource,

 --Operation code for registration

 OperationCode,

 --Measurement capability

 MeasurementCapability,

 --List of available frequencies of the subject WSO

 ListOfSubjectWSOAvailableFrequencies,

 --Transmission schedule

 TxSchedule,

 --CM registration

 CMRegistration,

 --CE registration

 CERegistration,

 --Coexistence report

 CoexistenceReport,

 --Channel priority

 ChannelPriority,

 --List of subject CEs

 ListOfSubjectCEs,

 --List of neighbor CMs transport information

 ListOfNeighborCMsTransport,

 --List of neighbor CM

 ListOfNeighborCM,

 --List of neighbor CM WSOs

 ListOfNeighborCMWSOs,

 --List of CEs for reconfiguration

 ReconfigListOfCEs,

 --Channel classification information

 ChClassInfo,

 --Channel classification information list

 ChClassInfoList,

 --Failed parameters

 FailedParameters,

 --Event parameters

 EventParams,

 --Required information description

 ReqInfoDescr,

 -- Requested information value

 ReqInfoValue,

 -- Negotiation status

 NegotiationStatus,

 -- Negotiation information

 NegotiationInformation

 -- Winner CM ID list

 ListOfWinnerCMID,

 -- Slot time position list

 ListOfSlotTimePosition

 --Measurement description

 MeasurementDescription,

 --Measurement result

 MeasurementResult,

 --Mobility Information

 MobilityInformation,

 --Entity profile

 EntityProfile;

--List of recommended operation Frequency

ListOfRecommendedOperationFrequency,

--List of master CM candidate

ListOfMasterCMCandidate,

--List of neighbor CMs

ListOfNeighborCMs;

**-----------------------------------------------------------**

**--Coexistence protocol entity ID**

**-----------------------------------------------------------**

--Coexistence protocol entity type

CxType ::= ENUMERATED {

 --Coexistence enabler

 ce,

 --Coexistence manager

 cm,

 --Coexistence discovery and information server

 cdis}

--Coexistence protocol entity ID

CxID ::= SEQUENCE {

 --Entity type

 type CxType,

 --Entity ID

 id OCTET STRING}

**-----------------------------------------------------------**

**--Status**

**-----------------------------------------------------------**

--Status

Status ::= ENUMERATED {

 --Primitive/message is successfully processed

 noError,

 --Primitive/message is rejected due to security reasons

 rejected,

 --Primitive/message cannot be successfully processed because according to the current entity status different primitive/message is expected

 invalidEntityStatus,

 --Primitive/message cannot be successfully processed because of invalid values of parameters

 invalidArgument,

 --Primitive/message cannot be successfully processed because of the process error in the receiving entity

 processFailure,

 --Primitive/message cannot be successfully processed because of the connection error

 networkFailure}

--CxMedia status

CxMediaStatus ::= ENUMERATED {

 noErrorAccepted,

 noErrorRejected,

 errorInvalidEntityStatus,

 errorInvalidArgument,

 errorProcessFailure,

 errorNetworkFailure,

 errorUnknown

}

**-----------------------------------------------------------**

**--Coexistence service**

**-----------------------------------------------------------**

--Coexistence service

CoexistenceService ::= ENUMERATED {

 --Information service

 information,

 --Management service

 management,

 --No service

 noService}

SubscribedService::= ENUMERATED {

 information,

 management,

 interCMCoexistenceSetElementsNeighbors,

 allCoexistenceSetElementsNeighbors

}

**-----------------------------------------------------------**

**--Network technology**

**-----------------------------------------------------------**

NetworkTechnology ::= ENUMERATED {

 --IEEE 802.11af

 ieee802dot11af,

 --IEEE 802.22

 ieee802dot22,

 --Radio microphone

 radioMic,

 --Area broadcast

 areaBroadcast,

 --ECMA 392

 ecma392}

**-----------------------------------------------------------**

**--Network type**

**-----------------------------------------------------------**

NetworkType ::= ENUMERATED {

 fixed,

 mode1,

 mode2,

 …

}

**-----------------------------------------------------------**

**--Discovery information**

**-----------------------------------------------------------**

DiscoveryInformation ::= SEQUENCE {

 coordinateX REAL,

 coordinateY REAL,

 coordinateZ REAL,

 maxTxPower REAL,

 rxSensitivity REAL,

 antennaGain REAL,

 minReqSNR REAL,

 antennaHeight REAL,

 …

}

**-----------------------------------------------------------**

**--Location**

**-----------------------------------------------------------**

--Location

Geolocation ::= CHOICE {

 --Place name or ID

 placeID OCTET STRING,

 --Coordinates of the master station

 coordinates SEQUENCE {

 --Latitude

 latitude REAL,

 --Longitude

 longitude REAL,

 --Altitude

 altitude REAL OPTIONAL}}

**-----------------------------------------------------------**

**--Coverage area**

**-----------------------------------------------------------**

--Coverage area

CoverageArea ::= SEQUENCE {

 --Coverage radius

 radius REAL,

 --Reference central frequency

 refFrequency REAL,

 --Reference height of master station

 refMasterHeight REAL,

 --Reference height of slave station

 refSlaveHeight REAL,

 --Reference transmission power

 refTxPower REAL}

**-----------------------------------------------------------**

**--Installation parameters**

**-----------------------------------------------------------**

--Installation parameters

InstallationParameters ::= SEQUENCE {

 --Operating height of master station

 opMasterHeight REAL OPTIONAL,

 --Operating height of slave station

 opSlaveHeight REAL OPTIONAL,

 --Operating transmission power

 opTxPower REAL OPTIONAL,

 --Adjacent channel selectivity of the WSO

 aCS REAL OPTIONAL,

 --Adjacent channel leakage ratio of the WSO

 aCLR REAL OPTIONAL,

 --Guaranteed QoS of backhaul connection of the WSO

 guaranteedQoSOfBackhaulConnection GuaranteedQoSOfBackhaulConnection OPTIONAL}

**-----------------------------------------------------------**

**--Guaranteed QoS of backhaul connection related data types**

**----------------------------------------------------------**

GuaranteedQoSOfWiredConnection ::= SEQUENCE{

 --Backhaul type ID

 backhaulTypeID ENUMERATED{

 xDSL,

 opticalFibre,

 …},

 --Guaranteed minimum bit rates of backhaul connection

 GuaranteedMinimumBitRates REAL OPTIONAL,

 …}

**-----------------------------------------------------------**

**--Frequency range related data types**

**-----------------------------------------------------------**

--Frequency range

FrequencyRange ::= SEQUENCE {

 --Start frequency

 startFreq REAL,

 --Stop frequency

 stopFreq REAL}

--List of available frequencies

ListOfAvailableFrequencies ::= SEQUENCE OF SEQUENCE {

 --Frequency range

 frequencyRange FrequencyRange,

 --Transmission power limit

 txPowerLimit REAL OPTIONAL,

 --Start time when this frequency range is available

 availableStartTime GeneralizedTime OPTIONAL,

 --Duration during which this frequency range is available

 availableDuration REAL OPTIONAL,

 --Aggregated interference control parameters

 aggInterfCtrolParam
AggregatedInterferenceControlParameters OPTIONAL}

--Aggregated interference control parameters

AggregatedInterferferenceControlParameters ::= SEQUENCE{

 --Reference point ID to be protected in controlling

 --aggregated interference from the other WSO(s)

 referencePointID INTEGER,

 --Geolocation information of the reference point ID

 geolocation Geolocation,

 --Adjacent channel selectivity of the WSO

 aCS REAL,

 --Adjacent channel leakage ratio of the WSO

 aCLR REAL,

 --Potential antenna height of the reception to be protected

 --in the reference point

 antennaHeight REAL,

 --Potential antenna gain of the reception to be protected

 --in the reference point

 antennaGain REAL,

 --Protection ratio of the reception to be protected

 --at the reference point for the frequency

 protectionRatio REAL,

 …}

--List of supported frequencies

ListOfSupportedFrequencies ::= SEQUENCE OF SEQUENCE {

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

 supportedFrequency FrequencyRange,

 -- Extra channel configuration

 -- (subchannelization or channel aggregation) supported or not

 extrachannelizationIsSupported BOOLEAN,

 -- Extra channel configuration description

 extrachannelizationDescription
ExtraChannelizationDescription OPTIONAL}

extraChannelizationDescription ::= SEQUENCE{

 --Maximum number of non-contiguous channels

 --supported in channel aggregation

 maxNuNonconCH INTEGER,

 --Maximum number of contiguous channels

 --supported in channel bonding

 maxNuConCH INTEGER,

 --Min channel raster for fine tuning of frequency

 minChRaster REAL OPTIONAL,

 --Maximum supported bandwidth per channel

 maxCHBW REAL,

 --Minimum supported bandwidth per channel

 minCHBW REAL,

 --Resolution for additional channel bandwidth

 --between minCHBW and maxCHBW

 resolutionSBW REAL,

 --Minimum bandwidth within either maxCHBW or minCHBW.

