IEEE P802.19
Wireless Coexistence Working Group

Project	IEEE 802.19 Wireless Coexistence Working Group (WG)
Title	Proposal for Chapter 6
Date Submitted	July 18, 2011
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Contents

6. Procedures and protocols

6.1 Procedures

6.1.1 Authentication and deauthentication procedures

This set includes the following procedures:

— TVBD network or device authentication procedure
— TVBD network or device deauthentication procedure
— CM authentication procedure
— CM deauthenticaiton procedure.

6.1.1.1 TVBD network or device authentication procedure

This procedure is performed when a CE receives a request to start operation. It is shown in Figure 1.

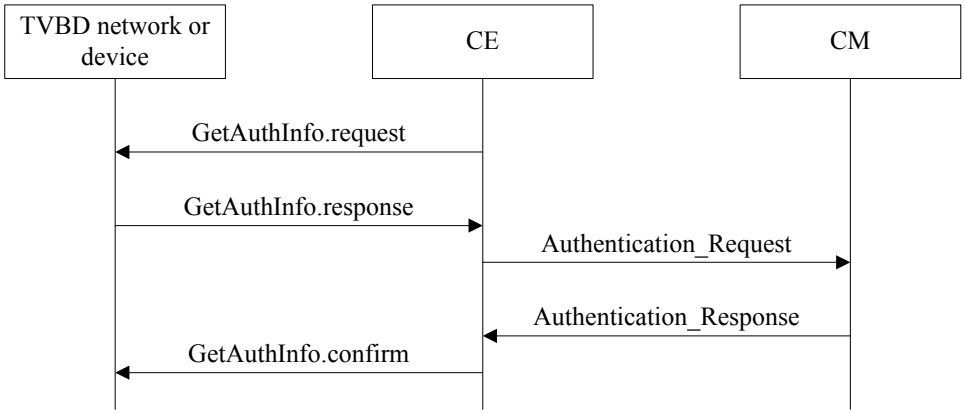

Figure 1—TVBD network or device authentication procedure

6.1.1.2 TVBD network or device deauthentication procedure

This procedure is performed when a CE receives a request to stop operation. It is shown in Figure 2.

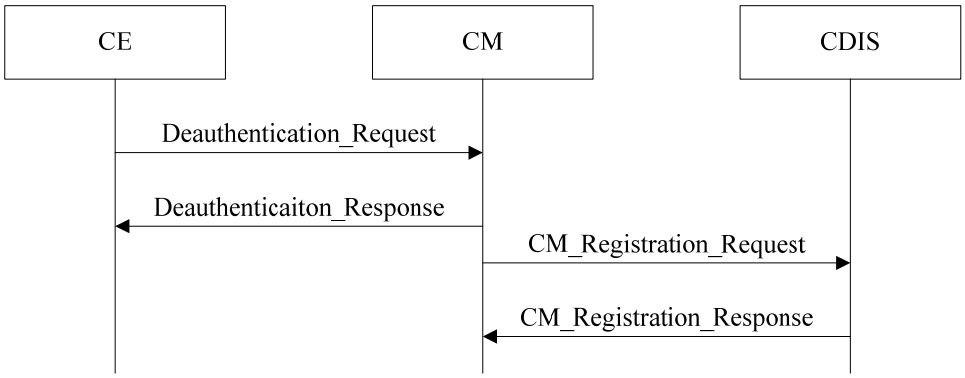

Figure 2—TVBD network or device deauthentication procedure

6.1.1.3 CM authentication procedure

This procedure is performed when a CM receives a request to start operation. It is shown in Figure 3.

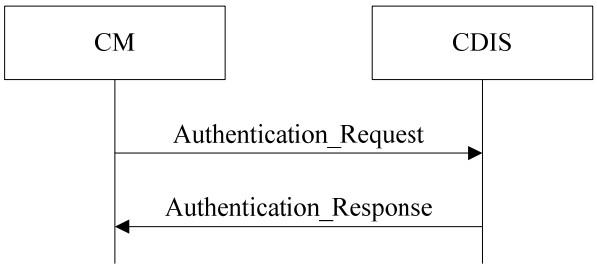

Figure 3—CM authentication procedure

6.1.1.4 CM deauthentication procedure

This procedure is performed when CM receives request to stop operation. It is shown in Figure 4.

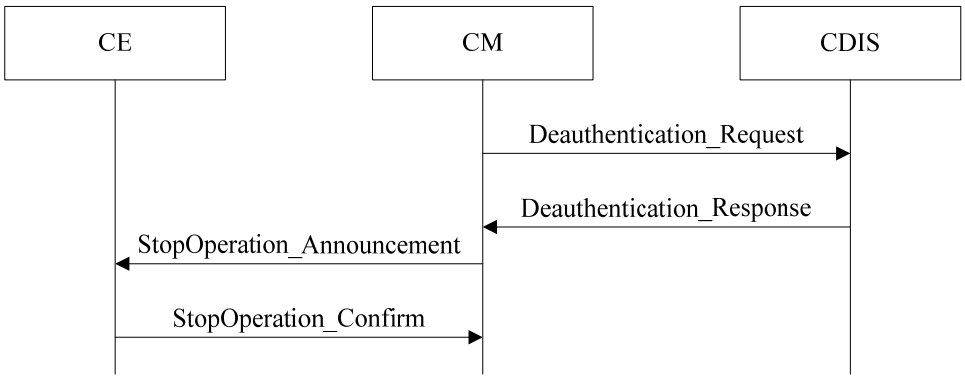

Figure 4—CM deauthentication procedure

6.1.2 Coexistence service subscription procedures

This set includes the following procedures:

— TVBD network or device subscription procedure
— TVBD network or device subscription update procedure
— CM subscription procedure
— CM subscription update procedure
— TVBD network or device subscription change procedure.

6.1.2.1 TVBD network or device subscription procedure

This procedure is performed after the TVBD network or device authentication procedure. It is shown in Figure 5.

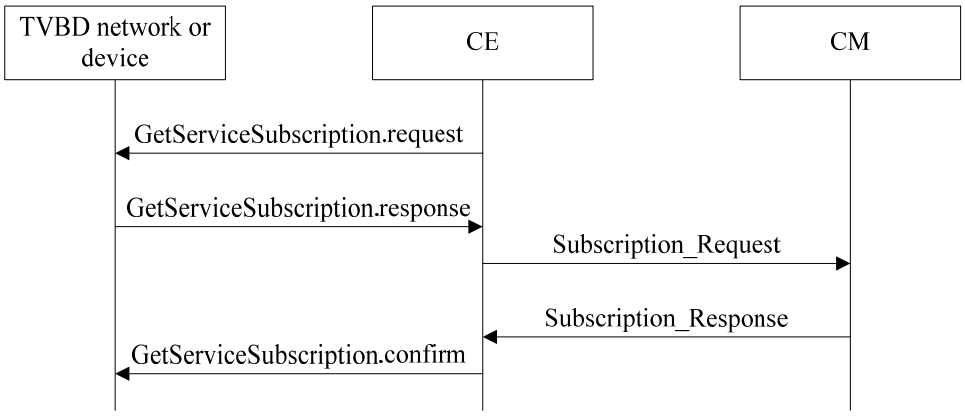

Figure 5—TVBD network or device subscription procedure

6.1.2.2 TVBD network or device subscription update procedure

This procedure is performed when the TVBD network or device wants to change the service it receives from the coexistence system. It is shown in Figure 6.

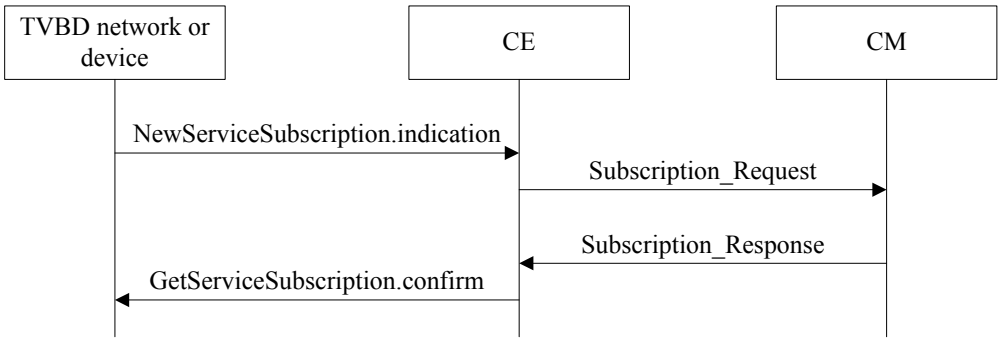

Figure 6—TVBD network or device subscription update procedure

6.1.2.3 CM subscription procedure

This procedure is performed by CM to subscribe to discovery service. It is shown in Figure 7.

