

IEEE P802.19

Wireless Coexistence Working Group

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Re:	
Abstract	Proposal for Coexistence Procedures and Protocols clause
Purpose	
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1 Overview

1.1 Scope

The standard specifies radio technology independent methods for coexistence among dissimilar or independently operated TV Band Device (TVBD) networks and dissimilar TV Band Devices

1.2 Purpose

The purpose of the standard is to enable the family of IEEE 802 Wireless Standards to most effectively use TV White Space by providing standard coexistence methods among dissimilar or independently operated TVBD networks and dissimilar TVBDs. This standard addresses coexistence for IEEE 802 networks and devices and will also be useful for non IEEE 802 networks and TVBDs.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

TBD

3 Definitions, abbreviations, and acronyms

3.1 Definitions

3.2 Abbreviations and acronyms

4 System description

4.1 Architecture

4.2 Entities

4.3 Interfaces

4.4 Coexistence scenarios

4.5 Coexistence services

5 Reference model

5.1 General description

5.2 Service access points

5.3 Data type definition

6 Procedures and protocols

6.1 General description

TBD

6.2 Procedures

Procedures are categorized as the followings;

- Interface setup
- Registration/Deregistration
- Coexistence information gathering
- Neighbor discovery

- Channel classification
- Coexistence decision making
- Reconfiguration
- Measurement
- Event
- Registration
- Neighbor discovery
- Get available channel list
- Channel list update
- Measurement
- Information collection
- Event
- Reconfiguration
- Session activity check
- Connection Setup
- Coexistence Resource Allocation
- Coexistence Command
- Coexistence Measurement
- Neighbor Discovery
- Master Selection

6.2.1 Interface setup

6.2.1.1 Interface between CM and CE

The CM state machine for interface between CM and CE consists of the following 4 states as depicted in figure 1:

- Inactive
- Active
- Engaged
- Request sent

State transition shall be occurred as follows:

- The active state goes to the engaged state if CM receives connection request from CE and sends connection response to CE.
- The engaged state goes to the request sent state if CM sends request for context information (CI) or measurement (ME) or reconfiguration (RC) to CE. After CM receives corresponding response from CE it goes back to the engaged state.
- CM receives event indication from CE and sends event acknowledgement to CE at the engaged state.
- CM stays the engaged state if it periodically receives being-engagement request from CE.
- The engaged state goes to the active state if CM receives disconnection request from CE, or fails to receive being-engagement request from CE periodically.

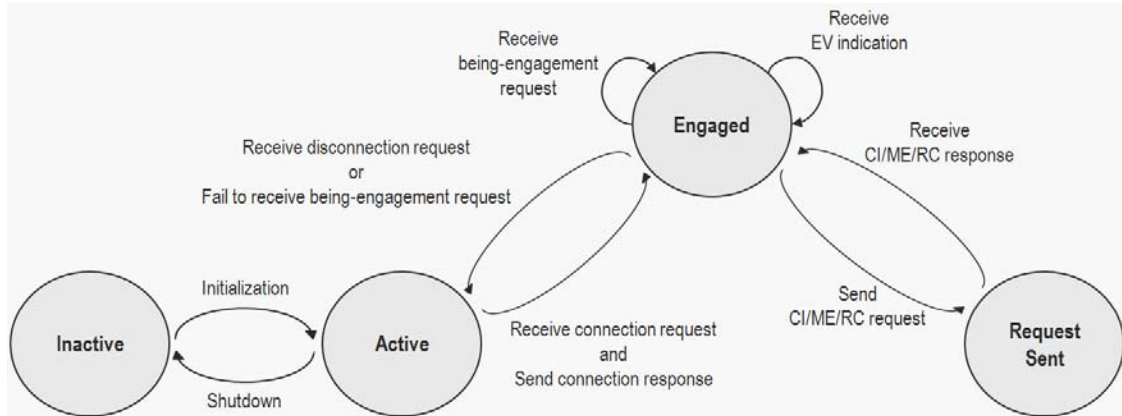


Figure 1. CM state diagram for interface between CM and CE

The CE state machine for interface between CM and CE consists of the following 5 states as depicted in figure 2:

- Inactive
- Active
- Waiting engagement
- Engaged
- Request received

State transition shall be occurred as follows:

- The active state goes to the waiting engagement state if CE sends connection request to CM.
- The waiting engagement state goes to the engaged state if CE receives connection response from CM within time limit. If not, it goes back to the active state.
- The engaged state goes to the request received state if CE receives request for context information or measurement or reconfiguration from CM. After CE sends corresponding response to CM it goes back to the engaged state.
- CE sends event indication to CM and receives event acknowledgement from CM at the engaged state.
- CE stays the engaged state if it periodically sends being-engagement request to CM.
- The engaged state goes to the active state if CE sends disconnection request to CM.

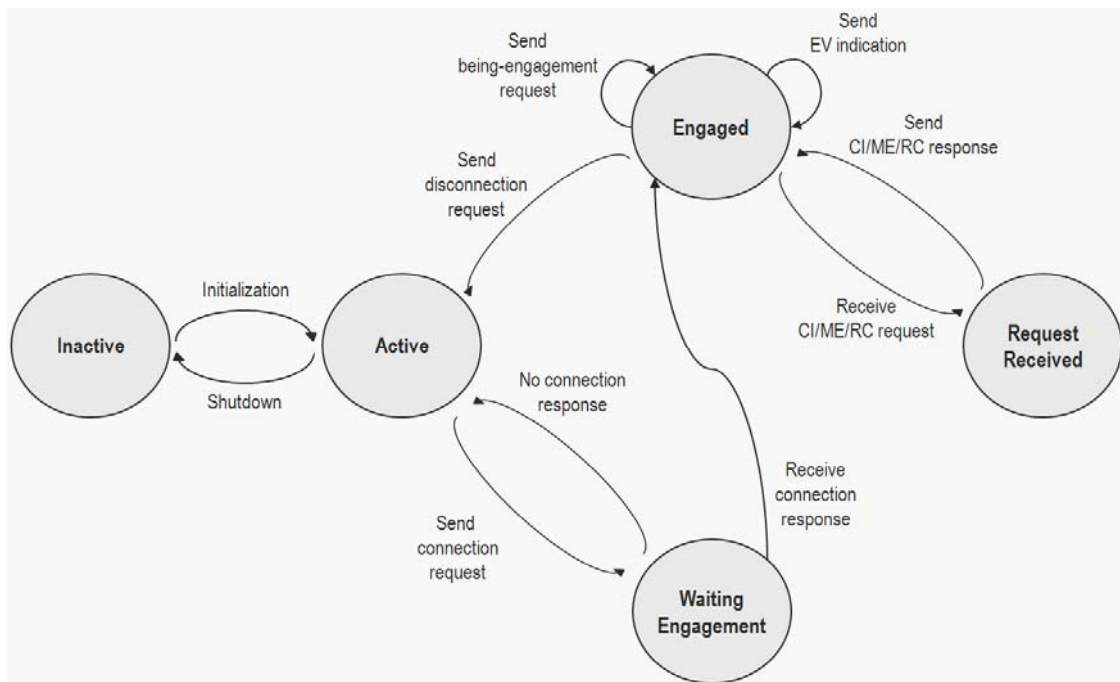


Figure 2. CE state diagram for interface between CM and CE

6.2.1.2 Interface between CM and CDIS

The CM state machine for interface between CM and CDIS consists of the following 6 states as depicted in figure 3:

- Inactive
- Active
- Waiting engagement
- Engaged
- Request sent
- Request received

State transition shall be occurred as follows:

- The active state goes to the waiting engagement state if CM sends connection request to CDIS.
- The waiting engagement state goes to the engaged state if CM receives connection response from CM within time limit. If not, it goes back to the active state.
- The engaged state goes to the request received state if CM receives request for context information from CDIS. After CM sends corresponding response to CDIS it goes back to the engaged state.
- CM receives event indication from CDIS and sends event acknowledgement to CDIS at the engaged state.
- CM sends event indication to CDIS and receives event acknowledgement from CDIS at the engaged state.
- The engaged state goes to the request sent state if CM sends request for context information to CDIS. After CM receives corresponding response from CDIS it goes back to the engaged state.
- CM stays the engaged state if it periodically sends being-engagement request to CDIS.

- The engaged state goes to the active state if CM sends disconnection request to CDIS.

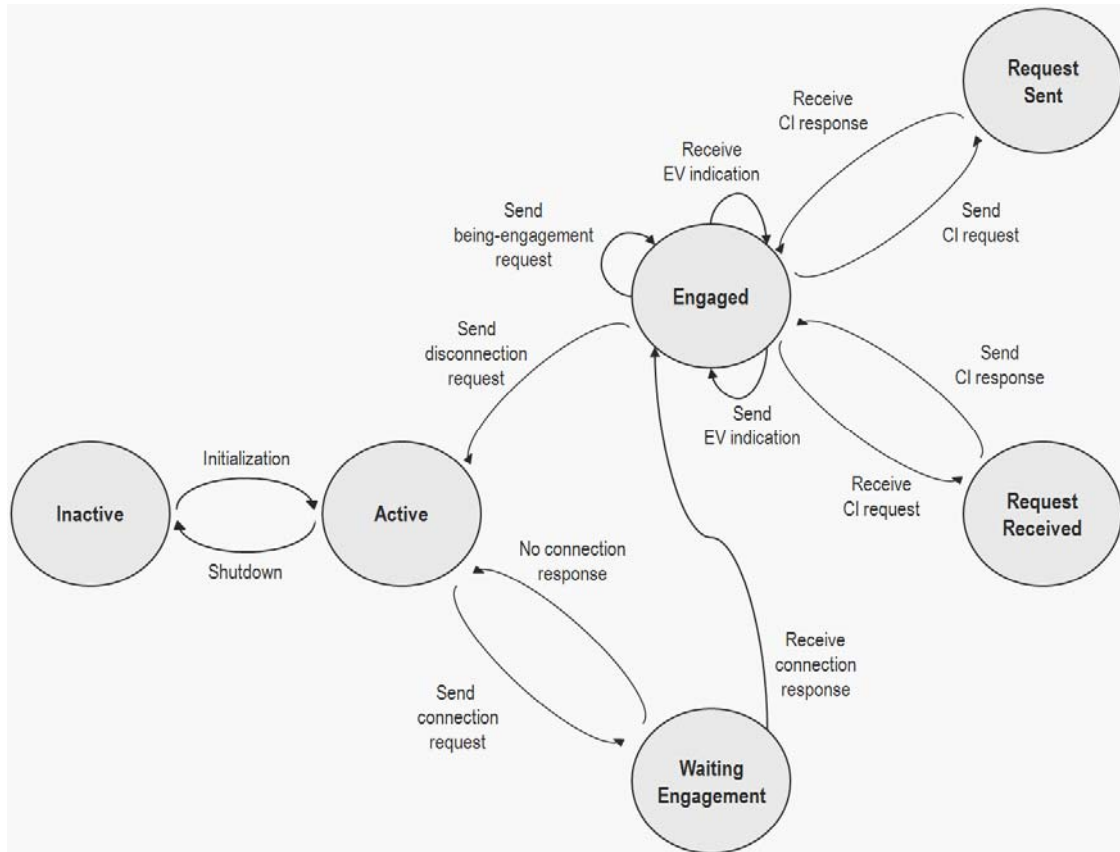


Figure 3. CM state diagram for interface between CM and CDIS

The CDIS state machine for interface between CM and CDIS consists of the following 5 states as depicted in figure 4:

- Inactive
- Active
- Engaged
- Request sent
- Request received

State transition shall be occurred as follows:

- The active state goes to the engaged state if CDIS receives connection request from CM and sends connection response to CM.
- The engaged state goes to the request sent state if CDIS sends request for context information or event to CM. After CDIS receives corresponding response from CM it goes back to the engaged state.
- CDIS receives event indication from CM and sends event acknowledgement to CM at the engaged state.

- CDIS sends event indication to CM and receives event acknowledgement from CM at the engaged state.
- The engaged state goes to the request received state if CDIS receives request for context information from CM. After CDIS sends corresponding response to CM it goes back to the engaged state.
- CDIS stays the engaged state if it periodically receives being-engagement request from CM.
- The engaged state goes to the active state if CDIS receives disconnection request from CM, or fails to receive being-engagement request from CM periodically.

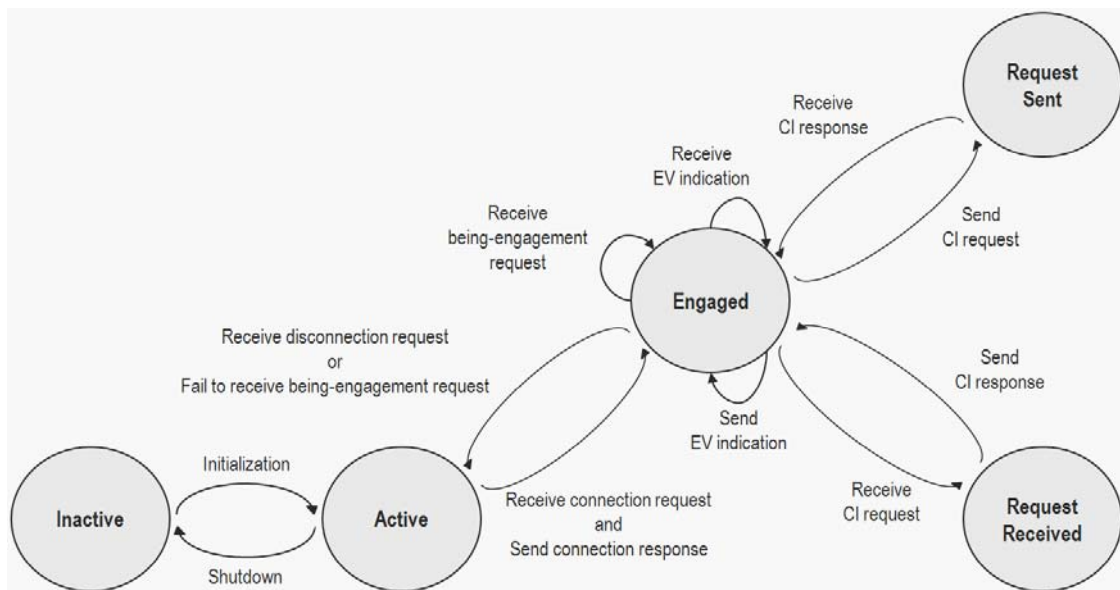


Figure 4. CDIS state diagram for interface between CM and CDIS

6.2.1.3 Interface between CM and neighbor CM

6.2.1.3.1 Centralized topology

In centralized topology, there is one master CM which has a number of slave CMs. The master CM performs coexistence decision making and slave CMs follows it.

The master CM state machine for interface between master CM and slave CM consists of the following 5 states as depicted in figure 5:

- Inactive
- Active
- Engaged
- Request sent
- Request received

State transition shall be occurred as follows:

- The active state goes to the engaged state if master CM receives connection request from slave CM and sends connection response to slave CM.
- The engaged state goes to the request sent state if master CM sends request for context information or measurement or reconfiguration to slave CM. After master CM receives corresponding response from slave CM it goes back to the engaged state.
- Master CM receives event indication from slave CM and sends event acknowledgement to slave CM at the engaged state.
- The engaged state goes to the request received state if master CM receives request for context information from slave CM. After master CM sends corresponding response to slave CM it goes back to the engaged state.
- Master CM stays the engaged state if it periodically receives being-engagement request from slave CM.
- The engaged state goes to the active state if master CM receives disconnection request from slave CM, or fails to receive being-engagement request from slave CM periodically.

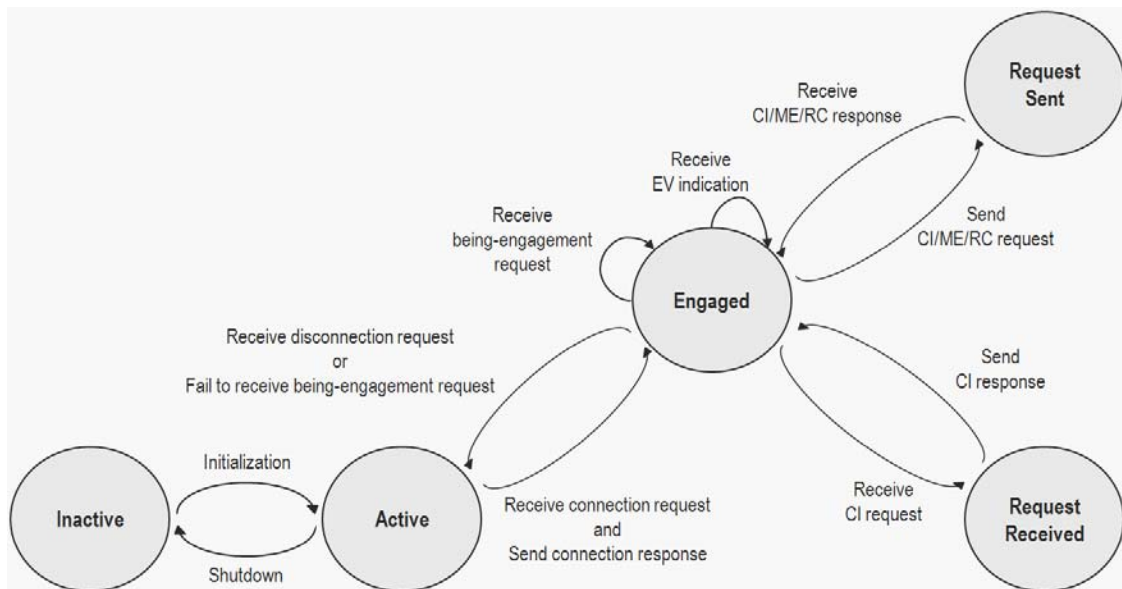


Figure 5. Master CM state diagram for interface between master CM and slave CM

The slave CM state machine for interface between master CM and slave CM consists of the following 6 states as depicted in figure 6:

- Inactive
- Active
- Waiting engagement
- Engaged
- Request sent
- Request received

State transition shall be occurred as follows:

- The active state goes to the waiting engagement state if slave CM sends connection request to master CM.
- The waiting engagement state goes to the engaged state if slave CM receives connection response from master CM within time limit. If not, it goes back to the active state.
- The engaged state goes to the request received state if slave CM receives request for context information or measurement or reconfiguration from master CM. After slave CM sends corresponding response to master CM it goes back to the engaged state.
- Slave CM sends event indication to master CM and receives event acknowledgement from master CM at the engaged state.
- The engaged state goes to the request sent state if slave CM sends request for context information to master CM. After slave CM receives corresponding response from master CM it goes back to the engaged state.
- Slave CM stays the engaged state if it periodically sends being-engagement request to master CM.
- The engaged state goes to the active state if slave CM sends disconnection request to master CM.

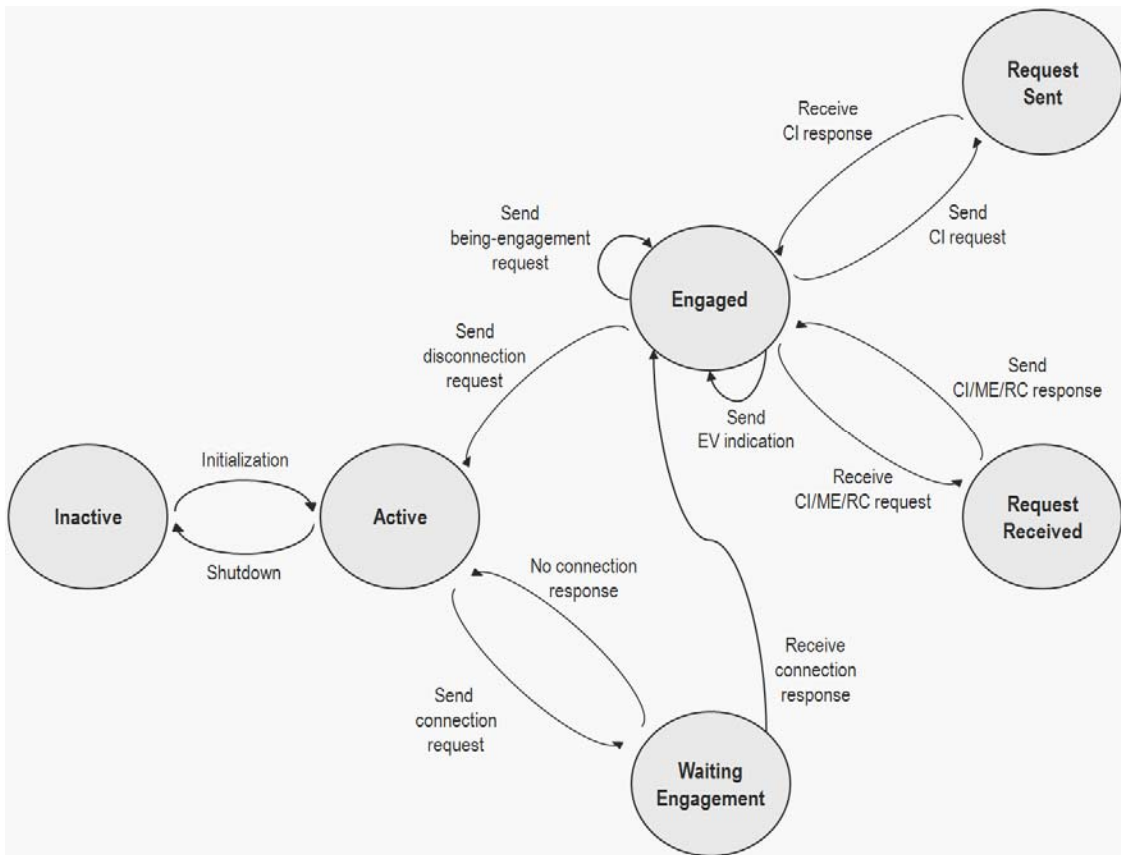


Figure 6. Slave CM state diagram for interface between master CM and slave CM

6.2.1.3.2 Distributed topology

In distributed topology, a CM pair, one CM and its neighbor CM, is connected each other. Any two CMs could be connected each other. Each CM performs coexistence decision making by negotiation with neighbor CMs.