 --Any number or location, which fits within

 --either maxCHBW or minCHBW is allowed.

 minUnderlayBW REAL,

 --Offset of the start frequency in the case of maxCHBW

 offsetFreqMaxCHBW REAL,

 --Offset of the start frequency in the case of minCHBW

 offsetFreqMinCHBW REAL,

 --Offset always based on the Primary Channelization or not

 OffsetPerPrimaryChannelization BOOLEAN}

--List of operating frequencies

ListOfOperatingFrequencies ::= SEQUENCE OF SEQUENCE {

 --Frequency range

 frequencyRange FrequencyRange,

 --Occupancy if known

 occupancy REAL OPTIONAL}

**-----------------------------------------------------------**

**--Available channel numbers**

**-----------------------------------------------------------**

ConstOfChUseID :: = ENUMERATED {

 regulationMaxTxPower,

 regulationMaxAntGain,

 regulationMaxAntHeight,

 regulationTVDBUpdateTime,

 outOfBandEmissionLimit,

 …

}

ConstOfChUseValue ::= CHOICE {

 regulationMaxTxPower REAL,

 regulationMaxAntMaxGain REAL,

 regulationAntMaxHeight REAL,

 regulationTVDBUpdateTime REAL,

 outOfBandEmissionLimit REAL,

 …

}

ConstOfChUses ::= SEQUENCE OF SEQUENCE {

 constOfChUseID ConstOfChUseID,

 constOfChUseValue ConstOfChUseValue

}

ListOfAvailableChNumbers ::= SEQUENCE OF SEQUENCE {

 chNumber INTEGER,

 availableStartTime GeneralizedTime,

 availableDuration REAL,

 constOfChUses ConstOfChUses

}

**-----------------------------------------------------------**

**--Operating channel numbers**

**-----------------------------------------------------------**

ListOfOperatingChNumbers ::= SEQUENCE OF SEQUENCE {

 chNumber INTEGER,

 occupancy REAL

}

**-----------------------------------------------------------**

**--Required resource**

**-----------------------------------------------------------**

--Required resource

RequiredResource ::= SEQUENCE OF SEQUENCE {

 --Required bandwidth

 requiredBandwidth REAL,

 --Expected occupancy if known

 occupancy REAL OPTIONAL}

**-----------------------------------------------------------**

**--Operation code for registration**

**-----------------------------------------------------------**

--Operation code for registration

OperationCode ::= ENUMERATED {

 --New registration

 new,

 --Update of registration information

 update,

 --Deregistration

 delete}

**-----------------------------------------------------------**

**--Measurement capability**

**-----------------------------------------------------------**

MeasurementCapability ::= ENUMERATED {

 energyDetection,

 featureDetection,

 …

}

**-----------------------------------------------------------**

**--Reconfiguration related data types**

**-----------------------------------------------------------**

--Transmission schedule

TxSchedule ::= SEQUENCE {

 --Schedule start time

 scheduleStartTime GeneralizedTime,

 --Schedule frame duration

 scheduleFrameDuration REAL,

 --Number of schedule frames

 numberOfFrames INTEGER,

 --Transmission start time within a schedule frame

 transmissionStartTime REAL,

 --Transmission duration within a schedule frame

 transmissionDuration REAL}

**-----------------------------------------------------------**

**--CM registration**

**-----------------------------------------------------------**

--CM registration

CMRegistration ::= SEQUENCE {

 --CM IP address

 ipAddress OCTET STRING,

 --CM port number

 portNumber INTEGER}

--List of WSO for registration

ListOfWSORegistrations ::= SEQUENCE OF SEQUENCE {

 --New registration, registration update or deregistration

 operationCode OperationCode,

 --WSO ID

 wsoID OCTET STRING,

 --Network technology

 networkTechnology NetworkTechnology OPTIONAL,

 --Location

 geolocation Geolocation OPTIONAL,

 --Coverage area

 coverageArea CoverageArea OPTIONAL,

 -- Mobility information

 mobilityInformation MobilityInformation OPTIONAL,

 --Installation parameters

 installationParameters InstallationParameters OPTIONAL,

 --List of available frequencies

 listOfAvailableFrequencies ListOfAvailableFrequencies OPTIONAL,

 -- Operating frequency if available

 operatingFrequency FrequencyRange OPTIONAL,

 -- Upper limit of transmission power level of its operating frequency

 txPowerLimit REAL,

 --Maximum number of controllable WSO

 maximumNumberOfControllableWSO INTEGER OPTIONAL}

--CE registration

CERegistration ::= SEQUENCE OF SEQUENCE{

 --CE ID

 ceID CxID,

 -- List of WSO registration

 listOfWSORegistration ListOfWSORegistrations}

**-----------------------------------------------------------**

**--Coexistence report**

**-----------------------------------------------------------**

CoexistenceReport ::= SEQUENCE OF SEQUENCE {

 networkID OCTET STRING,

 networkTechnology NetworkTechnology,

 listOfOperatingChNumbers ListOfOperatingChNumbers

}

ChannelPriority ::= SEQUENCE OF SEQUENCE {

 channelNumber INTEGER,

 priority INTEGER

}

**-----------------------------------------------------------**

**--Coexistence set information related data types**

**-----------------------------------------------------------**

--Interference direction

InterferenceDirection ::= ENUMERATED {

 --Subject WSO creates interference to neighbor WSO

 source,

 --Neighbor WSO creates interference to subject WSO

 victim,

 --Both subject WSO and neighbor WSO create interference to each other

 mutual}

--Network geometry class

NetworkGeometryClass ::= ENUMERATED {

 --Class#1 network geometry

 class\_1,

 --Class#2 network geometry

 class\_2,

 --Class#3 network geometry

 class\_3,

 --Class#4 network geometry

 class\_4}

--List of neighbor WSOs

ListOfNeighborWSOs ::= SEQUENCE OF SEQUENCE {

 --Neighbor WSO ID

 wsoID OCTET STRING,

 --Neighbor WSO network technology

 networkTechnology NetworkTechnology,

 --Interference direction

 interferenceDirection InterferenceDirection,

 --Network geometry classification

 networkGeometryClass NetworkGeometryClass OPTIONAL,

 --Distance to subject WSO

 distance REAL

 --List of operating frequencies

 --Not used in CoexistenceSetInformationAnnouncement

 --Used in CoexistenceReportAnnouncement and CxMediaCoexistenceReportIndication

 listOfOperatingFrequencies ListOfOperatingFrequencies OPTIONAL,

listOfAvailableFrequencies ListOfAvailableFrequencies}

--List of master CM candidate

ListOfMasterCMCandidate ::= SEQUENCE OF SEQUENCE {

 cmID cxID,

 ipAddress IPAddress,

 portNumber PortNumber

}

--List of neighbor CEs

ListOfNeighborCEs ::= SEQUENCE OF SEQUENCE {

 --Neihgbor CE ID

 ceID CxID,

 --List of neighbor WSOs

 listOfNeighborWSOs ListOfNeighborWSOs}

--List of neighbor CMs

ListOfNeighborCMs ::= SEQUENCE OF SEQUENCE {

 --Neighbor CM ID

 cmID CxID,

 --List of neighbor CEs

 listOfNeighborCEs ListOfNeighborCEs}

--List of available frequencies of the subject WSO

ListOfSubjectWSOAvailableFrequencies ::= SEQUENCE OF SEQUENCE {

 --Frequency range

 frequencyRange FrequencyRange,

 --List of neighbor CMs

 listOfNeighborCMs ListOfNeighborCMs}

-- List of recommended operation frequencies

ListOfRecommendedOperationFrequency :: = SEQUENCE OF SEQUENCE {

 frequencyRange FrequencyRange,

 txPowerLevel REAL,

 availableStartTime GeneralizedTime,

 availableDuration REAL