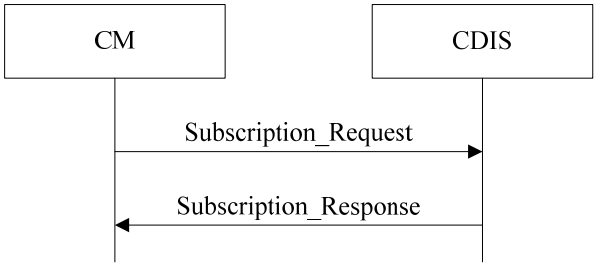

Figure 7—CM subscription procedure

6.1.2.4 CM subscription update procedure

This procedure is performed when CM wants to change the service it receives from the CDIS. It is shown in Figure 8.

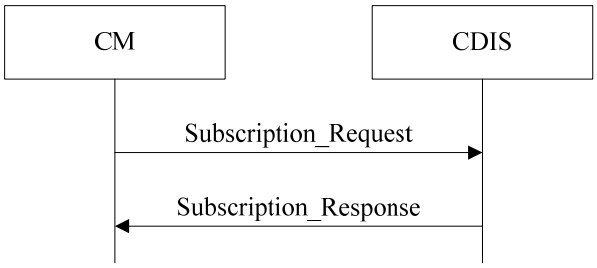

Figure 8—CM subscription update procedure

6.1.2.5 TVBD network or device subscription change procedure

This procedure is performed when CM wants to ask a TVBD network or device to change its subscription. It is shown in Figure 9.

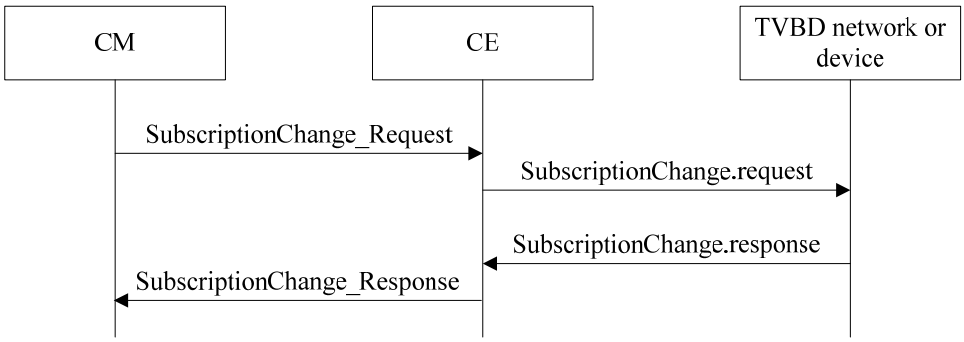

Figure 9— TVBD network or device subscription change procedure

6.1.3 Providing registration information procedures

This set includes the following procedures:

— TVBD network or device registration procedure

— TVBD network or device registration update procedure.

6.1.3.1 TVBD network or device registration procedure

This procedure is performed after the TVBD network or device subscription procedure. It is shown in Figure 10.

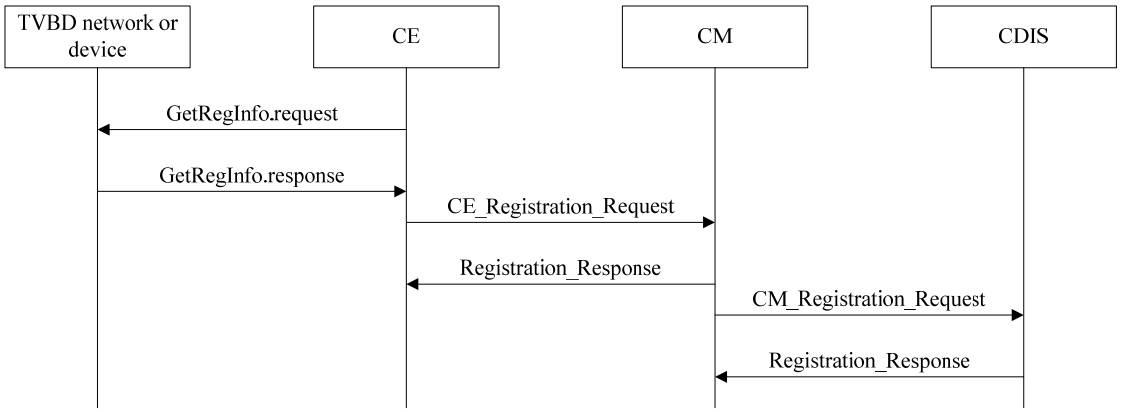

Figure 10—TVBD network or device registration procedure

6.1.3.2 TVBD network or device registration update procedure

This procedure is performed when the TVBD network or device registration information is changed. It is shown in Figure 11.

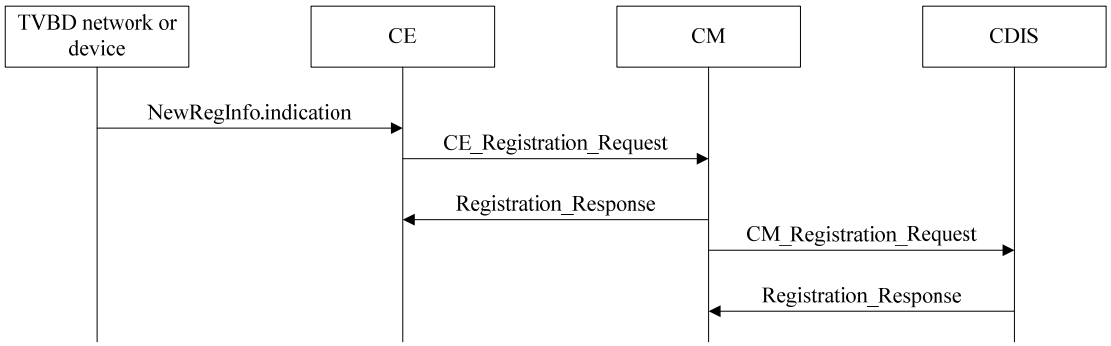

Figure 11—TVBD network or device registration update procedure

6.1.4 Obtaining neighbor information procedures

This set includes the following procedures:

- Obtaining neighbor list
- Obtaining neighbor report
- Providing neighbor list
- Providing neighbor report.

6.1.4.1 Obtaining neighbor list

This procedure is performed when CM wants to obtain neighbor list from CDIS. It is shown in Figure 12.

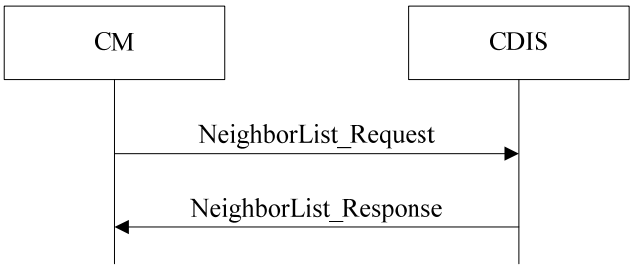

Figure 12—Obtaining neighbor list

6.1.4.2 Obtaining neighbor report

This procedure is performed when TVBD network or device wants to obtain neighbor report from CM.

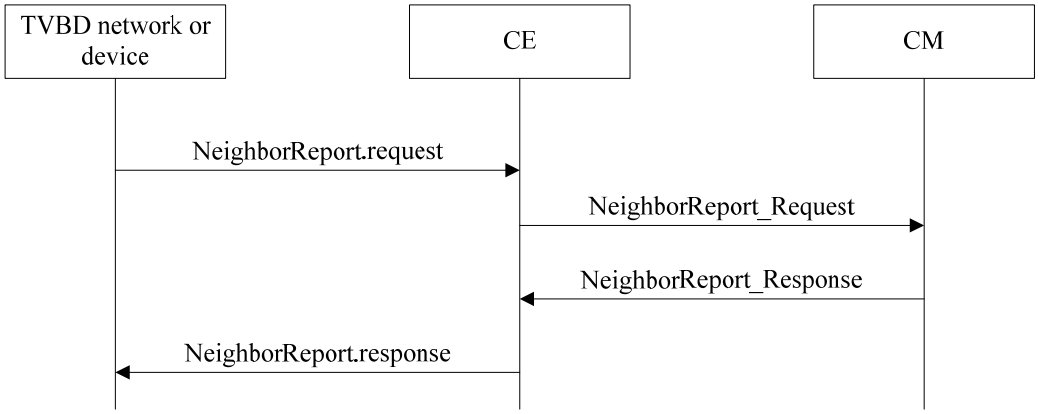

Figure 13—Obtaining neighbor report

6.1.4.3 Providing neighbor list

This procedure is performed when neighbor information is changed for one or several TVBD networks or devices of a CM. It is shown in Figure 14.

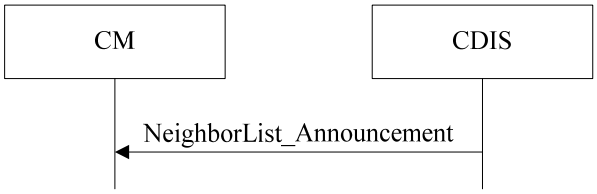

Figure 14—Providing neighbor list procedure

6.1.4.4 Providing neighbor report

This procedure is performed when neighbor information is changed for one or several TVBD networks or devices subscribed to the information service. It is shown in Figure 15 with only one CE and TVBD network or device illustrated.