The CM state machine for interface between CM and neighbor CM consists of the following 6 states as depicted in figure 7:

- Inactive
- Active
- Waiting engagement
- Engaged
- Request sent
- Request received

State transition shall be occurred as follows:

- If CM sends connection request to neighbor CM,
 - The active state goes to the waiting engagement state if CM sends connection request to neighbor CM.
 - The waiting engagement state goes to the engaged state if CM receives connection response from neighbor CM within time limit. If not, it goes back to the active state.
- If CM receives connection request from neighbor CM,
 - The active state goes to the engaged state if CM receives connection request from neighbor CM and sends connection response to neighbor CM.
- The engaged state goes to the request sent state if CM sends request for context information or measurement or negotiation to neighbor CM. After CM receives corresponding response from neighbor CM it goes back to the engaged state.
- CM receives event indication from neighbor CM and sends event acknowledgement to neighbor CM at the engaged state.
- CM sends event indication to neighbor CM and receives event acknowledgement from neighbor CM at the engaged state.
- The engaged state goes to the request received state if CM receives request for context information or measurement or negotiation from neighbor CM. After CM sends corresponding response to neighbor CM it goes back to the engaged state.
- If CM sends connection request to neighbor CM,
 - CM stays the engaged state if it periodically sends being-engagement request to neighbor CM.
 - The engaged state goes to the active state if CM sends disconnection request to neighbor CM.
- If CM receives connection request from neighbor CM,
 - CM stays the engaged state if it periodically receives being-engagement request from neighbor CM.
 - The engaged state goes to the active state if CM receives disconnection request from neighbor CM, or fails to receive being-engagement request from neighbor CM periodically.

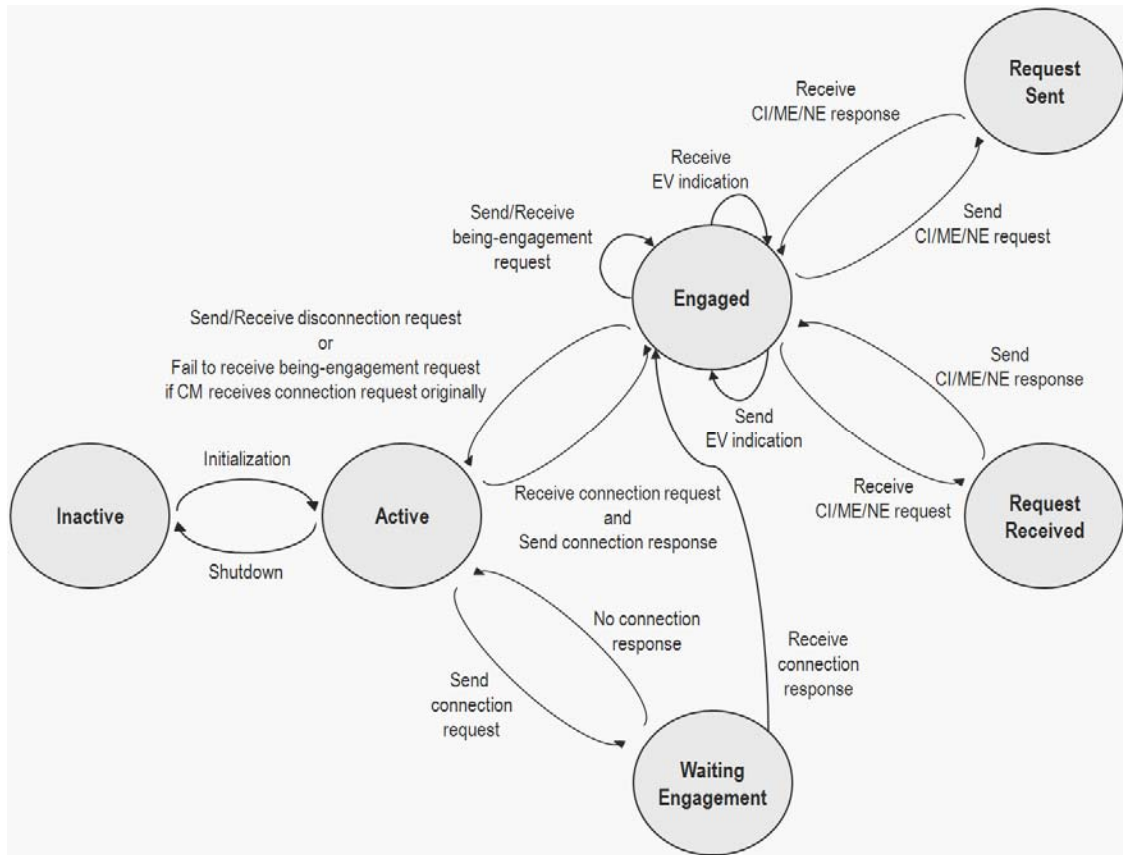


Figure 7. CM state diagram for interface between CM and neighbor CM

6.2.2 Registration procedure

6.2.2.1 CE connection to CM

This procedure is used by CE to check connection with CM. The procedure is shown in the following Figure.

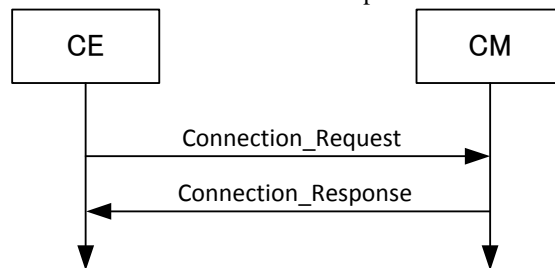


Figure 8. CE connection to CM procedure

6.2.2.2 CE authentication

This procedure is used by CE to authenticate itself to CM. The procedure is shown in the following Figure.

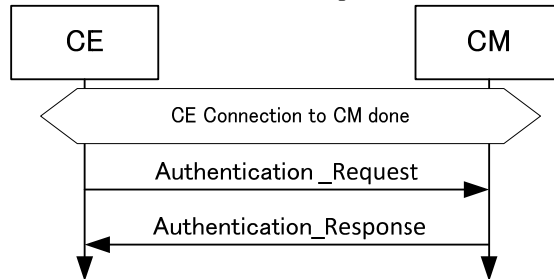


Figure 9. CE authentication procedure

6.2.2.3 CE registration update

This procedure is used by CE to update information of its TVBD network or device to CM. The procedure is shown in the following Figure.

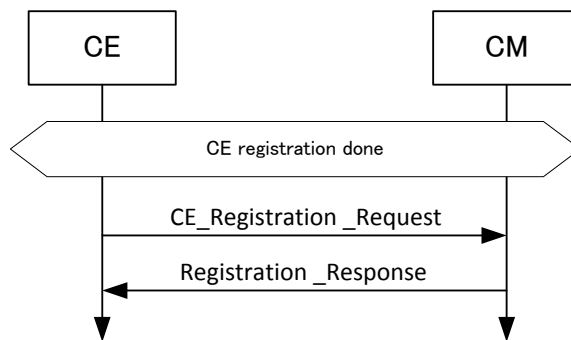


Figure 10. CE registration update procedure

6.2.2.4 CE deregistration

This procedure is used by CE to deregister its TVBD network or device from CM. The procedure is shown in the following Figure.

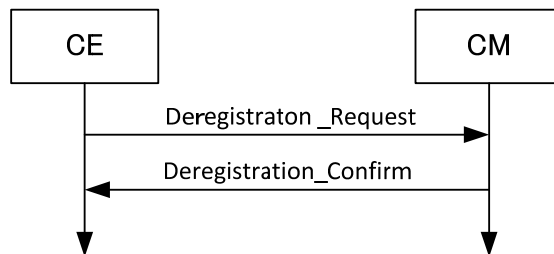


Figure 11. CE deregistration procedure

6.2.2.5 CE deauthentication

This procedure is used by CE to deauthenticate itself from CM. The procedure is shown in the following Figure.

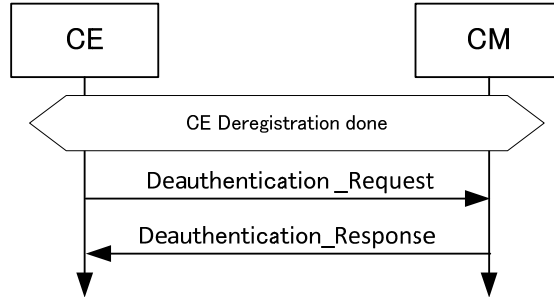


Figure 12. CE deauthentication procedure

6.2.2.6 CM connection to CDIS

Before connecting to CDIS, CM has list of candidate CDISs. This procedure is used by CM to find the first CDIS from the list that can serve this CM. The procedure is shown in the following Figure.

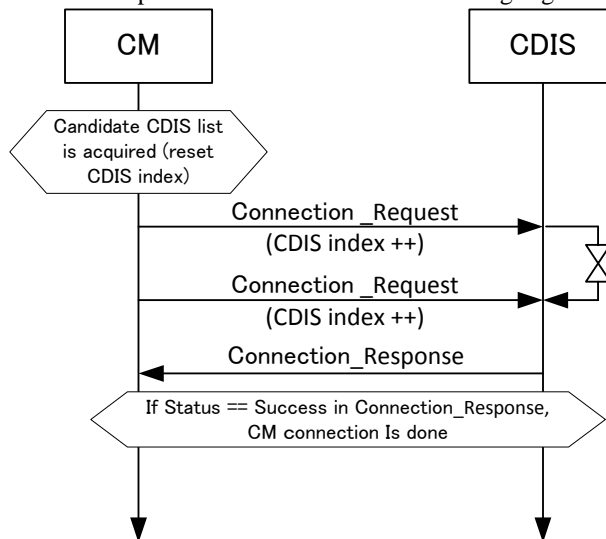


Figure 13. CM connection to CDIS procedure

6.2.2.7 CM authentication

This procedure is used by CM to authenticate itself to CDIS. The procedure is shown in the following Figure.

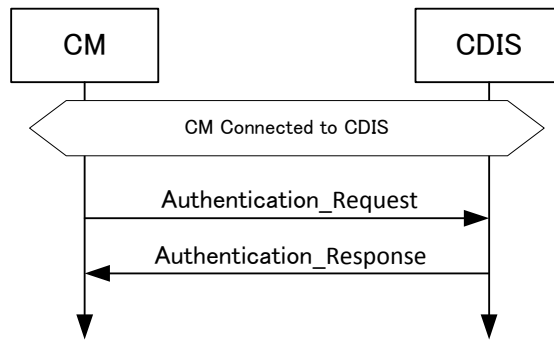


Figure 14. CM authentication procedure

6.2.2.8 CM registration

This procedure is used by CM to register information of its TVBD networks and devices to CDIS. The procedure is shown in the following Figure.

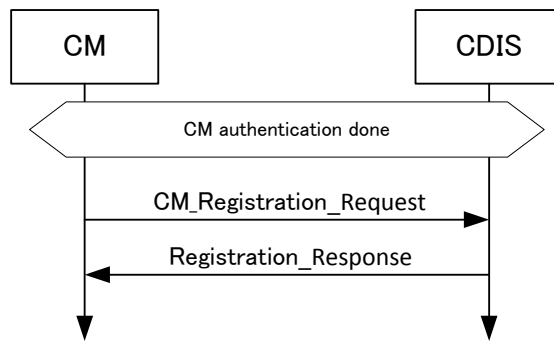


Figure 15. CM registration procedure

6.2.2.9 CM registration update

This procedure is used by CM to update information of its TVBD networks and devices to CDIS. The procedure is shown in the following Figure.

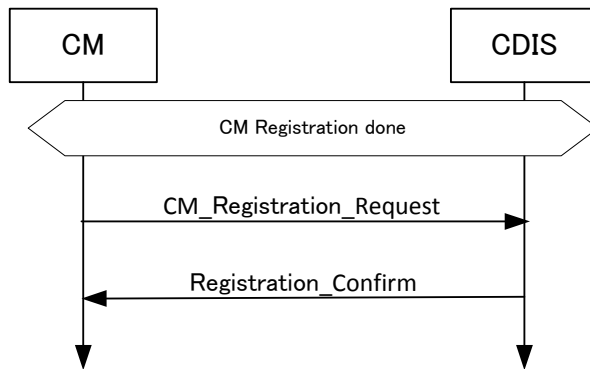


Figure 16. CM registration update procedure

6.2.2.10 CM deregistration and deauthentication

This procedure is used by CM to deregister its TVBD networks and devices from CDIS. The procedure is shown in the following Figure.

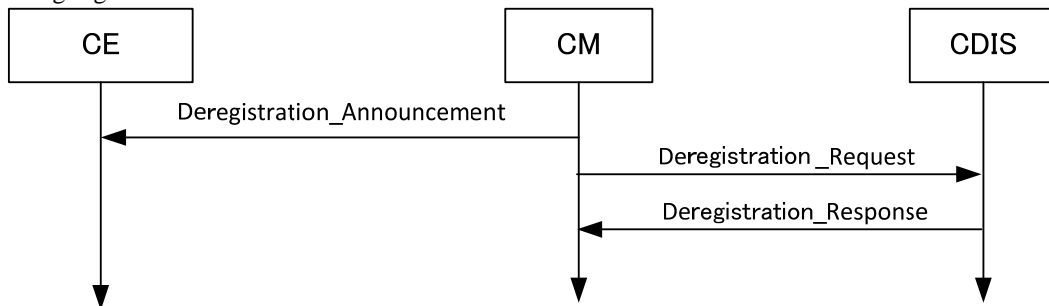


Figure 17. CM deregistration procedure

6.2.2.11 CM deauthentication

This procedure is used by CM to deregister its TVBD networks and devices from CDIS and to deauthenticate itself from CDIS. The procedure is shown in the following Figure.

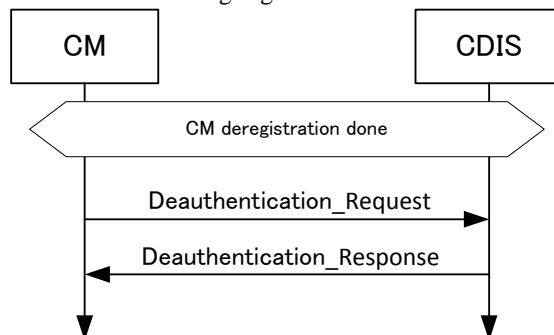


Figure 18. CM deauthentication procedure

This procedure is used for registration between entities.

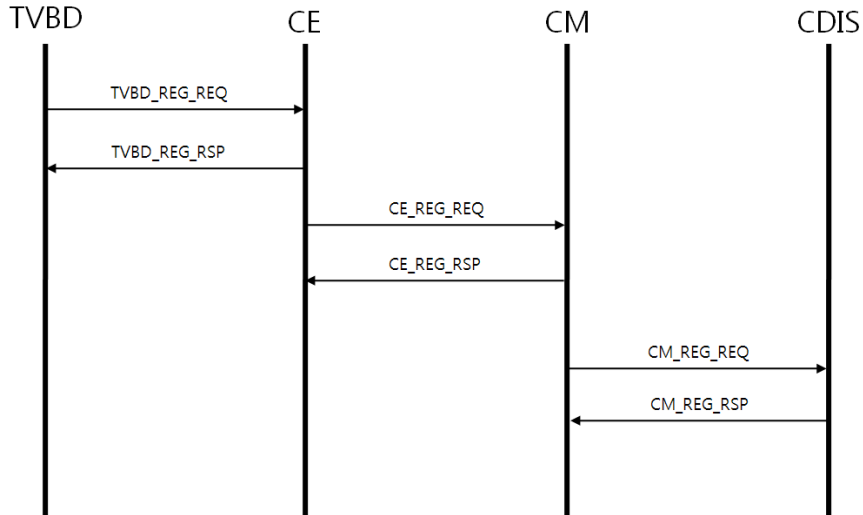


Figure 19. Registration between entities

This procedure is used for deregistration between entities.

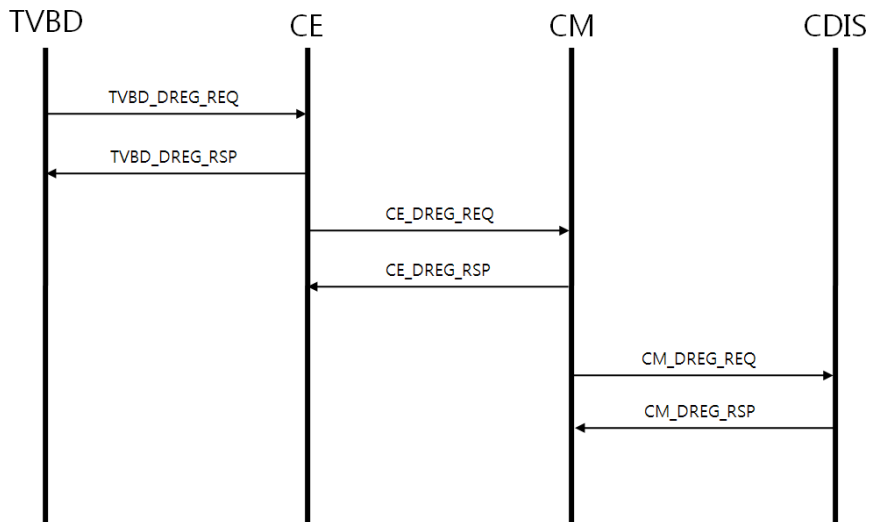


Figure 20. Deregistration between entities

This procedure is used for registration between neighbor CMs based on topologies (centralized vs. distributed). A centralized topology consists of one master CM (MCM) and one or more slave CMs (SCMs). A distributed topology consists of two or more neighbor CMs (NCMs).

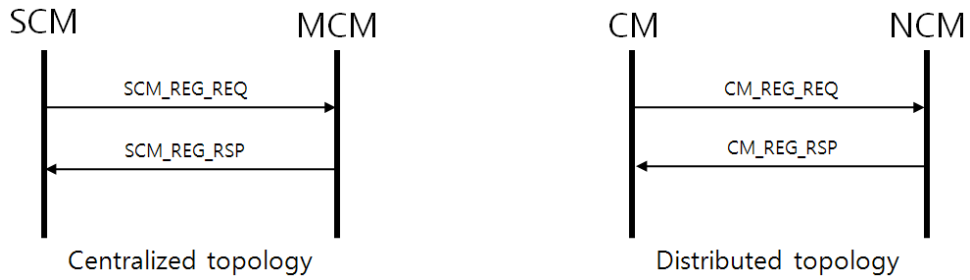


Figure 21. Registration between entities based on topologies

This procedure is used for deregistration between neighbor CMs based on topologies (centralized vs. distributed).

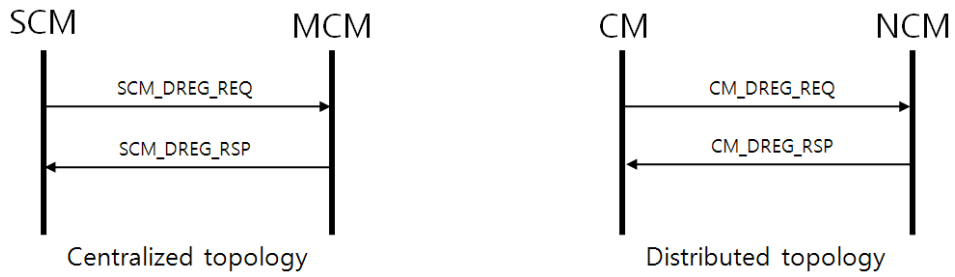


Figure 22. Deregistration between entities based on topologies

This procedure is used by CE to set up a connection with CM

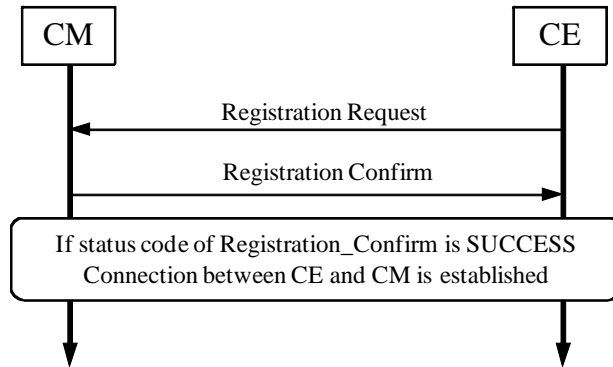


Figure 23. registration between CM and CE

This procedure is used by CM to set up a connection with CDIS or another CM.

