IEEE P802.19
Wireless Coexistence

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| Proposed CDIS operation |
| Date: 2013-03-18 |
| Author(s): |
| Name | Company | Address | Phone | email |
| Stanislav Filin | NICT |  |  | sfilin@nict.go.jp |
| Hiroshi Harada | NICT |  |  |  |

Abstract

This document is a submission to IEEE 802.19 TG1 proposing CDIS operation.

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# Proposed update

*It is proposed to create new section Entities Operation and add subsection CDIS Operation for Profile N using the text below.*

# Entities Operation

# CDIS Operation for Profile N

# General description

Figure below shows operation of CDIS.



After receiving a request to start operation, a CDIS shall wait for incoming messages from CMs or for a request to stop operation.

If the CDIS has received a CM registration request, it shall perform WSO registration / registration update procedure.

If the CDIS has received a CM stop operation announcement, it shall perform CM stop operation procedure.

After performing a WSO registration / registration update procedure or a CM stop operation procedure, the CDIS shall update WSO information, run coexistence discovery algorithm, perform providing coexistence set information procedure, and switch back to the waiting state.

If the CDIS stops operation, the CDIS shall perform CDIS stop operation procedure and shall stop operation.

# WSO information

The CDIS shall maintain up to date at least the following information about CMs, CEs, and WSOs it serves.

--Default coverage area parameters

DefaultCoverageAreaParameters ::= SEQUENCE {

 --List of supported network technologies

 ListOfNetworkTechnologies SEQUENCE OF SEQUENCE {

 --Supported network technology

 networkTechnology NetworkTechnology,

 --Network technology default coverage area

 coverageArea SEQUENCE {

 --Default coverage area radius

 defRadius REAL,

 --Default central frequency

 defFrequency REAL,

 --Default height of master station

 defMasterHeight REAL,

 --Default height of slave station

 defSlaveHeight REAL,

 --Default transmission power

 defTxPower REAL

 }

 }

}

--Coexistence discovery thresholds

CoexistenceDiscoveryThresholds ::= SEQUENCE {

 --List of supported network technologies

 ListOfNetworkTechnologies SEQUENCE OF SEQUENCE {

 --Supported network technology

 networkTechnology NetworkTechnology,

 -- List of supported network technologies

 ListOfNetworkTechnologies ::= SEQUENCE OF SEQUENCE {

 --Supported network technology

 networkTechnology NetworkTechnology,

 --Coexistence discovery threshold

 cxDiscoveryThreshold REAL

 }

 }

}

-- Maintained information about WSOs

MaintainedInformation ::= SEQUENCE {

--List of CMs

 ListOfCMs SEQUENCE OF SEQUENCE {

 --CM ID

 cmID CxID,

 --CM IP address

 ipAddress OCTET STRING,

 --CM port number

 portNumber INTEGER,

 --List of CEs

 listOfCEs SEQUENCE OF SEQUENCE {

 --CE ID

 ceID CxID,

 --List of WSOs

 listOfWSOs SEQUENCE OF SEQUENCE {

 --WSO ID

 wsoID OCTET STRING,

 --WSO network technology

 networkTechnology NetworkTechnology,

 --WSO location

 geolocation Geolocation,

 --WSO reference coverage area

 coverageArea SEQUENCE {

 --Reference coverage area radius

 refRadius 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

 },

 --WSO list of available frequencies

 listOfAvailableFrequencies SEQUENCE OF SEQUENCE {

 --Frequency range

 frequencyRange FrequencyRange,

 --Coverage area radius for this available frequency

 radius REAL

 }

 }

 }

 }

}

Also, based on the path loss models used in the CDIS, the CDIS shall be able to calculate new coverage area radius based on the old and new coverage area parameters:

.

# WSO registration / registration update

After the CDIS has received the ***CMRegistrationRequest*** message from a CM, the CDIS shall perform the **WSO reconfiguration / reconfiguration update procedure**, described in (reference).