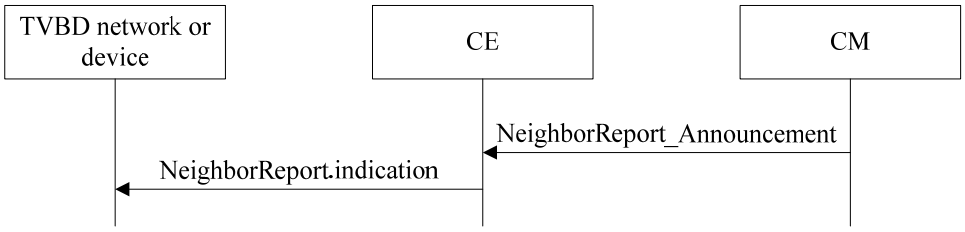

Figure 15—Providing neighbor report procedure

6.1.5 Obtaining available channel list procedures

This set includes the following procedures:

- Obtaining an available channel list from a TVBD network or device procedure
- Announcing an available channel list change by a TVBD network or device procedure
- Obtaining an available channel list from a TVWS database procedure
- Announcing an available channel list change by a TVWS database procedure.

6.1.5.1 Obtaining available channel list from TVBD network or device procedure

This procedure is performed when a CM obtains a list of available channels from a TVBD network or device. It is shown in Figure 16.

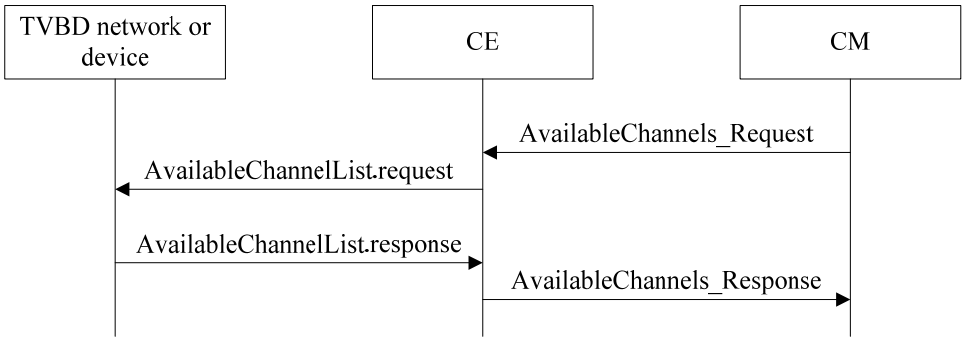

Figure 16—Obtaining available channel list from TVBD network or device procedure

6.1.5.2 Announcing available channel list change by TVBD network or device procedure

This procedure is performed when a CM has previously requested a TVBD network or device to provide a list of available channels and this list is changed. It is shown in Figure 16.

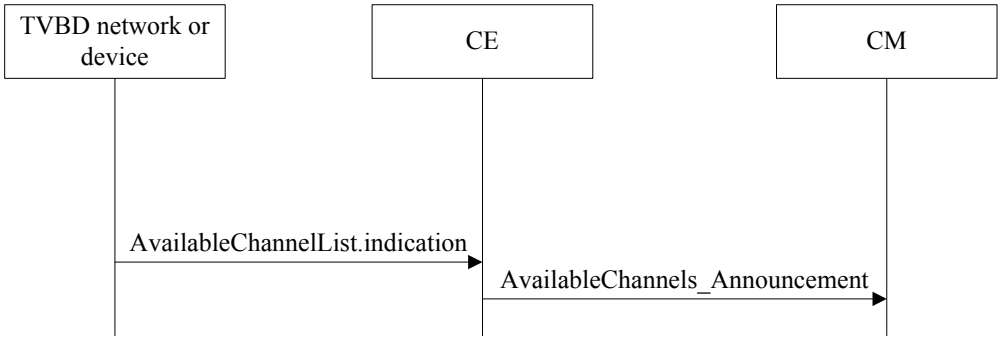

Figure 17—Announcing available channel list change by TVBD network or device procedure

6.1.5.3 Obtaining available channel list from TVWS database procedure

This procedure is performed when a CM obtains a list of available channels from a TVWS database. It is shown in Figure 18.

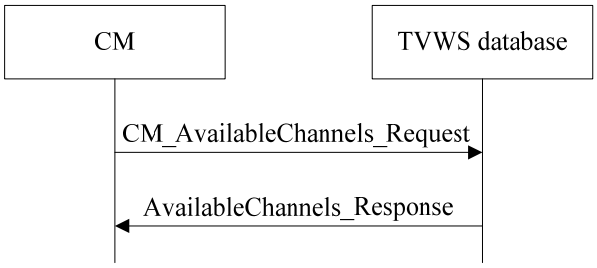

Figure 18—Obtaining available channel list from TVWS database procedure

6.1.5.4 Announcing available channel list change by TVWS database procedure

This procedure is performed when a CM has previously requested a TVWS database to provide list of available channels and this list is changed. It is shown in Figure 19.

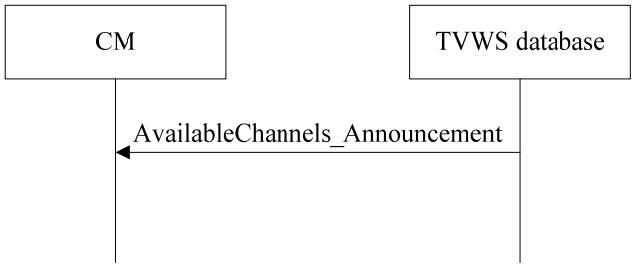

Figure 19—Announcing available channel list change by TVWS database procedure

6.1.6 Obtaining channel classification information procedures

This set includes the following procedures:

- Obtaining channel classification information by CM
- Obtaining channel classification information by CE
- Announcing channel classification information update to CM
- Announcing channel classification information update to CE

6.1.6.1 Obtaining channel classification information by CM procedure

This procedure is used by a CM to obtain channel classification information from another CM.

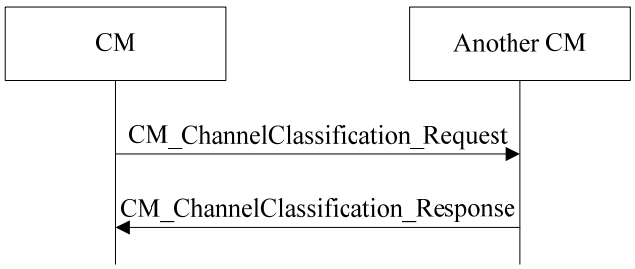

Figure 20— Obtaining channel classification information by CM

6.1.6.2 Obtaining channel classification information by CE procedure

This procedure is used by a TVBD to obtain channel classification information from a CM via a CE.

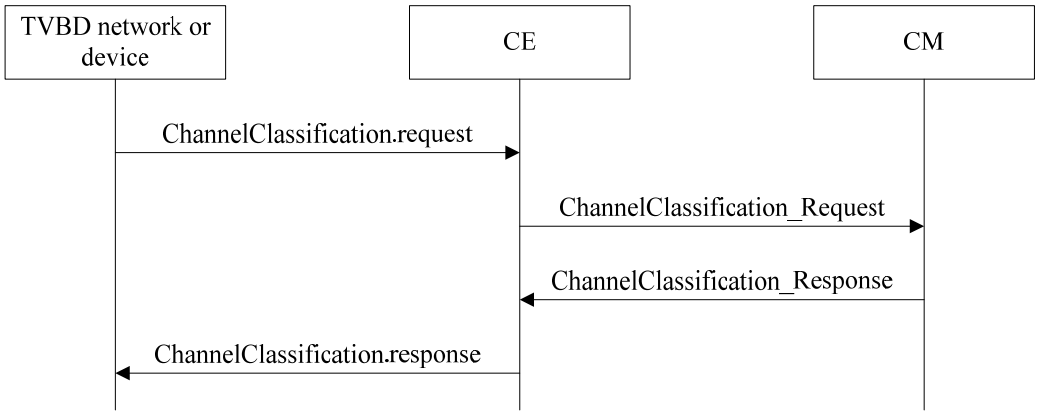

Figure 21— Obtaining channel classification information by CE

6.1.6.3 Announcing channel classification information update to CM procedure

This procedure is used by a CM to announce channel classification information update to another CM.

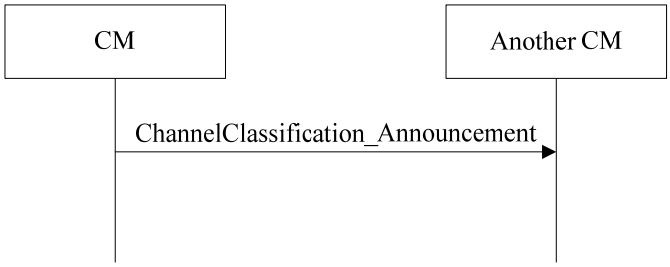

Figure 22— Announcing channel classification information update to CM

6.1.6.4 Announcing channel classification information update to CE procedure

This procedure is by a CM to announce channel classification information update to a CE.