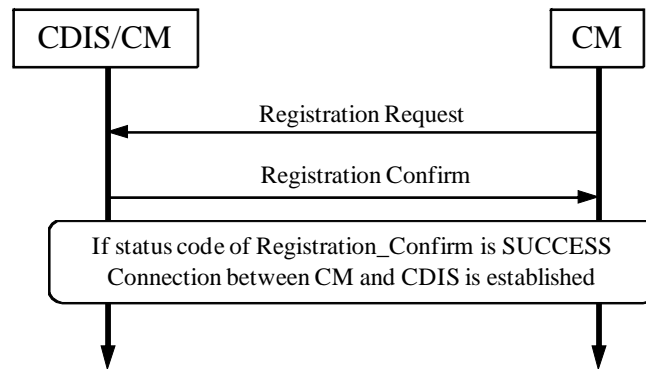


Figure 24. CM registration

6.2.3 Resource allocation procedures

This procedure is used by CE to obtain channel list on which it can operate from CM

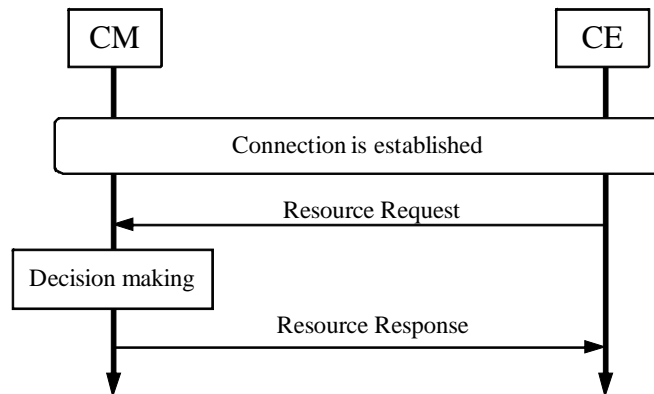


Figure 25. Coexistence resource allocation

6.2.4 Get available channel list procedures

6.2.4.1 CM acquires available channel list from CDIS or TV WS database

This procedure is used by CM to obtain available channel list from CDIS or TV WS database. The procedure is shown in the following Figure.

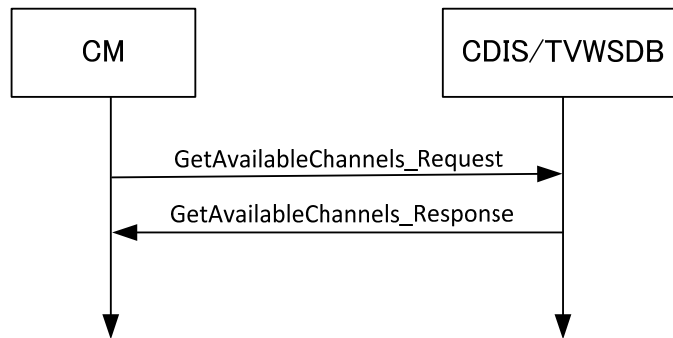


Figure 26. CM acquires available channel list from CDIS or TV WS database

6.2.4.2 CM acquires available channel list from CE

This procedure is used by CM to obtain available channel list from CE. The procedure is shown in the following Figure.

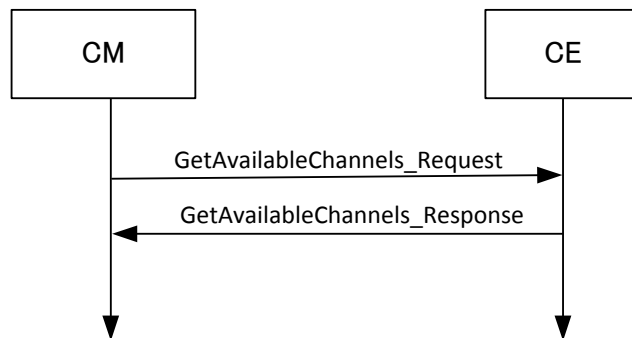


Figure 27. CM acquires available channel list from CE

6.2.5 Channel list update procedures

6.2.5.1 CDIS announces the available channel list to CM

This procedure is used by CDIS to update the provided available channel list CM. The procedure is shown in the following Figure.

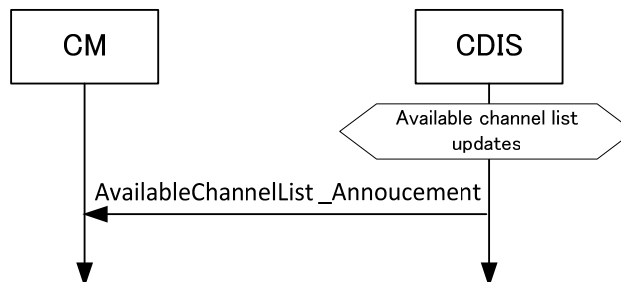


Figure 28. CDIS announces the available channel list to CM

6.2.5.2 CM announces the available channel list to CE

This procedure is used by CM to update the provided available channel list CE. The procedure is shown in the following Figure.

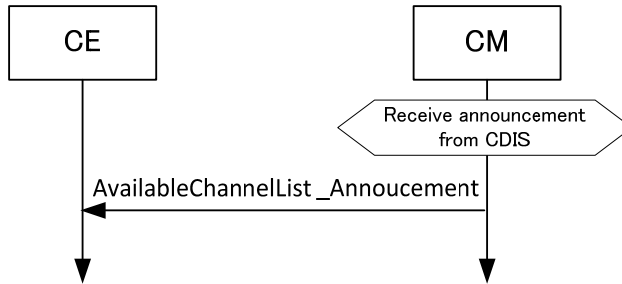


Figure 29. CM announces the available channel list to CE

6.2.4 Coexistence Information Gathering/Information collection

This procedure is used for coexistence information gathering by CE.

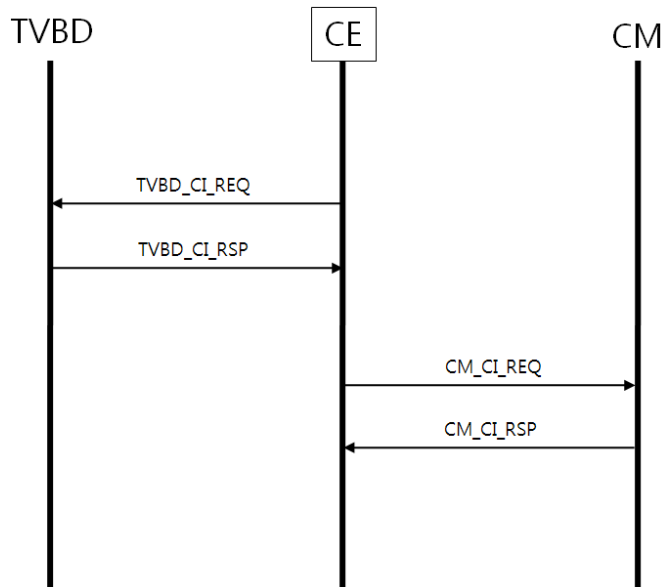


Figure 30. Coexistence information gathering by CE

This procedure is used for coexistence information gathering by CM.

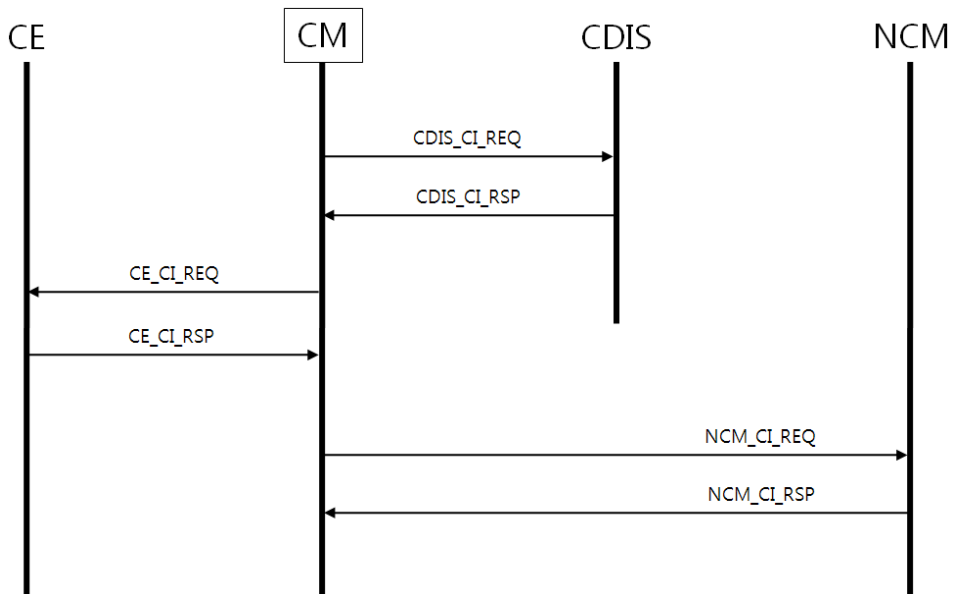


Figure 31. Coexistence information gathering by CM

This procedure is used for coexistence information gathering by CDIS.

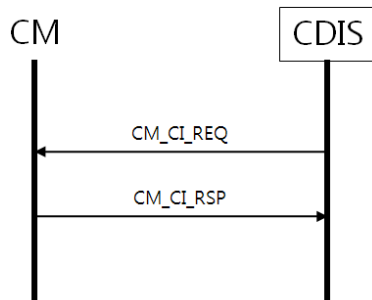


Figure 32. Coexistence information gathering by CDIS

6.2.4.1 CE information collection

This procedure is used by CE to collect information from CM. The procedure is shown in the following Figure.

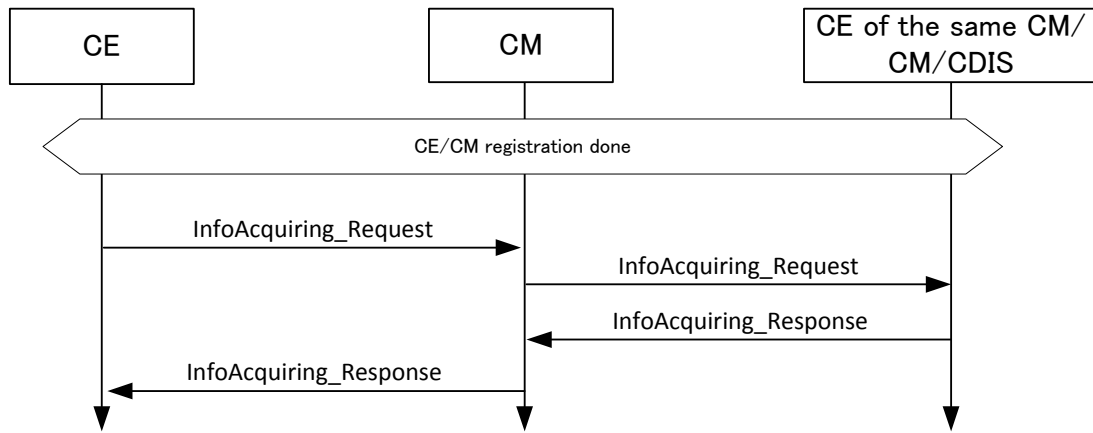


Figure 33. CE information collection procedure

6.2.4.2 CM information collection

This procedure is used by CM to collect information from CE, another CM, or CDIS. The procedure is shown in the following Figure.

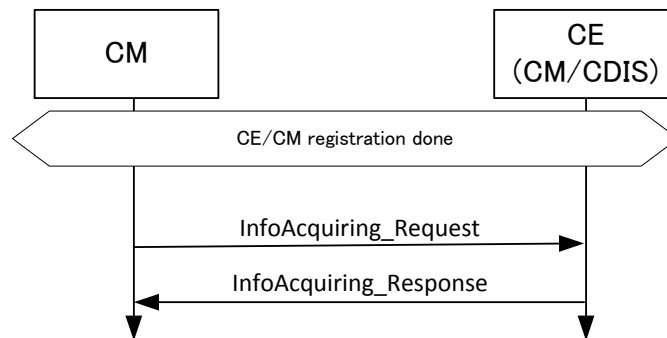


Figure 34. CM information collection procedure

6.2.5 Neighbor Discovery

This procedure is used by CM to get the neighbour list. Note that the neighbour list contains intra and inter CM neighbour relationship between registered CEs and TVBDs of each CM.

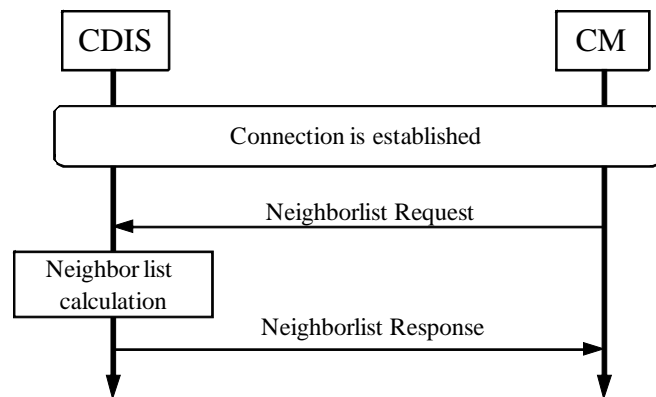


Figure 35. Neighbor discovery

This procedure is used for neighbor discovery between TVBDs registered to the same CM. Two or more intra-CM TVBD neighbor if they registered to the same CM as well as interfere each other with the same operating channel due to their geo-location, transmission range, interference range, and etc.

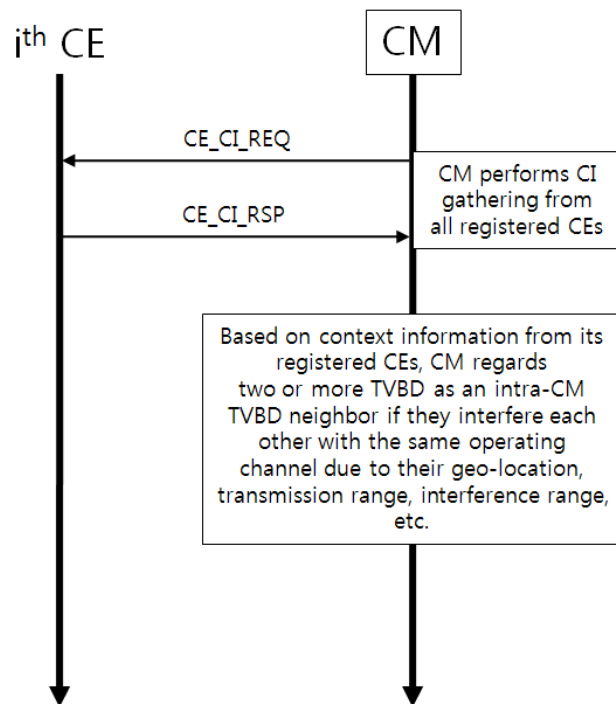


Figure 36. Intra-CM TVBD neighbor discovery

This procedure depicted in the following figure is used for neighbor discovery between TVBDs registered to the different CM. Two or more inter-CM TVBD neighbor if they registered to the different CM as well as interfere with each other with the same operating channel due to their geo-location, transmission range, interference range, and etc.

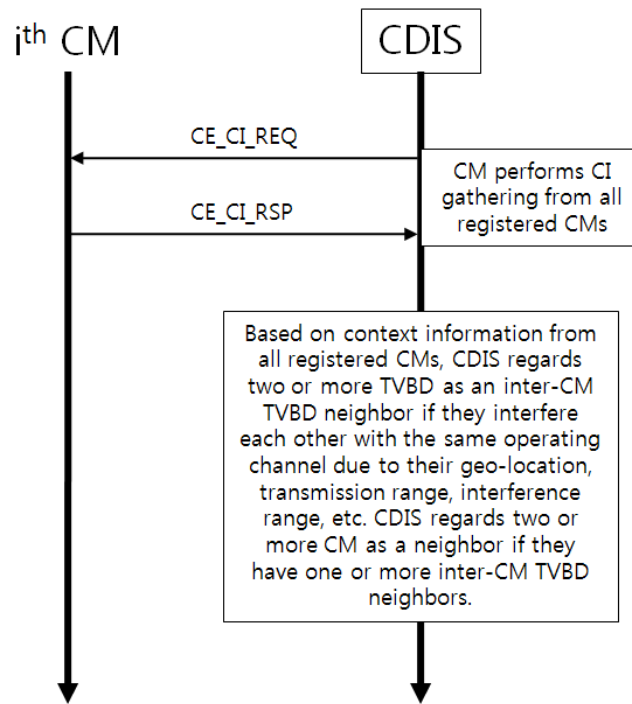


Figure 37. Inter-CM TVBD neighbor discovery

This procedure is used for neighbor CM discovery.

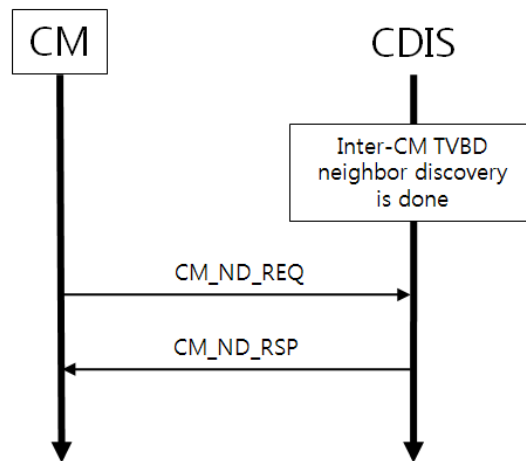


Figure 38. Neighbor CM discovery

This procedure is used for neighbor TVBD discovery.

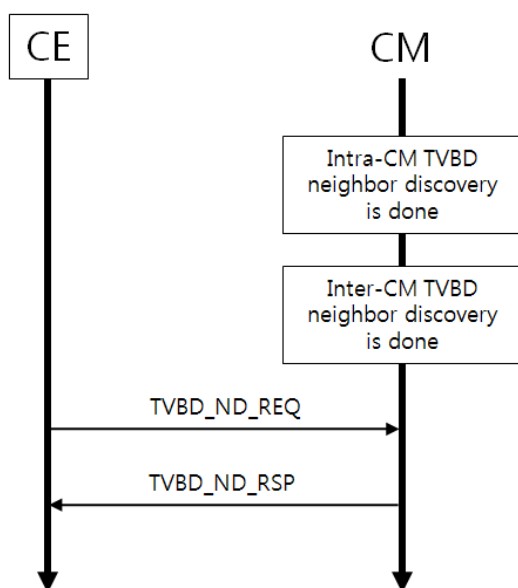


Figure 39. Neighbor TVBD discovery

6.2.5.1 CE neighbour discovery

This procedure is used by CE to obtain information on neighbours for TVBD network or device served by this CE. The procedure is shown in the following Figure.

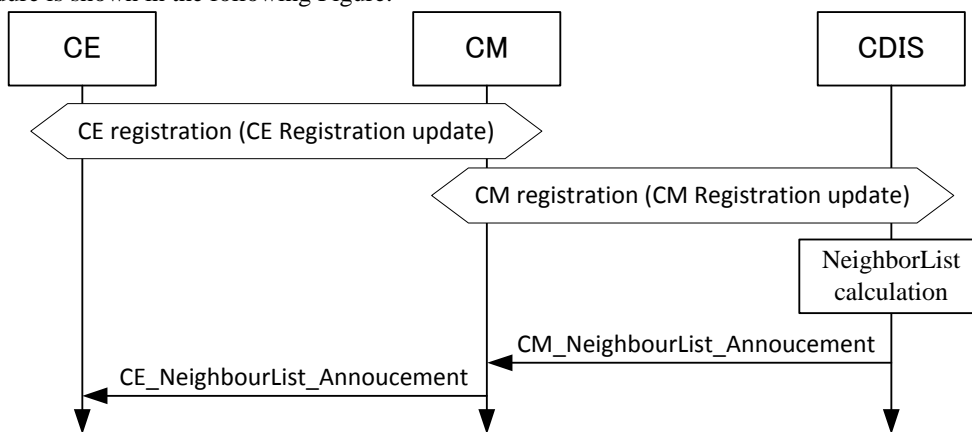


Figure 40. CE neighbour discovery procedure

6.2.5.2 CM neighbour discovery

This procedure is used by CM to obtain information on neighbours for one TVBD network or device served by this CM. The procedure is shown in the following Figure.

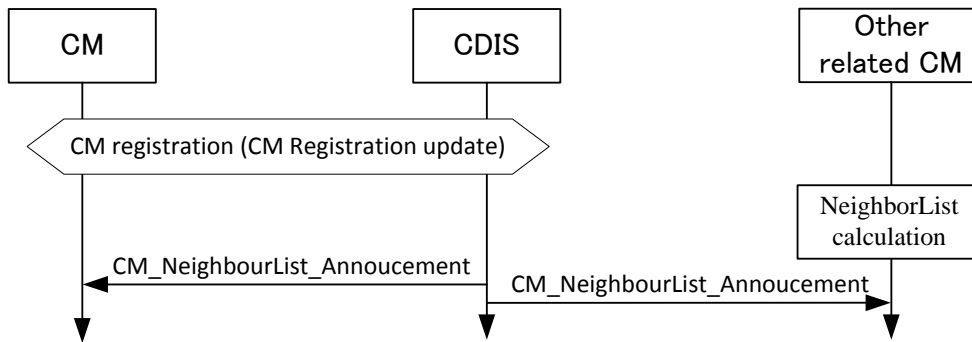


Figure 41. CM neighbour discovery procedure

6.2.6 Channel Classification

This procedure is used for channel classification by CM.

