IEEE P802.19
Wireless Coexistence

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| A proposal for obtaining and providing coexistence information procedures between CMs: addition and section shift |
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Abstract

This document is a submission to IEEE 802.19 TG1 about restructuring section 6.3.4 according to CID 83. The purpose is to have all the coexistence set information, coexistence set element information and coexistence report related procedures defined in one clause. Changes are highlighted with yellow.

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**Introduction**

The proposal is to refine the structure of clause 6.34 and have it to include all the coexistence set related procedures. The procedures are currently to some extent scattered around the draft and it would be better to have them described in one clause. Additionally, the TG agreed earlier that both pull and push methods are needed in the draft but the current draft does provide only push method for a CM to provide coexistence set element information to another CM. There is no method for a CM to request such information from another CM.

Summary of the changes to the procedure clause is shown in the table below. Additionally, at the end of the contribution there are two new messages which are proposed to be defined in clause 6.4 for the newly proposed procedure.

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| **Proposed clause order** | **Procedure summary** | **DF3.02 clause number** |
| 6.3.4.1 Obtaining coexistence set information | A CM obtains coexistence set information from a CDIS | 6.3.4.1 |
| 6.3.4.2 Providing coexistence set information | A CDIS provides coexistence set information to a CM | 6.3.4.3 |
| 6.3.4.3 Obtaining coexistence set element information | A CM obtains coexistence set element information from another CM | Not in DF3.02 but a new procedure |
| 6.3.4.4 Providing coexistence set element information | A CM provides coexistence set element information to another CM | 6.3.7.3 |
| 6.3.4.5 Obtaining coexistence report | A CE obtains coexistence report from a CM | 6.3.4.2 |
| 6.3.4.6 Providing coexistence report | A CM provides coexistence report to a CE | 6.3.4.4 |

### 6.3.4 Obtaining coexistence set information procedures

* + - 1. Obtaining coexistence set information

A CM shall perform this procedure in order to obtain coexistence set information from the CDIS. Based on the CM's subscription to the CDIS, the CM shall get the information for inter-CM coexistence set elements only or for all coexistence set elements including both intra-CM and inter-CM ones. An illustrative example of this procedure is shown in Figure 19. CoexistenceSetInformationRequest and CoexistenceSetInformationResponse messages are defined in clause 6.4.



1. — Obtaining coexistence set information

In order to start the procedure a CM shall generate a CoexistenceSetInformationRequest message and send this message to the CDIS. CM operations related to generating and sending a CoexistenceSetInformationRequest message are specified in clause 8.

After a CDIS receives a CoexistenceSetInformationRequest message from the CM, the CDIS shall obtain coexistence set information, and shall genereate a CoexistenceSetInformation message send this CoexistenceSetInformationResponse message to the CM. CDIS operations related to obtaining coexistence set information and generating and sending a CoexistenceSetInformationResponse message are specified in clause 9.

After the CM has received a CoexistenceSetInformationResponse message from the CDIS, the CM shall process the CoexistenceSetInformationResponse message. CM operations related to processing a CoexistenceSetInformationResponse message are specified in clause 8.

* + - 1. Providing coexistence set information

A CDIS shall perform the providing coexistence set information procedure when coexistence set information has been changed for one or several WSOs served by one or several CMs. The CDIS shall provide coexistence set information based on the type of the discovery service to which a particular CM is subscribed. An illustrative example of this procedure is shown in Figure 21. The CoexistenceSetInformationAnnouncement message is defined in clause 6.4.



1. — Providing coexistence set information

After coexistence set information has been changed for one or several WSOs served by one or several CMs, the CDIS shall generate one or several CoexistenceSetInformationAnnoucement messages. Number of the generated CoexistenceSetInformationAnnoucement messages is equal to the number of the CMs serving WSOs which coexistence set information has been changed. After the CoexistenceSetInformationAnnoucement messages has been generated, the CDIS shall send these CoexistenceSetInformationAnnoucement messages to the CMs serving WSOs which coexistence set information has been changed. CDIS operations related to generating and sending a CoexistenceSetInformationAnnoucement message are specified in clause 9.

After a CM has received the CoexistenceSetInformationAnnoucement message from the CDIS, the CM shall process the CoexistenceSetInformationAnnoucement message. CM operations related to processing a CoexistenceSetInformationAnnoucement message are specified in clause 8.

* + - 1. Obtaining coexistence set element information

A CM shall perform this procedure to obtain coexistence set information from another CM. An illustrative example of this procedure is shown in 21. CoexistenceSetElementInformationRequest and CoexistenceSetElementInformationResponse messages are defined in clause 6.4.



1. — Obtaining coexistence set element information

In order to start the procedure a CM shall generate a CoexistenceSetElementInformationRequest message and send this message to another CM. CM operations related to generating and sending a CoexistenceSetElementInformationRequest message are specified in clause 8.

After the other CM has received a CoexistenceSetElementInformationRequest message from the CM, the other CM shall obtain coexistence set element information, and shall generate a CoexistenceSetElementInformation message send this CoexistenceSetElementInformationResponse message to the CM. CM operations related to obtaining coexistence set element information and generating and sending a CoexistenceSetElementInformationResponse message are specified in clause 8.

After the CM has received a CoexistenceSetElementInformationResponse message from another CM, the CM shall process the CoexistenceSetElementInformationResponse message. CM operations related to processing a CoexistenceSetElementInformationResponse message are specified in clause 8.

