IEEE P802.19  
Wireless Coexistence

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| --- | --- | --- | --- | --- |
| Proposed resolution to comments r01-18, r01-19, and r01-20 | | | | |
| Date: 2014-02-14 | | | | |
| Author(s): | | | | |
| Name | Company | Address | Phone | email |
| Stanislav Filin | NICT |  |  | sfilin@nict.go.jp |
| Naotaka Sato | Sony |  |  |  |
| Ryo Sawai | Sony |  |  |  |
| Chen Sun | Sony |  |  |  |

Abstract

This document is a submission to IEEE 802.19 BRC proposing resolution to comments r01-18, r01-19, and r01-20.

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# Proposed update

*It is proposed to modify clause 6.2.4 Profile 3 as shown in the text below.*

* + 1. Profile 3
       1. General description

A CDIS that operates as per Profile 3 shall support the following procedures:

* WSO registration
* WSO registration update
* Obtaining coexistence set information.

High level flow chart of the CDIS operation is provided in 2.



1. ・High level flow chart of the CDIS operation.

After receiving a CM registration/update request, a CDIS shall correspond to the WSO registration (update) procedure and store/update the subject CM information. When coexistence set information request is received from the subject CM and its operation code shows new or update, CDIS shall correspond to the obtaining coexistence set information procedure. When coexistence set information request is received from the subject CM and its operation code shows delete, CDIS shall check whether or not the number of registered CM is larger than 1. If the number of registered CM is none, the CDIS may stop the operation.

Further procedure specific constraints may apply and if that is the case those are specified in the clauses below.

* + - 1. WSO registration

After the CDIS has received a CMRegistrationRequest message from a CM indicating new registration, the CDIS shall perform the WSO registration procedure described in clause 5.2.2.1. The CDIS shall generate and send the RegistrationResponse message to the CM.

Table below shows ***CxMessage*** fields in ***RegistrationResponse*** message.

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

Table below shows ***registrationResponse*** payload element.

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

* + - 1. WSO registration update

After the CDIS has received a CMRegistrationRequest message from a CM indicating registration update, the CDIS shall perform the WSO registration update procedure described in clause 5.2.2.2. The CDIS shall generate and send the RegistrationResponse message to the CM.

Table below shows ***CxMessage*** fields in ***RegistrationResponse*** message.

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

Table below shows ***registrationResponse*** payload element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***status*** | ***CxMediaStatus*** | status |

* + - 1. Obtaining coexistence set information

After the CDIS has received a CoexistenceSetInformationRequest message from a CM, the CDIS shall perform the obtaining coexistence information procedure described in clause 5.2.3.1. The CDIS shall generate and send the CoexistenceSetInformationResponse message to the CM.

Table below shows ***CxMessage*** fields in ***CoexistenceSetInformationResponse*** message.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***Header*** | ***CxHeader*** | ***requestID*** |
| ***Payload*** | ***CxPayload*** | ***coexistenceSetInformationResponse*** |

Table below shows ***CxMessage*** fields in ***CoexistenceSetInformationResponse*** payload.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***networkID*** | ***OCTET STRING*** | Subject network ID for coexistence set information |
| ***listOfneighborCMs*** | ***ListOfneighborCMs*** | As specified in table below |
| ***listOfMasterCMCandidate*** | ***ListOfMasterCMCandidate*** | As specified in table below |

Table below shows ***ListOfneighborCMs*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***cmID*** | ***cxID*** | CM ID |
| ***listOfNeighborCEs*** | ***ListOfNeighborCEs*** | As shown in table below |

Table below shows ***ListOfneighborCEs*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***cmID*** | ***cxID*** | CE ID |
| ***listOfNeighborWSOs*** | ***ListOfNeighborWSOs*** | As shown in table below |

Table below shows ***ListOfneighborWSOs*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***wsoID*** | ***OCTET STRING*** | WSO ID |
| ***networkTechnology*** | ***NetworkTechnology*** | Network technology |
| ***networkGeometryClass*** | ***NetworkGeometryClass*** | As shown in table below |
| ***listOfAvailableFrequencies*** | ***ListOfAvailableFrequencies*** | As shown in table below |
| ***listOfOperatingFrequencies*** | ***ListOfOperatingFrequencies*** | As shown in table below |

Table below shows ***ListOfAvailableFrequencies*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***frequencyRange*** | ***FrequencyRange*** | Shall be set to indicate the available frequency range. |
| ***txPowerLimit*** | ***REAL*** | Shall be set to indicate the power limit in the available frequency range. |
| ***availableStartTime*** | ***GeneralizedTime*** | Shall be set to indicate start time of the available frequency range if applicable. |
| ***availableDuration*** | ***REAL*** | Shall be set to indicate duration of the available frequency range if applicable. |
| ***aggInterfControlParam*** | ***AggregatedInterference***  ***ControlParameters*** | As specified in table below |