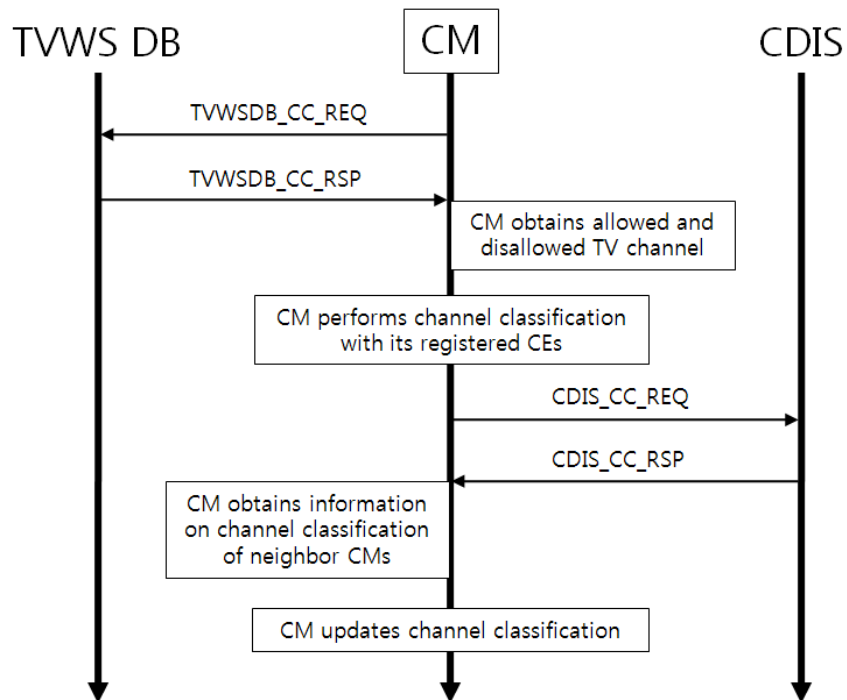


Figure 42. Channel classification by CM

This procedure is used for channel classification by CE.

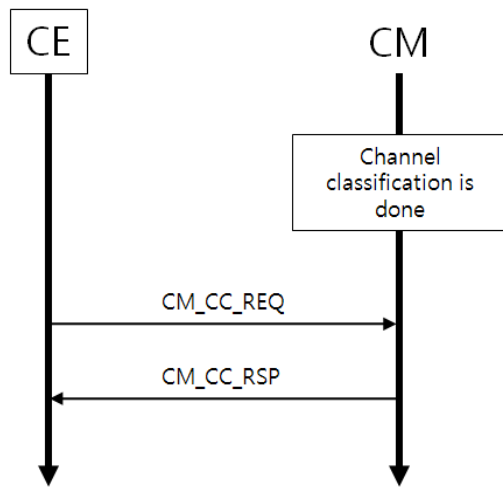


Figure 43. Channel classification by CE

This procedure is used for channel classification by CDIS.

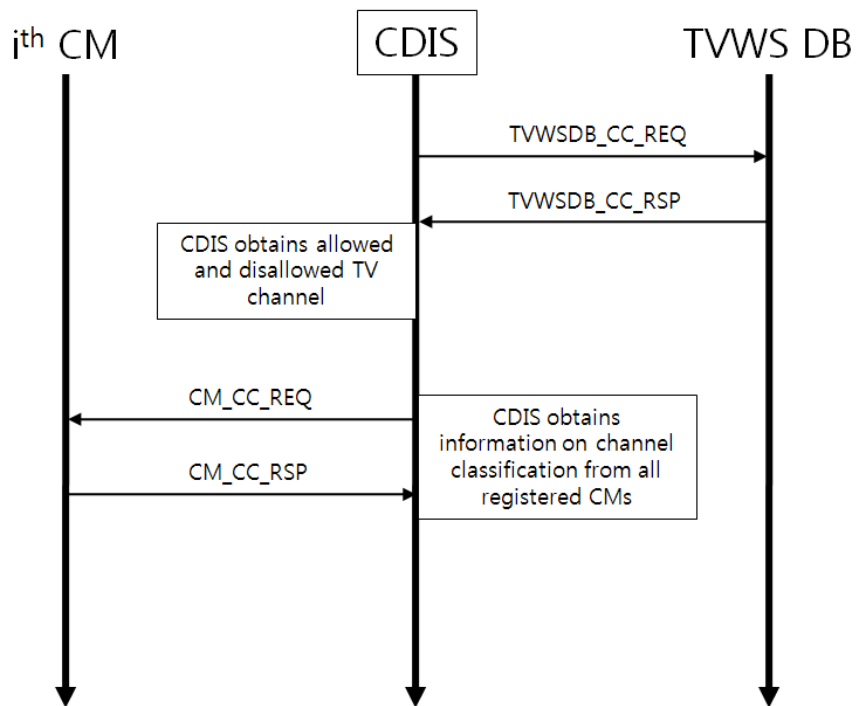


Figure 44. Channel classification by CDIS

6.2.7 Coexistence decision making

This procedure is used for coexistence decision making by master CM (MCM) for centralized topology. MCM commands its slave CMs (SCMs).

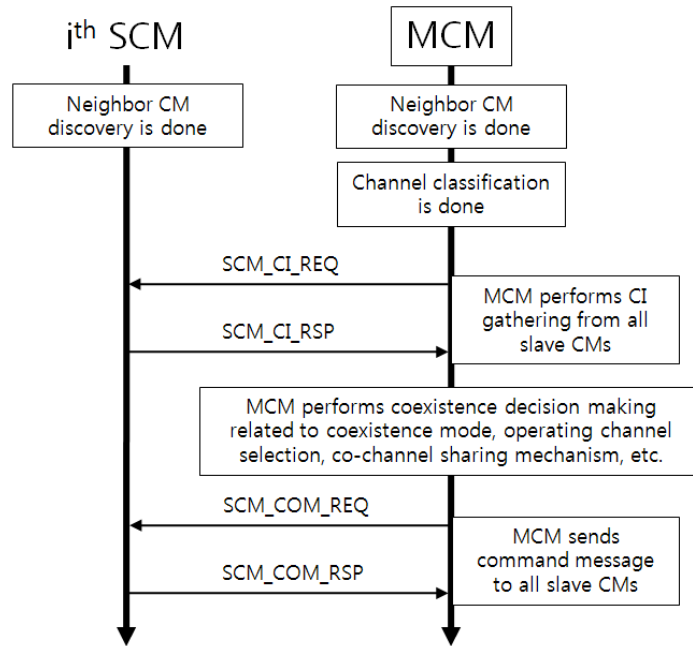


Figure 45. Coexistence decision making: Command by MCM for centralized topology

This procedure is used for coexistence decision making by each CM for distributed topology. Negotiation shall be needed between neighbor CMs.

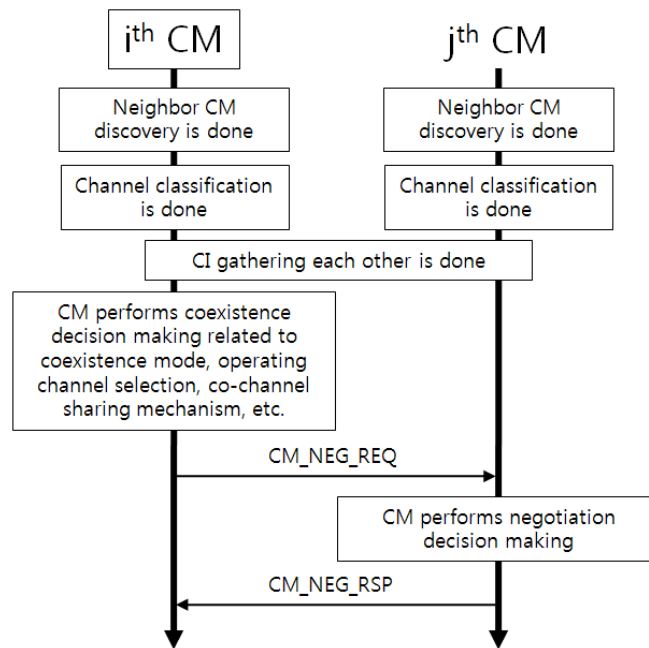


Figure 46. Coexistence decision making: Negotiation by CM for distributed topology

6.2.8 Reconfiguration/Command

This procedure is used by CM to command its registered CE or TVBD to be configured as requested.

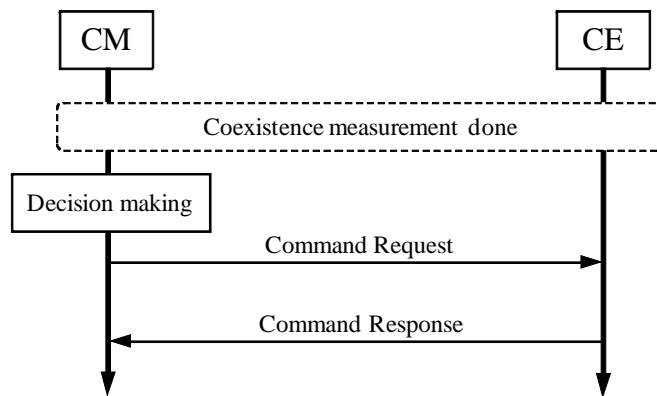


Figure 47. Coexistence command

This procedure is used for reconfiguration by CM.

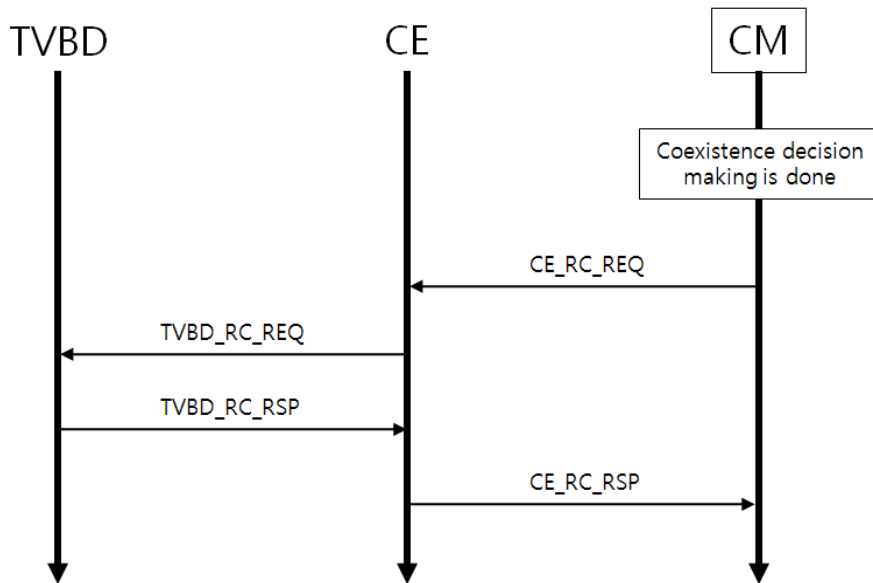


Figure 48. Reconfiguration for management mode

6.2.8.1 CE reconfiguration

This procedure is used by CM to request reconfiguration of one of its TVBD network or device.

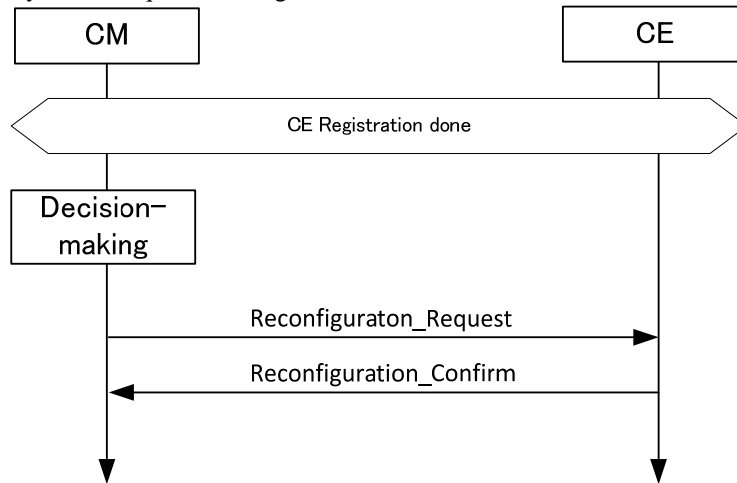


Figure 49. CE reconfiguration procedure

6.2.9 Measurement

6.2.9.1 Measurement request and report

This procedure is used by CM to request CE to perform measurements and to obtain measurement results from CE. The procedure is shown in the following Figure.

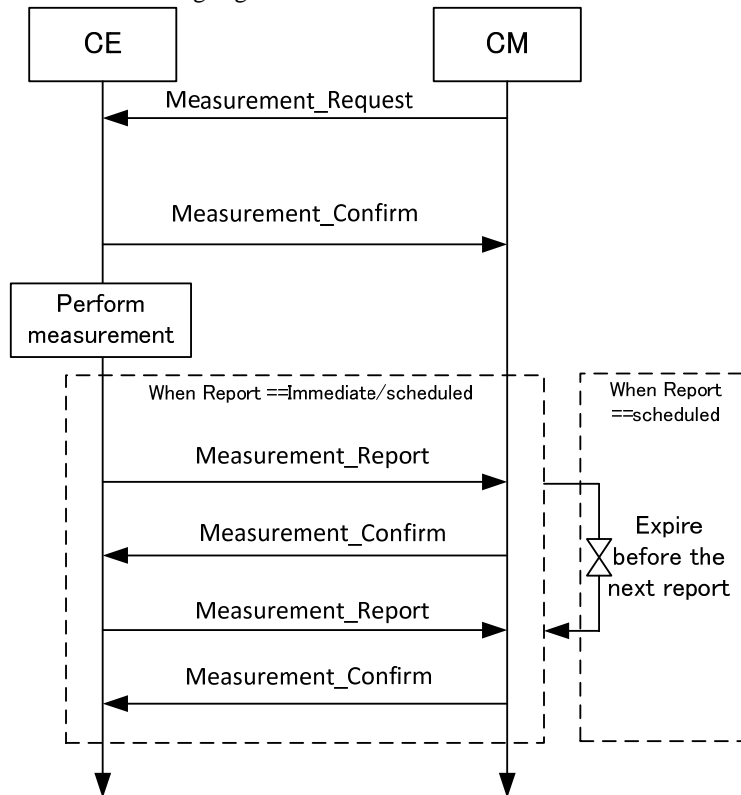


Figure 50. Measurement and report procedure

When report type is set to on-demand value, the measurement results are collected from CE by using CE information collection procedure.

This procedure is used for measurement between entities.

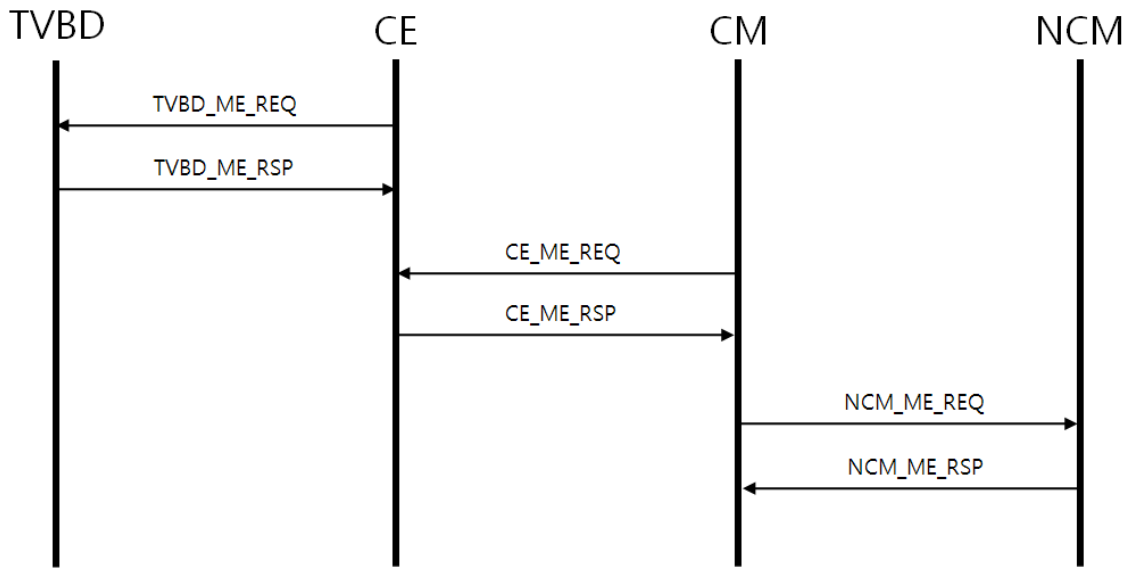


Figure 51. Measurement between entities

This procedure is used by CM to request CE to perform measurements.

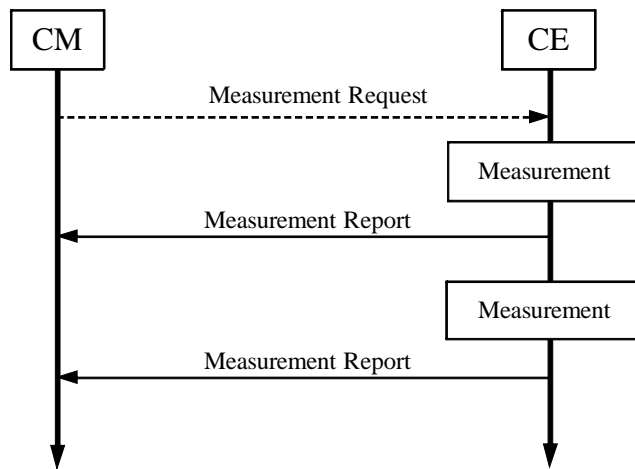


Figure 52. CE Measurement

6.2.10 Event

This procedure is used for event between entities.

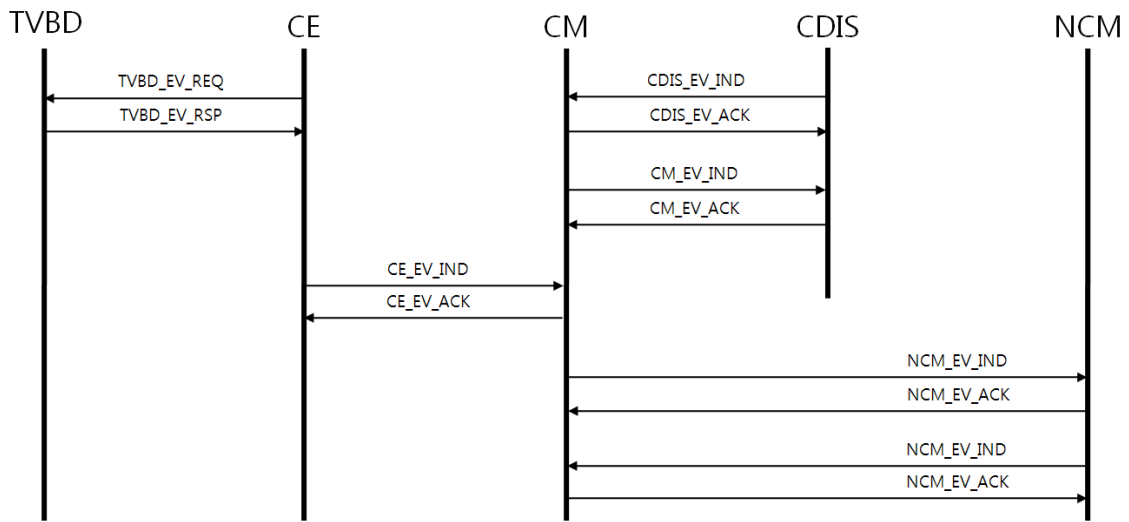


Figure 53. Event between entities

6.2.10.1 Event from CE to CM

This procedure is used by CE to indicate an event to CM. The procedure is shown in the following Figure.

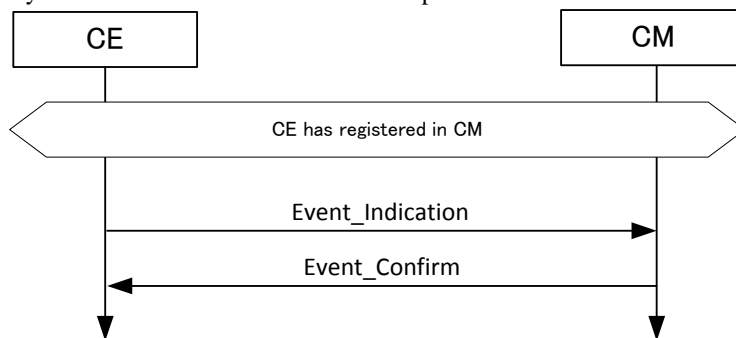


Figure 54. Event from CE to CM procedure

6.2.10.2 Event from CM to CE

This procedure is used by CM to indicate an event to CE. The procedure is shown in the following Figure.

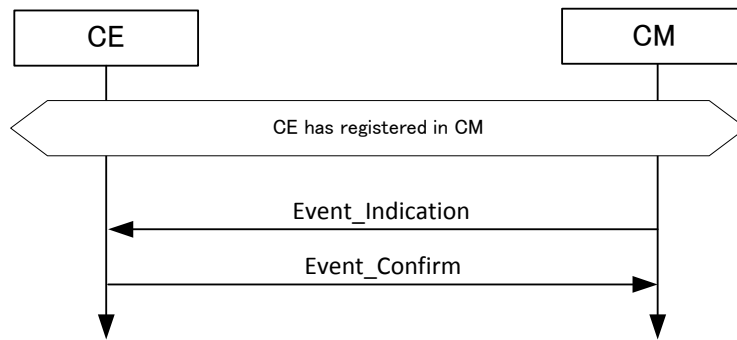


Figure 55. Event from CM to CE procedure

6.2.10.3 Event from CM to CM

This procedure is used by CM to indicate an event to another CM. The procedure is shown in the following Figure.

