IEEE P802.19  
Wireless Coexistence

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| Profile O messages | | | | |
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Abstract

This document is a submission to IEEE 802.19 TG1 that contains definition of profile O messages.

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# Annex C (normative) Messages

# Profile O

IEEE802191ProtocolMessage DEFINITIONS AUTOMATIC TAGS ::= BEGIN

IMPORTS

SubscribedService,

OperationCode,

NetworkTechnology,

NetworkType,

DiscoveryInformation,

AvailableChannelsInformation,

ListOfAvailableFrequencies,

ListOfSupportedFrequencies,

ListOfSupportedChNumber,

ListOfOperatingFrequencies,

InterferenceDirection,

RadioEnvironmentInformation,

NetworkGeometryClass,

DeviceClass,

RequiredResource,

ListOfAllowedTVWSChNumber,

ConstOfChUses,

ChClassInfo,

FrequencyRange,

ReqInfoDescr,

ReqInfoValue,

MeasurementDescription,

MeasurementResult,

NegotiationInformation,

ListOfWinnerCMID,

ListOfSlotTimePosition,

ReconfigurationParameters,

FailedParameters,

EventParams,

ListOfGeolocation,

DatabaseInformation,

CoexistenceSetRadioEnvironmentInformation

FROM IEEE802191ProtocolDataType;

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- \* Message structure definitions

-- \* a) The overall message structure with header and payload

-- \* b) Message header structure with respective fields and their types

-- \* c) Message payload options, i.e. coexistence system messages

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-- \* a) The overall message structure with header and payload

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- The overall message structure

CxMessage ::= SEQUENCE {

-- Message header

messageHeader MessageHeader,

-- Message payload

payload CxPayload

}

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- \* b) Message header structure with respective fields and their types

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- Message header

MessageHeader ::= {

-- Source indetifier

sourceIdentifier CxID,

-- Destination identifier

destinationIdentifier CxID,

-- Indicates whether ack service is required

ackPolicy BOOLEAN,

-- Message identifier

messageIdentification MessageIdentification,

}

-- Source and destination identifiers within the message header

CxID ::= SEQUENCE {

-- Entity type

type CxType,

-- Entity identifier

id OCTET STRING

}

-- Entity type identifier

CxType ::= ENUMERATED {

ce,

cm,

cdis,

tvwsdb

}

-- Message identifier

MessageIdentification ::= CHOICE {

None NULL,

-- Request identifier

requestID INTEGER (0..2147483647),

-- Multiple response identifier

multipleResponse SEQUENCE {

requestID INTEGER (0..2147483647),

sequenceNumber INTEGER (0..2147483647),

isLastResponse BOOLEAN

}

}

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- \* c) Message payload options, i.e. all the different coexistence

-- \* system messages

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

CxPayload ::= CHOICE {

stopOperationAnn StopOperationAnnouncement,

subscriptionReq SubscriptionRequest,

subscriptionRsp SubscriptionResponse,

subscriptionChangeReq SubscriptionChangeRequest,

subscriptionChangeRsp SubscriptionChangeResponse,

ceRegistrationReq CERegistrationRequest,

registrationRsp RegistrationResponse,

cmRegistrationReq CMRegistrationRequest,

coexSetInformationAnn CoexistenceSetInformationAnnouncement,

coexSetInformationReq CoexistenceSetInformationRequest,

coexSetInformationRsp CoexistenceSetInformationResponse,

coexReportAnn CoexistenceReportAnnouncement,

coexReportReq CoexistenceReportRequest,

coexReportRsp CoexistenceReportResponse,

availableChannelsReq AvailableChannelsRequest,

cmAvailableChannelsReq CMAvailableChannelsRequest,

availableChannelsRsp AvailableChannelsResponse,

availableChannelsAnn AvailableChannelsAnnouncement,

coexSetElementInfoAnn CoexistenceSetElementInformationAnnouncement,

coexSetElementInfoConf CoexistenceSetElementInformationConfirm,

measurementReq MeasurementRequest,

measurementRsp MeasurementResponse,

measurementCnf MeasurementConfirm,

reconfigurationRequest ReconfigurationRequest,

reconfigurationRsp ReconfigurationResponse,

cmReconfigurationReq CMReconfigurationRequest,

cmReconfigurationRsp CMReconfigurationResponse,

resourceReconfReq CMReconfigurationRequest,

resourceReconfRsp CMReconfigurationResponse,

keepAliveReq KeepAliveRequest,

keepAliveRsp KeepAliveResponse

}

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- \* Definitions of individual coexistence system messages