Table below shows ***AggregatedInterferenceControlParameters*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***referencePointID*** | ***INTEGER*** | Reference point ID to be protected in controlling aggregated interference from the other WSO(s) |
| ***geolocation*** | ***Geolocation*** | Geolocation information of the reference point ID |
| ***aCS*** | ***REAL*** | Adjacent Channel Selectivity of the reception to be protected at the reference point if available |
| ***aCLR*** | ***REAL*** | Referenced adjacent channel leakage ratio if available |
| ***antennaHeight*** | ***REAL*** | Potential antenna height of the reception to be protected if available |
| ***antennaGain*** | ***REAL*** | Potential antenna gain of the reception to be protected at the reference point if available |
| ***protection ratio*** | ***REAL*** | Protection ratio of the reception to be protected at the reference point for the frequency if available |

Table below shows ***networkGeometryClass*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***networkGeometryClass*** | ***INTEGER*** | 0: Network geometry class 1  1: Network geometry class 2  2: Network geometry class 3  3: Network geometry class 4  4-x: Others |

Table below shows ***listOfOperatingFreqeuencies*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***frequencyRange*** | ***FrequencyRange*** | Operating frequency range |

Table below shows ***listOfMasterCMCandidate*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***cmID*** | ***cxID*** | CM ID |
| ***ipAddress*** | ***IOAddress*** | IP address of the subject CM |
| ***portnumber*** | ***PortNumber*** | Its port number |

*It is proposed to modify clause 6.3.4 Profile 3 as shown in the text below.*

* + 1. Profile 3
       1. General description

A CM that operates as per Profile 3 shall support the following procedures:

* WSO subscription
* WSO subscription update
* WSO subscription change
* WSO registration
* WSO registration update
* WSO reconfiguration
* Obtaining coexistence set information
* Providing coexistence report
* Master/slave CM configuration procedure
* Sending reconfiguration request from CM to another CM.

High level flow chart of the CM operation is provided in 3.



1. ・High level flow chart of the CM operation.

After receiving requests for both WSO subscription procedure and its registration procedure, a CM shall start operation either management service operation or information service operation for the subject WSO. In case of information service operation, the overall operation is shown in 4. Until receiving either a stop request of coexistence service subscription for the subject CE or having a need to start a coexistence subscription change procedure, CM will continue a coexistence set information procedure and a providing coexistence report procedure for its information service operation. If any update on its registered WSO information, CM shall correspond to a WSO registration update procedure.



1. ・Information service operation.

In case of management service operation, the overall operation is shown in 5. Until receiving either a stop request of coexistence service subscription for the subject CE or having a need to start a coexistence subscription change procedure, CM will continue a coexistence set information procedure and a WSO reconfiguration procedure for its management service operation. If any update on its registered WSO information, CM shall correspond to a WSO registration update procedure. If the CM receives a request of master/slave configuration procedure from the other CM(s) and accepts that request, CM shall start a sending reconfiguration request from CM to another CM procedure when the CM wants to reconfigure the operational parameters of the subject WSO being connected to its slave CM.

In case of management service operation as slave CM, the overall operation is shown in 6. Until receiving either a stop request of coexistence service subscription for the subject CE or having a need to start a coexistence subscription change procedure, CM will wait a reconfiguration request from its master CM procedure and continue to conduct a WSO reconfiguration procedure to the subject CE for its management service operation as slave CM. If any update on its registered WSO information, CM shall correspond to a WSO registration update procedure.

Further procedure specific constraints may apply and if that is the case those are specified in the clauses below.



1. ・Management service operation.



1. ・Management service operation as slave CM.
   * + 1. WSO subscription

After the CM has received a SubscriptionRequest message from a CE indicating a new subscription, the CM shall perform the subscription procedure described in clause 5.2.1.1. The CM shall generate and send the SubscriptionResponse message to the CE.

***CxMessage*** fields in ***SubscriptionResponse*** message are shown in the table below.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***Header*** | ***CxHeader*** | ***requestID*** |
| ***Payload*** | ***cxPayload*** | ***subscriptionResponse*** |

Table below shows the parameters in the ***subscriptionResponse*** payload.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***serverID*** | ***IA5String*** | serverID |
| ***serverPassword*** | ***IA5String*** | serverPassword |
| ***status*** | ***CxMediaStatus*** | status |

* + - 1. WSO subscription update

After the CM has received a SubscriptionRequest message from a CE indicating a subscription change, the CM shall perform the subscription update procedure described in clause 5.2.1.2. The CM shall generate and send the SubscriptionResponse message to the CE.

Table below shows ***CxMessage*** fields in ***SubscriptionResponse*** message.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***header*** | ***CxHeader*** | ***requestID*** |
| ***payload*** | ***cxPayload*** | ***subscriptionResponse*** |

Table below shows ***SubscriptionResponse*** payload element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***serverID*** | ***IA5String*** | serverID |
| ***serverPassword*** | ***IA5String*** | serverPassword |
| ***status*** | ***CxMediaStatus*** | Status |

* + - 1. Subscription change

When a CM requires to change subscription of a WSO, the CM shall perform the subscription change procedure described in clause 5.2.1.5. The CM shall generate and send the SubscriptionChangeRequest message to the CE serving this WSO.