Table below shows expected values of the parameters in the ***CMRegistrationRequest*** message.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***header*** | ***CxHeader*** | ***requestID*** |
| ***payload*** | ***CxPayload*** | ***cmRegistrationRequest*** |

Table below shows expected values of the parameters in the ***cmRegistrationRequest*** payload.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***cmRegistration*** | ***CMRegistration*** | This parameter is used only in the first ***CMRegistrationRequest*** message from a particular CM. It is not used for the consequent ***CMRegistrationRequest*** messages from the same CM. When this parameter is used it contains CM transport address (see table below). |
| ***ceRegistration*** | ***CERegistration*** | Registration information of the WSOs (see table below). |

Table below shows expected values of the parameters in the ***cmRegistration*** parameter.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***ipAddress*** | ***OCTET STRING*** | CM IP address. |
| ***portNumber*** | ***INTEGER*** | CM port number. |

Table below shows expected values of the parameters of the each element of the sequence in the ***ceRegistration*** parameter. The number of the elements shall be equal to the number of the CEs that serves WSOs that are been registered.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***ceID*** | ***CxID*** | CE ID. |
| ***listOfWSORegistration*** | ***ListOfWSORegistration*** | List of WSOs with their registration information (see table below). |

Table below shows expected values of the parameters of the each element of the sequence in the ***listOfWSORegistration*** parameter. The number of the elements shall be equal to the number of WSOs served by this CE that are been registered.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***operationCode*** | ***OperationCode*** | Operation code. Set to ***new*** for new registration, to ***update*** for registration update, and to ***delete*** for deregistration. |
| ***wsoID*** | ***OCTET STRING*** | WSO ID. |
| ***networkTechnology*** | ***NetworkTechnology*** | WSO network technology. This parameter is used only for new registration. |
| ***geolocation*** | ***Geolocation*** | WSO location. This parameter is used only for new registration and registration update. |
| ***coverageArea*** | ***CoverageArea*** | WSO coverage area if known (see table below). This parameter is used only for new registration. |
| ***installationParameters*** | ***InstallationParameters*** | WSO installation parameters if known (see table below). This parameter is used only for new registration. |
| ***listOfAvailableFrequencies*** | ***ListOfAvailableFrequencies*** | List of WSO available frequencies (see table below). This parameter is used only for new registration and registration update. |

Table below shows expected values of the parameters in the ***coverageArea*** parameter.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***radius*** | ***REAL*** | Radius of the coverage area. |
| ***refFrequency*** | ***REAL*** | Reference frequency for which the radius is calculated. |
| ***refMasterHeight*** | ***REAL*** | Reference height of the master station for which the radius is calculated. |
| ***refSlaveHeight*** | ***REAL*** | Reference height of the slave station for which the radius is calculated. |
| ***refTxPower*** | ***REAL*** | Reference transmission power for which the radius is calculated. |

Table below shows expected values of the parameters in the ***installationParameters*** parameter.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***opMasterHeight*** | ***REAL*** | Height of the master station. |
| ***opSlaveHeight*** | ***REAL*** | Height of the slave station. |
| ***opTxPower*** | ***REAL*** | Transmission power (minimum of the master and slave stations). |

Table below shows expected values of the parameters of the each element of the sequence in the ***listOfAvailableFrequencies*** parameter.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***frequencyRange*** | ***FrequencyRange*** | Frequency range of the available frequency. |
| ***txPowerLimit*** | ***REAL*** | Power limit in this available frequency. |
| ***availableStartTime*** | ***GeneralizedTime*** | Available start time of the available frequency if applicable. |
| ***availableDuration*** | ***REAL*** | Available duration of the available frequency if applicable. |

After the CDIS has received the ***CMRegistrationRequest*** message from the CM, the CDIS shall generate and send the ***RegistrationResponse*** message to the CM.

The CDIS shall set the parameters in the ***ReconfigurationResponse*** message as shown in the table below.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***header*** | ***CxHeader*** | ***requestID*** |
| ***payload*** | ***CxPayload*** | ***registrationResponse*** |

The CDIS shall set the parameters in the payload of the ***ReconfigurationResponse*** message as shown in the table below.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***status*** | ***Status*** | ***noError*** |

# CM stop operation

After the CDIS has received the ***StopOperationAnnouncement*** message from a CM, the CDIS shall perform the **CM stop operation procedure**, described in (reference).