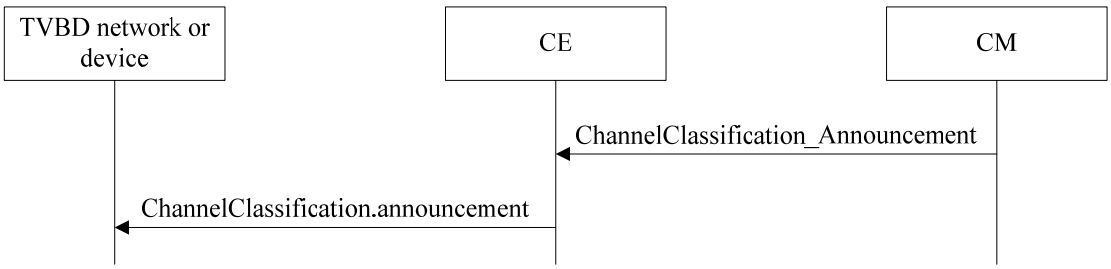

Figure 23— Announcing channel classification information update to CE procedure

6.1.7 Obtaining information procedures

This set includes the following procedures:

— Obtaining information from TVBD network or device procedure
— Obtaining information from another CM procedure
— Sharing neighbor information procedure.

6.1.7.1 Obtaining information from TVBD network or device procedure

This procedure is performed when a CM wants to obtain information from a TVBD network or device. It is shown in Figure 24.

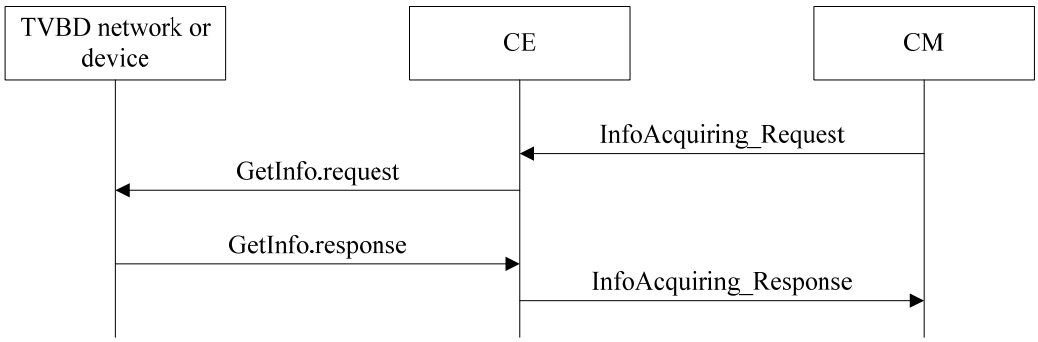

Figure 24—Obtaining information from TVBD network or device procedure

6.1.7.2 Obtaining information from another CM procedure

This procedure is performed when a CM wants to obtain information from another CM. It is shown in Figure 25.

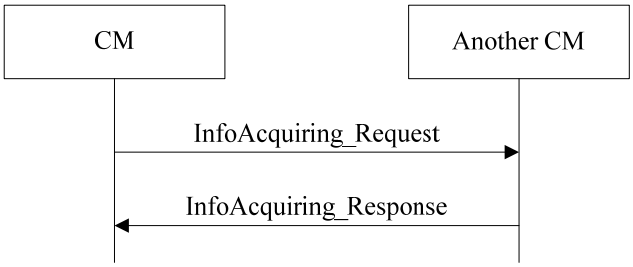

Figure 25—Obtaining information from another CM procedure

6.1.7.3 Sharing neighbor information procedure

This procedure is performed when a CM needs to share TVBD network or device information with another CM that serves a neighbor TVBD network or device. It is shown in Figure 26.

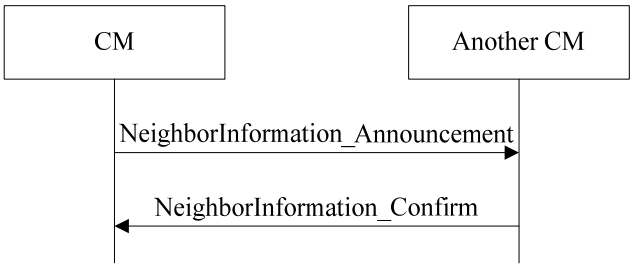

Figure 26—Sharing neighbor information procedure

6.1.8 Requesting and obtaining measurement procedures

This set includes the following procedures:

- Requesting measurement procedure
- Obtaining one-time measurement procedure
- Obtaining scheduled measurement procedure.

6.1.8.1 Requesting measurement procedure

This procedure is performed when a CM wants to obtain measurement results from a TVBD network or device. The CM requests the TVBD to perform measurements and provide measurement reports either once per the request or on schedule basis. The request procedure is shown in Figure 27.

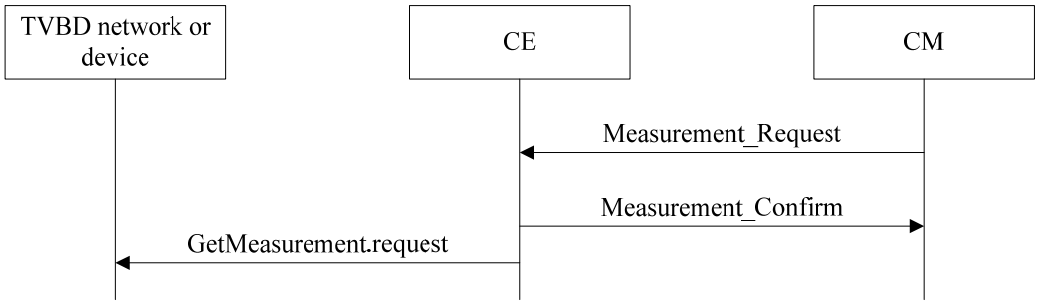

Figure 27—Requesting measurement procedure

6.1.8.2 Obtaining one-time measurement procedure

This procedure is performed when a CM has requested a one-time measurement from a TVBD network or device. It is shown in Figure 28.

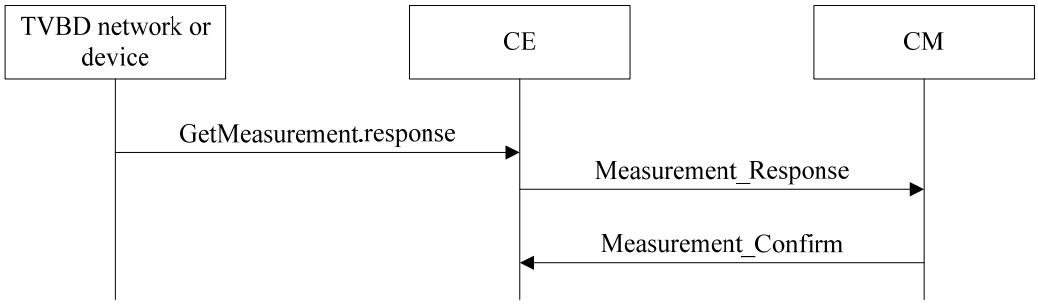

Figure 28—Obtaining one-time measurement procedure

6.1.8.3 Obtaining scheduled measurement procedure

This procedure is performed when a CM has requested scheduled measurements from a TVBD network or device. It is shown in Figure 29.

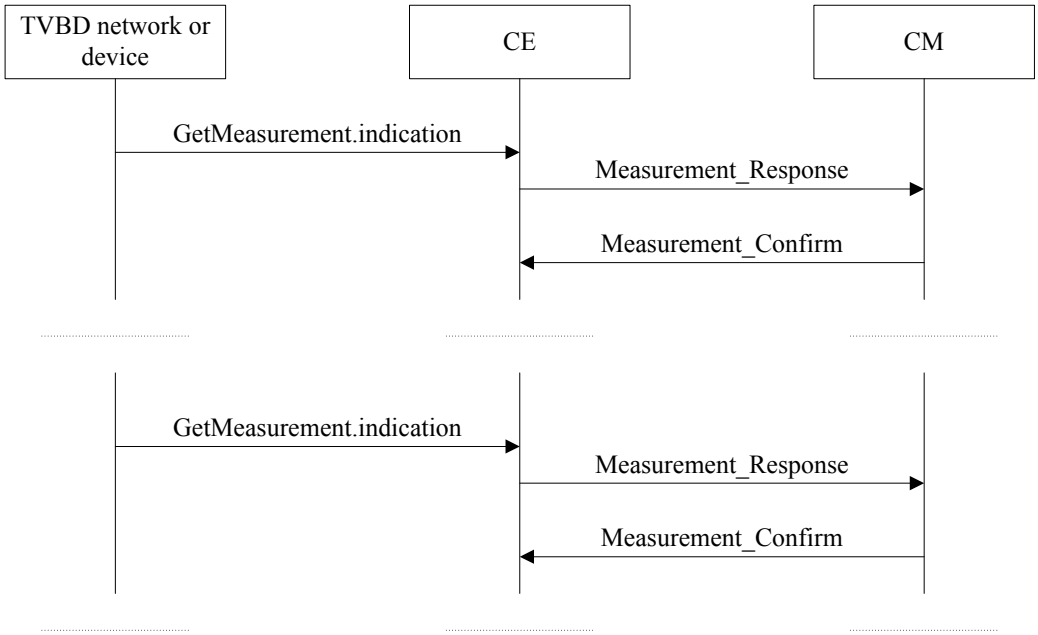

Figure 29—Obtaining scheduled measurement procedure

6.1.9 Negotiation between CMs procedure

This procedure is used for coexistence decision making by each CM for distributed topology. It is shown in Figure 30.