Table below shows ***SubscriptionChangeRequest*** payload element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***Header*** | ***CxHeader*** | ***requestID*** |
| ***Payload*** | ***CxPayload*** | ***sucscriptionChangeRequest*** |

Table below shows ***CxMessage*** fields in ***SubscriptionChangeRequest*** message.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***coexistenceService*** | ***CoexistenceService*** | Set to “information” if the intent is to update the service subscription to the information service.  Set to “management” if the intent is to update the service subscription to the management service. |

* + - 1. WSO registration

After the CM has received a CERegistrationRequest message from a CE indicating a new registration, the CM shall perform the WSO registration procedure described in clause 5.2.2.1. The CM shall generate and send the RegistrationResponse message to the CE.

Table below shows ***CxMessage*** fields in ***RegistrationResponse*** message.

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

Table below shows ***registrationResponse*** payload element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***Status*** | ***cxMediaStatus*** | Status |

Also, the CM shall generate and send the ***CMRegistrationRequest*** message to the CDIS to which this CM is subscribed.

Table below shows ***CxMessage*** fields in ***CMRegistrationRequest*** message.

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

Table below shows ***CMRegistrationRequest*** payload element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***cmProfile*** | ***EntityProfile*** | Shall be set to indicate the entity profile |
| ***cmRegistration*** | ***CMRegistration*** | As specified in table below |
| ***ceRegistration*** | ***CERegistration*** | As specified in table below |
| ***operationCode*** | ***OperationCode*** | Shall be set to indicate that information is new. |
| ***ceID*** | ***CxID*** | CM ID |
| ***maximumNumberOfControllableWSO*** | ***INTEGER*** | Maximum number of controllable WSOs |

Table below shows ***CMRegistration*** information element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***iPAddress*** | ***OCTET STRING*** | IP address |
| ***portNumber*** | ***INTEGER*** | Port number |

Table below shows ***CERegistration*** information element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***ceID*** | ***CxID*** | CE ID |
| ***listOfWSORegistrations*** | ***ListOfWSORegistrations*** | As specified in table below |

Table below shows ***ListOfWSORegistrations*** information element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***wsoID*** | ***OCTET STRING*** | WSO ID |
| ***networkTechnology*** | ***NetworkTechnology*** | Network technology |
| ***geolocation*** | ***Geolocation*** | Geolocation |
| ***coverageArea*** | ***CoverageArea*** | As specified in table below |
| ***installationParameters*** | ***InstallationParameters*** | As specified in table below |
| ***listOfAvailableFrequencies*** | ***ListOfAvailableFrequencies*** | As specified in table below |
| ***operatingFrequency*** | ***OperatingFrequency*** | As specified in table below |
| ***txPowerLimit*** | ***REAL*** | Transmission power limit of the operating frequency if available |
| ***maximumNumberOf***  ***ControllableWSO*** | ***MaximumNumberOf***  ***ControlableWSO*** | Optionally, present |

Table below shows ***CoverageArea*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***radius*** | ***REAL*** | Shall be set to indicate the available frequency range. |

Table below shows ***InstallationParameters*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***opMasterHeight*** | ***REAL*** | Shall be set to indicate the height of master station, if available |
| ***opSlaveHeight*** | ***REAL*** | Shall be set to indicate the height of slave station, if available |
| ***opTxPower*** | ***REAL*** | Shall be set to indicate the maximum transmission power level if applicable. |
| ***aCLR*** | ***REAL*** | Adjacent Channel Leakage Ratio |
| ***aCS*** | ***REAL*** | Adjacent Channel Selectivity |
| ***guaranteedQoSOf***  ***BackhaulConnection*** | ***GuranteedQoSOf***  ***BackhaulConnection*** | As specified in table below |

Table below shows ***ListOfAvailableFrequencies*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***frequencyRange*** | ***FrequencyRange*** | Shall be set to indicate the available frequency range. |
| ***txPowerLimit*** | ***REAL*** | Shall be set to indicate the power limit in the available frequency range. |
| ***availableStartTime*** | ***GeneralizedTime*** | Shall be set to indicate start time of the available frequency range if applicable. |
| ***availableDuration*** | ***REAL*** | Shall be set to indicate duration of the available frequency range if applicable. |
| ***aggInterfControlParam*** | ***AggregatedInterference***  ***ControlParameters*** | As specified in table below |

Table below shows ***AggregatedInterferenceControlParameters*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***referencePointID*** | ***INTEGER*** | Reference point ID to be protected in controlling aggregated interference from the other WSO(s) |
| ***geolocation*** | ***Geolocation*** | Geolocation information of the reference point ID |
| ***aCS*** | ***REAL*** | Adjacent Channel Selectivity of the reception to be protected at the reference point if available |
| ***aCLR*** | ***REAL*** | Referenced adjacent channel leakage ratio if available |
| ***antennaHeight*** | ***REAL*** | Potential antenna height of the reception to be protected if available |
| ***antennaGain*** | ***REAL*** | Potential antenna gain of the reception to be protected at the reference point if available |
| ***protection ratio*** | ***REAL*** | Protection ratio of the reception to be protected at the reference point for the frequency if available |