Table below shows expected values of the parameters in the ***StopOperationAnnouncement*** message.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***header*** | ***CxHeader*** | ***requestID*** |
| ***payload*** | ***CxPayload*** | ***stopOperationAnnouncement*** |

After the CDIS has received the ***StopOperationAnnouncement*** message from a CM, the CDIS shall generate and send the ***StopOperationConfirm*** message to the CM.

When generating the ***StopOperationConfirm*** message, the CDIS shall set the parameters of the ***CxMessage*** as shown in the table below.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***header*** | ***CxHeader*** | ***requestID*** |
| ***payload*** | ***CxPayload*** | ***stopOperationConfirm*** |

The CDIS shall set the parameters of the ***stopOperationConfirm*** payload as shown in the table below.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***status*** | ***Status*** | ***noError*** |

# Updating WSO information

When CDIS has received the ***CMRegistrationRequest*** message, the CDIS shall do the following.

If this is the first ***CMRegistrationRequest*** message from this CM, then the CDIS shall create new element in the ***MaintainedInformation*** for this CM. The CDIS shall set the parameters ***cmID***, ***ipAddress***, and ***portNumber*** to the values from the ***cmRegistration*** parameter in the received ***CMRegistrationRequest*** message. If this is not the first ***CMRegistrationRequest*** message from this CM, the ***cmRegistration*** parameter is not present in the ***CMRegistrationRequest*** message.

Then the CDIS shall check the values of the ***operationCode*** parameter in the received ***CMRegistrationRequest*** message.

For the WSOs with the ***operationCode*** parameter equal to ***new***, the CDIS shall do the following.

The CDIS shall compare ***ceID*** parameters in the ***listOfCEs*** parameter in the ***MaintainedInformation*** and ***ceID*** parameters in the ***ceRegistration*** parameter in the ***CMRegistrationRequest*** message. If there are any new CEs in the ***CMRegistrationRequest*** message, the CDIS shall create corresponding number of new elements in the ***listOfCEs*** parameter and shall set ***ceID*** parameters of the new elements to the values of the corresponding ***ceID*** parameters in the ***ceRegistration*** parameter.

Then, for all CEs that are in the ***ceRegistration*** parameter in the ***CMRegistrationRequest*** message, the CDIS shall add new elements to the ***listOfWSOs*** parameter from the ***listOfWSORegistration*** parameter in the ***ceRegistration*** parameter. The CDIS shall set ***wsoID***, ***networkTechnology***, and ***geolocation*** parameters in the ***listOfWSOs*** parameter to the values of the corresponding ***wsoID***, ***networkTechnology***, and ***geolocation*** parameters in the ***CMRegistrationRequest*** message.

Then, for all WSOs that are in the ***listOfWSORegistration*** parameter in the ***CMRegistrationRequest*** message, the CDIS shall create new ***listOfAvailableFrequencies*** parameters using the corresponding ***listOfAvailableFrequencies*** parameters in the ***CMRegistrationRequest*** message and set the values of the ***frequencyRange*** parameters in the created ***listOfAvailableFrequencies*** parameters using the corresponding ***frequencyRange*** parameters in the ***CMRegistrationRequest*** message.

Then, for all WSOs that have been added to the ***listOfWSOs*** parameters in the ***MaintainedInformation***, the CDIS shall check whether ***coverageArea*** parameter and ***intallationParameters*** parameter are provided in the ***CMRegistrationRequest*** message. Four cases are distinguished:

* ***coverageArea*** parameter is provided and none of the parameters inside ***intallationParameters*** parameter are provided
* ***coverageArea*** parameter is provided and one or several parameters inside ***intallationParameters*** parameter are provided
* ***coverageArea*** parameter is not provided and one or several parameters inside ***intallationParameters*** parameter are provided
* ***coverageArea*** parameter is not provided and none of the parameters inside ***intallationParameters*** parameter are provided.