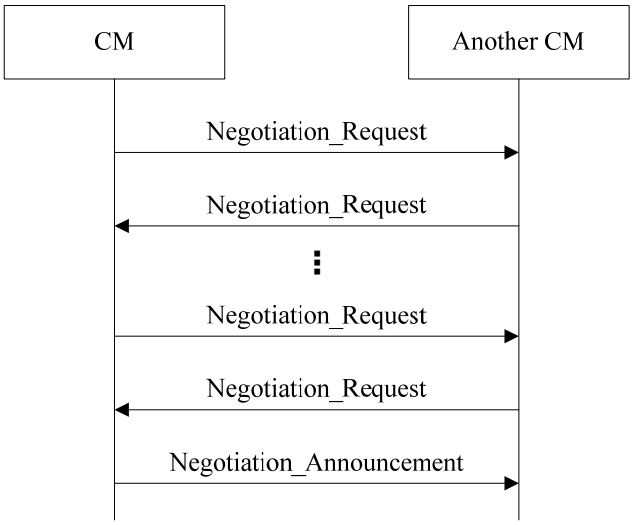

Figure 30— Negotiations between CMs

6.1.10 Master CM selection procedures

This set includes the following procedures:

- Master CM selection by CDIS
- Master CM selection by CMs
- Master/slave CM configuration by CDIS
- Master/slave CM configuration by CMs.

6.1.10.1 Master CM selection by CDIS

This procedure is performed when a CM intends to become a slave CM and requests the CDIS to select a master CM. After receiving such request, CDIS selects candidate master CM and sends MasterCM_Request to the selected CM. If confirm message is negative from the selected CM, CDIS selects next candidate master CM. If confirm message is positive, CDIS indicates selected master CM to the salve CM by sending MasterCM_Confirm message. The procedure is shown in Figure 31.

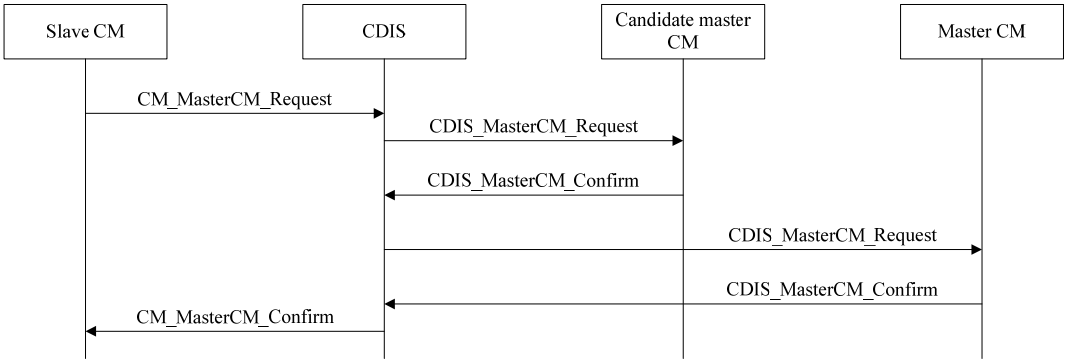

Figure 31—Master CM selection by CDIS procedure

6.1.10.2 Master CM selection by CMs

This procedure is performed when a CM intends to become a slave CM and requests another CM to become a master CM. If confirm message is negative from the requested CM, slave CM selects next candidate master CM. If confirm message is positive, master CM informs CDIS about new configuration. The procedure is shown in Figure 32.

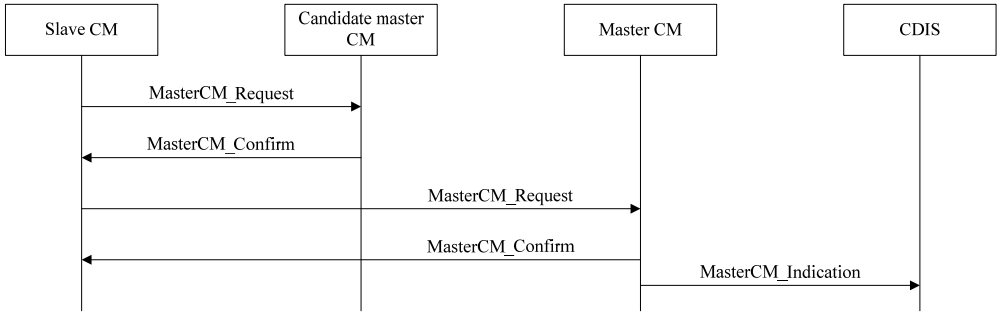

Figure 32—Master CM selection by CMs procedure

6.1.10.3 Master/slave CM configuration by CDIS

This procedure is performed when multiple CMs request CDIS to select master/slave configuration for them.

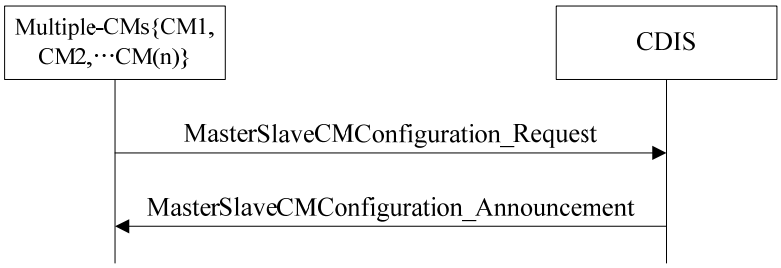

Figure 33—Master/slave CM configuration by CDIS

6.1.10.4 Master/slave CM configuration by CMs

This procedure is performed when one CM asks another CM to select master/slave configuration among them.

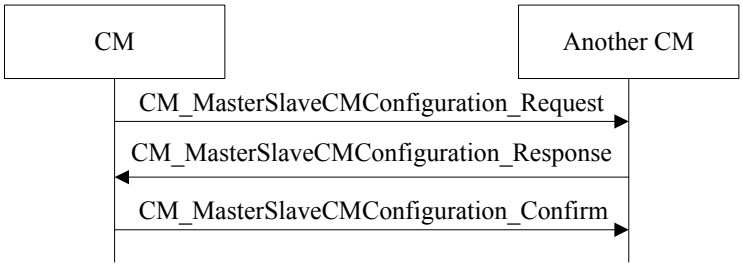

Figure 34—Master/slave CM configuration by CMs

6.1.11 Reconfiguration procedures

This set includes the following procedures:

- Sending reconfiguration request from CM to CE
- Sending reconfiguration request from CM to another CM
- Sending resource reconfiguration request from CE to CM.

6.1.11.1 Sending reconfiguration request from CM to CE

This procedure is performed when a CM has made a coexistence decision that requires reconfiguration of the TVBD network or device. It is shown in Figure 35.

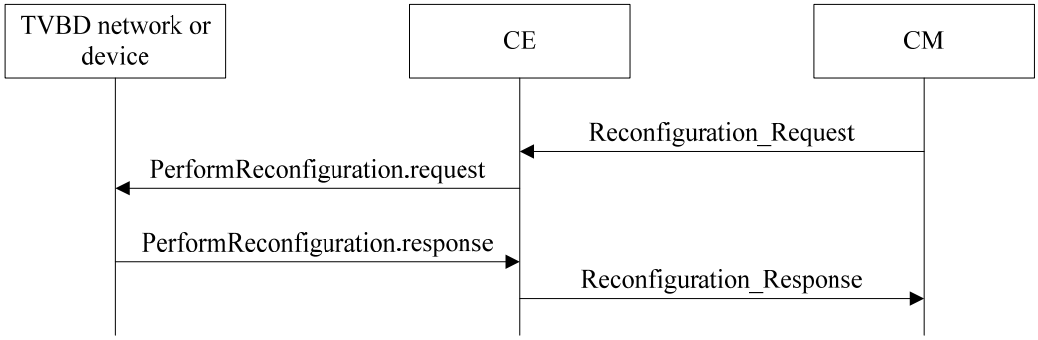

Figure 35—Sending reconfiguration request from CM to CE

6.1.11.2 Sending reconfiguration request from CM to another CM

This procedure is performed when a CM has made a coexistence decision that requires reconfiguration of the TVBD network or device. It is shown in Figure 36.