}

--List of subject WSOs

ListOfSubjectWSOs ::= SEQUENCE OF SEQUENCE {

 --Subject WSO ID

 wsoID OCTET STRING,

 --List of available frequencies of the subject WSO

 listOfSubjectWSOAvailableFrequencies ListOfSubjectWSOAvailableFrequencies}

--List of subject CEs

ListOfSubjectCEs ::= SEQUENCE OF SEQUENCE {

 --Subject CE ID

 ceID CxID,

 --List of subject WSOs

 listOfSubjectWSOs ListOfSubjectWSOs}

--List of neighbor CMs transport information

ListOfNeighborCMsTransport ::= SEQUENCE OF SEQUENCE {

 --Neighbor CM ID

 cmID CxID,

 --Neighbor CM profile

 cmProfile EntityProfile,

 -- Neighbor CM IP address

 ipAddress OCTET STRING,

 -- Neighbor CM port number

 portNumber INTEGER}

**-----------------------------------------------------------**

**--Coexistence set information**

**-----------------------------------------------------------**

ListOfCoexSetElement ::= SEQUENCE OF SEQUENCE {

 networkID OCTET STRING,

 networkTechnology NetworkTechnology

}

ListOfNeighborCM ::= SEQUENCE OF SEQUENCE {

 neighborCMID CxID,

 --Neighbor CM profile

 cmProfile EntityProfile,

 listOfCoexSetElement ListOfCoexSetElement

}

**-----------------------------------------------------------**

**--Coexistence set element information related data types**

**-----------------------------------------------------------**

--List of neighbor CM WSOs

ListOfNeighborCMWSOs ::= SEQUENCE OF SEQUENCE {

 --WSO ID

 wsoID OCTET STRING,

 --List of available frequencies

 listOfAvailableFrequencies ListOfAvailableFrequencies OPTIONAL,

 --List of operating frequencies

 listOfOperatingFrequencies ListOfOperatingFrequencies OPTIONAL,

 --Network geometry classification

 networkGeometryClass NetworkGeometryClass OPTIONAL

}

**-----------------------------------------------------------**

**--Coexistence set element reconfiguration related data types**

**-----------------------------------------------------------**

--List of WSOs

ReconfigListOfWSOs ::= SEQUENCE OF SEQUENCE {

 --WSO ID

 wsoID OCTET STRING,

 --Potential new operating frequency

 newOperatingFrequency FrequencyRange,

 --Additionally operable network technology

 addNetworkTechnology NetworkTechnology OPTIONAL

}

--List of CEs

ReconfigListOfCEs ::= SEQUENCE OF SEQUENCE {

 --CE ID

 ceID CxID,

 --List of WSOs

 reconfigListOfWSOs ReconfigListOfWSOs

}

**-----------------------------------------------------------**

**--Channel classification**

**-----------------------------------------------------------**

OperatingChannelInfo ::= SEQUENCE {

 operatingChannelNumber INTEGER,

 listOfNetworkID SEQUENCE OF OCTET STRING,

 …

}

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,

 …

}

ChClassInfoList ::= SEQUENCE OF SEQUENCE {

 networkID OCTET STRING,

 chClassInfo ChClassInfo

}

**-----------------------------------------------------------**

**--Failed parameters**

**-----------------------------------------------------------**

FailedParameterID ::= ENUMERATED {

 listOfoperatingChNumber,

 txPowerLimit,

 channelIsShared,

 txSchedule

}

FailedParameterValue ::= CHOICE {

 listOfoperatingChNumber SEQUENCE OF INTEGER,

 txPowerLimit REAL,

 channelIsShared BOOLEAN,

 txSchedule TxSchedule

}

FailedParameters ::= SEQUENCE OF SEQUENCE {

 failedParameterID FailedParameterID,

 failedParameterValue FailedParameterValue

}

**-----------------------------------------------------------**

**--Event indication**

**-----------------------------------------------------------**

EventDescr ::= ENUMERATED{

 sinrThresholdReached,

 qosDegradation,

 …

}

EventParams ::= SEQUENCE {

 eventDescr EventDescr

}

**-----------------------------------------------------------**

**--Information Acquiring**

**-----------------------------------------------------------**

ReqInfoDescr ::= SEQUENCE OF ENUMERATED {

 sinr,

 desiredBandwidth,

 desiredOccupancy,

 desiredQoS,

 desiredCoverage,

 channelNumber,

 subscribedService,

 interferenceLevel,

 fairness,

 threshold,

 mobilityInformation,

 ...

}

ReqInfoValue ::= SEQUENCE OF SEQUENCE {

 reqInfoDescr ReqInfoDescr,

 reqInfoValue CHOICE {

 sinrValue REAL,

 desiredBandwidthValue REAL,

 desiredOccupancyValue REAL,

 desiredQoSValue REAL,

 desiredCoverageValue REAL,

 channelNumberValue REAL,

 subscribedServiceValue SubscribedService

 interferenceLevelValue REAL,

 fairnessValue REAL,

 thresholdValue REAL,

mobilityInformation MobilityInformation,

 otherValue ANY

 }

}

**-----------------------------------------------------------**

**--Negotiation**

**-----------------------------------------------------------**

NegotiationStatus :: = SEQUENCE {

 negotiationSuccess BOOLEAN,

 negotiationFailure BOOLEAN,

 underNegotiation BOOLEAN,

 …

}

StartEndTime :: = SEQUENCE {

 startTime REAL,

 endTime REAL

}

TimeSharingUnitInfo ::= SEQUENCE {

 referenceTime REAL,

 windowTime StartEndTime,

 slotTime StartEndTime,

 …

}

NegotiationInformation :: = SEQUENCE {

 mode BOOLEAN,

 listOfChNumber SEQUENCE OF INTEGER,

 timeSharingUnitInfo TimeSharingUnitInfo,

 slotTimePosition StartEndTime,

 numberOfSlots INTEGER,

 disallowedSlotTimePosition StartEndTime,

 listOfContentionNumbers SEQUENCE OF REAL,

 …

}

ListOfWinnerCMID ::= SEQUENCE OF CxID

ListOfSlotTimePosition ::= SEQUENCE OF REAL

**-----------------------------------------------------------**

**--Measurement**

**-----------------------------------------------------------**

MeasurementSchedule ::= SEQUENCE {

 measStartTime REAL,

 numberOfMeasurements INTEGER,

 timeBetweenMeasurements REAL

}

MeasurementFreq ::= SEQUENCE OF INTEGER

MeasurementType ::= ENUMERATED {

 interferenceLevel

}

MeasurementDescription ::= SEQUENCE {

 measType MeasurementType,

 measSchedule MeasurementSchedule,

 measFreq MeasurementFreq

}

MeasurementReport ::= CHOICE {

 interferenceLevelValue REAL,

 …

}

MeasurementResult ::= SEQUENCE OF SEQUENCE {

 measurementDescription MeasurementDescription,

 measurementReport MeasurementReport

}

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

--Mobility Information

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

MobilityInformation :: = CHOICE {

maxSpeed REAL, /\*unit [km/h] \*/

speedInformation SpeedInformation,

routeInformation RouteInformation

}

SpeedInformation ::= SEQUENCE {

WSOSpeed REAL, /\* unit [km/h] \*/

WSODirection REAL, /\* unit [radian] \*/

}

RouteInformation ::= SEQUENCE {

 PlannedRoute SEQUENCE of Geolocation,

 PlannedTime SEQUENCE of GeneralizedTime

}

**-----------------------------------------------------------**

**--Entity profile**

**-----------------------------------------------------------**

--Entity profile

EntityProfile ::= ENUMERATED {

 --Profile 1

 profile1,

 --Profile 2

 profile2,

 --Profile 3

 profile3}

END

# (normative) Primitives

##  Transport SAP

IEEE80219TRSAPPrimitive DEFINITIONS AUTOMATIC TAGS::= BEGIN

**-----------------------------------------------------------**

**--Imported data types**

**-----------------------------------------------------------**

--Imported data types

IMPORTS

 --Coexistence protocol entity ID

 CxID,

 --Status

 Status

FROM IEEE802191DataType;