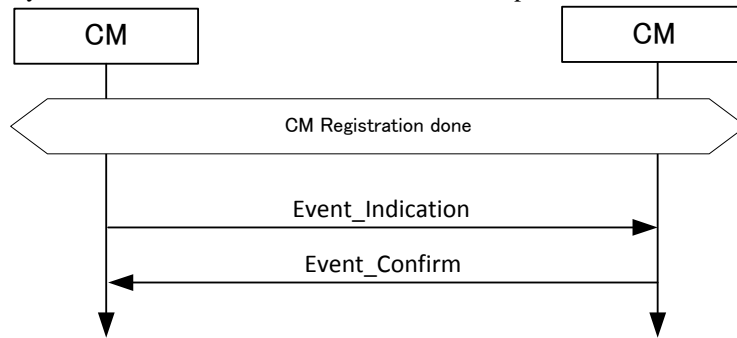


Figure 56. Event from CM to CM procedure

6.2.10.4 Event from CM to CDIS

This procedure is used by CM to indicate an event to CDIS. The procedure is shown in the following Figure.

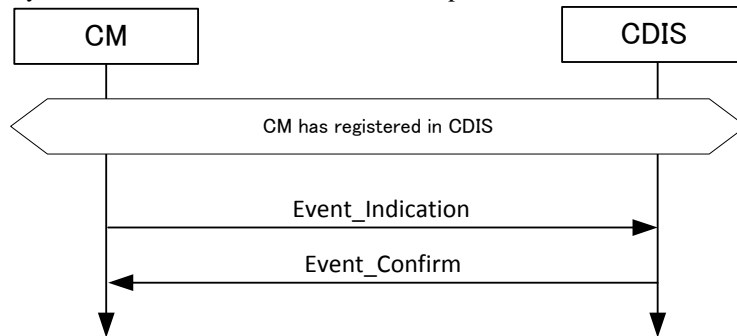


Figure 57. Event from CM to CDIS procedure

6.2.10.5 Event from CDIS to CM

This procedure is used by CDIS to indicate an event to CM. The procedure is shown in the following Figure.

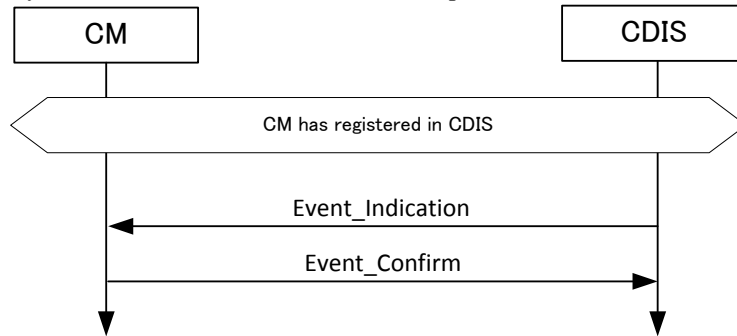


Figure 58. Event from CDIS to CM procedure

6.2.11 Master selection procedure

This procedure is to support more flexible and efficient coexistence architecture. This is used by CM to hand over its role to another CM.

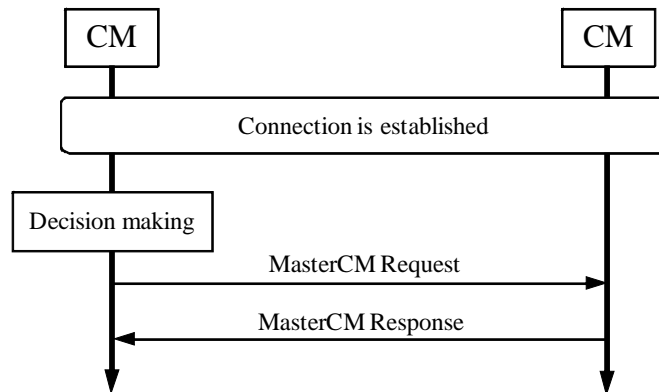


Figure 59. Master CM selection

This procedure is to announce CDIS that the CM takes the role of master so that CDIS can take it into account when it calculates neighbor list.

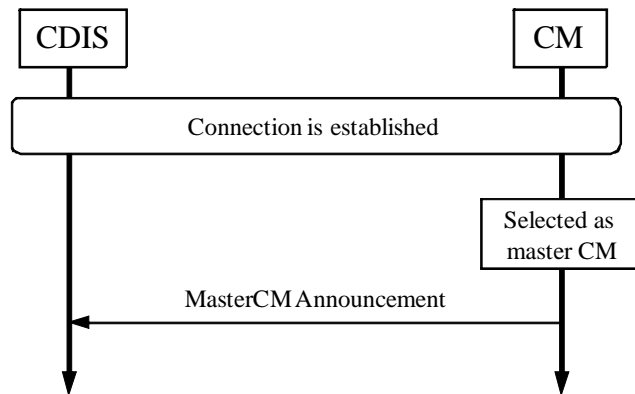


Figure 60. Master CM announcement

6.2.12 Unsupported message procedure

6.2.12.1 MessageUnsupported_Indication

The procedure is used by CM or CDIS to indicate to CE or CM that the received message is not supported.

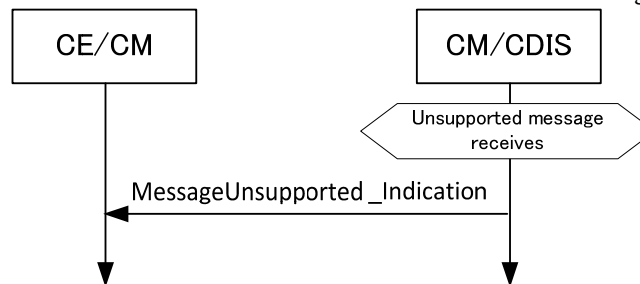


Figure 61. Unsupported message procedure

6.2.13 Examples of using procedures (informative)

6.2.13.1 Coexistence decisions are done by TVBD

The following Figure shows example of using the above described procedure for scenario when decisions are done by TVBD network or device.

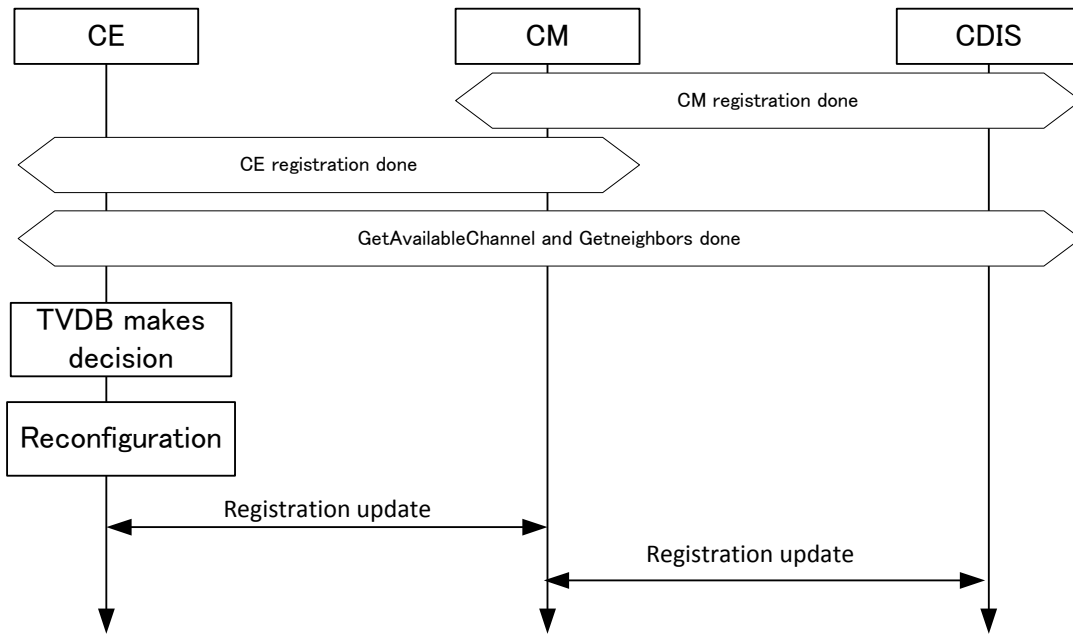


Figure 62. Coexistence decisions are done by TVBD

6.2.13.2 Coexistence decisions are done by Coexistence System

The following Figure shows example of using the above described procedure for scenario when decisions are done by coexistence system.

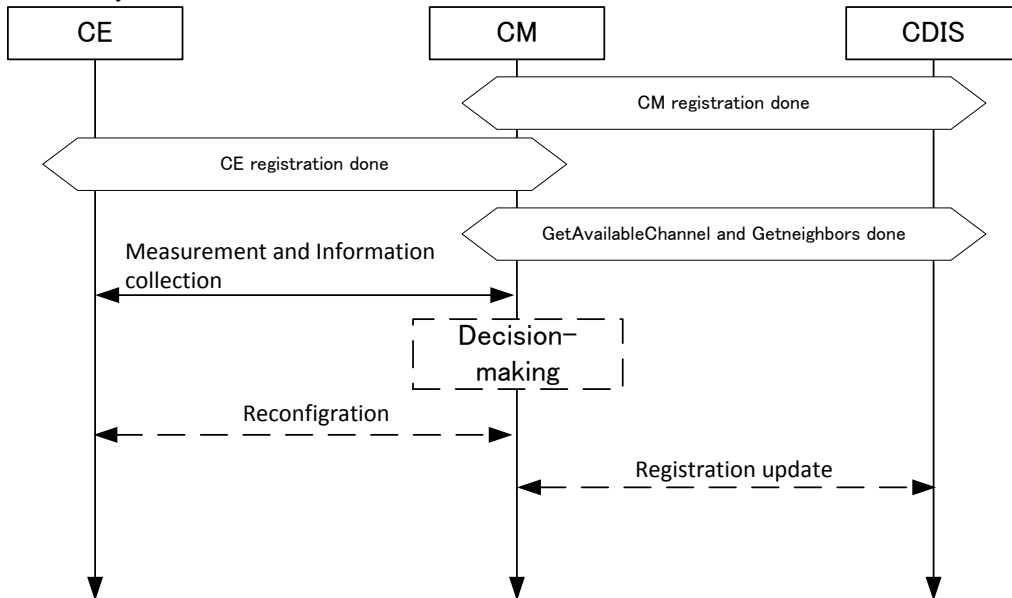


Figure 63. Coexistence decisions are done by Coexistence System

6.3 Messages

The logical entities in the 802.19.1 system communicate with each other using the transmission control protocol/internet protocol (TCP/IP) over internet. This clause specifically defines messages for data transfers between 802.19.1 entities, or between 802.19.1 entity and TVWS DB.

The following sub-clauses specify different messages and contents for interface between entities ((master/slave) CM, CE and CDIS) in the 802.19.1 system. The primitives and contents for interface between TVBD and CE are already defined in the 5.2 sub-clause. Messages in the following sub-clauses are specified for centralized and distributed topologies.

All messages convey a source identifier followed by a destination identifier as the first two of the message. Any message received that does not contain the source and destination identifiers, or has an unrecognizable or invalid message shall be discarded without sending any indication to the source entity.

The messages between the 802.19.1 entities are categorized into eight kinds of procedure messages, given as

1. Registration/deregistration procedure messages
2. Coexistence information gathering procedure messages
3. Neighbor discovery procedure messages
4. Channel classification procedure messages
5. Coexistence decision making procedure messages
6. Reconfiguration procedure messages
7. Measurement procedure messages
8. Event procedure messages

Registration/deregistration procedure messages specify demands of TVBD in the registration procedure and the removal of TVBD in the deregistration procedure. These messages in the 802.19.1 system are defined for interface between CM-CE, CM-CDIS, slave CM (SCM)-master CM (MCM) for the centralized topology and CM-neighbor CM (NCM) for the distributed topology, respectively.

Context information procedure messages convey fundamental information of the corresponding entity for decision making on radio resource usage optimization within this standard to be possible. The context information messages in the 802.19.1 system are defined for interface between CM-CE, CM-CDIS and CM-NCM for the distributed topology, respectively.

Neighbor discovery procedure messages convey the neighbor discovery information of the corresponding entity for the optimized radio resource usage. The neighbor discovery procedure messages in the 802.19.1 system are defined for interface between CM-CE and CM-CDIS, respectively.

Channel classification procedure messages inform channel classification information of TVWS to the corresponding entity based on TVWS DB information. These procedure messages in the 802.19.1 system are defined for interface between CM-CE, CM-CDIS and TVWS DB-CM/CDIS, respectively.

Coexistence decision making procedure messages are used to give command or negotiation information to the corresponding entity. These messages in the 802.19.1 system are defined for interface between SCM-MCM for the centralized topology, CM-NCM for the distributed topology, respectively.

Reconfiguration procedure messages provide the information for setting hardware and/or software of TVBD in order to properly change its operating parameters in the physical and MAC layers, such as operating channel,

transmitting power and communicating coverage. The reconfiguration message in the 802.19.1 system is defined for interface between CM and CE.

Measurement procedure messages give measurement results of TVBD the corresponding entity. These procedure messages in the 802.19.1 system are defined for interface between CM-CE, SCM-MCM for the centralized topology and CM-NCM for the distributed topology, respectively.

Event message is used for a means of notifying a change of the entity status that triggers specific procedures for maintaining system performance. The event message in the 802.19.1 system is defined for interface between CM-CE, CM-CDIS, SCM-MCM for the centralized topology and CM-NCM for the distributed topology, respectively.

Brief description of all messages defined in the 802.19.1 system is given as follows:

Category	Name	Description
Registration/ Deregistration	CE_REG_REQ/CE_REG_RSP CM_REG_REQ/CM_REG_RSP SCM_REG_REQ/SCM_REG_RSP	Registration of the corresponding entity
	CE_DREG_REQ/CE_DREG_RSP CM_DREG_REQ/CM_DREG_RSP SCM_DREG_REQ/SCM_DREG_RSP	Deregistration of the corresponding entity
	Authentication_Request/Authentication_Response Deauthentication_Request/Deauthentication_Response CE_Registration_Request/CM_Registration_Request/Registration_Response Deregistration_Request/Deregistration_Confirm/Deregistration_Announcement Connection_Request/Connection_Response	TBD
	Registration_Request/Registration_Response	TBD
	Coexistence Resource Allocation	Resource_Request/Resource_Response
Coexistence information gathering	CE_CI_REQ/CE_CI_RSP CDIS_CI_REQ/CDIS_CI_RSP NCM_CI_REQ/NCM_CI_RSP CM_CI_REQ/CM_CI_RSP SCM_CI_REQ/SCM_CI_RSP	Coexistence information of the corresponding entity
Information collection	InfoAcquiring_Request /InfoAcquiring_Response	TBD
Neighbor discovery	CM_ND_REQ/CM_ND_RSP TVBD_ND_REQ/TVBD_ND_RSP	Neighbor discovery information of the corresponding entity
	CE_NeighbourList_Announcement CM_NeighbourList_Announcement	TBD
	Neighborlist_Request /Neighborlist_Response	TBD
Get available channel list	GetAvailableChannels_Request /GetAvailableChannels_Response	TBD
Channel list update	AvailableChannels_Announcement	TBD
Channel classification	TVWSDB_CC_REQ/TVWSDB_CC_RSP CDIS_CC_REQ/CDIS_CC_RSP CM_CC_REQ/CM_CC_RSP	Channel classification information of the corresponding CM

Coexistence decision making	SCM_COM_REQ/ SCM_COM_RSP CM_NEG_REQ/CM_NEG_RSP	Command or negotiation information of the corresponding CM
Reconfiguration	CE_RC_REQ/ CE_RC_RSP	Reconfiguration information of the corresponding CE
	Reconfiguration_Request /Reconfiguration_Confirm	TBD
	Command_Request /Command_Confirm	TBD
Measurement	CE_ME_REQ/CE_ME_RSP NCM_ME_REQ/ NCM_ME_RSP	Measurement information of the corresponding CE
	Measurement_Request Measurement_Report Measurement_Confirm	TBD
	Measurement_Request /Mesurement_Report	TBD
Event	CE_EV_IND/ CE_EV_ACK CDIS_EV_IND/CDIS_EV_ACK CM_EV_IND/ CM_EV_ACK NCM_EV_IND/NCM_EV_ACK	Event information of the corresponding entity
	Event_Indication Event_Confirm	TBD
Master selection	MasterCM_Request/MasterCM_Reponse /MasterCM_Announcement	TBD
Session activity check	SessionActive_Request/ SessionActive_Confirm	TBD
Unsupported message	MessageUnsupported_indication	TBD

6.3.1 Registration/Deregistration procedure messages

6.3.1.1 CE_REG_REQ

This message is identical to all topologies, that is, centralized and distributed topologies. This message used by CE is transmitted to (master/slave) CM to request registration of the corresponding TVBD. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	CE ID	Source identifier
DestinationID	(Master/Slave) CM ID	Destination identifier
Payload		
Name	Data Type	Description
TVBDFCCID	STRING	FCC ID of the corresponding TVBD
RequiredBandwidth	REAL	Required bandwidth of the corresponding TVBD which is a mandatory parameter
RequiredServiceDuration	INTEGER	Required service duration of the corresponding TVBD which is a mandatory parameter
RequiredServiceCoverage	REAL	Required service coverage of the corresponding TVBD which is a mandatory parameter
RegistrationOptions	COEX_REG_OPTIONS	Optional parameters:

		<ul style="list-style-type: none"> • Desired TVWS channel number list • Service time
--	--	--

6.3.1.2 CE_REG_RSP

This message is identical to all topologies. This message used by (master/slave) CM is transmitted to CE to give the registration results of the corresponding TVBD. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	(Master/Slave) CM ID	Source identifier
DestinationID	CE ID	Destination identifier
Payload		
Name	Data Type	Description
TVBDFCCID	STRING	FCC ID of the corresponding TVBD
RegistrationStatus	COEX_REG_STATUS	The status information of registration parameters is provided with <ul style="list-style-type: none"> • accepted values of parameters when registration is succeed. • recommended values of parameters when registration is failed.

6.3.1.3 CM_REG_REQ

This message is identical to all topologies, that is, centralized and distributed topologies. This message used by (master/slave) CM is transmitted to CDIS to request registration of the corresponding (master/slave) CM. Also, this message is sent from CM to neighbor CM for the distributed topology. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	(Master/Slave) CM ID/ CM ID	Source identifier
DestinationID	CDIS ID/Neighbor CM ID	Destination identifier
Payload		
Name	Data Type	Description
RegisteredCMID	CM ID	Registered CM ID

6.3.1.4 CM_REG_RSP

This message is identical to all topologies. This message used by CDIS is transmitted to (master/slave) CM to give the registration results of the corresponding (master/slave) CM. Also, this message is sent from neighbor CM to CM for the distributed topology. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	CDIS ID/Neighbor CM ID	Source identifier
DestinationID	(Master/Slave) CM ID/ CM ID	Destination identifier
Payload		
Name	Data Type	Description
RegistrationStatus	BOOLEAN	Status of registration <ul style="list-style-type: none"> • True: Registration of the corresponding CM is succeed.

		<ul style="list-style-type: none"> False:Registration of the corresponding CM is failed.
--	--	---

6.3.1.5 CE_DREG_REQ

This message is identical to all topologies. This message used by CE is transmitted to (master/slave) CM to request deregistration of the corresponding TVBD. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	CE ID	Source identifier
DestinationID	(Master/Slave) CM ID	Destination identifier
Payload		
Name	Data Type	Description
TVBDFCCID	STRING	FCC ID of the corresponding TVBD

6.3.1.6 CE_DREG_RSP

This message is identical to all topologies. This message used by (master/slave) CM is transmitted to CE to give the deregistration results of the corresponding TVBD. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	(Master/Slave) CM ID	Source identifier
DestinationID	CE ID	Destination identifier
Payload		
Name	Data Type	Description
TVBDFCCID	STRING	FCC ID of the corresponding TVBD
DeregistrationStatus	BOOLEAN	Status of de-registration <ul style="list-style-type: none"> True: De-registration of the corresponding TVBD is succeed. False:De-registration of the corresponding TVBD is failed.

6.3.1.7 CM_DREG_REQ

This message is identical to all topologies. This message used by (master/slave) CM is transmitted to CDIS to request deregistration of the corresponding (master/slave) CM. Also, this message is sent from CM to neighbor CM for the distributed topology. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	(Master/Slave) CM ID/ CM ID	Source identifier
DestinationID	CDIS ID/ Neighbor CM ID	Destination identifier
Payload		
Name	Data Type	Description
RegisteredCMID	CM ID	Registered CM ID

6.3.1.8 CM_DREG_RSP

This message is identical to all topologies. This message used by CDIS is transmitted to (master/slave) CM to give the deregistration results of the corresponding (master/slave) CM. Also, this message is sent from neighbor CM to CM for the distributed topology. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	CDIS ID /Neighbor CM ID	Source identifier
DestinationID	(Master/Slave) CM ID/CM ID	Destination identifier
Payload		
Name	Data Type	Description
DeregistrationStatus	BOOLEAN	Status of de-registration <ul style="list-style-type: none"> • True: De-registration of the corresponding CM is succeed. • False:De-registration of the corresponding CM is failed.