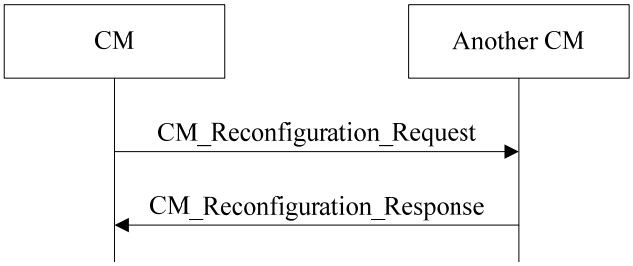

Figure 36—Sending reconfiguration request from CM to another CM

6.1.11.3 Sending resource reconfiguration request from CE to CM

This procedure is performed when a TVBD network or device requires resource. It is shown in .

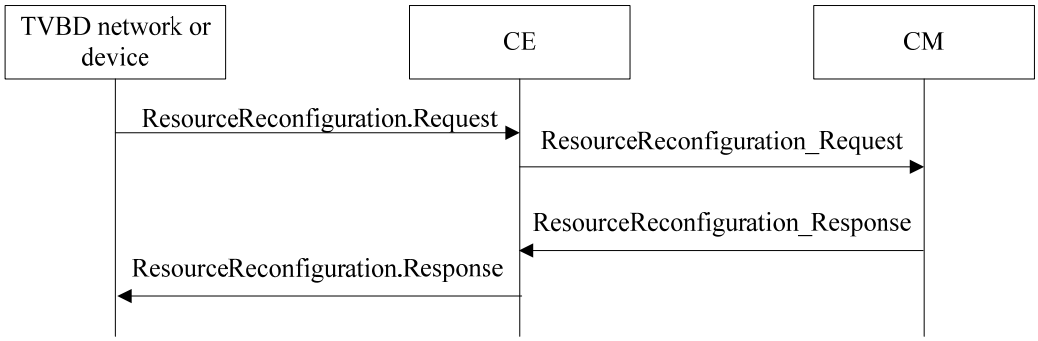

Figure 37 · Sending resource reconfiguration request from CE to CM

6.1.12 Sending event indication procedures

This set includes the following procedures:

— Sending event indication from TVBD network or device to CM

— Sending event indication from CM to another CM.

6.1.12.1 Sending event indication from TVBD network or device to CM

This procedure is performed when a TVBD network or device wants to send an event indication to a CM. It is shown in Figure 38.

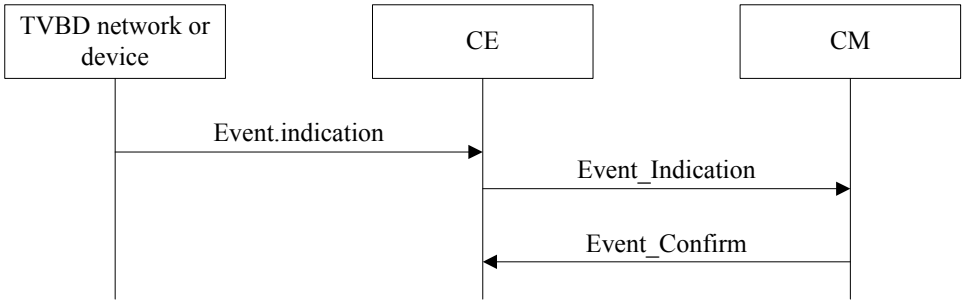

Figure 38—Sending event indication from TVBD network or device to CM

6.1.12.2 Sending event indication from CM to another CM

This procedure is performed when a CM wants to send an event indication to another CM. It is shown in .

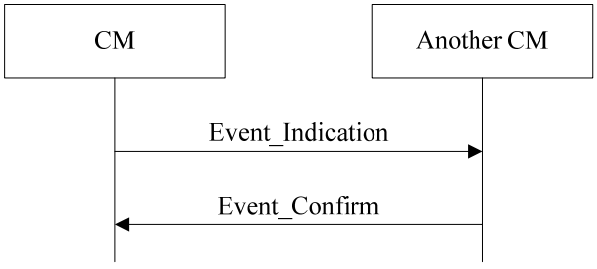

Figure 39—Sending event indication from CM to another CM

6.2 Messages

6.2.1 Authentication and deauthentication procedure messages

6.2.1.1 Authentication_Request

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

Header		
Information element	*Data type*	*Description*
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 an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
clientID	IA5String	Client ID (client is a CE or a CM)
clientPassword	IA5String	Client password

6.2.1.2 Authentication_Response

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

Header		
Information element	*Data type*	*Description*
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 an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
serverID	IA5String	Server ID (server is a CM or a CDIS)
serverPW	IA5String	Server password (server is a CM or a CDIS)
status	BOOLEAN	Status: successful or not

6.2.1.3 Deauthentication_Request

This message is sent from a CE to a CM to log off from the CM. Also, this message is sent from a CM to a CDIS to log off from the CDIS.

Header		
Information element	*Data type*	*Description*

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 an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
clientID	IA5String	Client ID (client is a CE or a CM)
clientPW	IA5String	Client password (client is a CE or a CM)

6.2.1.4 Deauthentication_Response

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

Header		
Information element	*Data type*	*Description*
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 an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
serverID	IA5String	Server ID (server is a CM or a CDIS)
serverPW	IA5String	Server password (server is a CM or a CDIS)
status	BOOLEAN	Status: successful or not

6.2.1.5 StopOperation_Announcement

This message is sent from a CM to a CE to notify the CE that the CM stops its operation.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CE_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
None		

6.2.1.6 StopOperation_Confirm

This message is sent from a CE to a CM to confirm reception of the StopOperation_Announcement from the CM.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CE_ID	CX_ID	Source identifier

destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
None		

6.2.2 Coexistence service subscription procedure messages

6.2.2.1 Subscription_Request

This message is sent from a CE to a CM to subscribe a TVBD network or device to a coexistence service. Also, this message is sent from a CM to a CDIS to subscribe to a coexistence service.

Header		
Information element	*Data type*	*Description*
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 an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
subscribedService	SubscribedService	Subscribed coexistence service

6.2.2.2 Subscription_Response

This message is sent from a CM to a CE to confirm or reject a TVBD network's or device's coexistence service subscription. Also, this message is sent from a CDIS to a CM to confirm or reject a coexistence service subscription.

Header		
Information element	*Data type*	*Description*
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 an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
status	BOOLEAN	Status: successful or not

6.2.2.3 SubscriptionChange_Request

This message is sent from a CM to a CE to ask a TVBD network or device to change subscription to a coexistence service.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier =	CX_ID	Destination identifier

CE_ID		
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
newSubscribedService	SubscribedService	Proposed new subscribed coexistence service

6.2.2.4 SubscriptionChange_Response

This message is sent from a CE to a CM to confirm or reject changing subscribed service.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CE_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACK Policy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
status	BOOLEAN	Status: accepted or not

6.2.3 Providing registration information procedure messages

6.2.3.1 CE_Registration_Request

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

Header		
Information element	*Data type*	*Description*
SourceIdentifier = CE_ID	CX_ID	Source identifier
DestinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
operationCode	OperationCode	Indicates whether this is a new registration or registration update
networkID	NetworkID	E.g., BSS ID
networkTechnology	NetworkTechnology	E.g., 802.11af, 802.22
networkType	NetworkType	E.g., fixed, mode 2
discoveryInformation	DiscoveryInformation	Information for discovery
ACLR	REAL	Adjacent Channel Leakage Ratio of the TVBD device
ACS	REAL	Adjacent Channel Selection of the receiver
GuranteedQoSOfBackhaulConnection	GuranteedQoSOfBackhaulConnection	Guaranteed QoS of backhaul connection in

		the TVBD device
listOfSupportedChNumber	ListOfSupportedChNumber OPTIONAL	List of supported channel number
listOfOperatingChNumber	ListOfOperatingChNumber OPTIONAL	List of operating channel number
listOfSupportedFrequencies	ListOfSupportedFrequencies OPTIONAL	List of supported frequencies
listOfOperatingFrequencies	ListOfOperatingFrequencies OPTIONAL	List of operating frequencies including occupancy information
minTxPower	REAL	Minimum transmission power
txScheduleSupported	BOOLEAN	Indicates whether scheduled transmission is supported or not
networkTechnology ReconfigurationSupported	BOOLEAN	Indicates whether network technology reconfiguration can be requested by CM
addNetworkTechnology	SEQUENCE OF NetworkTechnology	Additional supported network technologies
radioEnvironmentInformation	RadioEnvironmentInformation OPTIONAL	Information on radio environment as observed by this TVBD network or device
requiredResource	RequiredResource	Information on resource required for operation of this TVBD network or device

6.2.3.2 Registration_Response

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

Header		
Information element	*Data type*	*Description*
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 an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
None		

6.2.3.3 CM_Registration_Request

This message is sent from a CM to a CDIS to register information of a TVBD networks or devices served by this CM to the CDIS. This message is used for initial registration, for registration update and to remove a TVBD network or device from the CDIS. This message includes registration information of one or several TVBD networks or devices.