* + - 1. Providing coexistence set element information

A CM shall perform the providing coexistence set information procedure when coexistence set information including radio environment has been changed for one or several WSOs which the CM serves and which have in their coexistence set WSOs served by one or several other CMs. An illustrative example of this procedure is shown in 22. The CoexistenceSetElementInformationAnnouncement and CoexistenceSetElementInformationConfirm messages are defined in clause 6.4.



Figure 22 — Providing coexistence set information procedure

After coexistence set information has changed for one or several WSOs which this CM serves and which have in their coexistence set WSOs served by one or several other CMs, the CM shall generate one or several CoexistenceSetElementInformationAnnouncement messages. Number of the generated CoexistenceSetElementInformationAnnouncement messages is equal to the number of the CMs serving WSOs that are in the coexistence set of the WSOs which coexistence set information has changed. After the CoexistenceSetElementInformationAnnouncement messages has been generated, the CM shall send these CoexistenceSetElementInformationAnnouncement messages to the CMs serving WSOs that are in the coexistence set of the WSOs which coexistence set information has changed. CM operations related to generating and sending a CoexistenceSetElementInformationAnnouncement message are specified in clause 8.

After the other CM has received the CoexistenceSetElementInformationAnnouncement message, the other CM shall process the CoexistenceSetElementInformationAnnouncement message, shall generate a CoexistenceSetElementInformationConfirm message, and shall send this CoexistenceSetElementInformationConfirm message to the CM from which it received the CoexistenceSetElementInformationAnnouncement message. CM operations related to processing a CoexistenceSetElementInformationAnnouncement message, generating and sending a CoexistenceSetElementInformationConfirm message are specified in clause 8.

* + - 1. Obtaining coexistence report

A CE shall perform this procedure when the WSO interfaced to the CE needs to obtain coexistence report from the CM. An illustrative example of this procedure is shown in Figure 23. CoexistenceReportRequest and CoexistenceReportResponse messages are defined in clause 6.4.



1. — Obtaining coexistence report

In order for a CE to obtain coexistence report from the CM which serves the CE, the CE shall generate a CoexistenceReportRequest message and send this CoexistenceReportRequest message to the CM. CE operations related to generating and sending a CoexistenceReportRequest message are specified in clause 7.

After a CM receives a CoexistenceReportRequest message from the CE, the CM shall obtain coexistence report information, and shall generate a CoexistenceReportResponse message and send this CoexistenceReportResponse message to the CE. CM operations related to obtaining coexistence report information and generating and sending a CoexistenceReportResponse message are specified in clause 8.

After the CE receives a CoexistenceReportResponse message from the CM, the CE shall process the message and provide the information to the WSO. CE operations related to processing CoexistenceReportResponse message and providing related information to the WSO are specified in clause 7.

* + - 1. Providing coexistence report

A CM shall perform the providing coexistence report procedure when coexistence report information has been changed for one or several WSOs subscribed to information service and served by this CM. An illustrative example of this procedure is shown in Figure 24. The CoexistenceReportAnnouncement message is defined in clause 6.4.



1. — Providing coexistence report

After coexistence report information has been changed for one or several WSOs subscribed by information service and served by a CM, the CM shall generate one or several CoexistenceReportAnnoucement messages. Number of the generated CoexistenceReportAnnouncement messages is equal to the number of the WSOs which coexistence report information has been changed. After the CoexistenceReportAnnoucement messages has been generated, the CM shall send these CoexistenceReportAnnouncement messages to the WSOs which coexistence report information has been changed. CM operations related to generating and sending a CoexistenceReportAnnouncement message are specified in clause 8.

After a CE has received the CoexistenceReportAnnouncement message from the CM, the CE shall process the CoexistenceReportAnnoucement message. CE operations related to processing a CoexistenceReportAnnouncement message are specified in clause 7.

### 6.4 Messages

*Editorial instruction: Add the following new messages to an appropriate place in the clause 6.4.*

CoexistenceSetElementInformationRequest ::= SEQUENCE {

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

 ceID Cx\_ID

}

CoexistenceSetElementInformationResponse ::= SEQUENCE {

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

 ceID Cx\_ID

 -- WSO identifier

 sourceWSOId OCTET STRING,

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

 sourceNetwTech NetworkTechnology,

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

 networkType NetworkType,

 -- List of supported resources: channel numbers or frequencies

 listOfSupportedResources CHOICE {

 -- List of supported channel numbers

 listOfSuppChNumber ListOfSupportedChNumber,

 -- List of supported frequencies

 listOfSuppFreq ListOfSupportedFrequencies

 },

 -- List of operating resources: channel numbers or frequencies

 listOfOperatingResources CHOICE {

 -- List of operating channel numbers

 listOfOperChNum ListOfOperatingChNumber,

 -- List of operating frequencies including occupancy information

 listOfOperFreq ListOfOperatingFrequencies

 },

 -- WSO capabilities that have an effect on coexistence decisions

 sourceNetworkCapabilities NetworkCapabilities,

 -- Coexistence service subscription

 sourceSubscribedService SubscribedService,

 -- Indicates whether this WSO shall be managed by source CM or

 -- destination CM

 managingCM BOOLEAN,

 -- Channel classification information

 chClassInfo ChClassInfo OPTIONAL,

 -- Indicates whether this WSO finished scheduled time when channel

 -- is shared

 scheduledTimeEnd BOOLEAN OPTIONAL,

 -- Indicates whether the coexistence set element releases resources

 -- temporarily or reclaims them

 temporaryResource ENUMERATED {release, reclaim} OPTIONAL

}