Table below shows ***OperatingFrequency*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***frequencyRange*** | ***FrequenyRange*** | Shall be set to indicate the frequency range in which the WSO currently operates. |
| ***occupancy*** | ***REAL*** | Optionally present. If present, this parameter shall be set to indicate occupancy of the WSO frequency range. |

Table below shows ***GuranteedQoSOfBackhaulConnection*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***backhaulTypeID*** | ***BackhalTypeID*** | Shall be set to indicate backhaul type of the WSO. |
| ***guranteedMinimumBitRates*** | ***REAL*** | Shall be set to indicate the guaranteed maximum latency of its backhaul connection |
| ***guranteedMaximumLatency*** | ***REAL*** | Optionally present. If present, this parameter shall be set to indicate the guaranteed maximum latency of its backhaul connection |

* + - 1. WSO registration update

After the CM has received a CERegistrationRequest message from a CE indicating a registration update, the CM shall perform the WSO registration update procedure described in clause 5.2.2.2. The CM shall generate and send the RegistrationResponse message to the CE.

Table below shows ***CxMessage*** fields in ***RegistrationResponse*** message.

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

Table below shows the parameters in the ***registrationResponse*** payload.

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

Also, the CM shall generate and send the ***CMRegistrationRequest*** message to the CDIS to which this CM is subscribed.

Table below shows ***CxMessage*** fields in ***CMRegistrationRequest*** message.

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

Table below shows ***cMRegistrationRequest*** payload element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***cmProfile*** | ***EntityProfile*** | Shall be set to indicate the entity profile |
| ***cmRegistration*** | ***CMRegistration*** | As specified in table below if any update |
| ***ceRegistration*** | ***CERegistration*** | As specified in table below if any update |
| ***operationCode*** | ***OperationCode*** | Shall be set to indicate that information is update/to-be-deleted. |
| ***ceID*** | ***CxID*** | CM ID |

Table below shows ***CMRegistration*** information element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***iPAddress*** | ***OCTET STRING*** | IP address |
| ***portNumber*** | ***INTEGER*** | Port number |

Table below shows ***CERegistration*** information element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***ceID*** | ***CxID*** | CE ID |
| ***listOfWSORegistrations*** | ***ListOfWSORegistrations*** | As specified in table below |

Table below shows ***ListOfWSORegistrations*** information element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***operationCode*** | ***OperationCode*** | Shall be set to indicate that information is update/to-be-deleted. |
| ***wsoID*** | ***OCTET STRING*** | WSO ID |
| ***networkTechnology*** | ***NetworkTechnology*** | Network technology if any update |
| ***geolocation*** | ***Geolocation*** | Geolocation if any update |
| ***coverageArea*** | ***CoverageArea*** | As specified in 6.1.1.4 if any update |
| ***installationParameters*** | ***InstallationParameters*** | As specified in 6.1.1.4 if any update |
| ***listOfAvailableFrequencies*** | ***ListOfAvailableFrequencies*** | As specified in 6.1.1.4 if any update |
| ***operatingFrequency*** | ***OperatingFrequency*** | Shall be set to indicate the operating frequency if any update |
| ***txPowerLimit*** | ***REAL*** | Transmission power limit of the operating frequency if any update |

* + - 1. Reconfiguration

When a CM requires to reconfigure a WSO, the CM shall perform the WSO reconfiguration procedure described in clause 5.2.10.1. The CM shall generate and send the ReconfigurationRequest message to the CE serving this WSO.

Table below shows ***CxMessage*** fields in ***ReconfigurationRequest*** message.

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

Table below shows ***reconfigurationRequest*** fields in ***ReconfigurationRequest*** message.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***wsoID*** | ***OCTET STRING*** | WSO ID. |
| ***OperatingFrequency*** | ***FrequencyRange*** | Operating frequency range allocated for the WSO. |
| ***txPowerLimit*** | ***REAL*** | Transmission power limit |
| ***addNetworkTechnology*** | ***NetworkTechnology*** | Optionally present. If present, this parameter shall be set to indicate its WSO network technology type(s) to be reconfigured |

* + - 1. Obtaining coexistence set information

When a CM requires to obtain coexistence set information, the CM shall perform the obtaining coexistence set information procedure described in clause 5.2.3.1. The CM shall generate and send the CoexistenceSetInformationRequest message to the CDIS to which this CM is subscribed.

Table below shows ***CxMessage*** fields in ***CoexistenceSetInformationRequest*** message.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***Header*** | ***CxHeader*** | ***requestID*** |
| ***Payload*** | ***CxPayload*** | ***coexistenceSetInformationRequest*** |

Table below shows the parameters in the ***coexistenceSetInformationRequest*** payload.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***listOfNetworkID*** | ***SEQUENCE OF OCTET STRING*** | List of network ID |
| ***operationCode*** | ***OperationCode*** | Shall be set to indicate that is new-request/update-request/stop-request. |

* + - 1. Providing coexistence report

When a CM requires to provide a coexistence report to a WSO, the CM shall perform the providing coexistence report procedure described in clause 5.2.3.6. The CM shall generate and send the CoexistenceReportResponse message to the CE that serves this WSO.