6.3.1.9 SCM_REG_REQ

This message is for the centralized topology. This message used by slave CM is transmitted to master CM to request registration of the corresponding slave CM. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	Slave CM ID	Source identifier
DestinationID	Master CM ID	Destination identifier
Payload		
Name	Data Type	Description
NeighborCEIDList	SEQUENCE OF STRING	Neighbor CE ID list
The message contents below are repeated for each neighbor CE		
NeighborCEID	STRING	Neighbor CE ID
RequiredBandwidth	REAL	Required bandwidth of the corresponding TVBD which is a mandatory parameter
RequiredServiceDuration	INTEGER	Required service duration of the corresponding TVBD which is a mandatory parameter
RequiredServiceCoverage	REAL	Required service coverage of the corresponding TVBD which is a mandatory parameter
RegistrationOptions	COEX_REG_OPTIONS	Optional parameters: <ul style="list-style-type: none"> • Desired TVWS channel number list • Service time

6.3.1.10 SCM_REG_RSP

This message is for the centralized topology. This message used by master CM is transmitted to slave CM to give the registration results of the corresponding slave CM. The contents of this message are given as follows

Header

Name	Data Type	Description
SourceID	Master CM ID	Source identifier
DestinationID	Slave CM ID	Destination identifier
Payload		
Name	Data Type	Description
NeighborCEIDList	SEQUENCE OF STRING	Neighbor CE ID list
The message contents below are repeated for each neighbor CE		
NeighborCEID	STRING	Neighbor CE ID
RegistrationStatus	COEX_REG_STATUS	The status information of registration parameters is provided with <ul style="list-style-type: none"> accepted values of parameters when registration is succeed. recommended values of parameters when registration is failed.

6.3.1.11 SCM_DREG_REQ

This message is for the centralized topology. This message used by slave CM is transmitted to master CM to request deregistration of the corresponding slave CM. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	Slave CM ID	Source identifier
DestinationID	Master CM ID	Destination identifier
Payload		
Name	Data Type	Description
NeighborCEIDList	SEQUENCE OF STRING	Neighbor CE ID list

6.3.1.12 SCM_DREG_RSP

This message is for the centralized topology. This message used by master CM is transmitted to slave CM to give the deregistration results of the corresponding slave CM. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	Master CM ID	Source identifier
DestinationID	Slave CM ID	Destination identifier
Payload		
Name	Data Type	Description
NeighborCEIDList	SEQUENCE OF STRING	Neighbor CE ID list
The message contents below are repeated for each neighbor CE		
NeighborCEID	STRING	Neighbor CE ID
DeregistrationStatus	BOOLEAN	Status of de-registration <ul style="list-style-type: none"> True: De-registration of the corresponding TVBD is succeed. False: De-registration of the corresponding TVBD is failed.

6.3.1.13 Authentication_Request

This message is sent from CE to CM to login to CM. Also, this message is sent from CM to CDIS to login to CDIS.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CE_ID or CM_ID	CX_ID	Source identifier
DestinationIdentifier = CM_ID or CDIS_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
ClientID	IA5String	Client ID (client is CE or CM)
ClientPW	IA5String	Client password (client is CE or CM)

6.3.1.14 Authentication_Response

This message is sent from CM to CE to confirm or reject CE authentication. Also, this message is sent from CDIS to CM to confirm or reject CM authentication.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CM_ID or CDIS_ID	CX_ID	Source identifier
DestinationIdentifier = CE_ID or CM_ID	CX_ID	Destination identifier
ACK Policy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
ServerID	IA5String	Server ID (server is CM or CDIS)
ServerPW	IA5String	Server password (server is CM or CDIS)
Status	STATUS	Status

6.3.1.15 Deauthentication_Request

This message is sent from CE to CM to logoff from CM. Also, this message is sent from CM to CDIS to logoff from CDIS.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CE_ID or CM_ID	CX_ID	Source identifier
DestinationIdentifier = CM_ID or CDIS_ID	CX_ID	Destination identifier
ACK Policy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
ClientID	IA5String	Client ID (client is CE or CM)
ClientPW	IA5String	Client password (client is CE or CM)
Reason	REASON	Reason

6.3.1.16 Deauthentication_Response

This message is sent from CM to CE to confirm or reject CE deauthentication. Also, this message is sent from CDIS to CM to confirm or reject CM deauthentication.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CM_ID or CDIS_ID	CX_ID	Source identifier
DestinationIdentifier = CE_ID or CM_ID	CX_ID	Destination identifier
ACK Policy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
ServerID	IA5String	Server ID (server is CM or CDIS)
ServerPW	IA5String	Server password (server is CM or CDIS)
Status	STATUS	Status

6.3.1.17 CE_Registration_Request

This message is sent from CE to CM to register information of TVBD network or device served by this CE to CM. This message is used for initial registration or for registration update.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CE_ID	CX_ID	Source identifier
DestinationIdentifier = CM_ID	CX_ID	Destination identifier
ACK Policy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
OperationCode	OPERATION_CODE	Indicates whether this is new registration or registration update
NetworkID	NETWORK_ID	E.g., FCC ID of TVBD network or device
NetworkType	NETWORK_TYPE	E.g., 802.11af, 802.22
SubscrCoexService	SUBSCR_COEX_SERVICE	Coexistence service to which TVBD network or device served by this CE is subscribed
OperatingChannel	OPERATING_CHANNEL	Operating channels if any
ServiceAreaInfo	SERVICE_AREA	Service area related information
InterferenceAreaInfo	INTERFERENCE_AREA	Interference area related information

6.3.1.18 CM_Registration_Request

This message is sent from CM to CDIS to register information of TVBD networks or devices served by this CM to CDIS. This message is used for initial registration or for registration update.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CM_ID	CX_ID	Source identifier
DestinationIdentifier =	CX_ID	Destination identifier

CDIS_ID		
ACK Policy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
Note: For each TVBD network or device, the information elements below are repeated.		
OperationCode	OPERATION_CODE	Indicates whether this is new registration, adding registration, modifying registration, or removing registration
NetworkID	NETWORK_ID	E.g., FCC ID of TVBD network or device
NetworkType	NETWORK_TYPE	E.g., 802.11af, 802.22
SubscrCoexService	SUBSCR_COEX_SERVICE	Coexistence service to which TVBD network or device served by this CE is subscribed
OperatingChannel	OPERATING_CHANNEL	Operating channels if any
ServiceAreaInfo	SERVICE_AREA	Service area related information
InterferenceAreaInfo	INTERFERENCE_AREA	Interference area related information

6.3.1.19 Registration_Response

This message is sent from CM to CE to confirm the registration. Also, this message is sent from CDIS to CM to confirm the registration.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CM_ID or CDIS_ID	CX_ID	Source identifier
DestinationIdentifier = CE_ID or CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
Status	STATUS	Status

6.3.1.20 Deregistration_Announcement

This message is sent from CM to CE to announce to CE that it will start deregistration procedure. This message does not have any payload.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CM_ID	CX_ID	Source identifier
DestinationIdentifier = CE_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
None	None	None

6.3.1.21 Deregistration_Request

This message is sent from CE to CM to remove its registered record from CM. Also, this message is sent from CM to CDIS to remove its registered record from CDIS.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CE_ID or CM_ID	CX_ID	Source identifier
DestinationIdentifier = CM_ID or CDIS_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
Reason	REASON	Reason

6.3.1.22 Deregistration_Confirm

This message is sent from CM to CE to confirm deregistration. Also, this message is sent from CDIS to CM to confirm deregistration.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CM_ID or CDIS_ID	CX_ID	Source identifier
DestinationIdentifier = CE_ID or CM_ID	CX_ID	Destination identifier
ACK Policy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
Status	STATUS	Status

6.3.1.23 Connection_Request

This message is sent from CE to CM to check CM availability. Also this message is sent from CM to CDIS to check CDIS availability. This message does not have payload.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CE_ID or CM_ID	CX_ID	Source identifier
DestinationIdentifier = CM_ID or CDIS_ID	CX_ID	Destination identifier
ACK Policy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
None	None	None

6.3.1.24 Connection_Response

This message is sent from CM to CE to indicate CM availability to provide service for the CE. Also this message is sent from CDIS to CM to indicate CDIS availability to provide service for the CM. This message does not have payload.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CDIS_ID	CX_ID	Source identifier
DestinationIdentifier = CM_ID	CX_ID	Destination identifier
ACK Policy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
None	None	None

6.3.1.25 Registration_Request

This message is sent from CE to CM to set up a connection to with CM. Also this message is sent from CM to CDIS or CM to CM.

Header		
<i>Name</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier	COEX_ID	CE/CM identifier
DestinationIdentifier	COEX_ID	CM/CDIS identifier
InformationType	COEX_INFO_TYPE	Message type
DialogToken	Integer	Message sequence number
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
Geolocation (<i>optional</i>)	GEO_LOC	Registrar geolocation of TVBD

6.3.1.26 Registration_Response

This message is sent from CM to CE. This message contains the result of requested connection setup.

Header		
<i>Name</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier	COEX_ID	CE/CM identifier
DestinationIdentifier	COEX_ID	CM/CDIS identifier
InformationType	COEX_INFO_TYPE	Message type
DialogToken	Integer	Message sequence number
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
StatusCode	STATUS_CODE	Status

6.3.2 Coexistence resource allocation procedure message

6.3.2.1 Resource_Request

This message is sent from CE to CM to request to allocate resource. This message contains each of TVBD device or network's information including available channel list obtained from TVWS DB.

Header		
<i>Name</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier	COEX_ID	CE identifier
DestinationIdentifier	COEX_ID	CM identifier
InformationType	COEX_INFO_TYPE	Message type
DialogToken	Integer	Message sequence number
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
Note: Information elements below are repeated for each TVBD device or network		
TVBDType	TVBD_TYPE	TVBD device or network type
Geolocation	GEO_LOC	Registered geolocation
Note: Information elements below are repeated for each available channel of TVBD.		
ChannelNumber	Integer	Channel number
MaximumPowerLevel	Real	Power limit
ChannelLoad (<i>optional</i>)	Real	Expected throughput

6.3.2.2 Resource_Response

This message is sent from CM to allocate resources to requested CE.

Header		
<i>Name</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier	COEX_ID	CM identifier
DestinationIdentifier	COEX_ID	CE identifier
InformationType	COEX_INFO_TYPE	Message type
DialogToken	Integer	Message sequence number
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
Note: Information elements below are repeated for each allocated channel for CE		
ChannelNumber	Integer	Channel number
MaximumPowerLevel	Real	Power limit

6.3.3 Coexistence information gathering procedure message

6.3.3.1 CM_CI_REQ

This message is for all topologies. This message used by CDIS is transmitted to (master/slave) CM to request coexistence information of the corresponding (master/slave) CM. Also, this message is sent from CE to (master/slave) CM. The contents of this message are given as follows

Header

Name	Data Type	Description
SourceID	CDIS ID/CE ID	Source identifier
DestinationID	(Master/Slave) CM ID	Destination identifier
Payload		
Name	Data Type	Description
RegisteredCMInformationIDs	COEX_CM_INFO_IDS	Registered CM information IDs <ul style="list-style-type: none"> • Registered CE ID list • Registered CEs information <ul style="list-style-type: none"> ✓ Operating channel list ✓ TVBD type ✓ Network type ✓ Antenna gain ✓ Antenna Height ✓ Geolocaiton ✓ Coverage ✓ Interference range ✓ Reconfiguraiton options

6.3.3.2 CM_CI_RSP

This message is for all topologies. This message used by (master/slave) CM is transmitted to CDIS to give the coexistence information of corresponding (master/slave) CM. Also, this message is sent from (master/slave) CM to CE. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	(Master/Slave) CM ID	Source identifier
DestinationID	CDIS ID/CE ID	Destination identifier
Payload		
Name	Data Type	Description
RegisteredCEIDList	SEQUENCE OF STRING	Registered CE ID list
The message contents below are repeated for each registered CE		
RegisteredCEID	STRING	Registered CE ID
RegisteredCEOperatingChannelList	SEQUENCE OF INTEGER	TVBD operating channe list
RegisteredCETVBDType	COEX_TVBD_TYPE	TVBD type, categorized by <ul style="list-style-type: none"> • Fixed device type • Personal/portable mode I type • Personal/portable mode II type
RegisteredCENetworkType	COEX_TVBD_NET_TYPE	TVBD network type such as IEEE 802.11af, IEEE 802.22 and IEEE 802.16, etc.
RegisteredCEAntennaGain	REAL	TVBD antenna gain
RegisteredCEAntennaHeight	REAL	TVBD antenna height
RegisteredCEGeolocation	COEX_TVBD_GEOLOCATION	TVBD geolocation, including <ul style="list-style-type: none"> • Latitude • Longitude • Altitude
RegisteredCECoverage	REAL	TVBD coverage for

		communications
RegisteredCEInterferenceRange	REAL	TVBD interference range
RegisteredCEReconfigurationOptions	COEX_TVBD_RC_OPTIONS	Reconfiguration options of TVBD such as <ul style="list-style-type: none"> • Reconfigurable TVWS channel list • Resolution of transmit power control • Range of transmit power • Reconfigurable antenna polarization list • Resolution of antenna half power beam width (HPBW) control • Range of HPBW

6.3.3.3 CE_CI_REQ

This message is for all topologies. This message used by (master/slave) CM is transmitted to CE to request coexistence information of the corresponding TVBD. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	(Master/Slave) CM ID	Source identifier
DestinationID	CE ID	Destination identifier
Payload		
Name	Data Type	Description
TVBDInformationIDs	COEX_TVBD_INFO_IDS	TVBD information IDs <ul style="list-style-type: none"> • TVBD operating channel list • TVBD type • TVBD network type • TVBD antenna gain • TVBD antenna height • TVBD aeolocation • TVBD coverage • TVBD interference range • TVBD reconfiguration options

6.3.3.4 CE_CI_RSP

This message is for all topologies. This message used by CE is transmitted to (master/slave) CM to give the coexistence information of corresponding CE. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	CE ID	Source identifier
DestinationID	(Master/Slave) CM ID	Destination identifier
Payload		
Name	Data Type	Description

TVBDOperatingChannelList	SEQUENCE OF INTEGER	TVBD operating channel number list
TVBDType	COEX_TVBD_TYPE	TVBD type, categorized by <ul style="list-style-type: none"> • Fixed device type • Personal/portable mode I type • Personal/portable mode II type
TVBDNetworkType	COEX_TVBD_NET_TYPE	TVBD network type such as IEEE 802.11af, IEEE 802.22 and IEEE 802.16, etc.
TVBDAntennaGain	REAL	TVBD antenna gain
TVBDAntennaHeight	REAL	TVBD antenna height
TVBDGeolocation	COEX_TVBD_GEOLOCATION	TVBD geolocation, including <ul style="list-style-type: none"> • Latitude • Longitude • Altitude
TVBDCoverage	REAL	TVBD coverage for communications
TVBDInterferenceRange	REAL	TVBD interference range
TVBDReconfigurationOptions	COEX_TVBD_RC_OPTIONS	Reconfiguration options of TVBD such as <ul style="list-style-type: none"> • Reconfigurable TVWS channel list • Resolution of transmit power control • Range of transmit power • Reconfigurable antenna polarization list • Resolution of antenna half power beam width (HPBW) control • Range of HPBW

6.3.3.5 CDIS_CI_REQ

This message is for all topologies. This message used by (master/slave) CM is transmitted to CDIS to request coexistence information of the neighbor (master/slave) CM for neighbor discovery. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	(Master/Slave) CM ID	Source identifier
DestinationID	CDIS ID	Destination identifier
Payload		
Name	Data Type	Description
NeighborList	SEQUENCE OF STRING	Neighbor list such as <ul style="list-style-type: none"> • Neighbor CM ID list • Neighbor CE ID list
NeighborCMsInformationIDs	COEX_CM_INFO_IDS	Neighbor CMs information IDs <ul style="list-style-type: none"> • Neighbor CM ID list • Neighbor CMs information • Neighbor CE ID list • Neighbor CEs information

6.3.3.6 CDIS_CI_RSP

This message is for all topologies. This message used by CDIS is transmitted to (master/slave) CM to give coexistence information of the neighbor (master/slave) CM for neighbor discovery. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	CDIS ID	Source identifier
DestinationID	(Master/Slave) CM ID	Destination identifier
Payload		
Name	Data Type	Description
NeighborCMIDList	SEQUENCE OF STRING	When this content is null from the (master/slave) CM message, a default value is all neighbor CM ID list
The message contents below are repeated for each neighbor CM		
NeighborCMID	STRING	Neighbor CM ID
NeighborCEIDList	SEQUENCE OF STRING	When this content is null from the (master/slave) CM message, a default value is all neighbor CE ID list
The message contents below are repeated for each neighbor CE		
NeighborCEsInformation	COEX_CE_INFO	Neighbor CEs information <ul style="list-style-type: none"> • Operating channel list • TVBD type • Network type • Antenna gain • Antenna height • Geolocation • Coverage • Interference range • Reconfiguration options

6.3.3.7 NCM_CI_REQ

This message is for the distributed topology. This message used by CM is transmitted to neighbor CM to request coexistence information of corresponding neighbor CM. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	CM ID	Source identifier
DestinationID	Neighbor CM ID	Destination identifier
Payload		
Name	Data Type	Description
NeighborCEIDList	SEQUENCE OF STRING	Neighbor CE ID list to collect context information
NeighborCEInformationIDs	COEX_CE_INFO_IDS	Neighbor CEs information <ul style="list-style-type: none"> • Operating channel list • TVBD type • Network type

		<ul style="list-style-type: none"> • Antenna gain • Antenna height • Geolocaliton • Coverage • Interference range • Reconfiguration options
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6.3.3.8 NCM_CI_RSP

This message is for the distributed topology. This message used by neighbor CM is transmitted to CM to give the coexistence information of corresponding neighbor CM. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	Neighbor CM ID	Source identifier
DestinationID	CM ID	Destination identifier
Payload		
Name	Data Type	Description
NeighborCMChannelClassificationList	COEX_CH_CLASSIFICATION	Neighbor CM channel classification list
NeighborCEIDList	SEQUENCE OF STRING	Neighbor CE ID list
The message contents below are repeated for each neighbor CE		
NeighborCEID	STRING	Neighbor CE ID
NeighborCEOperatingChannelList	COEX_CH_CLASSIFICATION	TVBD operating channe list
NeighborCETVBDType	COEX_TVBD_TYPE	TVBD type, categorized by <ul style="list-style-type: none"> • Fixed device type • Personal/portable mode I type • Personal/portable mode II type
NeighborCENetworkType	COEX_TVBD_NET_TYPE	TVBD network type such as IEEE 802.11af, IEEE 802.22 and IEEE 802.16, etc.
NeighborCEAntennaGain	REAL	TVBD antenna gain
NeighborCEAntennaHeight	REAL	TVBD antenna height
NeighborCEGeolocation	COEX_TVBD_GEOLOCATION	TVBD geolocation, including <ul style="list-style-type: none"> • Latitude • Longitude • Altitude
NeighborCECoverage	REAL	TVBD coverage for communications
NeighborCEInterferenceRange	REAL	TVBD interference range
NeighborCEReconfigurationOptions	COEX_TVBD_RC_OPTIONS	Reconfiguration options of TVBD such as <ul style="list-style-type: none"> • Reconfigurable TVWS channel list • Resolution of transmit power control

		<ul style="list-style-type: none"> • Range of transmit power • Reconfigurable antenna polarization list • Resolution of antenna half power beam width (HPBW) control • Range of HPBW
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6.3.3.9 SCM_CI_REQ

This message is for the centralized topology. This message used by master CM is transmitted to slave CM to request coexistence information of the corresponding slave CM for the centralized topology. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	Master CM ID	Source identifier
DestinationID	Slave CM ID	Destination identifier
Payload		
Name	Data Type	Description
RegisteredCMInformationID	COEX_CM_INFO_IDS	Registered CM information IDs <ul style="list-style-type: none"> • Registered CE ID list • Registered CEs information <ul style="list-style-type: none"> ✓ Operating channel list ✓ TVBD type ✓ Network type ✓ Antenna gain ✓ Antenna Height ✓ Geolocaiton ✓ Coverage ✓ Interference range ✓ Reconfiguraiton options
NeighborCMsInformationIDs	COEX_CM_INFO_IDS	Neighbor CMs information IDs <ul style="list-style-type: none"> • Neighbor CM ID list • Neighbor CE ID list

6.3.3.10 SCM_CI_RSP

This message is for the centralized topology. This message used by slave CM is transmitted to master CM to give coexistence information of corresponding slave CM. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	Slave CM ID	Source identifier
DestinationID	Master CM ID	Destination identifier
Payload		
Name	Data Type	Description
RegisteredCEIDList	SEQUENCE OF STRING	Registered CE ID list

The message contents below are repeated for each registered CE		
RegisteredCEInformation	COEX_CE_INFO	Registered CE information <ul style="list-style-type: none"> • Registered CE ID • Registered CE information <ul style="list-style-type: none"> ✓ Operating channel list ✓ TVBD type ✓ Network type ✓ Antenna gain ✓ Antenna Height ✓ Geolocaition ✓ Coverage ✓ Interference range ✓ Reconfiguraiton options
NeighborCMIDList	SEQUENCE OF STRING	Neighbor CM ID list
The message contents below are repeated for each neighbor CM		
NeighborCMID	STRING	Neighbor CM ID
NeighborCEIDList	SEQUENCE OF STRING	Neighbor CE ID list
NeighborCEChannelNumberList	SEQUENCE OF INTEGER	Neighbor CE channel number list