**-----------------------------------------------------------**

**--Transport service configuration**

**-----------------------------------------------------------**

--Transport service configuration request

TrConfigurationRequest ::= SEQUENCE {

 --Source ID

 sourceID CxID,

 --Destination ID

 destinationID CxID,

 --Destination IP address

 destinationIPAddress OCTET STRING,

 --Destination port number

 destinationPortNumber INTEGER}

--Transport service configuration response

TrConfigurationResponse ::= SEQUENCE {

 --Destination ID

 destinationID CxID,

 --Configuration status

 status Status}

**-----------------------------------------------------------**

**--Connection establishment**

**-----------------------------------------------------------**

--Request for connection

TrConnectionRequest ::= SEQUENCE {

 --Source ID

 sourceID CxID,

 --Destination ID

 destinationID CxID}

--Indication of the received connection request

TrConnectionIndication ::= SEQUENCE {

 --Source ID

 sourceID CxID}

--Response to the received connection request

TrConnectionResponse ::= SEQUENCE {

 --Destination ID

 destinationID CxID,

 --Connection status

 status Status}

--Confirmation to the connection request

TrConnectionConfirm ::= SEQUENCE {

 --Source ID

 sourceID CxID,

 --Connection status

 status Status}

**-----------------------------------------------------------**

**--Connection termination**

**-----------------------------------------------------------**

--Connection termination request

TrDisconnectionRequest ::= SEQUENCE {

 --Destination ID

 destinationID CxID}

--Connection termination indication

TrDisconnectionIndication ::= SEQUENCE {

 --Source ID

 sourceID CxID}

**-----------------------------------------------------------**

**--Sending a coexistence protocol message**

**-----------------------------------------------------------**

--Request to send coexistence protocol message

TrSendRequest ::= SEQUENCE {

 --Destination ID

 destinationID CxID,

 --Encoded coexistence protocol message

 cxMessage OCTET STRING}

--Confirmation of sending coexistence protocol message

TrSendConfirm ::= SEQUENCE {

 --Destination ID

 destinationID CxID,

 --Status of sending coexistence protocol message

 status Status}

**-----------------------------------------------------------**

**--Receiving a coexistence protocol message**

**-----------------------------------------------------------**

--Indication of received coexistence protocol message

TrReceiveIndication ::= SEQUENCE {

 --Source ID

 sourceID CxID,

 --Encoded coexistence protocol message

 cxMessage OCTET STRING}

END

## Coexistence Media SAP

IEEE80219MEDIASAPPrimitive DEFINITIONS AUTOMATIC TAGS::= BEGIN

**-----------------------------------------------------------**

**--Imported data types**

**-----------------------------------------------------------**

--Imported data types

IMPORTS

 --Status

 Status,

 --CxMedia status

 CxMediaStatus,

 --Coexistence service

 CoexistenceService,

 --Subscribed service

 SubscribedService,

 --Network technology

 NetworkTechnology,

 --Network type

 NetworkType,

 --Geolocation

 Geolocation,

 --Discovery information

 DiscoveryInformation,

 --Coverage area

 CoverageArea,

 --Installation parameters

 InstallationParameters,

 --List of available frequencies

 ListOfAvailableFrequencies,

 --List of operating frequencies

 ListOfOperatingFrequencies,

 --List of available channel numbers

 ListOfAvailableChNumbers,

 --List of operating channel numbers

 ListOfOperatingChNumbers,

 --List of supported frequencies

ListOfSupportedFrequencies,

 --Required resource

 RequiredResource,

 --List of subject WSO available frequencies

 ListOfSubjectWSOAvailableFrequencies,

 --Transmission schedule

 TxSchedule,

 --Coexistence protocol entity ID

 CxID,

 --Frequency range

 FrequencyRange,

 --Coexistence report

 CoexistenceReport,

 --Channel priority

 ChannelPriority,

 --Measurement capability

 MeasurementCapability,

 -- Operation code

 OperationCode,

 --Failed parameters

 FailedParameters,

 --Channel classification information list

 ChClassInfoList,

 --Event parameters

 EventParams,

 --Measurement description

 MeasurementDescription,

 --Measurement result

 MeasurementResult,

 --Mobility Information

 MobilityInformation,

 --Entity profile

 EntityProfile,

--List of recommended operation Frequency

ListOfRecommendedOperationFrequency

FROM IEEE802191DataType;

**-----------------------------------------------------------**

**--WSO subscription**

**-----------------------------------------------------------**

--Request for subscription information

CxMediaSubscriptionRequest ::= SEQUENCE {}

--Subscription information

CxMediaSubscriptionResponse ::= SEQUENCE {

 --WSO subscription ID

 clientID IA5String OPTIONAL,

 --WSO subscription password

 clientPassword IA5String OPTIONAL,

 --List of serving CMs

 listOfCMs SEQUENCE OF SEQUENCE {

 --CM ID

 cmID CxID,

 --CM IP address

 cmIPAddress OCTET STRING,

 --CM port number

 cmPortNumber INTEGER,

 --CM subscription ID

 serverID IA5String,

 --CM subscription password

 serverPassword IA5String} OPTIONAL,

 --Coexistence service to which WSO is subscribed

 coexistenceService CoexistenceService OPTIONAL,

 --Coexistence service to which WSO is subscribed

 subscribedService SubscribedService OPTIONAL,

 --Status

 status CxMediaStatus OPTIONAL}

--Request to change subscription

CxMediaSubscriptionIndication ::= SEQUENCE {

 --Coexistence service to which WSO is subscribed

 coexistenceService CoexistenceService OPTIONAL,

 --Coexistence service to which WSO is subscribed

 subscribedService SubscribedService OPTIONAL}

--Subscription status

CxMediaSubscriptionConfirm ::= SEQUENCE {

 --Subscription status

 --noError means subscription is confirmed

 --rejected means subscription is not confirmed

 status Status OPTIONAL,

 --Status

 cxMediaStatus CxMediaStatus OPTIONAL}

--Request to change subscription

CxMediaChangeSubscriptionRequest ::= SEQUENCE {

 --Coexistence service to which WSO is subscribed

 subscribedService SubscribedService,

coexistenceService CoexistenceService }

--Response for subscription change

CxMediaChangeSubscriptionResponse :: = SEQUENCE {

 --Status

 Status CxMediaStatus}

**-----------------------------------------------------------**

**--WSO registration**

**-----------------------------------------------------------**

--Request for registration information

CxMediaRegistrationRequest ::= SEQUENCE {}

--Registration information

CxMediaRegistrationResponse ::= SEQUENCE OF SEQUENCE {

 --WSO ID

 wsoID OCTET STRING OPTIONAL,

 --Network ID

 networkID OCTET STRING,

 --Network technology

 networkTechnology NetworkTechnology,

 --Network type

 networkType NetworkType OPTIONAL,

 --Geolocation

 geolocation Geolocation OPTIONAL,

 --Discovery information

 discoveryInformation DiscoveryInformation 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,