Table below shows ***CxMessage*** fields in ***CoexistenceReportResponse*** message.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***Header*** | ***CxHeader*** | ***requestID*** |
| ***Payload*** | ***CxPayload*** | ***CoexistenceReportResponse*** |

Table below shows the parameters in the ***coexistenceReportResponse*** payload.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***networkID*** | ***OCTET STRING*** | Network ID |
| ***wsoID*** | ***OCTET STRING*** | WSO ID |
| ***listOfRecommended***  ***OperatingFrequency*** | ***ListOfRecommended***  ***OperatingFrequency*** | As specified in table below |

Table below shows ***ListOfRecommendedOperationFrequency*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***frequencyRange*** | ***FrequencyRange*** | Shall be set to indicate the recommended operation frequency range. |
| ***txPowerLevel*** | ***REAL*** | Shall be set to indicate the power limit in the frequency range. |
| ***availableStartTime*** | ***GeneralizedTime*** | Shall be set to indicate start time of the recommended operation frequency range if applicable. |
| ***availableDuration*** | ***REAL*** | Shall be set to indicate duration of the operation recommended frequency range if applicable. |

* + - 1. Master/Slave CM configuration

When a CM requires to start a master/slave configuration, the CM shall perform the master/slave configuration procedure described in clause 5.2.9.2. The CM shall generate and send the MasterSlaveCMConfigurationRequest message to the CM with which it requires to do master/slave configuration.

Table below shows ***CxMessage*** fields in ***MasterSlaveCMConfigurationRequest*** message.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***Header*** | ***CxHeader*** | ***requestID*** |
| ***Payload*** | ***CxPayload*** | ***MasterSlaveCMConfigurationRequest*** |

Table below shows the parameters in the ***masterSlaveCMConfigurationRequest*** payload.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***cmID*** | ***cxID*** | Subject CM ID |
| ***operationCode*** | ***OperationCode*** | Shall be set to indicate that subject configuration request is new/update/ deleted. |
| ***cmProfile*** | ***EntityProfile*** | Shall be set to indicate the entity profile |
| ***registeredCeInfo*** | ***CERegistration*** | As specified in 6.1.1.5 |

The CM shall send ***MasterSlaveCMConfigurationResponse*** to the subject CM when receiving ***MasterSlaveCMConfigurationRequest*** from the subject CM.

Table below shows ***CxMessage*** fields in ***MasterSlaveCMConfigurationResponse*** message.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***Header*** | ***CxHeader*** | ***requestID*** |
| ***Payload*** | ***CxPayload*** | ***MasterSlaveCMConfigurationResponse*** |

Table below shows ***CxMessage*** fields in ***MasterSlaveCMConfigurationResponse*** message.

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

* + - 1. Sending reconfiguration request from CM to another CM

When a CM 1 requires to reconfigure a WSO served by a CM 2, the CM 1 shall perform the sending reconfiguration request from CM to another CM procedure described in clause 5.2.10.2. The CM shall generate and send the CMReconfigurationRequest message to the CM2.

Table below shows ***CxMessage*** fields in ***CMReconfigurationRequest*** message.

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

Table below shows ***cMReconfigurationRequest*** fields in ***CMReconfigurationRequest*** message.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***wsoID*** | ***OCTET STRING*** | WSO ID. |
| ***cmID*** | ***cxID*** | Subject CE ID |
| ***OperatingFrequency*** | ***FrequencyRange*** | Operating frequency range allocated for the WSO. |
| ***txPowerLimit*** | ***REAL*** | Transmission power limit |
| ***newNetworkTechnology*** | ***NetworkTechnology*** | Optionally present. If present, this parameter shall be set to indicate its WSO network technology type(s) to be reconfigured |
| ***newNetowkTechnology*** | ***NetworkTechnology*** | Change request for its operating network technology if available |

The CM 2 shall send ***CMReconfigurationResponse*** to the CM 1 after it has received the ***CMReconfigurationRequest*** from the CM 1.

Table below shows ***CxMessage*** fields in ***CMReconfigurationResponse*** message.

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

Table below shows ***cMReconfigurationResponse*** fields in ***CMReconfigurationResponse*** message.

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

*It is proposed to modify clause 6.4.3 Profile 3 as shown in the text below.*

* + 1. Profile 3
       1. General description

A CE that operates as per Profile 3 shall support the following procedures:

* WSO subscription
* WSO subscription update
* WSO subscription change
* WSO registration
* WSO registration update
* WSO reconfiguration
* Providing coexistence report.

High level flow chart of the CE operation is provided in Figures 7-9.



1. ・High level flow chart of the CE operation.



1. ・Information service CE operation.



1. ・Management service CE operation.

After receiving a request to start operation, a CE shall perform the initial step sequences which are composed of WSO subscription and registration procedures for the coexistence service subscription of each subject WSO/RLSS for the CE which will be coordinated by its connected CM. After that, the CE shall switch to its operation mode in accordance with subscription service type which is either information service or management service.