6.3.4 Information collection procedure message

6.3.4.1 InfoAcquiring_Request

This message is sent from CM to CE to request CE to obtain information from TVBD network or device. Also, this message is sent from CM to another CM to obtain information from this CM.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CM_ID	CX_ID	Source identifier
DestinationIdentifier = CE_ID or CM_ID	CX_ID	Destination identifier
ACK Policy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
ReqInfoDescr	REQ_INFO_DESCR	Requested information ID

6.3.4.2 InfoAcquiring_Response

This message is sent from CE to CM to provide requested information to CM. Also, this message is sent from CM to another CM to provide requested information to this CM.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CE_ID or	CX_ID	Source identifier

CM_ID		
DestinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
ReqInfo	REQ_INFO	Requested information value

6.3.5 Neighbor discovery procedure message

6.3.5.1 CM_ND_REQ

This message is for all topologies. This message used by (master/slave) CM is transmitted to CDIS to request inter-CM TVBD neighbor discovery information of the corresponding (master/slave) CM. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	(Master/Slave) CM ID	Source identifier
DestinationID	CDIS ID	Destination identifier
Payload		
Name	Data Type	Description
None		

6.3.5.2 CM_ND_RSP

This message is for all topologies. This message used by CDIS is transmitted to (master/slave) CM to give inter-CM TVBD neighbor discovery information of corresponding (master/slave) CM. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	CDIS ID	Source identifier
DestinationID	(Master/Slave) CM ID	Destination identifier
Payload		
Name	Data Type	Description
CMFunction	COEX_CM_FUNC	To command a function of corresponding CM for the centralized topology <ul style="list-style-type: none"> • Master CM • Slave CM
NeighborCMIDList	SEQUENCE OF STRING	Neighbor CM ID list
The message contents below are repeated for each neighbor CM		
NeighborCMID	STRING	Neighbor CM ID
NeighborCEIDList	SEQUENCE OF STRING	Neighbor CE ID list
NeighborCEChannelNumberList	SEQUENCE OF INTEGER	Neighbor CE channel number list

6.3.5.3 TVBD_ND_REQ

This message is for all topologies. This message used by CE is transmitted to (master/slave) CM to request intra/inter-CM neighbor discovery information of the corresponding CM. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	CE ID	Source identifier
DestinationID	(Master/Slave) CM ID	Destination identifier
Payload		
Name	Data Type	Description
None		

6.3.5.4 TVBD_ND_RSP

This message is for all topologies. This message used by (master/slave) CM is transmitted to CE to give inter/intra-CM neighbor discovery information of corresponding CM. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	(Slave/Master) CM ID	Source identifier
DestinationID	CE ID	Destination identifier
Payload		
Name	Data Type	Description
NeighborCMIDList	SEQUENCE OF STRING	Neighbor CM ID list
The message contents below are repeated for each neighbor CM		
NeighborCMID	STRING	Neighbor CM ID
NeighborCEIDList	SEQUENCE OF STRING	Neighbor CE ID list
NeighborCEChannelNumberList	SEQUENCE OF INTEGER	Neighbor CE channel number list

6.3.5.5 CE_NeighbourList_Announcement

This message is sent from CM to CE for CM to provide neighbour information to CE.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CM_ID	CX_ID	Source identifier
DestinationIdentifier = CE_ID	CX_ID	Destination identifier
ACK Policy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
Note: Information elements below are repeated for each neighbour network.		
NetworkID	NETWORK_ID	E.g., FCC ID of TVBD network or device
NetworkType	NETWORK_TYPE	E.g., 802.11af, 802.22
OperatingChannel	OPERATING_CHANNEL	Operating channels if any

6.3.5.6 CM_NeighbourList_Announcement

This message is sent from CDIS to CM for CDIS to provide neighbour information regarding TVBD network or device mentioned in the request to CM.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CDIS_ID	CX_ID	Source identifier
DestinationIdentifier = CM_ID	CX_ID	Destination identifier
ACK Policy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
Note: Information elements below are repeated for each neighbour CM.		
NeighbourCMID = CM_ID	CX_ID	Neighbour CM ID
Note: Information elements below are repeated for each neighbour network.		
NetworkID	NETWORK_ID	E.g., FCC ID of TVBD network or device
NetworkType	NETWORK_TYPE	E.g., 802.11af, 802.22
OperatingChannel	OPERATING_CHANNEL	Operating channels if any

6.3.5.7 Neighbourlist_Request

This message is sent from CM to CDIS to get its candidate neighbour list.

Header		
<i>Name</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier	COEX_ID	CM identifier
DestinationIdentifier	COEX_ID	CDIS identifier
InformationType	COEX_INFO_TYPE	Message type
DialogToken	Integer	Message sequence number
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
Note: Information elements below are repeated for each CM		
CM identifier	COEX_ID	CM may request neighbour list of another CM it serves
Note: Information elements below are repeated for each registered CE		
CE identifier	COEX_ID	Registered CE
Note: Information elements below are repeated for each TVBD device or network		
TVBDType	TVBD_TYPE	TVBD device or network type
Geolocation	GEO_LOC	Registered geolocation
Note: Information elements below are repeated for each available channel of TVBD.		
ChannelNumber	Integer	Channel number
MaximumPowerLevel	Real	Power limit

6.3.5.8 Neighbourlist_Response

This message is sent from CDIS to CM to provide candidate neighbour information.

Header

<i>Name</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier	COEX_ID	CM identifier
DestinationIdentifier	COEX_ID	CDIS identifier
InformationType	COEX_INFO_TYPE	Message type
DialogToken	Integer	Message sequence number
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
Note: Information elements below are repeated for each CM		
CM identifier	COEX_ID	CM may request neighbour list of another CM it serves
Note: Information elements below are repeated for each registered CE		
CE identifier	COEX_ID	Registered CE
Note: Information elements below are repeated for each TVBD device or network		
TVBDAddress	OCTET(6)	MAC address of TVBD
Note: Information elements below are repeated for each channel which has neighbor TVBD		
ChannelNumber	Integer	Channel number
Note: Information elements below are repeated for each neighbor TVBD device or network		
NeighbourCM	COEX_ID	Neighbour CM identifier
NeighbourCE	COEX_ID	Neighbour CE identifier
NeighbourTVBDAddress	OCTET(6)	MAC address of neighbour TVBD

6.3.6 Get available channel list procedure message

6.3.6.1 GetAvailableChannels_Request

This message is sent from CM to CE to request available channel list from CE. Also this message is sent from CM to CDIS/TVWSDB for CM to request available channel list for a particular TVBD network or device from CDIS/TVWSDB. This message does not have payload.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CM_ID	CX_ID	Source identifier
DestinationIdentifier = CE_ID or CDIS_ID or TVWSDB_ID	CX_ID	Destination identifier
ACK Policy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
None	None	None

6.3.6.2 GetAvailableChannels_Response

This message is sent from CE to CM to provide available channel list to CM. Also, this message is sent from CDIS/TVWSDB to CM for CDIS/TVWSDB to provide available channel list to CM.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CE_ID or CDIS_ID or TVWSDB_ID	CX_ID	Source identifier
DestinationIdentifier = CM_ID	CX_ID	Destination identifier
ACK Policy	BOOLEAN	Request to send acknowledgement of

		reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
AvailableChsNumber	INTEGER	Number of available channels
RegDomain	REG_DOMAIN	Regulatory domain
Note: Information elements below are repeated for each available channel.		
ChannelNumber	INTEGER	Channel number
TransmitPowerLimit	REAL	Transmit power limit

6.3.7 Channel list update procedure message

6.3.7.1 AvailableChannels_Announcement

This message is sent from CDIS/TVWSDB to CM to provide available channel list to CM.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CDIS_ID or TVWSDB_ID	CX_ID	Source identifier
DestinationIdentifier = CM_ID	CX_ID	Destination identifier
ACK Policy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
AvailableChsNumber	INTEGER	Number of available channels
RegDomain	REG_DOMAIN	Regulatory domain
Note: Information elements below are repeated for each available channel.		
ChannelNumber	INTEGER	Channel number
TransmitPowerLimit	REAL	Transmit power limit

6.3.8 Channel classification procedure message

6.3.8.1 TVWSDB_CC_REQ

This message is for all topologies. This message used by (master/slave) CM or CDIS is transmitted to TVWS DB to request information of the allowed TVWS channel list. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	(Master/Slave) CM ID/CDIS ID	Source identifier
DestinationID	TVWS DB ID	Destination identifier
Payload		
Name	Data Type	Description
TVWSDBInformationIDs	COEX_TVWSDB_INFO_INS	TVWS DB information IDs <ul style="list-style-type: none"> • Allowed TVWS channel list • Channel use constraint

6.3.8.2 TVWSDB_CC_RSP

This message is for all topologies. This message used by TVWS DB is transmitted to (master/slave) CM or CDIS to give information of the allowed TVWS channel list. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	TVWS DB ID	Source identifier
DestinationID	(Master/Slave) CM ID/ CDIS ID	Destination identifier
Payload		
Name	Data Type	Description
AllowedTVWSChannelList	SEQUENCE OF INTEGER	Allowed TVWS channel number list
ChannelUseContrain	COEX_CH_USE_CONT	Channel use constraint

6.3.8.3 CDIS_CC_REQ

This message is for all topologies. This message used by (master/slave) CM is transmitted to CDIS to request channel classificaiton information of the corresponding neighbor (master/slave) CM. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	(Master/Slave) CM ID	Source identifier
DestinationID	CDIS ID	Destination identifier
Payload		
Name	Data Type	Description
ChannelClassificationInformaitonIDs	COEX_CH_INFO_IDS	Information ID such as <ul style="list-style-type: none"> • Channel classification of the registered CM • Channel classification of the neighbor CM
RegisteredCMID	STRING	Registered CM ID
NeighborCMIDList	SEQUENCE OF STRING	Neighbor CM ID list

6.3.8.4 CDIS_CC_RSP

This message is for all topologies. This message used by CDIS is transmitted to (master/slave) CM to give channel classificaiton information of corresponding neighbor (master/slave) CM. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	CDIS ID	Source identifier
DestinationID	(Master/Slave) CM ID	Destination identifier
Payload		
Name	Data Type	Description
RegisteredCMID	STRING	Registered CM ID
RegisteredCMChannelClassificationList	COEX_CH_CLASSIFICATION	Channel classification of registered CM such as <ul style="list-style-type: none"> • Allowed channel list • Available channel list • Available channel list

		with neighbor <ul style="list-style-type: none"> • Restricted channel list • Restricted channel list with neighbor
NeighborCMIDList	SEQUENCE OF STRING	Neighbor CM ID list
The message contents below are repeated for each neighbor CM		
NeighborCMID	STRING	Neighbor CM ID
NeighborCMChannelClassificationList	COEX_CH_CLASSIFICATION	Channel classification of neighbor CM such as <ul style="list-style-type: none"> • Allowed channel list • Available channel list • Available channel list with neighbor • Restricted channel list • Restricted channel list with neighbor

6.3.8.5 CM_CC_REQ

This message is for all topologies. This message used by CDIS is transmitted to (master/slave) CM to request channel classification information of the corresponding (master/slave) CM. Also, this message is sent from CE to (master/slave) CM. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	CDIS ID/ CE ID	Source identifier
DestinationID	(Master/Slave) CM ID	Destination identifier
Payload		
Name	Data Type	Description
None		

6.3.8.6 CM_CC_RSP

This message is for all topologies. This message used by (master/slave) CM is transmitted to CDIS to give the channel classification information of corresponding (master/slave) CM. Also, this message is sent from (master/slave) CM to CE. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	(Master/Slave) CM ID	Source identifier
DestinationID	CDIS ID/CE ID	Destination identifier
Payload		
Name	Data Type	Description
RegisteredCMChannelClassificationList	COEX_CH_CLASSIFICATION	Registered CM channel classification list

6.3.9 Coexistence decision making procedure messages

6.3.9.1 SCM_COM_REQ

This message is for the centralized topology. This message used by master CM is transmitted to slave CM to give reconfiguration command of the corresponding slave CM. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	Master CM ID	Source identifier
DestinationID	Slave CM ID	Destination identifier
Payload		
Name	Data Type	Description
NeighborCEIDList	SEQUENCE OF STRING	Neighbor CE ID list included in corresponding slave CM
The message contents below are repeated for each CE		
NeighborCEID	STRING	Neighbor CE ID included in corresponding slave CM
CoexistenceMode	COEX_MODE	Coexistence mode such as <ul style="list-style-type: none"> • Individual channel assignment mode • Co-channel sharing mode
ChannelClassificationList	COEX_CH_CLASSIFICATION	Channel classification list such as <ul style="list-style-type: none"> • Allowed channel list • Available channel list • Restricted channel list
ServiceDuration	INTEGER	Service duration
ServiceCoverage	REAL	Service coverage for communications
ReconfigurationOptions	COEX_RC_OPTIONS	Reconfiguration options of CE for coexistence <ul style="list-style-type: none"> • Transmit power • Antenna polarization • Antenna HPBW

6.3.9.2 SCM_COM_RSP

This message is for the centralized topology. This message used by slave CM is transmitted to master CM to give the reconfiguration response of corresponding slave CM. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	Slave CM ID	Source identifier
DestinationID	Master CM ID	Destination identifier
Payload		
Name	Data Type	Description
NeighborCEIDList	SEQUENCE OF STRING	Neighbor CE ID list included in corresponding slave CM
The message contents below are repeated for each neighbor CE		
NeighborCEID	STRING	Neighbor CE ID included in corresponding slave CM

ReconfigurationParameters	COEX_RC_PARAMETER S	The status information of reconfiguration parameters is provided with <ul style="list-style-type: none"> • accepted values of parameters when reconfiguration is succeed • recommended values of parameters when reconfiguration is failed
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6.3.9.3 CM_NEG_REQ

This message is for the distributed topology. When CM₁ and CM₂ are neighbor relation, this message used by CM₁ is transmitted to CM₂ to give negotiation information of the corresponding CM. Also, this message is sent from CM₂ to CM₁. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	CM ₁ ID/ CM ₂ ID	Source identifier
DestinationID	CM ₂ ID/ CM ₁ ID	Destination identifier
Payload		
Name	Data Type	Description
NeighborCEIDList	SEQUENCE OF STRING	Neighbor CE ID list included in corresponding CM ₁ ID/ CM ₂ ID
The message contents below are repeated for each neighbor CE		
NeighborCEID	STRING	Neighbor CE ID included in corresponding CM ₁ ID/ CM ₂ ID
ServiceChannelNumbers	SEQUENCE OF INTEGER	Selected service TVWS channel number
ServiceDuration	INTEGER	Service duration
ServiceCoverage	REAL	Service coverage for communications

6.3.9.4 CM_NEG_RSP

This message is for the distributed topology. When CM₂ is received CM_NEG_REQ message from CM₁, this message used by CM₂ is transmitted to CM₁ to give the negotiation response of corresponding CM₂. Also, this message is sent from CM₁ to CM₂ when CM₁ received CM_NEG_REQ message from CM₂. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	CM ₂ ID/ CM ₁ ID	Source identifier
DestinationID	CM ₁ ID/ CM ₂ ID	Destination identifier
Payload		
Name	Data Type	Description
NeighborCEIDList	SEQUENCE OF STRING	Neighbor CE ID list included in corresponding CM ₁ ID/ CM ₂ ID
The message contents below are repeated for each neighbor CE		
NeighborCEID	STRING	Neighbor CE ID included in corresponding CM ₁ ID/ CM ₂ ID
NegotiationStatus	COEX_NE_STATUS	The negotiation status of service parameters is provided with <ul style="list-style-type: none"> • accepted values of parameters when negotiation is succeed • recommended values of parameters when negotiaiton is failed

6.3.10 Reconfiguration procedure message/command procedure message

6.3.10.1 CE_RC_REQ

This message is for centralized and distributed topologies. This message used by (master/slave) CM is transmitted to CE to give reconfiguration command of the corresponding CE. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	(Master/Slave) CM ID	Source identifier
DestinationID	CE ID	Destination identifier
Payload		
Name	Data Type	Description
CoexistenceMode	COEX_MODE	Coexistence mode such as <ul style="list-style-type: none"> • Individual channel assignment mode • Co-channel sharing mode
ChannelClassificationList	COEX_CH_CLASSIFICATION	Channel classification list such as <ul style="list-style-type: none"> • Allowed channel list • Available channel list • Restricted channel list
ServiceDuration	INTEGER	Service duration
ServiceCoverage	REAL	Service coverage for communications
ReconfigurationOptions	COEX_RC_OPTIONS	Reconfiguration options of CE for coexistence <ul style="list-style-type: none"> • Transmit power • Antenna polarization • Antenna HPBW

6.3.10.2 CE_RC_RSP

This message is for centralized and distributed topologies. This message used by CE is transmitted to (master/slave) CM to give the reconfiguration response of corresponding CE. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	CE ID	Source identifier
DestinationID	(Master/Slave) CM ID	Destination identifier
Payload		
Name	Data Type	Description
ReconfigurationParameters	COEX_RC_PARAMETERS	The status information of reconfiguration parameters is provided with <ul style="list-style-type: none"> • accepted values of parameters when reconfiguration is succeed • recommended values of parameters when reconfiguration is failed

6.3.10.3 Reconfiguration_Request

This message is sent from CM to CE to request reconfiguration of TVBD network or device served by this CE.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CM_ID	CX_ID	Source identifier
DestinationIdentifier = CE_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
ReconfigRequest	RECONFIG_REQUEST	Reconfiguration request description

6.3.10.4 Reconfiguration_Confirm

This message is sent from CE to CM to report the result of the requested reconfiguration of TVBD network or device served by this CE.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CE_ID	CX_ID	Source identifier
DestinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
Status	STATUS	Status

6.3.10.5 Command_Request

This message is sent from CM to CE to request reconfiguration of CE or TVBD devices or networks served by the CE.

Header		
<i>Name</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier	COEX_ID	CM identifier
DestinationIdentifier	COEX_ID	CDIS identifier
InformationType	COEX_INFO_TYPE	Message type
DialogToken	Integer	Message sequence number
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
Note: Information elements below are repeated for each CMD_TYPE		
CommandType	CMD_TYPE	Command type
CommandRequest	Defined in 6.3.10.5	Command request description

6.3.10.5.1 CommandRequest element of TVBD deenablement

A CommandType may indicate TVBD deenablement. The corresponding CommandRequest element is as follows.

<i>Information subelement</i>	<i>Data type</i>	<i>Description</i>
TVBDAddress	OCTET(6)	MAC address of a TVBD to be deenabled
Note: Information subelements below are repeated for each channel to be deenabled		
ChannelNumber	INTEGER	TV channel number for which

		deenablement applies.
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6.3.10.6 Command_Confirm

This message is sent from CM to CE to report the reconfiguration result.

Header		
<i>Name</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier	COEX_ID	CE identifier
DestinationIdentifier	COEX_ID	CM identifier
InformationType	COEX_INFO_TYPE	Message type
DialogToken	Integer	Message sequence number
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
Note: Information elements below are repeated for each CMD_TYPE		
CommandType	CMD_TYPE	Command type
StatusCode	STATUS_CODE	Status

6.3.11 Measurement procedure messages

6.3.11.1 CE_ME_REQ

This message is for centralized and distributed topologies. This message used by (master/slave) CM is transmitted to CE to request measurement of the corresponding CE. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	(Master/Slave) CM ID	Source identifier
DestinationID	CE ID	Destination identifier
Payload		
Name	Data Type	Description
MeasurementID	COEX_MES_ID	Measurement list such as <ul style="list-style-type: none"> • TVBD QoS • TVBD spectrum sensing
ChannelNumberList	SEQUENCE OF INTEGER	Measuring channel number list
MeasurementOptions	COEX_MES_OPTIONS	Measurement options such as <ul style="list-style-type: none"> • Measurement duration • Measurement frequency range

6.3.11.2 CE_ME_RSP

This message is for centralized and distributed topologies. This message used by CE is transmitted to (master/slave) CM to give measurement results of corresponding CE. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	CE ID	Source identifier
DestinationID	(Master/Slave) CM ID	Destination identifier
Payload		

Name	Data Type	Description
MeasurementID	COEX_MES_ID	Measurement ID
ChannelNumberList	SEQUENCE OF INTEGER	Measured channel number list
MeasurementResults	COEX_MES_RESULTS	Measurement results
MeasurementParameters	COEX_MES_OPTIONS	Actual measurement parameters such as <ul style="list-style-type: none"> • Actual measurement duration • Actual measurement frequency range

6.3.11.3 NCM_ME_REQ

This message is for centralized and distributed topologies. This message used by master CM is transmitted to slave CM to request measurement of the corresponding CE for the centralized topology. Also, this message is sent from CM to neighbor CM for the distributed topology. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	Master CM ID/ CM ID	Source identifier
DestinationID	Slave CM ID/ Neighbor CM ID	Destination identifier
Payload		
Name	Data Type	Description
RegisteredCEID	STRING	Registered CE ID
MeasurementID	COEX_MES_ID	Measurement list such as <ul style="list-style-type: none"> • TVBD QoS • TVBD spectrum sensing
ChannelNumberList	SEQUENCE OF INTEGER	Measuring channel number list
MeasurementOptions	COEX_MES_OPTIONS	Measurement options such as <ul style="list-style-type: none"> • Measurement duration • Measurement frequency range

6.3.11.4 NCM_ME_RSP

This message is for centralized and distributed topologies. This message used by slave CM is transmitted to master CM to give measurement results of corresponding CE for the centralized topology. Also, this message is sent from neighbor CM to CM for the distributed topology. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	Slave CM ID/ Neighbor CM ID	Source identifier
DestinationID	Master CM ID/ CM ID	Destination identifier
Payload		
Name	Data Type	Description
RegisteredCEID	STRING	Registered CE ID
MeasurementID	COEX_MES_ID	Measurement ID
ChannelNumberList	SEQUENCE OF INTEGER	Measured channel number list
MeasurementResults	COEX_MES_RESULTS	Measurement results
MeasurementParameters	COEX_MES_OPTIONS	Actual measurement parameters such as

		<ul style="list-style-type: none"> • Actual measurement duration • Actual measurement frequency range
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6.3.11.5 Measurement_Request

This message is sent from CM to CE to request CE to perform measurements.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CM_ID	CX_ID	Source identifier
DestinationIdentifier = CE_ID	CX_ID	Destination identifier
ACK Policy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
Note: Information elements below are repeated for each requested measurement.		
ChannelNumber	INTEGER	Channel number
MeasDescr	MEAS_DESCR	Measurement description
ReportingMode	REPORTING_MODE	Reporting mode. If reporting mode is On-demand, measurement results are not reported by CE, they are collected by CM.

