# (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;

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

**--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 {

 --Latitude [degree]

 coordinateX REAL,

 --Longitude [degree]

 coordinateY REAL,

 --Altitude [m]

 coordinateZ REAL,

 --Maximum transmit power [dBm]

 maxTxPower REAL,

 --Receiver sensitivity [dBm]

 rxSensitivity REAL,

 --Antenna gain [dBi]

 antennaGain REAL,

 --Minimum required SNR [dB]

 minReqSNR REAL,

 --Antenna height above ground [m]

 antennaHeight REAL,

 …

}

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

**--Location**

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

--Location

Geolocation ::= CHOICE {

 --Place name or ID

 placeID OCTET STRING,

 --Coordinates of the master station

 coordinates SEQUENCE {

 --Latitude [degree]

 latitude REAL,

 --Longitude [degree]

 longitude REAL,

 --Altitude [m]

 altitude REAL OPTIONAL}}

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

**--Coverage area**

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

--Coverage area

CoverageArea ::= SEQUENCE {

 --Coverage radius [m]

 radius REAL,

 --Reference central frequency [MHz]

 refFrequency REAL,

 --Reference height of master station [m]

 refMasterHeight REAL,

 --Reference height of slave station [m]

 refSlaveHeight REAL,

 --Reference transmission power [dBm]

 refTxPower REAL}

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

**--Installation parameters**

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

--Installation parameters

InstallationParameters ::= SEQUENCE {

 --Operating height of master station [m]

 opMasterHeight REAL OPTIONAL,

 --Operating height of slave station [m]

 opSlaveHeight REAL OPTIONAL,

 --Operating transmission power [dBm]

 opTxPower REAL OPTIONAL,

 --Adjacent channel selectivity of the WSO [dB]

 aCS REAL OPTIONAL,

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

 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 [Mb/s]

 GuaranteedMinimumBitRates REAL OPTIONAL,

 …}

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

**--Frequency range related data types**

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

--Frequency range

FrequencyRange ::= SEQUENCE {

 --Start frequency [MHz]

 startFreq REAL,

 --Stop frequency [MHz]

 stopFreq REAL}

--List of available frequencies

ListOfAvailableFrequencies ::= SEQUENCE OF SEQUENCE {

 --Frequency range

 frequencyRange FrequencyRange,

 --Transmission power limit [dBm]

 txPowerLimit REAL OPTIONAL,

 --Start time when this frequency range is available

 availableStartTime GeneralizedTime OPTIONAL,

 --Duration during which this frequency range is available [s]

 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 [dB]

 aCS REAL,

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

 aCLR REAL,

 --Potential antenna height of the reception to be protected

 --in the reference point [m]

 antennaHeight REAL,

 --Potential antenna gain of the reception to be protected

 --in the reference point [dBi]

 antennaGain REAL,

 --Protection ratio of the reception to be protected

 --at the reference point for the frequency [dB]

 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 [MHz]

 minChRaster REAL OPTIONAL,

 --Maximum supported bandwidth per channel [MHz]

 maxCHBW REAL,

 --Minimum supported bandwidth per channel [MHz]

 minCHBW REAL,

 --Resolution for additional channel bandwidth

 --between minCHBW and maxCHBW [MHz]

 resolutionSBW REAL,

 --Minimum bandwidth within either maxCHBW or minCHBW [MHz].

 --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 [MHz]

 offsetFreqMaxCHBW REAL,

 --Offset of the start frequency in the case of minCHBW [MHz]

 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 [fractional value between 0 and 1]

 occupancy REAL OPTIONAL}

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

**--Available channel numbers**

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

ConstOfChUseID :: = ENUMERATED {

 regulationMaxTxPower,

 regulationMaxAntGain,

 regulationMaxAntHeight,

 regulationTVDBUpdateTime,

 outOfBandEmissionLimit,

 …

}

ConstOfChUseValue ::= CHOICE {

 --Maximum transmit power allowed by regulations [dBm]

 regulationMaxTxPower REAL,

 --Maximum antenna gain allowed by regulation [dBi]

 regulationMaxAntMaxGain REAL,

 --Maximum antenna height above ground allowed by regulation [m]

 regulationAntMaxHeight REAL,

 --WSO location update time required by regulation [s]

 regulationTVDBUpdateTime REAL,

 --Out of band emission power density limit [dBm/MHz]

 outOfBandEmissionLimit REAL,

 …

}

ConstOfChUses ::= SEQUENCE OF SEQUENCE {

 constOfChUseID ConstOfChUseID,

 constOfChUseValue ConstOfChUseValue

}

ListOfAvailableChNumbers ::= SEQUENCE OF SEQUENCE {

 chNumber INTEGER,

 availableStartTime GeneralizedTime,

 --Duration of availability [s]