In case of subscribing information service, CE shall provide coexistence report being served by its connected CM to its connected WSO/RLSS until stopping coexistence service subscription or changing it to the management service subscription.

In case of subscribing management service, CE shall provide reconfiguration request being served by its connected CM to the subject WSO/RLSS until stopping coexistence service subscription or changing it to the information service subscription.

In both cases, when the CE tries to stop its coexistence service subscription to its connected CM, CE shall indicate “no service subscription” to the subject CM via WSO subscription update procedure, and CE shall request deregistration as “remove” to its CM via WSO registration procedure.

In both cases, when the CE tries to change its coexistence service subscription to its connected CM, CE shall request the change to different type of service subscription via WSO subscription update procedure.

Subsequently, when CM requests a change of the type of coexistence service subscription to the subject CE, CE shall respond that request from the CM whether or not such request is acceptable via WSO subscription change procedure.

Further procedure specific constraints may apply and if that is the case those are specified in the clauses below.

* + - 1. WSO subscription

After the start-up, a CE shall perform the WSO subscription procedure described in clause 5.2.1.1. The CE shall send the CxMediaSubscriptionRequest primitive to the WSO/RLSS it serves and shall wait for the CxMediaSubscriptionResponse primitive from this WSO/RLSS. After the CE has received the CxMediaSubscriptionResponse primitive from the WSO/RLSS, the CE shall generate and send the SubscriptionRequest message to the CM to which it prefers to subscribe.

Table below shows ***CxMessage*** fields in ***SubscriptionRequest*** message.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***Header*** | ***CxHeader*** | ***requestID*** |
| ***Payload*** | ***CxPayload*** | ***subscriptionRequest*** |

Table below shows ***subscriptionRequest*** payload element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***clientID*** | ***IA5String*** | WSO subscription identifier |
| ***clientPassword*** | ***IA5String*** | WSO subscription password |
| ***coexistenceService*** | ***CoexistenceService*** | Set to “information” if the intent is to subscribe to the information service.  Set to “management” if the intent is to subscribe to the management service. |

The CE shall send ***CxMediaSubscriptionConfirm*** primitive to the WSO/RLSS after it has received the ***SubscriptionResponse*** message from the CM.

Table below shows ***CxMediaSubscriptionConfirm*** primitive.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***cxMediaStatus*** | ***CxMediaStatus*** | Status |

* + - 1. WSO subscription update

After a CE has received a CxMediaSubscriptionIndication primitive from the WSO/RLSS it serves, the CE shall perform the WSO subscription update procedure described in clause 5.2.1.2. The CE shall generate and send the SubscriptionRequest message to the CM to which it is subscribed.

Table below shows ***CxMessage*** fields in ***SubscriptionRequest*** message.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***Header*** | ***CxHeader*** | ***requestID*** |
| ***Payload*** | ***CxPayload*** | ***subscriptionRequest*** |

Table below shows ***subscriptionRequest*** payload element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***clientID*** | ***IA5String*** | WSO subscription identifier |
| ***clientPassword*** | ***IA5String*** | WSO subscription password |
| ***coexistenceService*** | ***CoexistenceService*** | Set to “information” if the intent is to subscribe to the information service.  Set to “management” if the intent is to subscribe to the management service.  Set to “noService” if the intent is to stop the service subscription |

The CE shall send ***CxMediaSubscriptionConfirm*** primitive to the WSO/RLSS after it has received the ***SubscriptionResponse*** message from the CM.

Table below shows ***CxMediaSubscriptionConfirm*** primitive.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***cxMediaStatus*** | ***cxMediaStatus*** | ***Status*** |

* + - 1. Subscription change

After a CE has received a SubscriptionChangeRequest message from the CM to which it is subscribed, the CE shall perform the subscription change procedure described in clause 5.2.1.5. The CE shall generate and send the CxMediaChangeSybscriptionRequest message to the WSO/RLSS that is serves.

Table below shows ***CxMediaChangeSubscriptionRequest*** primitives.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***coexistenceService*** | ***CoexistenceService*** | Set to “information” if the intent is to update the service subscription to the information service.  Set to “management” if the intent is to update the service subscription to the management service. |

Also, the CE shall send the SubscriptionChangeResponse message to the CM after it has received the ***CxMediaChangeSubscriptionResponse*** primitive from the WSO/RLSS.

Table below shows ***CxMessage*** fields in ***SubscriptionChangeResponse*** message.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***Header*** | ***CxHeader*** | ***requestID*** |
| ***Payload*** | ***CxPayload*** | ***sucscriptionChangeResponse*** |

Table below shows ***SubscriptionChangeResponse*** payload element.

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

* + - 1. WSO registration

After a CE has performed the WSO subscription procedure, the CE shall perform the WSO registration procedure described in clause 5.2.2.1. The CE shall generate and send the CERegistrationRequest message to the CM to which it is subscribed.

Table below shows ***CxMessage*** fields in ***CERegistrationRequest*** message when requesting registration.