6.3.11.6 Measurement_Report

This message is sent from CE to CM to report measurement results.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CE_ID	CX_ID	Source identifier
DestinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
MeasResult	MEAS_RESULT	Measurement result

6.3.11.7 Measurement_Confirm

This message is sent from CE to CM to confirm reception of measurement request. This message is also sent from CM to CE to confirm reception of measurement results.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CE_ID or CM_ID	CX_ID	Source identifier
DestinationIdentifier = CM_ID or CE_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>

Status	STATUS	Status
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6.3.11.8 Measurement_Request

This message is sent from CM to request CE to perform measurement.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier	COEX_ID	CM identifier
DestinationIdentifier	COEX_ID	CE identifier
InformationType	COEX_INFO_TYPE	Coexistence measurement request
DialogToken	Integer	Message sequence number
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
Note: Information elements below are repeated for each MEAS_TYPE		
MeasurementType	MEAS_TYPE	Measurement type
MeasurementRequest	defined in 6.3.11.8	Measurement request description

6.3.11.8.1 MeasurementRequest element of TVBD detection

A MeasurementType may indicate TVBD Detection. The MeasurementRequest element corresponding to TVBD detection request is as follows.

<i>Information subelement</i>	<i>Data type</i>	<i>Description</i>
MeasurementStartTime	OCTET(8)	The time at which the requested measurement starts. A value of 0 indicates it starts immediately.
MeasurementDuration	OCTET(2)	The time duration of the requested measurement
Note: Information subelements below are repeated for each channel to be measured		
TVChannelNumber	INTEGER	TV channel number for which the measurement request applies.

6.3.11.8.2 MeasurementRequest element of channel load information

A MeasurementType may indicate channel load information. The MeasurementRequest element corresponding to channel load information is as follows.

<i>Information subelement</i>	<i>Data type</i>	<i>Description</i>
MeasurementStartTime	OCTET(8)	The time at which the requested measurement starts. A value of 0 indicates it starts immediately.
MeasurementDuration	OCTET(2)	The time duration of the requested measurement
Note: Information subelements below are repeated for each channel to be measured		
TVChannelNumber	INTEGER	TV channel number for which the measurement request applies.

6.3.11.8.3 MeasurementRequest element of primary user detection

A MeasurementType may indicate primary user detection. The MeasurementRequest element corresponding to primary user detection report is as follows.

<i>Information subelement</i>	<i>Data type</i>	<i>Description</i>
MeasurementStartTime	OCTET(8)	The time at which the requested measurement starts. A value of 0 indicates it starts immediately.
MeasurementDuration	OCTET(2)	The time duration of the requested measurement
SpectrumSensingThreshold	OCTET(2)	The energy detection threshold for detecting the primary user, expressed in dBm.
Note: Information subelements below are repeated for each channel to be measured		
TVChannelNumber	INTEGER	TV channel number for which the measurement request applies.

6.3.11.9 Measurement_Report

This message is sent from CE to CM to provide measurement results.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier	COEX_ID	CE identifier
DestinationIdentifier	COEX_ID	CM identifier
InformationType	COEX_INFO_TYPE	Message type
DialogToken	Integer	Message sequence number
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
Note: Information elements below are repeated for each MEAS_TYPE		
MeasurementType	MEAS_TYPE	Measurement type
MeasurementReport	Defined in 6.3.11.9.1 and 6.3.11.9.2	Measurement results

6.3.11.9.1 MeasurementReport element of TVBD detection

A MeasurementType may indicate TVBD Detection. The MeasurementReport element corresponding to TVBD detection report is as follows.

<i>Information subelement</i>	<i>Data type</i>	<i>Description</i>
ActualMeasurementStartTime	OCTET(8)	The time at which the requested measurement starts. A value of 0 indicates it starts immediately.
MeasurementDuration	OCTET(2)	The time duration of the requested measurement
Note: Information subelements below are repeated for measuring TVBD		
MeasuringTVBDAddress	OCTET(6)	The MAC address of a TVBD which actually performed measurement
Note: Information subelements below are repeated for detected TVBD		

DetectedTVBDAddress	OCTET(6)	The MAC address of a TVBD which are detected on the channels it measured
DetectedTVBDType	TVBD_TYPE	Type of TVBD
RCPI	OCTET	Received channel power in a dBm scale
CEIdentifierofDetectedTVBD	OCTET(6)	CE identifier
Note: Information subelements below are repeated for each channel		
ChannelNumber	INTEGER	Channel numbers on which the measuring TVBD actually performs measurement. It shall be matched to the value of channel numbers field in the corresponding TVBD request.

6.3.11.9.2 Measurement Report element of channel load information

A MeasurementType may indicate channel load information. The MeasurementReport element corresponding to channel load information report is as follows.

<i>Information subelement</i>	<i>Data type</i>	<i>Description</i>
ActualMeasurementStartTime	OCTET(8)	The time at which the requested measurement starts. A value of 0 indicates it starts immediately.
MeasurementDuration	OCTET(2)	The time duration of the requested measurement
Note: Information subelements below are repeated for measuring TVBD		
MeasuringTVBDAddress	OCTET(6)	The MAC address of a TVBD which actually performed measurement
Note: Information subelements below are repeated for each channel		
ChannelNumber	INTEGER	Channel numbers on which the measuring TVBD actually performs measurement. It shall be matched to the value of channel numbers field in the corresponding TVBD request.
ChannelLoad	OCTET	An indicator which corresponds to the expected throughput. For example, the proportion of measurement duration for which the measuring STA determined the channel to be busy.

6.3.11.9.3 Measurement Report element of primary user detection

A MeasurementType may indicate primary user detection. The MeasurementReport element corresponding to primary user detection report is as follows.

<i>Information subelement</i>	<i>Data type</i>	<i>Description</i>
ActualMeasurementStartTime	REAL	The time at which the requested measurement starts. A value of 0 indicates it starts immediately.
MeasurementDuration	REAL	The time duration of the requested measurement
Note: Information subelements below are repeated for each channel		

TVChannelNumber	INTEGER	TV channel number for which the measurement request applies.
PrimaryUserType	PUSER_TYPE	Type of detected primary user
ReceivedPower	OCTET	Received power from detected primary users in dBm

6.3.12 Event procedure messages

6.3.12.1 CE_EV_IND

This message is for centralized and distributed topologies. This message used by CE is transmitted to (master/slave) CM to notify the detected event of corresponding CE. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	CE ID	Source identifier
DestinationID	(Master/Slave) CM ID	Destination identifier
Payload		
Name	Data Type	Description
RegisteredCEStatus	COEX_REG_CE_STATU S	Registered CE's event such as <ul style="list-style-type: none"> • TVBD QoS change • TVBD geolocation change • TVBD coverage change

6.3.12.2 CE_EV_ACK

This message is for centralized and distributed topologies. This message used by (master/slave) CM is transmitted to CE to give acknowledgment as a receipt. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	(Master/Slave) CM ID	Source identifier
DestinationID	CE ID	Destination identifier
Payload		
Name	Data Type	Description
EventAck	BOOLEAN	Acknowledgment of corresponding event as a receipt <ul style="list-style-type: none"> • True : Event receipt is succeed • False : Event receipt is failed

6.3.12.3 CDIS_EV_IND

This message is for centralized and distributed topologies. This message used by CDIS is transmitted to (master/slave) CM to notify the detected event of corresponding CDIS. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	CDIS ID	Source identifier

DestinationID	(Master/Slave) CM ID	Destination identifier
Payload		
Name	Data Type	Description
TVWSChannelStatus	COEX_TVWSCH_STATUS	Contents of TVWS channel status, given as <ul style="list-style-type: none"> Registered CDIS ID TVWS channel information event <ul style="list-style-type: none"> ✓ Allowed channel list change ✓ Use constraint change
NeighborCMsStatus	COEX_NEI_CM_STATUS	Contents of neighbor CMs status, given as <ul style="list-style-type: none"> Neighbor CM ID Neighbor CMs information event <ul style="list-style-type: none"> ✓ Channel classification list change of neighbor CMs ✓ Neighbor CE ID list change included in neighbor CMs
NeighborCEsStatus	COEX_NEI_CE_STATUS	Contents of neighbor CEs status, given as <ul style="list-style-type: none"> Neighbor CM ID Neighbor CE ID Neighbor CEs information event <ul style="list-style-type: none"> ✓ Neighbor CEs information change included in neighbor CMs

6.3.12.4 CDIS_EV_ACK

This message is for centralized and distributed topologies. This message used by (master/slave) CM is transmitted to CDIS to give acknowledgement as a receipt. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	(Master/Slave) CM ID	Source identifier
DestinationID	CDIS ID	Destination identifier
Payload		
Name	Data Type	Description
EventAck	BOOLEAN	Acknowledgment of corresponding event as a receipt <ul style="list-style-type: none"> True : Event receipt is succeed False : Event receipt is failed

6.3.12.5 CM_EV_IND

This message is for centralized and distributed topologies. This message used by (master/slave) CM is transmitted to CDIS to notify the detected event of corresponding (master/slave) CM. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	(Master/Slave) CM ID	Source identifier
DestinationID	CDIS ID	Destination identifier
Payload		
Name	Data Type	Description
RegisteredCMStatus	COEX_REG_CM_	Contents of registered CM status, given as

	STATUS	<ul style="list-style-type: none"> Registered CM ID Registered CM information event <ul style="list-style-type: none"> ✓ Channel classification list change of registered CM ✓ Registered CE ID list change
RegisteredCEsStatus	COEX_REG_CE_STATUS	Contents of registered CEs status, given as <ul style="list-style-type: none"> Registered CM ID Registered CE ID Registered CEs information event <ul style="list-style-type: none"> ✓ Operating channel number list change ✓ Geolocaition change ✓ Service coverage change

6.3.12.6 CM_EV_ACK

This message is for centralized and distributed topologies. This message used by CDIS is transmitted to (master/slave) CM to give acknowledgement as a receipt. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	CDIS ID	Source identifier
DestinationID	(Master/Slave) CM ID	Destination identifier
Payload		
Name	Data Type	Description
EventAck	BOOLEAN	Acknowledgment of corresponding event as a receipt <ul style="list-style-type: none"> True : Event receipt is succeed False : Event receipt is failed

6.3.12.7 NCM_EV_IND

This message is for centralized and distributed topologies. This message used by slave CM is transmitted to master CM to notify the detected event for the centralized topology. Also, this message is sent from CM to neighbor CM or is sent from neighbor CM to CM for the distributed topology. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	Slave CM ID/ CM ID/ Neighbor CM ID	Source identifier
DestinationID	Master CM ID/ Neighbor CM ID/ CM ID	Destination identifier
Payload		
Name	Data Type	Description
RegisteredCMStatus	COEX_REG_CM_STATUS	Contents of registered CM status, given as <ul style="list-style-type: none"> Registered CM ID Registered CM information event <ul style="list-style-type: none"> ✓ Channel classification list change of registered CM ✓ Registered CE ID list change

RegisteredCEsStatus	COEX_REG_CE_STATUS	Contents of registered CEs status, given as <ul style="list-style-type: none"> Registered CM ID Registered CE ID Registered CEs information event <ul style="list-style-type: none"> ✓ Operating channel number list change ✓ Geolocaion change ✓ Service coverage change
TVWSChannelStatus	COEX_TVWSCH_STATUS	Contents of TVWS channel status, given as <ul style="list-style-type: none"> Registered CDIS ID TVWS channel information event <ul style="list-style-type: none"> ✓ Allowed channel list change ✓ Use constraint change
NeighborCMsStatus	COEX_NEI_CM_STATUS	Contents of neighbor CMs status, given as <ul style="list-style-type: none"> Neighbor CM ID Neighbor CMs information event <ul style="list-style-type: none"> ✓ Channel classification list change of neighbor CMs ✓ Neighbor CE ID list change included in neighbor CMs
NeighborCEsStatus	COEX_NEI_CE_STATUS	Contents of neighbor CEs status, given as <ul style="list-style-type: none"> Neighbor CM ID Neighbor CE ID Neighbor CEs information event <ul style="list-style-type: none"> ✓ Neighbor CEs information change included in neighbor CMs

6.3.12.8 NCM_EV_ACK

This message is for centralized and distributed topologies. This message used by master CM is transmitted to slave CM to give acknowledgement as a receipt for the centralized topology. Also, this message is sent from neighbor CM to CM or is sent from CM to neighbor CM for the distributed topology. The contents of this message are given as follows

Header		
Name	Data Type	Description
SourceID	Master CM ID/ Neighbor CM ID/ CM ID	Source identifier
DestinationID	Slave CM ID/ CM ID/ Neighbor CM ID	Destination identifier
Payload		
Name	Data Type	Description
EventAck	BOOLEAN	Acknowledgment of corresponding event as a receipt <ul style="list-style-type: none"> True : Event receipt is succeed False : Event receipt is failed

6.3.12.9 Event_Indication

This message is sent from CE to CM to indicate an event. Also, this message is sent from CM to CE to indicate an event. Also, this message is sent from CM to another CM to indicate an event. Also, this message is sent from CM to CDIS to indicate an event. Also, this message is sent from CDIS to CM to indicate an event.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CE_ID or CM_ID or CDIS_ID	CX_ID	Source identifier
DestinationIdentifier = CM_ID or CE_ID or CDIS_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
EventID	EVENT_ID	Event ID
EventDescription	EVENT_DESCRIPTION	Event description

6.3.12.10 Event_Confirm

This message is sent from CM to CE to confirm reception of the event indication. Also, this message is sent from CE to CM to confirm reception of the event indication. Also, this message is sent from CM to another CM to confirm reception of the event indication. Also, this message is sent from CDIS to CM to confirm reception of the event indication. Also, this message is sent from CM to CDIS to confirm reception of the event indication. This message does not have any payload.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CM_ID or CE_ID or CDIS_ID	CM/CE/CDIS ID	Source identifier
DestinationIdentifier = CE_ID or CM_ID or CDIS_ID	CE/CM/CDIS ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
None	None	None

6.3.13 Master selection procedure messages

6.3.13.1 MasterCM_Request

This message is sent from CM to request another CM to take over its role and behave as its master.

Header		
<i>Name</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier	COEX_ID	CM identifier
DestinationIdentifier	COEX_ID	CM identifier
InformationType	COEX_INFO_TYPE	Message type
DialogToken	Integer	Message sequence number

Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
Note: Information elements below are repeated for each registered CE		
CEIdentifier	COEX_ID	Registered CE
Note: Information elements below are repeated for each TVBD device or network		
TVBD type	TVBD_TYPE	TVBD device or network type
Geolocation	GEO_LOC	Registered geolocation

6.3.13.2 MasterCM_Response

This message is sent from CM to requested CM to indicate if the request is accepted.

Header		
<i>Name</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier	COEX_ID	CM identifier
DestinationIdentifier	COEX_ID	CM identifier
InformationType	COEX_INFO_TYPE	Message type
DialogToken	Integer	Message sequence number
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
StatusCode	STATUS_CODE	Status

6.3.13.3 MasterCM_Announcement

This message is sent from CM to CDIS or CDIS to CM to announce selected master CM and its slaves.

Header		
<i>Name</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier	COEX_ID	CM/CDIS identifier
DestinationIdentifier	COEX_ID	CDIS/CM identifier
InformationType	COEX_INFO_TYPE	Message type
DialogToken	Integer	Message sequence number
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
Note: Information elements below are repeated for each master CM		
MasterCMIdentifier	COEX_ID	CM identifier
Note: Information elements below are repeated for each slave CM		
SlaveCMIdentifier	COEX_ID	CM identifier

6.3.14 Session activity check procedure messages

6.3.14.1 SessionActive_Request

This message is sent from CM to CE to check that this CE is still active. Also, this message is sent from CDIS to CM to check that this CM is still active. This message does not have any payload.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>

SourceIdentifier = CM_ID or CDIS_ID	CX_ID	Source identifier
DestinationIdentifier = CE_ID or CM_ID	CX_ID	Destination identifier
ACK Policy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
None	None	None

6.3.14.2 SessionActive_Confirm

This message is sent from CE to CM to confirm that this CE is still active. Also, this message is sent from CM to CDIS to confirm that this CM is still active. This message does not have any payload.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CE_ID or CM_ID	CX_ID	Source identifier
DestinationIdentifier = CM_ID or CDIS_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
None	None	None

6.3.15 Unsupported message procedure messages

6.3.15.1 MessageUnsupported_indication

This message is sent from CM to CE, from CE to CM to indicate that the received message is not supported. Also, this message is sent from CM to CDIS, from CDIS to CM or from CM to other CM to indicate that the received message is not supported. This message does not have any payload.

Header		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
SourceIdentifier = CE_ID or CM_ID or CDIS_ID	CX_ID	Source identifier
DestinationIdentifier = CE_ID or CM_ID or CDIS_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Data type</i>	<i>Description</i>
None	None	None

6.4 Data type definition

```
CX_ID ::= CHOICE {
    CE_ID      INTEGER,
    CM_ID      INTEGER,
    CDIS_ID    INTEGER,
    TVWSDB_ID  INTEGER
}

STATUS ::= ENUMERATED {
    Success,
    Failure
}

REASON ::= ENUMERATED {
    PowerOff,
    TBD
}

OPERATION_CODE ::= ENUMERATED {
    New,
    Add,
    Modify,
    Remove
}

NETWORK_ID ::= ENUMERATED {
    BSSID,
    TBD
}

NETWORK_TYPE ::= ENUMERATED {
    IEEE802.11af,
    IEEE802.22,
    ECMA392
}

SUBSCR_COEX_SERVICE ::= ENUMERATED {
    Discovery,
    Management
}

OPERATING_CHANNEL ::= SEQUENCE {
    CentralFrequencyREAL,
    Bandwidth REAL
}

SERVICE_AREA ::= TBD

INTERFERENCE_AREA ::= TBD

REG_DOMAIN ::= ENUMERATED {
    USA,
```

```
    UK,
    Singapore
}

MEAS_DESCR ::= TBD

REPORTING_MODE ::= ENUMERATED {
    Immediate,
    Scheduled,
    OnDemand
}

MEAS_RESULT ::= TBD

REQ_INFO_DESCR ::= TBD

REQ_INFO ::= TBD

EVENT_ID ::= TBD

EVENT_DESCRIPTION ::= TBD

RECONFIG_REQUEST ::= SEQUENCE OF SEQUENCE {
    OperatingChannel    OPERATING_CHANNEL,
    txPowerLimit        REAL,
    channelsShared      BOOLEAN,
    TxSchedule          SEQUENCE OF TX_SCHEDULE
}

TX_SCHEDULE ::= SEQUENCE {
    scheduleStartTime    REAL,
    scheduleDuration    REAL,
    numberOfScheduleRepetitions    INTEGER,
    transmissionStartTime    REAL,
    transmissionDuration    REAL
}

COEX_ID ::= CHOICE {
    CE_ID        INTEGER,
    CM_ID        INTEGER,
    CDIS_ID      INTEGER,
}

COEX_INFO_TYPE ::= ENUMERATED {
    Registration request,
    Registration response,
    Resource request,
    Resource response,
    Neighbourlist request,
    Neighbourlist response,
    Reconfiguration request,
    Reconfiguration confirm,
    Measurement request,
```

```
    Measurement report,
    MasterCM request,
    MasterCM response,
    MasterCMannouncement
}

STATUS_CODE ::= ENUMERATED {
    Success,
    Failure
}

PUSER_TYPE ::= ENUMERATED {
    TV signal,
    Low power auxiliary
}

TVBD_TYPE ::= ENUMERATED {
    Fixed,
    Personal/portable mode
}

MEAS_TYPE ::= ENUMERATED {
    Primary detection,
    TVBD detection,
    Channel load measurement
}

MEAS_REQ ::= SEQUENCE{
    MeasurementStartTime    REAL,
    MeasurementDuration     REAL,
    ChannelNumber           INTEGER
}

CMD_TYPE ::= ENUMERATED {
    Deenablement
}
```