-- \* Messages defined per procedures as follows

-- \* 1) Coexistence service subscription

-- \* 2) Providing registration information

-- \* 3) Obtaining coexistence set information

-- \* 4) Obtaining available channel list

-- \* 5) Obtaining information

-- \* 6) Requesting and obtaining measurements

-- \* 7) Reconfiguration

-- \* 8) Event

-- \* 9) Coexistence set element reconfiguration

-- \* 10) Keep alive

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-- \* Messages for the following procedures

-- \* 1) Coexistence service subscription

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

SubscriptionRequest ::= SEQUENCE {

-- Subscribed coexistence service

subscrivedService SubscribedService

}

SubscriptionResponse ::= SEQUENCE {

-- Subscription status

status BOOLEAN

}

SubscriptionChangeRequest ::= SEQUENCE {

-- Proposed new subscribed coexistence service

newSubscribedService SubscribedService

}

SubscriptionChangeResponse ::= SEQUENCE {

-- Subscription change status

status BOOLEAN

}

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- \* Messages for the following procedures

-- \* 2) Providing registration information

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

CERegistrationRequest ::= SEQUENCE {

-- Indicates whether this is new registration or registration update

operationCode OperationCode,

-- Network identifier, e.g., BSS ID

networkID OCTET STRING,

-- Network technology, e.g., 802.11af, 802.22

networkTechnology NetworkTechnology,

-- Network type, e.g., fixed, mode 2

networkType NetworkType,

-- Regulatory ID of the WSO, e.g. FCC ID

deviceRegulatoryID OCTET STRING,

-- Serial number of the WSO

deviceSN OCTET STRING,

-- Information about available white space resources

availableChannelsInfo AvailableChannelsInfo,

-- Information for discovery

discoveryInformation DiscoveryInformation,

-- Adjacent channel leakage ratio of the TVBD device

-- List of supported resources: channel numbers or frequencies

listOfSupportedResources CHOICE {

-- List of supported frequencies

listOfSuppFrequencies ListOfSupportedFrequencies },

-- List of operating resources: channel numbers or frequencies

listOfOperatingResources CHOICE {

-- List of operating frequencies

-- Includes occupancy information

listOfOperFrequencies ListOfOperatingFrequencies },

-- Minimum transmission power

minTxPower REAL,

-- Indicates whether scheduled transmission is supported

txScheduleSupported BOOLEAN,

-- Resource required for operation of this WSO

requiredResource RequiredResource,

-- Measurement capabilities of the WSO

measurementCapability MeasurementCapability

}

RegistrationResponse ::= SEQUENCE {

}

CMRegistrationRequest ::= SEQUENCE {

-- Indicates whether this is new registration, registration update,

-- or deletion of WSO

operationCode OperationCode,

-- CE identifier to which this message applies

ceID CxID,

-- Network identifier, e.g., BSS ID

networkID OCTET STRING,

-- Network technology, e.g., 802.11af, 802.22

networkTechnology NetworkTechnology,

-- Network type, e.g., fixed, mode 2

networkType NetworkType,

-- Information for discovery

discoveryInformation DiscoveryInformation,

-- List of supported resources: channel numbers or frequencies

listOfSupportedResources CHOICE {

-- List of supported channel numbers

listOfSuppChNumber ListOfSupportedChNumber,

-- List of supported frequencies

listOfSuppFrequencies ListOfSupportedFrequencies },

}

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- \* Messages for the following procedures