If ***coverageArea*** parameter is provided and none of the parameters inside ***intallationParameters*** parameter are provided, the CDIS shall set the values of the ***refRadius***, ***refFrequency***, ***refMasterHeight***, ***refSlaveHeight***, and ***refTxPower*** parameters in the ***coverageArea*** parameter in the ***MaintainedInformation*** to the values of the ***radius***, ***refFrequency***, ***refMasterHeight***, ***refSlaveHeight***, and ***refTxPower*** parameters in the ***coverageArea*** parameter in the ***CMRegistrationRequest*** message.

If ***coverageArea*** parameter is provided and one or several parameters inside ***intallationParameters*** parameter are provided, the CDIS shall do the following.

The CDIS shall set the value of the ***refFrequency*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation*** to the value of the ***refFrequency*** parameter in the ***coverageArea*** parameter in the ***CMRegistrationRequest*** message.

If the ***opMasterHeight*** parameter is provided in the ***intallationParameters*** parameter, the CDIS shall set the value of the ***refMasterHeight*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation*** to the value of the ***opMasterHeight*** parameter, otherwise the CDIS shall set the value of the ***refMasterHeight*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation*** to the value of the ***refMasterHeight*** parameter in the ***coverageArea*** parameter in the ***CMRegistrationRequest*** message.

If the ***opSlaveHeight*** parameter is provided in the ***intallationParameters*** parameter, the CDIS shall set the value of the ***refSlaveHeight*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation*** to the value of the ***opSlaveHeight*** parameter, otherwise the CDIS shall set the value of the ***refSlaveHeight*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation*** to the value of the ***refSlaveHeight*** parameter in the ***coverageArea*** parameter in the ***CMRegistrationRequest*** message.

If the ***opTxPower*** parameter is provided in the ***intallationParameters*** parameter, the CDIS shall set the value of the ***refTxPower*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation*** to the value of the ***opTxPower*** parameter, otherwise the CDIS shall set the value of the ***refTxPower*** parameter in the ***coverageArea*** parameter in the ***ListOfCMs*** to the value of the ***refTxPower*** parameter in the ***coverageArea*** parameter in the ***CMRegistrationRequest*** message.

Then, the CDIS shall set the value of the ***refRadius*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation*** to the following value:



Where:

*  is the value of the ***radius*** parameter in the ***coverageArea*** parameter in the ***CMRegistrationRequest*** message
*  is the value of the ***refFrequency*** parameter in the ***coverageArea*** parameter in the ***CMRegistrationRequest*** message
*  is the value of the ***refMasterHeight*** parameter in the ***coverageArea*** parameter in the ***CMRegistrationRequest*** message
*  is the value of the ***refSlaveHeight*** parameter in the ***coverageArea*** parameter in the ***CMRegistrationRequest*** message
*  is the value of the ***refTxPower*** parameter in the ***coverageArea*** parameter in the ***CMRegistrationRequest*** message
*  is the value of the ***refFrequency*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation***
*  is the value of the ***refMasterHeight*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation***
*  is the value of the ***refSlaveHeight*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation***
*  is the value of the ***refTxPower*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation***.

If ***coverageArea*** parameter is not provided and one or several parameters inside ***intallationParameters*** parameter are provided, the CDIS shall do the following.

The CDIS shall set the value of the ***refFrequency*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation*** to the value of the ***defFrequency*** parameter in the ***coverageArea*** parameter in the ***DefaultCoverageAreaParameters***.

If the ***opMasterHeight*** parameter is provided in the ***intallationParameters*** parameter, the CDIS shall set the value of the ***refMasterHeight*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation*** to the value of the ***opMasterHeight*** parameter, otherwise the CDIS shall set the value of the ***refMasterHeight*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation*** to the value of the ***defMasterHeight*** parameter in the ***coverageArea*** parameter in the ***DefaultCoverageAreaParameters***.