Header

Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CDIS_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
MaximumNumberOfControlableTVBD	INTEGER	Maximum number of controllable TVBD networks or devices
Note: For each TVBD network or device, the information elements below are repeated.		
operationCode	OperationCode	Indicates whether this is new registration, registration update or deletion of a TVBD network or device
networkID	NetworkID	E.g., BSS ID
networkTechnology	NetworkTechnology	E.g., 802.11af, 802.22
networkType	NetworkType	E.g., fixed, mode 2
discoveryInformation	DiscoveryInformation	Information for discovery
ACLR	REAL	Adjacent Channel Leakage Ratio of the TVBD device
ACS	REAL	Adjacent Channel Selection of the receiver
GuranteedQoSOfBackhaulConnection	GuranteedQoSOfBackhaulConnection	Guaranteed QoS of backhaul connection in the TVBD device
listOfSupportedChNumber	ListOfSupportedChNumber OPTIONAL	List of supported channel number
listOfSupportedFrequencies	ListOfSupportedFrequencies OPTIONAL	List of supported frequencies

6.2.4 Obtaining neighbor information procedure messages

6.2.4.1 NeighborList_Announcement

This message is sent from a CDIS to a CM to provide neighbor information regarding a TVBD network or device or multiple of them served by this CM.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CDIS_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
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 TVBD network or device.		

networkID	NetworkID	E.g., BSSID
networkTechnology	NetworkTechnology	E.g., 802.11af, 802.22
interferenceDirection	InterferenceDirection	Mutual, source or victim
interferenceLevelFromNeighbor	REAL	Estimated worst case interference level caused by the neighbor
interferenceLevelToNeighbor	REAL	Estimated worst case interference level caused by the TVBD network or device for which neighbors are reported
NetworkGeometryClass	NetworkGeometryClass	Network geometry class between a TVBD network and its neighbour TVBD network(s)

6.2.4.2 NeighborList_Request

This message is sent from CM to CDIS to request neighbor information.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CDIS_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
listOfCEID	SEQUENCE OF CX_ID OPTIONAL	CE ID list

6.2.4.3 NeighborList_Response

This message is sent from CDIS to CM to provide neighbor information.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CDIS_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
Note: Information elements below are repeated for each TVBD network or device.		
CEID	CX_ID	CE ID
Note: Information elements below are repeated for each neighbor CM		
neighborCMID	CX_ID	Neighbor CM ID
Note: Information elements below are repeated for each neighbour TVBD network or device.		
networkID	NetworkID	E.g., BSSID
networkTechnology	NetworkTechnology	E.g., 802.11af, 802.22
interferenceDirection	InterferenceDirection	Mutual, source or victim
interferenceLevelFromNeighbor	REAL	Estimated worst case interference level caused by the neighbor
interferenceLevelToNeighbor	REAL	Estimated worst case interference level caused by the TVBD network or device for which neighbors are reported
NetworkGeometryClass	NetworkGeometryClass	Network geometry class between a TVBD network and its neighbour

		TVBD network(s)

6.2.4.4 NeighborReport_Announcement

This message is sent from a CM to a CE to provide a neighbor report.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CE_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
Note: Information elements below are repeated for each neighbor TVBD network or device.		
networkID	NetworkID	E.g., BSSID
networkTechnology	NetworkTechnology	E.g., 802.11af, 802.22
interferenceDirection	InterferenceDirection	Mutual, source or victim
interferenceLevelFromNeighbor	REAL	Estimated worst case interference level caused by the neighbor
interferenceLevelToNeighbor	REAL	Estimated worst case interference level caused by the TVBD network or device for which neighbors are reported
listOfOperatingChannelNumber	ListOfOperatingChannelNumber OPTIONAL	List of operating channel number
listOfOperatingFrequencies	ListOfOperatingFrequencies OPTIONAL	List of operating frequencies
radioEnvironmentInformation	RadioEnvironmentInformation OPTIONAL	Radio environment information
NetworkGeometryClass	NetworkGeometryClass	Network geometry class between a TVBD network and its neighbour TVBD network(s)

6.2.4.5 NeighborReport_Request

This message is sent from CE to CM to request a neighbor report.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CE_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
None		

6.2.4.6 NeighborReport_Response

This message is sent from CM to CE to provide a neighbor report.

Header		
Information element	*Data type*	*Description*

sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CE_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
Note: Information elements below are repeated for each neighbor CM		
neighborCMID	CX_ID	Neighbor CM ID
Note: Information elements below are repeated for each neighbor TVBD network or device.		
networkID	NetworkID	E.g., BSSID
networkTechnology	NetworkTechnology	E.g., 802.11af, 802.22
interferenceDirection	InterferenceDirection	Mutual, source or victim
interferenceLevelFromNeighbor	REAL	Estimated worst case interference level caused by the neighbor
interferenceLevelToNeighbor	REAL	Estimated worst case interference level caused by the TVBD network or device for which neighbors are reported
listOfOperatingChannelNumber	ListOfOperatingChannelNumber OPTIONAL	List of operating channel number
listOfOperatingFrequencies	ListOfOperatingFrequencies OPTIONAL	List of operating frequencies
radioEnvironmentInformation	RadioEnvironmentInformation OPTIONAL	Radio environment information
NetworkGeometryClass	NetworkGeometryClass	Network geometry class between a TVBD network and its neighbour TVBD network(s)

6.2.5 Obtaining available channel list procedure messages

6.2.5.1 AvailableChannels_Request

This message is sent from a CM to a CE to request an available channel list from the CE.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CE_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
None		

6.2.5.2 CM_AvailableChannels_Request

This message is sent from a CM to a TVWS DB to request an available channel list for a particular TVBD network or device.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier =	CX_ID	Destination identifier

TVWSDB_ID		
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
requestedTimeStamp	TIME	Time of the request
deviceFCCID		FCC ID of the TVBD network or device
deviceSN		Serial number of the TVBD network or device
deviceLocation	DeviceLocation	Location of the TVBD network or device
antennaHeight	REAL	Antenna height of the TVBD network or device
networkType	NetworkType	E.g., fixed mode 2
…		

6.2.5.3 AvailableChannels_Response

This message is sent from a CE to a CM to provide an available channel list. Also, this message is sent from TVWS DB to a CM to provide an available channel list to the CM.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CE_ID or TVWSDB_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
listOfAllowedTVWSChNumber	ListOfAllowedTVWSChNumber OPTIONAL	Allowed TVWS channel number list
constOfChUses	ConstOfChUses OPTIONAL	Channel user constraint
Note: Information elements below are repeated for each available frequency.		
startFreq	REAL OPTIONAL	Start frequency
stopFreq	REAL OPTIONAL	Stop frequency
txPowerLimit	REAL OPTIONAL	Transmit power limit
aggregatedInterference ControlParameters	AggregatedInterferference ControlParameters	Aggregated interference control parameters

6.2.5.4 AvailableChannels_Announcement

This message is sent from a CE/TVWS DB to a CM to provide an available channel list.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CE_ID or TVWSDB_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		

Information element	*Data type*	*Description*
listOfAllowedTVWSChNumber	ListOfAllowedTVWSChNumber OPTIONAL	Allowed TVWS channel number list
constOfChUses	ConstOfChUses OPTIONAL	Channel user constraint
Note: Information elements below are repeated for each available piece of frequency.		
networkID	NetworkID OPTIONAL	E.g., BSSID
startFreq	REAL OPTIONAL	Start frequency
stopFreq	REAL OPTIONAL	Stop frequency
txPowerLimit	REAL OPTIONAL	Transmit power limit
aggregatedInterference ControlParameters	AggregatedInterferference ControlParameters	Aggregated interference control parameters

6.2.6 Obtaining channel classification information procedure messages

6.2.6.1 CM_ChannelClassification_Request

This message is used when a CM wants to obtain channel classification information from another CM.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
listOfNetworkID	SEQUENCE OF NetworkID	Neighbor network ID list

6.2.6.2 CM_ChannelClassification_Response

This message is sent from a CM to another CM to provide channel classification information.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
Note: Information elements below are repeated for each neighbor TVBD network or device.		
networkID	NetworkID	Neighbor network ID
chClassInfo	ChClassInfo	Channel classification information of neighbor CE

6.2.6.3 CE_ChannelClassification_Request

This message is sent from CE to CM to request channel classification information of the CM.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CE_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier

ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
listOfNetworkID	SEQUENCE OF NetworkID	Network ID list

6.2.6.4 CE_ChannelClassification_Response

This message is sent from CM to CE to give the channel classification information of the CM.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CE_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
Note: Information elements below are repeated for each TVBD network or device.		
networkID	NetworkID	Network ID
chClassInfo	ChClassInfo	Channel classification information of the CE

6.2.6.5 ChannelClassification_Announcement

This message is from CM to another CM to provide updated channel classification information. Also, this message is sent from CM to CE to provide updated channel classification information.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier =CM_ID or CE_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
Note: Information elements below are repeated for each TVBD network or device.		
networkID	NetworkID	Network ID
chClassInfo	ChClassInfo	Channel classification information of the CE

6.2.7 Obtaining information procedures messages

6.2.7.1 InfoAcquiring_Request

This message is sent from a CM to a CE to request the CE to obtain information from the TVBD network or device. Also, this message is sent from a CM to another CM to request information about neighbor TVBD networks or devices.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier

destinationIdentifier = CE_ID or CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
reqInfoDescr	ReqInfoDescr	ID of the requested information