 --List of available channel number

 listOfAvailableChNumbers ListOfAvailableChNumbers OPTIONAL,

 --List of supported channel number

 listOfSupportedChNumbers SEQUENCE OF INTEGER OPTIONAL,

 -- List of supported frequencies

 listOfSuppFrequencies ListOfSupportedFrequencies OPTIONAL,

 --List of operating channel number

 listOfOperatingChNumbers ListOfOperatingChNumbers OPTIONAL,

 --Transmission schedule is supported or not

 txScheduleSupported BOOLEAN OPTIONAL,

 --Measurement capability

 measurementCapability MeasurementCapability OPTIONAL,

 --Required resource

 requiredResource RequiredResource,

 --Mobility Information

 mobilityInformation MobilityInformation OPTIONAL

}

--Updated registration information

CxMediaRegistrationIndication ::= SEQUENCE OF SEQUENCE {

 --WSO ID

 wsoID OCTET STRING OPTIONAL,

 --Network ID

 networkID OCTET STRING OPTIONAL,

 --Network technology

 networkTechnology NetworkTechnology OPTIONAL,

 --Network type

 networkType NetworkType OPTIONAL,

 --Indication of WSO stop operation

 wsoStopOperation BOOLEAN OPTIONAL,

 --List of available frequencies

 listOfAvailableFrequencies ListOfAvailableFrequencies OPTIONAL,

 --List of operating frequencies

 listOfOperatingFrequencies ListOfOperatingFrequencies OPTIONAL,

 --Required resource

 requiredResource RequiredResource OPTIONAL,

 --Discovery information

 discoveryInformation DiscoveryInformation OPTIONAL,

 --Transmission schedule is supported or not

 txScheduleSupported BOOLEAN OPTIONAL,

 --List of available channel number

 listOfAvailableChNumbers ListOfAvailableChNumbers OPTIONAL,

 --List of supported channel number

 listOfSupportedChNumbers SEQUENCE OF INTEGER OPTIONAL,

 -- List of supported frequencies

 listOfSuppFrequencies ListOfSupportedFrequencies OPTIONAL,

 --List of operating channel number

 listOfOperatingChNumbers ListOfOperatingChNumbers OPTIONAL,

 --Measurement capability

 measurementCapability MeasurementCapability OPTIONAL,

 --Mobility information

 mobilityInformation MobilityInformation OPTIONAL

}

--Registration confirmation

CxMediaRegistrationConfirm ::= SEQUENCE {

 --Registration status

 status Status OPTIONAL,

 --CxMedis status

 cxMediastatus CxMediaStatus OPTIONAL}

**-----------------------------------------------------------**

**--WSO reconfiguration**

**-----------------------------------------------------------**

--Reconfiguration request

CxMediaReconfigurationRequest ::= SEQUENCE OF SEQUENCE {

 --WSO ID

 wsoID OCTET STRING OPTIONAL,

 --Operating frequency

 operatingFrequency FrequencyRange OPTIONAL,

 --List of operating channel number

 listOfOperatingChNumber SEQUENCE OF INTEGER OPTIONAL,

 --Transmission power limit

 txPowerLimit REAL OPTIONAL,

 --Indication whether the channel is shared

 channelIsShared BOOLEAN,

 --Transmission schedule

 txSchedule TxSchedule OPTIONAL,

 -- Channel classification information

 chClassInfo ChClassInfo OPTIONAL,

 --Additionally operable network technology

 addNetworkTechnology NetworkTechnology OPTIONAL}

--Reconfiguration response

CxMediaReconfigurationResponse ::= SEQUENCE OF SEQUENCE {

 --WSO ID

 wsoID OCTET STRING OPTIONAL,

 --Reconfiguration status

 status Status OPTIONAL,

 --CxMedia status

 cxMediaStatus CxMediaStatus OPTIONAL,

 --Failed parameters

 failedParameters FailedParameters OPTIONAL}

**-----------------------------------------------------------**

**--CM stop operation**

**-----------------------------------------------------------**

--Stop operation indication

CxMediaStopOperationIndication ::= SEQUENCE {}

--Stop operation confirm

CxMediaStopOperationConfirm ::= SEQUENCE {

 --Stop operation status

 status Status}

**-----------------------------------------------------------**

**--Coexistence report**

**-----------------------------------------------------------**

-- Coexistence report indication

CxMediaCoexistenceReportAnnouncement ::= SEQUENCE OF SEQUENCE {

 --WSO ID

 wsoID OCTET STRING,

 --List of subject WSO available frequencies

 listOfSubjectWSOAvailableFrequencies ListOfSubjectWSOAvailableFrequencies}

-- Coexistence report confirm

CxMediaCoexistenceReportConfirm ::= SEQUENCE {

 --Coexistence report status

 status Status}

--Request for coexistence report

CxMediaCoexistenceReportRequest ::= SEQUENCE {}

--Response for coexistence report

CxMediaCoexistenceReportResponse ::= SEQUENCE {

--Coexistence report information

 coexistenceReport CoexistenceReport,

 --Channel priority information

 channelPriority ChannelPriority,

 networkID NetworkID,

 listOfRecommendedOperatingFrequency ListOfRecommendedOperatingFrequency

}

**-----------------------------------------------------------**

**--Channel classification requested by CE**

**-----------------------------------------------------------**

--Channel classification request

CxMediaChannelClassificationRequest ::= SEQUENCE {

 -- List of network ID

 listOfNetworkID SEQUENCE OF OCTET STRING}

-- Channel classification response

CxMediaChannelClassificationResponse ::= SEQUENCE {

 --List of channel classification information

 chClassInfoList ChClassInfoList}

**-----------------------------------------------------------**

**--Channel classification update**

**-----------------------------------------------------------**

--Channel classification update

CxMediaChannelClassificationIndication ::= SEQUENCE {

 --List of channel classification information

 chClassInfoList ChClassInfoList}

**-----------------------------------------------------------**

**--Available channel list from WSO**

**-----------------------------------------------------------**

-- Available channel List request

CxMediaAvailableChannelListRequest ::= SEQUENCE {}

-- Available channel list response

CxMediaAvailableChannelListResponse ::= SEQUENCE {

 --Available channel list information

 listOfAvailableChNumbers ListOfAvailableChNumbers}

**-----------------------------------------------------------**

**--Event indication**

**-----------------------------------------------------------**

-- Event indication

CxMediaEventIndication ::= SEQUENCE {

 -- Event indication information

 eventParams EventParams}

**-----------------------------------------------------------**

**--Measurement Request**

**-----------------------------------------------------------**

-- Measurement request