If the ***opSlaveHeight*** parameter is provided in the ***intallationParameters*** parameter, the CDIS shall set the value of the ***refSlaveHeight*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation*** to the value of the ***opSlaveHeight*** parameter, otherwise the CDIS shall set the value of the ***refSlaveHeight*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation*** to the value of the ***defSlaveHeight*** parameter in the ***coverageArea*** parameter in the ***DefaultCoverageAreaParameters***.

If the ***opTxPower*** parameter is provided in the ***intallationParameters*** parameter, the CDIS shall set the value of the ***refTxPower*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation*** to the value of the ***opTxPower*** parameter, otherwise the CDIS shall set the value of the ***refTxPower*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation*** to the value of the ***defTxPower*** parameter in the ***coverageArea*** parameter in the ***DefaultCoverageAreaParameters***.

Then, the CDIS shall set the value of the ***refRadius*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation*** to the following value:



Where:

*  is the value of the ***defRadius*** parameter in the ***coverageArea*** parameter in the ***DefaultCoverageAreaParameters***
*  is the value of the ***defFrequency*** parameter in the ***coverageArea*** parameter in the ***DefaultCoverageAreaParameters***
*  is the value of the ***defMasterHeight*** parameter in the ***coverageArea*** parameter in the ***DefaultCoverageAreaParameters***
*  is the value of the ***defSlaveHeight*** parameter in the ***coverageArea*** parameter in the ***DefaultCoverageAreaParameters***
*  is the value of the ***defTxPower*** parameter in the ***coverageArea*** parameter in the ***DefaultCoverageAreaParameters***
*  is the value of the ***refFrequency*** parameter in the ***coverageArea*** parameter in the ***DefaultCoverageAreaParameters***
*  is the value of the ***refMasterHeight*** parameter in the ***coverageArea*** parameter in the ***DefaultCoverageAreaParameters***
*  is the value of the ***refSlaveHeight*** parameter in the ***coverageArea*** parameter in the ***DefaultCoverageAreaParameters***
*  is the value of the ***refTxPower*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation***.

If ***coverageArea*** parameter is not provided and none of the parameters inside ***intallationParameters*** parameter are provided, the CDIS shall set the values of the ***refRadius***, ***refFrequency***, ***refMasterHeight***, ***refSlaveHeight***, and ***refTxPower*** parameters in the ***coverageArea*** parameter in the ***MaintainedInformation*** to the values of the ***defRadius***, ***defFrequency***, ***defMasterHeight***, ***defSlaveHeight***, and ***defTxPower*** parameters in the ***coverageArea*** parameter in the ***DefaultCoverageAreaParameters***.

Then, for all WSOs that have been added to the ***listOfWSOs*** parameters in the ***MaintainedInformation***, for all their available frequencies in the ***listOfAvailableFrequencies*** parameter in the ***MaintainedInformation***, the CDIS shall set the value of the ***radius*** parameter to the following value:



Where:

*  is the value of the ***refRadius*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation***
*  is the value of the ***refFrequency*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation***
*  and  is the value of the ***refMasterHeight*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation***
*  and  is the value of the ***refSlaveHeight*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation***
*  and  is the value of the ***refTxPower*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation***
*  is the value of the ***frequencyRange*** parameter in the ***listOfAvailableFrequencies*** parameter in the ***MaintainedInformation***.

For the WSOs with the ***operationCode*** parameter equal to ***update***, the CDIS shall do the following.

If for a WSO, the parameter ***geolocation*** is provided in the ***CMRegistrationRequest*** message, the CDIS shall set the value of the parameter ***geolocation*** in the ***MaintainedInformation*** to the value of the parameter ***geolocation*** is provided in the ***CMRegistrationRequest*** message for this WSO.

If for a WSO, the ***listOfAvailableFrequencies*** parameter is provided in the ***CMRegistrationRequest*** message, the CDIS shall do the following.