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

Table below shows ***CERegistrationRequest*** payload element for one WSO when requesting registration.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***operationCode*** | ***OperationCode*** | Shall be set to indicate new registration as “new”. |
| ***wsoID*** | ***INTEGER*** | WSO ID |
| ***networkID*** | ***OCTET STRING*** | Identifier of the network to which the WSO belongs. |
| ***networkTechnology*** | ***NetworkTechnology*** | Shall be set to a value that represents the network technology of the WSO. |
| ***networkType*** | ***NetworkType*** | Shall be set to a value that represents the network type of the WSO. |
| ***geolocation*** | ***Geolocation*** | Geolocation information of the WSO |
| ***deviceRegulatoryID*** | ***OCTET STRING*** | Shall be set to a value that equals the regulatory identifier of the WSO. |
| ***installationParameters*** | ***InstallationParameters*** | As specified in table below |
| ***listOfAvailableFrequencies*** | ***ListOfAvailableFrequencies*** | As specified in table below. |
| ***txScheduleSupported*** | ***BOOLEAN*** | Shall be set to a value that represents the WSO’s capability to support transmit scheduling. |
| ***listOfOperatingFrequencies*** | ***ListOfOperatingFrequencies*** | As specified in table below. |
| ***listOfSuppFrequencies*** | ***ListOfSupportedFrequencies*** | As specified in table below. |
| ***addNetworkTechnology*** | ***SEQUENCE of NetworkTechnology*** | Optionally present. If present, this parameter shall be set to indicate the sequence of its operable network technology type(s) |
| ***requiredResource*** | ***RequiredResource*** | As specified in table below. |
| ***mobilityInformation*** | ***MobilityInformation*** | As specified in table below. |

Table below shows ***InstallationParameters*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***opMasterHeight*** | ***REAL*** | Shall be set to indicate the height of master station, if available |
| ***opSlaveHeight*** | ***REAL*** | Shall be set to indicate the height of slave station, if available |
| ***opTxPower*** | ***REAL*** | Shall be set to indicate the maximum transmission power level if applicable. |
| ***aCLR*** | ***REAL*** | Adjacent Channel Leakage Ratio |
| ***aCS*** | ***REAL*** | Adjacent Channel Selectivity |
| ***guaranteedQoSOf***  ***BackhaulConnection*** | ***GuaranteedQoSOf***  ***BackhaulConnection*** | As specified in table below |

Table below shows ***GuaranteedQoSOfBackhaulConnection*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***backhaulTypeID*** | ***BackhalTypeID*** | Shall be set to indicate backhaul type of the WSO. |
| ***guaranteedMinimumBitRates*** | ***REAL*** | Shall be set to indicate the guaranteed maximum latency of its backhaul connection |
| ***guaranteedMaximumLatency*** | ***REAL*** | Optionally present. If present, this parameter shall be set to indicate the guaranteed maximum latency of its backhaul connection |

Table below shows ***ListOfAvailableFrequencies*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***frequencyRange*** | ***FrequencyRange*** | Shall be set to indicate the available frequency range. |
| ***txPowerLimit*** | ***REAL*** | Shall be set to indicate the power limit in the available frequency range. |
| ***availableStartTime*** | ***GeneralizedTime*** | Shall be set to indicate start time of the available frequency range if applicable. |
| ***availableDuration*** | ***REAL*** | Shall be set to indicate duration of the available frequency range if applicable. |
| ***aggInterfControlParam*** | ***AggregatedInterference***  ***ControlParameters*** | As specified in table below |

Table below shows ***AggregatedInterferenceControlParameters*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***referencePointID*** | ***INTEGER*** | Reference point ID to be protected in controlling aggregated interference from the other WSO(s) |
| ***geolocation*** | ***Geolocation*** | Geolocation information of the reference point ID |
| ***aCS*** | ***REAL*** | Adjacent Channel Selectivity of the reception to be protected at the reference point if available |
| ***aCLR*** | ***REAL*** | Referenced adjacent channel leakage ratio if available |
| ***antennaHeight*** | ***REAL*** | Potential antenna height of the reception to be protected if available |
| ***antennaGain*** | ***REAL*** | Potential antenna gain of the reception to be protected at the reference point if available |
| ***protection ratio*** | ***REAL*** | Protection ratio of the reception to be protected at the reference point for the frequency if available |

Table below shows ***listOfSuppFrequencies*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***supportedFrequency*** | ***FrequenyRange*** | Shall be set to indicate the frequency range in which the WSO is capable of operating. |
| ***extrachannelizationIsSupported*** | ***BOOLEAN*** | Shall be set to indicate if subchannelization or channel aggregation) supported or not |
| ***extrachannelizationDescription*** | ***ExtrachannelizationDescription*** | If present, this parameter shall be set to indicate the extra channel configuration description |

Table below shows ***listOfOperatingFrequencies*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***frequencyRange*** | ***FrequenyRange*** | Shall be set to indicate the frequency range in which the WSO currently operates. |
| ***occupancy*** | ***REAL*** | Optionally present. If present, this parameter shall be set to indicate occupancy of the WSO frequency range. |

Table below shows ***requiredResource*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***requiredBandwidth*** | ***REAL*** | Shall be set to indicate bandwidth requested for the WSO. |

The CE shall send ***CxMediaRegistrationConfirm*** to the subject WSO/RLSS when receiving ***RegistrationResponse*** from the subject CM.