 availableDuration REAL,

 constOfChUses ConstOfChUses

}

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

**--Operating channel numbers**

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

ListOfOperatingChNumbers ::= SEQUENCE OF SEQUENCE {

 chNumber INTEGER,

 --Occupancy [fractional value between 0 and 1]

 occupancy REAL

}

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

**--Required resource**

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

--Required resource

RequiredResource ::= SEQUENCE OF SEQUENCE {

 --Required bandwidth [MHz]

 requiredBandwidth REAL,

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

 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 [s]

 scheduleFrameDuration REAL,

 --Number of schedule frames

 numberOfFrames INTEGER,

 --Transmission start time within a schedule frame [s]

 transmissionStartTime REAL,

 --Transmission duration within a schedule frame [s]

 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,

 --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

 class1,

 --Class#2 network geometry

 class2,

 --Class#3 network geometry

 class3,

 --Class#4 network geometry

 class4}

--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,

 --Normalized distance to subject WSO [fractional value]

 distance REAL

 --List of operating frequencies

 --Not used in CoexistenceSetInformationAnnouncement

 --Used in CoexistenceReportAnnouncement and CxMediaCoexistenceReportIndication

 listOfOperatingFrequencies ListOfOperatingFrequencies OPTIONAL}

--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 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,

 --Transmit power limit [dBm]

 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 {

 --SINR value [dB]

 sinrValue REAL,

 --Desired bandwidth value [MHz]

 desiredBandwidthValue REAL,

 --Desired occupancy value [fractional value between 0 and 1]

 desiredOccupancyValue REAL,

 --Desired QoS value [fractional value between 0 and 1]

 desiredQoSValue REAL,

 --Desired coverage value [m]

 desiredCoverageValue REAL,

 channelNumberValue REAL,

 subscribedServiceValue SubscribedService

 --Interference level value [dBm]

 interferenceLevelValue REAL,

 --Fairness value [fractional value between 0 and 1]

 fairnessValue REAL,

 --Threshold value [factional value between 0 to 1]

 thresholdValue REAL,

mobilityInformation MobilityInformation,

 otherValue ANY

 }

}

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

**--Negotiation**

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

NegotiationStatus :: = SEQUENCE {

 negotiationSuccess BOOLEAN,

 negotiationFailure BOOLEAN,

 underNegotiation BOOLEAN,

 …

}

StartEndTime :: = SEQUENCE {

 --Start time [s]

 startTime REAL,

 --End time [s]

 endTime REAL

}

TimeSharingUnitInfo ::= SEQUENCE {

 referenceTime GeneralizedTime,

 windowTime StartEndTime,

 slotTime StartEndTime,

 …

}

NegotiationInformation :: = SEQUENCE {

 mode BOOLEAN,

 listOfChNumber SEQUENCE OF INTEGER,

 timeSharingUnitInfo TimeSharingUnitInfo,

 slotTimePosition StartEndTime,

 numberOfSlots INTEGER,

 disallowedSlotTimePosition StartEndTime,

 --List of contention numbers [factional value between 0 to 1]

 listOfContentionNumbers SEQUENCE OF REAL,

 …

}

ListOfWinnerCMID ::= SEQUENCE OF CxID

--List of slot time position [s]

ListOfSlotTimePosition ::= SEQUENCE OF REAL

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

**--Measurement**

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

MeasurementSchedule ::= SEQUENCE {

 measStartTime GeneralizedTime,

 numberOfMeasurements INTEGER,

 --Time between measurements [s]

 timeBetweenMeasurements REAL

}

MeasurementFreq ::= SEQUENCE OF INTEGER

MeasurementType ::= ENUMERATED {

 interferenceLevel

}

MeasurementDescription ::= SEQUENCE {

 measType MeasurementType,

 measSchedule MeasurementSchedule,

 measFreq MeasurementFreq

}

MeasurementReport ::= CHOICE {

 --Interference level value [dBm]

 interferenceLevelValue REAL,

 …

}

MeasurementResult ::= SEQUENCE OF SEQUENCE {

 measurementDescription MeasurementDescription,

 measurementReport MeasurementReport

}

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

--Mobility Information

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

MobilityInformation :: = CHOICE {

 --Maximum speed [km/h]

maxSpeed REAL,

speedInformation SpeedInformation,

routeInformation RouteInformation

}

SpeedInformation ::= SEQUENCE {

 --WSO speed [km/h]

WSOSpeed REAL,

 --WSO direction [degree]

WSODirection REAL

}

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

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}

--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 [dBm]

 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 OPTIONAL,

 --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}

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

**--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

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}

--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 [dBm]

 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 OPTIONAL,

 --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}

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

**--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 [dBm]

 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}

--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