The CDIS shall compare the ***frequencyRange*** parameters in the ***MaintainedInformation*** and in the ***CMRegistrationRequest*** message. If a particular ***frequencyRange*** parameter in the ***MaintainedInformation*** is not present in the ***CMRegistrationRequest*** message, this element shall be deleted from the ***listOfAvailableFrequencies*** parameter in the ***MaintainedInformation***. If a particular ***frequencyRange*** parameter is not present in the ***MaintainedInformation***, new element shall be created in the ***listOfAvailableFrequencies*** parameter in the ***MaintainedInformation***.

For a newly created element in the ***listOfAvailableFrequencies*** parameter in the ***MaintainedInformation***, the CDIS shall set the value of the ***frequencyRange*** parameter in the ***MaintainedInformation*** to the value of the ***frequencyRange*** parameter in the ***CMRegistrationRequest*** message.

Then for this element, the CDIS shall set the value of the ***radius*** parameter in the ***MaintainedInformation*** to the following value:



Where:

*  is the value of the ***refRadius*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation***
*  is the value of the ***refFrequency*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation***
*  and  is the value of the ***refMasterHeight*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation***
*  and  is the value of the ***refSlaveHeight*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation***
*  and  is the value of the ***refTxPower*** parameter in the ***coverageArea*** parameter in the ***MaintainedInformation***
*  is the value of the ***frequencyRange*** parameter in the ***listOfAvailableFrequencies*** parameter in the ***MaintainedInformation***.

For all WSOs which ***operationCode*** parameter has value ***delete*** in the ***CMRegistrationRequest*** message, the CDIS shall delete corresponding elements in the ***listOfWSOs*** in the ***MaintainedInformation***.

When the CDIS has received the ***StopOperationAnnouncement*** message from a CM, the CDIS shall delete corresponding element from the ***MaintainedInformation***.

After the CDIS has updated the ***MaintainedInformation***, the CDIS shall run the coexistence discovery algorithm as described in Annex A: Coexistence discovery algorithm.

# Providing coexistence set information

After the CDIS has run the coexistence discovery algorithm as described in Annex A: Coexistence discovery algorithm and coexistence set information has been changed for one or several WSOs served by the CDIS, the CDIS shall generate one or several ***CoexistenceSetInformationAnnouncement*** messages. The number of the ***CoexistenceSetInformationAnnouncement*** messages shall be equal to the number of the CMs which WSO coexistence set information has been change. After the CDIS has generated the ***CoexistenceSetInformationAnnouncement*** messages, it shall send them to the corresponding CMs and wait for the ***CoexistenceSetInformationConfirm*** messages from the CMs.

When generating a ***CoexistenceSetInformationAnnouncement*** message, the CDIS shall set the parameters of the ***CxMessage*** as shown in the table below.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***header*** | ***CxHeader*** | ***requestID*** |
| ***payload*** | ***CxPayload*** | ***coexistenceSetInformationAnnouncement*** |

The CDIS shall set the parameters of the ***coexistenceSetInformationAnnouncement*** payload as shown in the table below.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***listOfSubjectCEs*** | ***ListOfSubjectCEs*** | Coexistence set information for the WSOs (see table below). |
| ***listOfNeighborCMsTransport*** | ***ListOfNeighborCMsTransport*** | List of neighbor CMs transport information mentioned inside the list of subject CEs (see table below). |

The CDIS shall set the parameters of the each element of the sequence in the ***listOfSubjectCEs*** parameter as shown in the table below. The number of the elements shall be equal to the number of CEs serving WSOs which coexistence set information has been changed.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***ceID*** | ***CxID*** | CE ID. |
| ***listOfSubjectWSOs*** | ***ListOfSubjectWSOs*** | List of WSOs which coexistence set information has been changed served by this CE (see table below). |

The CDIS shall set the parameters of the each element of the sequence in the ***listOfSubjectWSOs*** parameter as shown in the table below. The number of the elements shall be equal to the number of WSOs served by a CE which coexistence set information has been changed.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***wsoID*** | ***OCTET STRING*** | WSO ID. |
| ***listOfSubjectWSO******AvailableFrequencies*** | ***ListOfSubjectWSO******AvailableFrequencies*** | List of available frequencies of the subject WSO (see table below). |