CxMediaGetMeasurementRequest ::= SEQUENCE {

 -- Measurement request information

 measurementDescription MeasurementDescription}

**-----------------------------------------------------------**

**-- Measurement results**

**-----------------------------------------------------------**

-- Measurement response

CxMediaGetMeasurementResponse ::= SEQUENCE OF SEQUENCE{

 -- Measurement results

 measurementResult MeasurementResult}

**-----------------------------------------------------------**

**-- WSO Deregistration**

**-----------------------------------------------------------**

--Deregistration request

CxMediaPerformDeregistrationRequest ::= SEQUENCE {

 --List of operating channel number

 wsoDeregistration BOOLEAN}

-- Deregistration response

CxMediaPerformReconfigurationResponse ::= SEQUENCE {

 --CxMedia status

 cxMediaStatus CxMediaStatus}

END

# (normative) Messages

IEEE802191Message DEFINITIONS AUTOMATIC TAGS ::= BEGIN

**-----------------------------------------------------------**

**--Imported data types**

**-----------------------------------------------------------**

--Imported data types

IMPORTS

 --Coexistence protocol entity ID

 CxID,

 --Status

 Status,

 --CxMedia status

 CxMediaStatus,

 --Coexistence service

 CoexistenceService,

 --Subscribed service

 SubscribedService,

 --Network technology

 NetworkTechnology,

 --Network type

 NetworkType,

 --Location

 Geolocation,

 --Discovery information

 DiscoveryInformation,

 --Coverage area

 CoverageArea,

 --Installation parameters

 InstallationParameters,

 --List of available frequencies

 ListOfAvailableFrequencies,

 --List of operating frequencies

 ListOfOperatingFrequencies,

 --List of available channel numbers

 ListOfAvailableChNumbers,

 --List of operating channel numbers

 ListOfOperatingChNumbers,

 --List of supported frequencies

ListOfSupportedFrequencies,

 --Required resource

 RequiredResource,

 --Operation code for registration

 OperationCode,

 --List of available frequencies of the subject WSO

 ListOfSubjectWSOAvailableFrequencies,

 --Transmission schedule

 TxSchedule,

 --Frequency range

 FrequencyRange,

 --CM registration

 CMRegistration,

 --CE registration

 CERegistration,

 --List of subject CEs

 ListOfSubjectCEs,

 --List of neighbor CMs transport information

 ListOfNeighborCMsTransport,

 --List of neighbor CM WSOs

 ListOfNeighborCMWSOs,

 --List of CEs for reconfiguration

 ReconfigListOfCEs

 --Coexistence report

 CoexistenceReport,

 --Channel priority

 ChannelPriority,

 --Measurement capability

 MeasurementCapability,

 --List of neighbor CM

 ListOfNeighborCM,

 --Failed parameters

 FailedParameters,

 --Channel classification information

 ChClassInfo,

 --Required information description

 ReqInfoDescr,

 --Requested information value

 ReqInfoValue,

 --Event parameters

 EventParams,

 --Negotiation status

 NegotiationStatus,

 --Negotiation information

 NegotiationInformation

 --Winner CM ID list

 ListOfWinnerCMID,

 -- Slot time position list

 ListOfSlotTimePosition

 --Measurement description

 MeasurementDescription,

 --Measurement result

 MeasurementResult,

 --Mobility Information

 MobilityInformation,

 --Entity profile

 EntityProfile,

List of master CM candidate

ListOfMasterCMCandidate,

--List of neighbor CMs

ListOfNeighborCMs

FROM IEEE802191DataType;

**-----------------------------------------------------------**

**--Message structure, header structure, and payload types**

**-----------------------------------------------------------**

--Message structure

CxMessage ::= SEQUENCE {

 -- Message header

 header CxHeader,

 -- Message payload

 payload CxPayload}

--Header

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

CxPayload ::= CHOICE {

 --WSO subscription request

 subscriptionRequest SubscriptionRequest,

 --WSO subscription response

 subscriptionResponse SubscriptionResponse,

 --WSO subscription change request

 subscriptionChangeRequest SubscriptionChangeRequest,

 --WSO subscription change response

 subscriptionChangeResponse SubscriptionChangeResponse,

 --CE registration request

 ceRegistrationRequest CERegistrationRequest,

 --Registration response

 registrationResponse RegistrationResponse,

 --Reconfiguration request

 reconfigurationRequest ReconfigurationRequest,

 --Reconfiguration response

 reconfigurationResponse ReconfigurationResponse,

 --Stop operation announcement

 stopOperationAnnouncement StopOperationAnnouncement,

 --Stop operation confirm

 stopOperationConfirm StopOperationConfirm,

 --Coexistence report announcement

 coexistenceReportAnnouncement CoexistenceReportAnnouncement,

 --Coexistence report confirm

 coexistenceReportConfirm CoexistenceReportConfirm,

 --Coexistence report request

 coexistenceReportRequest CoexistenceReportRequest,

 --Coexistence report response

 coexistenceReportResponse CoexistenceReportResponse,

 --CM registration request

 cmRegistrationRequest CMRegistrationRequest,

 --Coexistence set information announcement

 coexistenceSetInformationAnnouncement CoexistenceSetInformationAnnouncement,

 --Coexistence set information confirm

 coexistenceSetInformationConfirm CoexistenceSetInformationAnnouncement,

 --Coexistence set information request

 coexistenceSetInformationRequest CoexistenceSetInformationRequest,

 --Coexistence set information response

 coexistenceSetInformationResponse CoexistenceSetInformationResponse,

 --Coexistence set element information announcement

 coexistenceSetElementInformationAnnouncement CoexistenceSetElementInformationAnnouncement,

 --Coexistence set element information confirm

 coexistenceSetElementInformationConfirm CoexistenceSetElementInformationConfirm,

 --Coexistence set element information request

 coexistenceSetElementInformationRequest CoexistenceSetElementInformationRequest,

 --Coexistence set element information response

 coexistenceSetElementInformationResponse CoexistenceSetElementInformationResponse,

 --Coexistence set element reconfiguration request

 coexistenceSetElementReconfigurationRequest CoexistenceSetElementReconfigurationRequest,

 --Coexistence set element reconfiguration response

 coexistenceSetElementReconfigurationResponse CoexistenceSetElementReconfigurationResponse,