-- \* 3) Obtaining coexistence set information

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

CoexistenceSetInformationAnnouncement ::= SEQUENCE {

-- List of WSOs for which coexistence sets are reported in this

-- announcement

listofWSO SEQUENCE OF SEQUENCE {

-- Indication of a particular CE for which a coexistence

-- set is reported in this announcement

ceID CxID,

-- List of neighbor CMs

listOfNeighborCM SEQUENCE OF SEQUENCE {

-- Neighbor CM identifier

neighborCMID CxID,

-- Neighbor CM IP address

neighborCMIPAddress OCTET STRING,

-- Neighbor CM port number

neighborCMPortNum OCTET STRING,

-- List of coexistence elements served by this CM

listOfCoexSetElements SEQUENCE OF SEQUENCE {

-- Network identifier, e.g., BSS ID

networkID OCTET STRING,

-- CE Identifier

ceID CxID,

-- Network technology, e.g. 802.11af, 802.22

networkTechnology NetworkTechnology,

-- Interference direction, i.e. mutual, source or victim

interfDirection InterferenceDirection,

-- Estimated interference level caused by the

-- coexistence set element

interfLevelFromCoexSetElem InterfererData,

-- Estimated interference level caused to

-- the coexistence set element

interfLevelToCoexSetElem InterfererData,

}

}

}

}

CoexistenceSetInformationRequest ::= SEQUENCE {

-- List of WSO for which coexistence set information is requested

listofWSO SEQUENCE OF SEQUENCE {

-- Indication of a particular WSO for which coexistence set

-- information is requested

networkID OCTET STRING,

-- CE Identifier

ceID CxID

}

}

CoexistenceSetInformationResponse ::= SEQUENCE {

-- List of WSOs for which coexistence sets are reported in this

-- announcement

listofCE SEQUENCE OF SEQUENCE {

-- Indication of a particular CE/WSO for which a coexistence

-- set is reported in this announcement

-- CE identifier of the related WSO

ceID CxID,

networkID OCTET STRING,

-- List of neighbor CMs

listOfNeighborCM SEQUENCE OF SEQUENCE {

-- Neighbor CM identifier

neighborCMID CxID,

-- Neighbor CM IP address

neighborCMIPAddress OCTET STRING,

-- Neighbor CM port number

neighborCMPortNum OCTET STRING,

-- List of coexistence elements served by this CM

listOfCoexSetElements SEQUENCE OF SEQUENCE {

-- Network identifier, e.g., BSS ID

networkID OCTET STRING,

-- CE Identifier

ceID CxID,

-- Network technology, e.g. 802.11af, 802.22

networkTechnology NetworkTechnology,

-- Interference direction, i.e. mutual, source or victim

interfDirection InterferenceDirection,

-- Estimated interference level caused by the

-- coexistence set element

interfLevelFromCoexSetElem InterfererData,

-- Estimated interference level caused to

-- the coexistence set element

interfLevelToCoexSetElem InterfererData,

}

}

}

}

CoexistenceReportAnnouncement ::= SEQUENCE {

-- List of coexistence set elements reported in this announcement

listOfCoexistenceSetElement SEQUENCE OF SEQUENCE {

-- CE identifier of the related WSO

ceID CxID,

-- Network identifier, e.g., BSS ID

networkID OCTET STRING,

-- Network technology, e.g., 802.11af, 802.22

networkTechnology NetworkTechnology,

-- Interference direction, i.e., mutual, source or victim

interferenceDirection InterferenceDirection,

-- Estimated interference level caused by the neighbor

interfLevelFromCoexSetElem InterfererData,

-- Estimated interference level caused to the coexistence set

-- element

interfLevelToCoexSetElem InterfererData,

-- temporarily or reclaims them

temporaryResource ENUMERATED {release, reclaim} OPTIONAL

--Coexistence value of the network

coexistenceValue REAL OPTIONAL,

-- Radio environment information

radioEnvInformation RadioEnvironmentInformation,

},

}

CoexistenceReportRequest ::= SEQUENCE {

}

CoexistenceReportResponse ::= SEQUENCE {

-- List of coexistence set elements reported in this announcement

listOfCoexistenceSetElement SEQUENCE OF SEQUENCE {

-- CE identifier of the related WSO

ceID CxID,

-- Network identifier, e.g., BSS ID

networkID OCTET STRING,

-- Network technology, e.g., 802.11af, 802.22

networkTechnology NetworkTechnology,

-- Interference direction, i.e., mutual, source or victim

interferenceDirection InterferenceDirection,

-- Estimated interference level caused by the neighbor

interfLevelFromCoexSetElem InterfererData,

-- Estimated interference level caused to the coexistence set

-- element

interfLevelToCoexSetElem InterfererData,

-- temporarily or reclaims them

temporaryResource ENUMERATED {release, reclaim} OPTIONAL

--Coexistence value of the network

coexistenceValue REAL OPTIONAL,

-- Radio environment information

radioEnvInformation RadioEnvironmentInformation,

},

}

CoexistenceSetElementInformationAnnouncement ::= SEQUENCE OF SEQUENCE {

-- CE identifier of the related WSO

ceID CxID,

-- Network identifier, e.g., BSS ID

networkID OCTET STRING,

-- Network technology, e.g., 802.11af, 802.22

sourceNetwTech NetworkTechnology,

-- WSO type, e.g., fixed, mode 2

networkType NetworkType,

-- Indicates whether the coexistence set element releases resources

-- temporarily or reclaims them

temporaryResource ENUMERATED {release, reclaim} OPTIONAL,

-- Radio environment information

radioEnvInformation RadioEnvironmentInformation,

}

CoexistenceSetElementInformationConfirm ::= SEQUENCE {

}

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- \* Messages for the following procedures