Table below shows ***MobilityInformation*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***maxSpeed*** | ***REAL*** | If present, this parameter shall be set to indicate the maximum speed value of the WSO (in km/h) |
| ***speedInformation*** | ***SpeedInformation*** | If present, this parameter shall be set to indicate detailed information on the WSO speed and direction. |
| ***routeInformation*** | ***RouteInformation*** | If present, this parameter shall be set to indicate the WSO planned route and time. |

Table below shows ***CxMediaRegistrationConfirm*** primitive.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***cxMediaStatus*** | ***cxMediaStatus*** | ***Status*** |

* + - 1. WSO registration update

After a CE has received a CxMediaRegistrationIndication primitive from the WSO/RLSS it serves, the CE shall perform the WSO registration update procedure described in clause 5.2.2.2. The CE shall generate and send the CERegistrationRequest message to the CM to which it is subscribed.

Table below shows ***CxMessage*** fields in ***CERegistrationRequest*** message when requesting registration update.

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

Table below shows ***CEregistrationRequest*** payload element for one WSO when requesting registration update.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***operationCode*** | ***OperationCode*** | Shall be set to indicate registration update as “modify” or “remove”. |
| ***wsoID*** | ***INTEGER*** | WSO ID |
| ***geolocation*** | ***Geolocation*** | Geolocation information if any update |
| ***InstallationParameters*** | ***InstallationParameters*** | As specified in 7.1.1.4 if any update |
| ***listOfAvailableFrequencies*** | ***AvailableFrequencies*** | As specified in if any update |
| ***listOfOperatingFrequencies*** | ***ListOfOperatingFrequencies*** | As specified in 7.1.1.4 if any update |
| ***addNetworkTechnology*** | ***SEQUENCE of NetworkTechnology*** | Optionally present. If present, this parameter shall be set to indicate the sequence of its WSO operable network technology type(s) |
| ***requiredResource*** | ***RequiredResource*** | As specified in 7.1.1.4 if any update |
| ***mobilityInformation*** | ***MobilityInformation*** | As specified in 7.1.1.4 if any update. |

Also the CE shall send ***CxMediaRegistrationConfirm*** primitive to the WSO/RLSS after it has received the ***RegistrationResponse*** message from the CM.

Table below shows ***CxMediaRegistrationConfirm*** primitive.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***cxMediaStatus*** | ***cxMediaStatus*** | ***Status*** |

* + - 1. WSO reconfiguration

After a CE has received a ReconfigurationRequest message from the CM to which it is subscribed, the CE shall perform the WSO reconfiguration procedure described in clause 5.2.10.1. The CE shall generate and send the CxMediaReconfigurationRequest primitive to the WSO/RLSS it serves.

Table below shows ***CxMediaReconfigurationRequest*** primitive.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***wsoID*** | ***OCTET STRING*** | WSO ID. |
| ***OperatingFrequency*** | ***FrequencyRange*** | Operating frequency range allocated for the WSO. |
| ***txPowerLimit*** | ***REAL*** | Transmission power limit |
| ***addNetworkTechnology*** | ***NetworkTechnology*** | Optionally present. If present, this parameter shall be set to indicate its WSO network technology type(s) to be reconfigured |

Also, the CE shall send the ***ReconfigurationResponse*** message to the CM after it has received the ***CxMediaReconfigurationResponse*** primitive from the WSO/RLSS.

Table below shows ***CxMessage*** fields in ***ReconfigurationResponse*** message.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***header*** | ***CxHeader*** | ***requestID*** |
| ***Payload*** | ***cxPayload*** | ***status*** |

* + - 1. Providing coexistence report

After a CE has received a CoexistenceReportResonse message from the CM to which it is subscribed, the CE shall perform the providing coexistence report procedure described in clause 5.2.3.6. The CE shall generate and send the CxMediaCoexistenceReportResponse primitive to the WSO/RLSS it serves.

Table below shows ***CxMedia*** fields in ***CxMediaCoexistenceReportResponse*** primitive.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***networkID*** | ***OCTET STRING*** | Network ID |
| ***listOfRecommended***  ***OperatingFrequency*** | ***ListOfRecommended***  ***OperatingFrequency*** | As specified in table below |

Table below shows ***listOfRecommendedOperationFrequency*** parameter element.

|  |  |  |
| --- | --- | --- |
| *Parameter* | *Data type* | *Value* |
| ***frequencyRange*** | ***FrequencyRange*** | Shall be set to indicate the recommended operation frequency range. |
| ***txPowerLevel*** | ***REAL*** | Shall be set to indicate the power limit in the frequency range. |
| ***availableStartTime*** | ***GeneralizedTime*** | Shall be set to indicate start time of the recommended operation frequency range if applicable. |
| ***availableDuration*** | ***REAL*** | Shall be set to indicate duration of the operation recommended frequency range if applicable. |