 --CM Reconfiguration request

 cmReconfigurationRequest CMReconfigurationRequest,

 --CM Reconfiguration response

 cmReconfigurationResponse CMReconfigurationResponse,

 --WSO channel classification request

 channelClassificationRequest ChannelClassificationRequest,

 -- WSO channel classification response

 channelClassificationResponse ChannelClassificationResponse,

 --CM channel classification request

 cmChannelClassificationRequest CMChannelClassificationRequest,

 -- CM channel classification response

 cmChannelClassificationResponse CMChannelClassificationResponse,

 -- WSO channel classification update

 channelClassificationAnnouncement ChannelClassificationAnnouncement,

 --Available channel list request from WSO

 availableChannelsRequest AvailableChannelsRequest,

 -- Available channel list response from WSO

 availableChannelsResponse AvailableChannelsResponse,

 --Information acquiring request

 infoAcquiringRequest InforAcquiringRequest,

 --Information acquiring response

 infoAcquiringResponse InforAcquiringResponse,

 -- Event indication

 eventIndication EventIndication,

 -- Event confirm

 eventConfirm EventConfirm,

 --WSO measurement request

 measurementRequest MeasurementRequest,

 --WSO measurement response

 measurementResponse MeasurementResponse,

 --WSO measurement confirm

 measurementConfirm MeasurementConfirm,

 --Master/Slave CM request

 masterCMRequest MasterCMRequest,

 --Master/Slave CM response

 masterCMResponse MasterCMResponse,

 --Master/Slave CM configuration request

 masterSlaveCMconfigurationRequest MasterSlaveCMconfigurationRequest,

 --Master/Slave CM configuration response

 masterSlaveCMconfigurationResponse MasterSlaveCMconfigurationResponse,

 --Negotiation request

 negotiationRequest NegotiationRequest,

 --Negotiation announcement

 negotiationAnnouncement NegotiationAnnouncement,

 --Deregistration request

 wsoDeregistrationRequest WsoDeregistrationRequest,

 -- Deregistration response

 wsoDeregistrationResponse WsoDeregistrationResponse,

 --Inter-CM information announcement

 interCMInformationAnnouncement InterCMInformationAnnouncement,

 --Inter-CM information confirm

 interCMInformationCOnfirm InterCMInformationConfirm,

 --Inter-CM information request

 interCMInformationRequest InterCMInformationRequest,

 --Inter-CM information response

 interCMInformationResponse InterCMInformationResponse

}

**-----------------------------------------------------------**

**--WSO and CM subscription**

**-----------------------------------------------------------**

--WSO subscription request

SubscriptionRequest ::= SEQUENCE {

 --WSO subscription ID

 clientID IA5String OPTIONAL,

 --WSO subscription password

 clientPassword IA5String OPTIONAL,

 --Coexistence service to which WSO is subscribed

 coexistenceService CoexistenceService OPTIONAL,

 --Coexistence service to which WSO is subscribed

 subscribedService SubscribedService OPTIONAL}

--WSO subscription response

SubscriptionResponse ::= SEQUENCE {

 --CM subscription ID

 serverID IA5String OPTIONAL,

 --CM subscription password

 serverPassword IA5String OPTIONAL,

 --Subscription status

 --noError means subscription is confirmed

 --rejected means subscription is not confirmed

 status Status OPTIONAL,

 --Status

 status CxMediaStatus OPTIONAL}

**-----------------------------------------------------------**

**--WSO subscription change**

**-----------------------------------------------------------**

--Request to change subscription

SubscriptionChangeRequest ::= SEQUENCE {

 --Coexistence service to which WSO is subscribed

 subscribedService SubscribedService}

--Response for subscription change

SubscriptionChangeResponse :: = SEQUENCE {

 --Status

 status CxMediaStatus}

**-----------------------------------------------------------**

**--WSO registration**

**-----------------------------------------------------------**

CERegistrationRequest ::= SEQUENCE OF SEQUENCE {

 --New registration, registration update or deregistration

 operationCode OperationCode,

 --WSO ID

 wsoID OCTET STRING,

 --Network ID

 networkID OCTET STRING OPTIONAL,

 --Network technology

 networkTechnology NetworkTechnology OPTIONAL,

 --Network type

 networkType NetworkType OPTIONAL,

 --Location

 geolocation Geolocation OPTIONAL,

 --Discovery information

 discoveryInformation DiscoveryInformation OPTIONAL,

 --Coverage area

 coverageArea CoverageArea OPTIONAL,

 -- Mobility information

 mobilityInformation MobilityInformation OPTIONAL,

 --Installation parameters

 installationParameters InstallationParameters OPTIONAL,

 --List of available frequencies

 listOfAvailableFrequencies ListOfAvailableFrequencies OPTIONAL,

 --Transmission schedule is supported or not

 txScheduleSupported BOOLEAN OPTIONAL,

 --List of operating frequencies

 listOfOperatingFrequencies ListOfOperatingFrequencies OPTIONAL,

 --List of available channel number

 listOfAvailableChNumbers ListOfAvailableChNumbers OPTIONAL,

 --List of supported channel number

 listOfSupportedChNumbers SEQUENCE OF INTEGER OPTIONAL,

 -- List of supported frequencies

 listOfSuppFrequencies ListOfSupportedFrequencies OPTIONAL,

 --List of operating channel number

 listOfOperatingChNumbers ListOfOperatingChNumbers OPTIONAL,

 --Required resource

 requiredResource RequiredResource OPTIONAL,

 --Measurement capability

 measurementCapability MeasurementCapability OPTIONAL,

addNetworkTechnolgoy AddNetowrkTechnology OPTIONAL }

--Registration response

RegistrationResponse ::= SEQUENCE {

 --Registration status

 status Status OPTIONAL}

**-----------------------------------------------------------**

**--WSO reconfiguration**

**-----------------------------------------------------------**

--Reconfiguration request

ReconfigurationRequest ::= SEQUENCE OF SEQUENCE {

 --WSO ID

 wsoID OCTET STRING OPTIONAL,

 --Operating frequency

 operatingFrequency FrequencyRange OPTIONAL,

 --List of operating channel number

 listOfOperatingChNumber SEQUENCE OF INTEGER OPTIONAL,

 --Transmission power limit

 txPowerLimit REAL OPTIONAL,

 --Indication whether the channel is shared

 channelIsShared BOOLEAN OPTIONAL,

 --Transmission schedule

 txSchedule TxSchedule OPTIONAL,

 -- Channel classification information

 chClassInfo ChClassInfo OPTIONAL,

 -- Mobility information

 mobilityInformation MobilityInformation OPTIONAL,

 --Additionally operable network technology

 addNetworkTechnology NetworkTechnology OPTIONAL}

--Reconfiguration response

ReconfigurationResponse ::= SEQUENCE OF SEQUENCE {

 --WSO ID

 wsoID OCTET STRING OPTIONAL,

 --Reconfiguration status

 status Status OPTIONAL,

 --Status

 status BOOLEAN OPTIONAL,

 --Failed parameters

 failedParameters FailedParameters OPTIONAL}

**-----------------------------------------------------------**

**--Stop operation**

**-----------------------------------------------------------**

--Stop operation announcement

StopOperationAnnouncement ::= SEQUENCE {}

--Stop operation confirm

StopOperationConfirm ::= SEQUENCE {

 --Stop operation status

 status Status}

**-----------------------------------------------------------**

**--Coexistence report**

**-----------------------------------------------------------**

--Coexistence report announcement

CoexistenceReportAnnouncement ::= SEQUENCE OF SEQUENCE {

 --Subject WSO ID

 wsoID OCTET STRING,

 --List of subject WSO available frequencies

 listOfSubjectWSOAvailableFrequencies ListOfSubjectWSOAvailableFrequencies}

--Coexistence report confirm

CoexistenceReportConfirm ::= SEQUENCE {

 --Coexistence report status

 status Status}

--Request for coexistence report

CoexistenceReportRequest ::= SEQUENCE {}

--Response for coexistence report

CoexistenceReportResponse ::= SEQUENCE {

 --Coexistence report information

 coexistenceReport CoexistenceReport,

 --Channel priority information

 channelPriority ChannelPriority}

**-----------------------------------------------------------**

**--CM registration**

**-----------------------------------------------------------**

--CM registration request

CMRegistrationRequest ::= SEQUENCE {

 --CM profile

 cmProfile EntityProfile OPTIONAL,

 --CM registration

 cmRegistration CMRegistration OPTIONAL,

 --CE registration

 ceRegistration CERegistration OPTIONAL,

 --Operationg code

 operationCode OperationCode OPTIONAL,

 --CE ID

 ceID CxID OPTIONAL,

 --Network ID

 networkID OCTET STRING OPTIONAL,

 --Network technology

 networkTechnology NetworkTechnology OPTIONAL,

 --Network type

 networkType NetworkType OPTIONAL,

 --Discovery information

 discoveryInformation DiscoveryInformation OPTIONAL,

 --List of supported channel number

 listOfSupportedChNumbers SEQUENCE OF INTEGER OPTIONAL,

 -- List of supported frequencies

 listOfSuppFrequencies ListOfSupportedFrequencies OPTIONAL,

 --Maximum number of controllable WSO

 maximumNumberOfControllableWSO INTEGER OPTIONAL

}

**-----------------------------------------------------------**

**--Coexistence set information**

**-----------------------------------------------------------**

--Coexistence set information announcement

CoexistenceSetInformationAnnouncement ::= SEQUENCE {

 --List of subject CEs

 listOfSubjectCEs ListOfSubjectCEs,

 --List of neighbor CMs transport information mentioned inside the list of subject CEs