The CDIS shall set the parameters of the each element of the sequence in the ***listOfSubjectWSOAvailableFrequencies*** parameter as shown in the table below. The number of the elements shall be equal to the number of available frequencies of a WSO.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***frequencyRange*** | ***FrequencyRange*** | Frequency range of the available frequency. |
| ***listOfNeighborCMs*** | ***ListOfNeighborCMs*** | List of neighbor CMs on this available frequency (see table below). |

The CDIS shall set the parameters of the each element of the sequence in the ***listOfNeighborCMs*** parameter as shown in the table below. The number of the elements shall be equal to the number of neighbor CMs that serves WSOs that are neighbors to the subject WSO on this available frequency.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***cmID*** | ***CxID*** | CM ID. |
| ***listOfNeighborCEs*** | ***ListOfNeighborCEs*** | List of neighbor CEs served by this CM (see table below). |

The CDIS shall set the parameters of the each element of the sequence in the ***listOfNeighborCEs*** parameter as shown in the table below. The number of the elements shall be equal to the number of neighbor CEs served by the CM.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***ceID*** | ***CxID*** | CE ID. |
| ***listOfNeighborWSOs*** | ***ListOfNeighborWSOs*** | List of neighbor WSOs served by this CE (see table below). |

The CDIS shall set the parameters of the each element of the sequence in the ***listOfNeighborWSOs*** parameter as shown in the table below. The number of the elements shall be equal to the number of neighbor WSOs served by the CE.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***wsoID*** | ***OCTET STRING*** | WSO ID. |
| ***networkTechnology*** | ***NetworkTechnology*** | Network technology of the neighbor WSO. |
| ***interferenceDirection*** | ***InterferenceDicrection*** | Interference direction among subject WSO and neighbor WSO. |
| ***distance*** | ***REAL*** | Distance between subject WSO and neighbor WSO used as a measure of interference. |
| ***listOfOperatingFrequencies*** | ***ListOfOperatingFrequencies*** | *This parameter is not used.* |

The CDIS shall set the parameters of the each element of the sequence in the ***listOfNeighborCMsTransport*** parameter as shown in the table below. The number of the elements shall be equal to the number of the CMs in the ***listOfNeighborCMs*** parameter.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***cmID*** | ***CxID*** | CM ID. |
| ***ipAddress*** | ***OCTET STRING*** | CM IP address. |
| ***portNumber*** | ***INTEGER*** | CM port number. |

Table below shows expected values of the ***CoexistenceSetInformationConfirm*** message.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***header*** | ***CxHeader*** | ***requestID*** |
| ***payload*** | ***CxPayload*** | ***coexistenceSetInformationConfirm*** |

Table below shows expected values of the parameters in the ***coexistenceSetInformationConfirm*** payload.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***status*** | ***Status*** | ***noError*** |

# CDIS stop operation

After the CDIS has received the request to stop operation, it shall perform the **CDIS stop operation procedure**, described in (reference).

The CDIS shall generate and send the ***StopOperationAnnouncement*** messages to all CMs that it serves and shall wait for ***StopOperationConfirm*** messages from the CMs.

When generating the ***StopOperationAnnouncement*** message, the CDIS shall set the parameters of the ***CxMessage*** as shown in the table below.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***header*** | ***CxHeader*** | ***requestID*** |
| ***payload*** | ***CxPayload*** | ***stopOperationAnnouncement*** |

Table below shows expected values of the parameters in the ***StopOperationConfirm*** message from a CM.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***header*** | ***CxHeader*** | ***requestID*** |
| ***payload*** | ***CxPayload*** | ***stopOperationConfirm*** |

Table below shows expected values of the parameters in the ***stopOperationConfirm*** payload.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***status*** | ***Status*** | ***noError*** |

After the CDIS has received ***StopOperationConfirm*** messages from all CMs, the CDIS shall stop operation.