-- \* 4) Obtaining available channel list

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

AvailableChannelsRequest ::= SEQUENCE {

}

CMAvailableChannelsRequest ::= SEQUENCE {

-- Time of the request

requestedTimeStamp GeneralizedTime,

-- Regulatory identifier of the WSO, e.g. FCC ID

deviceRegulatoryID OCTET STRING,

-- Serial number of the WSO

deviceSN OCTET STRING,

-- Location of the WSO

deviceLocation GeoLocation,

-- Network type, e.g., fixed, mode 2

networkType NetworkType

}

AvailableChannelsResponse ::= SEQUENCE {

-- Information about available white space resources

availableChannelsInfo AvailableChannelsInfo

}

AvailableChannelsAnnouncement ::= SEQUENCE {

-- Information about available white space resources

availableChannelsInfo AvailableChannelsInfo

}

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- \* Messages for the following procedures

-- \* 5) Obtaining information

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

InfoAcquiringRequest ::= SEQUENCE {

-- Identifier of the CE to which the request relates to.

-- Available only when the request is transmitted from a CM to

-- another CM.

ceID Cx\_ID OPTIONAL,

-- ID of the requested information

listOfReqInfoDescr SEQUENCE OF ReqInfoDescr

}

InfoAcquiringResponse ::= SEQUENCE {

-- Identifier of the CE to which the response relates to.

-- Available only when the response is transmitted from a CM to

-- another CM.

ceID Cx\_ID OPTIONAL,

-- Requested information

reqInfoValue ReqInfoValue,

}

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- \* Messages for the following procedures

-- \* 6) Requesting and obtaining measurements

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

MeasurementRequest ::= SEQUENCE {

-- Indicates what type of measurement is requested

measurementDescription MeasurementDescription

}

MeasurementResponse ::= SEQUENCE OF SEQUENCE {

-- Measurement results in form of measurement reports

measurementDescription MeasurementDescription,

measurementReport MeasurementReport

}

MeasurementConfirm ::= SEQUENCE {

}

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- \* Messages for the following procedures

-- \* 7) Reconfiguration

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

ReconfigurationRequest ::= SEQUENCE {

-- Reconfiguration request description

reconfigParameters ReconfigurationParameters,

-- Indicates whether the CE is allowed to release resources in

-- temporary manner

tempReleaseAllowed BOOLEAN OPTIONAL

}

ReconfigurationResponse ::= SEQUENCE {

-- Status: successful or not

status BOOLEAN,

-- Failed reconfiguration parameters with recommended values of

-- parameters if reconfiguration request from CM to WSO is failed

failedParameters FailedParameters OPTIONAL

}

CMReconfigurationRequest ::= SEQUENCE {

-- Indicates CE of WSO to be reconfigured

reconfigTarget CxID,

-- Reconfiguration request description

reconfigParam ReconfigurationParameters,

}

CMReconfigurationResponse ::= SEQUENCE {

-- Indicates CE of WSO to be reconfigured

reconfigTarget CxID,

-- Status: successful or not

status BOOLEAN,

-- Failed reconfiguration parameters with recommended values of

-- parameters if reconfiguration request from CM to CE is failed

failedParameters FailedParameters OPTIONAL

}

ResourceReconfigurationRequest ::= SEQUENCE {

-- Indicates CE of the WSO wanting reconfiguration

reconfigTarget CxID,

-- Requested new resources

newOperResources ListOfOperatingResourceValues

}

ResourceReconfigurationResponse ::= SEQUENCE {

-- Requested new resources

newOperResources ListOfOperatingResourceValues

}

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

-- \* Messages for the following procedures

-- \* 9) Keep alive

-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

KeepAliveRequest ::= SEQUENCE {

-- Indicates KeepAliveExpiryTime parameter value in seconds

keepAliveExpiryTimeValue REAL,

-- Indicates status of the requesting entity

requestingEntityStatus EntityStatus

}

KeepAliveResponse ::= SEQUENCE {

-- Indicates status of the responding entity

respondingEntityStatus EntityStatus

}

END