 listOfNeighborCMsTransport ListOfNeighborCMsTransport}

--Coexistence set information confirm

CoexistenceSetInformationConfirm ::= SEQUENCE {

 --Coexistence set information status

 status Status}

--Request for coexistence set information

CoexistenceSetInformationRequest ::= SEQUENCE {

 listOfNetworkID SEQUENCE OF OCTET STRING}

--Response for coexistence set information

CoexistenceSetInformationResponse ::= SEQUENCE {

 --Network ID

 coexistenceReport CoexistenceReport,

 --List of neighbor CM

 listOfneighborCM ListOfneighborCM,

networkID OCTET STRING,

listOfneighborCMs listOfneighborCMs,

listOfMasterCMCandidate ListOfMasterCMCandidate

}

**-----------------------------------------------------------**

**--Coexistence set element information**

**-----------------------------------------------------------**

--Coexistence set element information announcement

CoexistenceSetElementInformationAnnouncement ::= SEQUENCE OF SEQUENCE{

 --CE ID

 ceID CxID,

 --Coexistence service

 coexistenceService CoexistenceService OPTIONAL,

 --List of neighbor CM WSOs

 listOfNeighborCMWSOs ListOfNeighborCMWSOs OPTIONAL

}

--Coexistence set element information confirm

CoexistenceSetElementInformationConfirm ::= SEQUENCE {

 --Coexistence set element information status

 status Status}

--Coexistence set element information request

CoexistenceSetElementInformationRequest ::= SEQUENCE OF SEQUENCE{

 --CE ID

 ceID CxID,

 --List of neighbor CM WSOs

 listOfNeighborCMWSOs ListOfNeighborCMWSOs

}

--Coexistence set element information response

CoexistenceSetElementInformationResponse ::= SEQUENCE OF SEQUENCE{

 --CE ID

 ceID CxID,

 --Coexistence service

 coexistenceService CoexistenceService,

 --List of neighbor CM WSOs

 listOfNeighborCMWSOs ListOfNeighborCMWSOs

}

**-----------------------------------------------------------**

**--Coexistence set element reconfiguration**

**-----------------------------------------------------------**

--Coexistence set element reconfiguration request

CoexistenceSetElementReconfigurationRequest ::= SEQUENCE{

 --List of subject CEs

 reconfigListOfSubjectCEs ReconfigListOfCEs,

 --List of neighbor CEs

 reconfigListOfNeighborCEs ReconfigListOfCEs

}

--Coexistence set element reconfiguration response

CoexistenceSetElementReconfigurationResponse ::= SEQUENCE{

 --Indicates whether the suggested reconfiguration is accepted or not

 requestIsAccepted BOOLEAN

}

**-----------------------------------------------------------**

**--WSO reconfiguration for another CM**

**-----------------------------------------------------------**

--Reconfiguration request

CMReconfigurationRequest ::= SEQUENCE {

 --Indication for CE to be reconfigured

 reconfigTarget CxID,

 --List of operating channel number

 listOfOperatingChNumber SEQUENCE OF INTEGER,

 --Transmission power limitation

 txPowerLimit REAL,

 --Indication whether the channel is shared

 channelIsShared BOOLEAN,

 --Transmission schedule

 txSchedule TxSchedule ,

 -- Channel classification information

 chClassInfo ChClassInfo,

 --Additionally operable network technology

 newNetworkTechnology NetworkTechnology OPTIONAL,

 wsoID OCTET STRING,

 cmID cxID,

 operatingFreqency OperatingFrequency,

 txPowerLimit REAL

}

--Reconfiguration response

ReconfigurationResponse ::= SEQUENCE {

 --Indication for CE to be reconfigured

 reconfigTarget CxID,

 --Status

 status BOOLEAN

 --Failed parameters

 failedParameters FailedParameters}

**-----------------------------------------------------------**

**--Channel classification**

**-----------------------------------------------------------**

--Channel classification request

ChannelClassificationRequest ::= SEQUENCE {

 -- List of network ID

 listOfNetworkID SEQUENCE OF OCTET STRING}

-- Channel classification response

ChannelClassificationResponse ::= SEQUENCE OF SEQUENCE{

 -- Network ID

 networkID OCTET STRING

 --Channel classification information

 chClassInfo ChClassInfo}

--CM Channel classification request

CMChannelClassificationRequest ::= SEQUENCE {

 -- List of network ID

 listOfNetworkID SEQUENCE OF OCTET STRING}

-- CM Channel classification response

CMChannelClassificationResponse ::= SEQUENCE OF SEQUENCE{

 -- Network ID

 networkID OCTET STRING

 --Channel classification information

 chClassInfo ChClassInfo}

**-----------------------------------------------------------**

**--Channel classification update**

**-----------------------------------------------------------**

--Channel classification update

ChannelClassificationAnnouncement ::= SEQUENCE OF SEQUENCE {

 -- Network ID

 networkID OCTET STRING

 --Channel classification information

 chClassInfo ChClassInfo}

**-----------------------------------------------------------**

**--Information acquiring from another CM**

**-----------------------------------------------------------**

-- Information acquiring request

InfoAcquringRequest ::= SEQUENCE {

 ceID CxID,

 listOfReqInfoDescr SEQUENCE OF ReqInfoDescr}

-- Information acquiring response

InfoAcquringResponse ::= SEQUENCE {

 ceID CxID,

 reqInfoValue ReqInfoValue}

**-----------------------------------------------------------**

**--Available channel list from WSO**

**-----------------------------------------------------------**

-- Available channel request

AvailableChannelsRequest ::= SEQUENCE {}

-- Available channel response

AvailableChannelsResponse ::= SEQUENCE {

 --Available channel list information

 listOfAvailableChNumbers ListOfAvailableChNumbers}

**-----------------------------------------------------------**

**--Event indication**

**-----------------------------------------------------------**

-- Event indication

EventIndication ::= SEQUENCE {

 -- Event indication information

 eventParams EventParams}

-- Event confirm

EventConfirm ::= SEQUENCE {}

**-----------------------------------------------------------**

**--Measurement Request**

**-----------------------------------------------------------**

-- Measurement request

MeasurementRequest ::= SEQUENCE {

 -- Measurement request information

 measurementDescription MeasurementDescription}

**-----------------------------------------------------------**

**-- Measurement results**

**-----------------------------------------------------------**

-- Measurement response

MeasurementResponse ::= SEQUENCE OF SEQUENCE{

 -- Measurement results

 measurementResult MeasurementResult}

**-----------------------------------------------------------**

**-- Negotiation**

**-----------------------------------------------------------**

-- Negotiation request

NegotiationRequest ::= SEQUENCE {

 -- Negotiation status

 negotiationStatus NegotiationStatus,

 -- Negotiation information

 negotiationInformation NegotiationInformation}

-- Negotiation announcement

NegotiationAnnouncement ::= SEQUENCE {

 -- Winner CM ID list

 listOfWinnerCMID ListOfWinnerCMID,

 -- Slot time position list

 listOfSlotTimePosition ListOfSlotTimePosition}

**-----------------------------------------------------------**

**--Master/Slave CM selection**

**-----------------------------------------------------------**

--Master/Slave CM selection request

MasterCMRequest ::= SEQUENCE {

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

 listOfCEs SEQUENCE OF CxID}

-- Master/Slave CM selection response

MasterCMResponse ::= SEQUENCE {

 --Status

 status CxMediaStatus}

**-----------------------------------------------------------**

**--Master/Slave CM configuration**

**-----------------------------------------------------------**

--Master/Slave CM configuration request

MasterSlaveCMconfigurationRequest ::= SEQUENCE {

 -- List of CEs managed by CM

 listOfCEs SEQUENCE OF CxID}

--Master/Slave CM configuration response

MasterSlaveCMconfigurationResponse ::= SEQUENCE {

 --Operationg code

 operationCode OperationCode,

 --Slave CE ID

 slaveCeID CxID,

 --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}

**-----------------------------------------------------------**

**--WSO deregistration**

**-----------------------------------------------------------**

--Deregistration request

WsoDeregistrationRequest ::= SEQUENCE {

 --Flag of wso deregistration

 wsoDeregistration BOOLEAN}

--Deregistration response

WsoDeregistrationResponse ::= SEQUENCE {

 --Status

 status CxMediaStatus}

**-----------------------------------------------------------**

**--Inter-CM information**

**-----------------------------------------------------------**

--Inter-CM information announcement

InterCMInformationAnnouncement ::= SEQUENCE OF SEQUENCE {

 --CE ID

 ceID CxID,

 --List of neighbor WSOs

 listOfNeighborWSOs SEQUENCE OF SEQUENCE {

 wsoID OCTET STRING,

 operatingFrequency ListOfOperatingFrequencies OPTIONAL,

 operatingChannel ListOfOperatingChNumbers OPTIONAL

 }

}

--Inter-CM information confirm

InterCMInformationConfirm ::= SEQUENCE {

 --Inter-CM information status

 status Status

}

--Inter-CM information request

InterCMInformationRequest ::= SEQUENCE OF SEQUENCE{

 --CE ID

 ceID CxID,

 --List of neighbor WSOs

 listOfNeighborWSOs SEQUENCE OF SEQUENCE {

 wsoID OCTET STRING

 }

}

--Inter-CM information response

InterCMInformationResponse ::= SEQUENCE OF SEQUENCE{

 --CE ID

 ceID CxID,

 --List of neighbor WSOs

 listOfNeighborWSOs SEQUENCE OF SEQUENCE {

 wsoID OCTET STRING,

 operatingFrequency ListOfOperatingFrequencies OPTIONAL,

 operatingChannel ListOfOperatingChNumbers OPTIONAL

 }

}

END