6.2.7.2 InfoAcquiring_Response

This message is sent from a CE/CM to a CM to provide requested information.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CE_ID or CM_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
reqInfoValue	ReqInfoValue	Requested information

6.2.8 Sharing neighbor information procedure messages

6.2.8.1 NeighborInformation_Announcement

This message is sent from a CM to another CM to share information about neighbor TVBD network or device.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
sourceTVBDIdentifier	CX_ID	CE_ID of the TVBD network or device served by the source CM
sourceNetworkTechnology	NetworkTechnology	E.g., 802.11af, 802.22
networkType	NetworkType	TVBD network or device type
sourceListOfSupportedChannelNumber	ListOfSupportedChannelNumber OPTIONAL	List of supported channel number
sourceListOfOperatingChannelNumber	ListOfOperatingChannelNumber OPTIONAL	List of operating channel number
sourceListOfSupportedFrequencies	ListOfSupportedFrequencies OPTIONAL	List of supported frequencies
sourceListOfOperatingFrequencies	ListOfOperatingFrequencies OPTIONAL	List of operating frequencies
sourceNetworkCapabilities	NetworkCapabilities	Device and network

		capabilities that have an effect on coexistence decision making
sourceSubscribedService	SubscribedService	Coexistence service subscription
managingCM	BOOLEAN	Indicates whether this TVBD network or device shall be managed by source CM or destination CM
chClassInfo	ChClassInfo OPTIONAL	Channel classification information
scheduledTimeEnd	BOOLEAN OPTIONAL	Indicate whether this TVBD network or device finished scheduled time when channel is shared

6.2.8.2 NeighborInformation_Confirm

This message is sent from a CM to another CM to cofirm reception of the NeighborInformation_Announcement message.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
None		

6.2.9 Requesting and obtaining measurement procedure messages

6.2.9.1 Measurement_Request

This message is sent from a CM to a CE to request the CE to request the TVBD network or device to perform measurements.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CE_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
measurementDescription	MeasurementDescription	Measurement description

6.2.9.2 Measurement_Response

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

Header

Information element	*Data type*	*Description*
sourceIdentifier = CE_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
measurementResult	MeasurementResult	Measurement results

6.2.9.3 Measurement_Confirm

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

Header		
Information element	*Data type*	*Description*
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 an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
None		

6.2.10 Negotiation between CMs procedure messages

6.2.10.1 Negotiation_Request

This message is sent from a CM to a neighbor CM to negotiate resource usage.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
negotiationStatus	NegotiationStatus	Negotiation status
negotiationInformation	NegotiationInformation	Negotiation information

6.2.10.2 Negotiation_Announcement

This message is sent from a CM to a neighbor CM to provide negotiation results.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception

Payload		
Information element	*Data type*	*Description*
listOfWinnerCMID	ListOfWinnerCMID	Winner CM ID list
listOfSlotTimePosition	ListOfSlotTimePosition	Slot time position list

6.2.11 Master CM selection procedure messages

6.2.11.1 CM_MasterCM_Request

This message is sent from a CM that intends to become a slave CM to a CDIS to select a master CM.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CDIS_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
numberOfTVBDs	INTEGER	Number of TVBDs managed by CM that intends to become slave CM

6.2.11.2 CM_MasterCM_Confirm

This message is sent from a CDIS to a slave CM to confirm master/slave CM configuration.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CDIS_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
masterCMID	CX_ID	ID of the CM accepting to be a master CM
status	BOOLEAN	Status: accepted or not

6.2.11.3 CDIS_MasterCM_Request

This message is sent from a CDIS to a candidate master CM to request it to become master CM.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CDIS_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
slaveCMID	CX_ID	ID of the CM that intends to become slave CM

numberOfTVBDs	INTEGER	Number of TVBDs managed by CM that intends to become slave CM

6.2.11.4 CDIS_MasterCM_Confirm

This message is sent from a candidate master CM to a CDIS to confirm master/slave CM configuration.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CDIS_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
status	BOOLEAN	Status: accepted or not

6.2.11.5 MasterCM_Request

This message is sent from a CM that intends to become a slave CM to a candidate master CM.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
numberOfTVBDs	INTEGER	Number of TVBDs managed by CM that intends to become slave CM

6.2.11.6 MasterCM_Confirm

This message is sent from a candidate master CM to a slave CM to confirm master/slave CM configuration.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
status	BOOLEAN	Status: accepted or not

6.2.11.7 MasterCM_Indication

This message is sent from a master CM to a CDIS to indicate master/slave CM configuration.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier

destinationIdentifier = CDIS_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
slaveCMID	CX_ID	ID of the slave CM

6.2.11.8 MasterSlaveCMConfiguration_Request

This message is sent from a CM to request CDIS to select master/slave CM configuration.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CDIS_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
None		

6.2.11.9 MasterSlaveCMConfiguration_Announcement

This message is sent from a CDIS to CMs to announce master/slave CM configuration.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CDIS_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
masterCMID	CX_ID	Master CM ID
slaveCMIDs	SEQUENCE OF CX_ID	List of slave CM IDs

6.2.11.10 CM_MasterSlaveCMConfiguration_Request

This message is sent from a CM to request another CM to select master/slave CM configuration.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
networkType	NetworkType	TVBD device or network type
geolocation	GEO_LOC	Registered geolocation
channelNumber	INTEGER	Channel number
maximumPowerLevel	REAL	Power limit

channelLoad	REAL OPTIONAL	Expected throughput
sourceCMID	CX_ID	CM identifier
destinationCMID	CX_ID	CM identifier

6.2.11.11 CM_MasterSlaveCMConfiguration_Response

This message is sent from a CM to another CM to announce master/slave CM configuration.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
networkType	NetworkType	TVBD device or network type
geolocation	GEO_LOC	Registered geolocation
channelNumber	INTEGER	Channel number
maximumPowerLevel	REAL	Power limit
channelLoad	REAL OPTIONAL	Expected throughput
masterCMID	CX_ID	CM identifier
slaveCMID	CX_ID	CM identifier

6.2.11.12 CM_MasterSlaveCMConfiguration_Confirm

This message is sent from a CM to another CM to confirm master/slave CM configuration.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
None		

6.2.12 Reconfiguration procedure messages

6.2.12.1 Reconfiguration_Request

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

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CE_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		

Information element	*Data type*	*Description*
reconfigurationRequest	ReconfigurationRequest	Reconfiguration request description
chClassInfo	ChClassInfo OPTIONAL	Channel classification information of the CE

6.2.12.2 Reconfiguration_Response

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

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CE_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
status	BOOLEAN	Status: successful or not
failedParameters	FailedParameters OPTIONAL	Failed reconfiguration parameters with recommended values of parameters if reconfiguration request from CM to TVBD is failed

6.2.12.3 CM_Reconfiguration_Request

This message is sent from a CM to another CM to request reconfiguration of one or several TVBD networks or devices served by this CM.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
Note: Information elements below are repeated for each TVBD network or device		
reconfigurationTarget = CE_ID	CX_ID	Indicates TVBD network or device to be reconfigured
reconfigurationRequest	ReconfigurationRequest	Reconfiguration request description
chClassInfo	ChClassInfo OPTIONAL	Channel classification information of the CE

6.2.12.4 CM_Reconfiguration_Response

This message is sent from a CM to another CM to report the result of the requested reconfiguration of the TVBD network or device.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of

		reception
Payload		
Information element	*Data type*	*Description*
Note: Information elements below are repeated for each TVBD network or device		
reconfigurationTarget = CE_ID	CX_ID	Indicates TVBD network or device to be reconfigured
status	BOOLEAN	Status: successful or not
failedParameters	FailedParameters OPTIONAL	Failed reconfiguration parameters with recommended values of parameters if reconfiguration request from CM to TVBD is failed

6.2.12.5 ResourceReconfiguration.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		
Name	*Data type*	*Description*
SourceIdentifier = CE_ID	COEX_ID	Source identifier
DestinationIdentifier = CM_ID	COEX_ID	Destination identifier
Payload		
Information element	*Data type*	*Description*
TVBDType	TVBD_TYPE	TVBD device or network type
Geolocation	GEO_LOC	Registered geolocation
ChannelNumber	INTEGER OPTIONAL	Channel number
startFreq	REAL OPTIONAL	Start frequency
endFreq	REAL OPTIONAL	End frequency
MaximumPowerLevel	REAL	Power limit
ChannelLoad	REAL OPTIONAL	Expected throughput

6.2.12.6 ResourceReconfiguration.Response

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

Header		
Name	*Data type*	*Description*
SourceIdentifier	COEX_ID	CM identifier
DestinationIdentifier	COEX_ID	CE identifier
Payload		

Information element	*Data type*	*Description*
ChannelNumber	INTEGER OPTIONAL	Channel number
startFreq	REAL OPTIONAL	Start frequency
endFreq	REAL OPTIONAL	End frequency
MaximumPowerLevel	REAL	Power limit

6.2.13 Sending event indication procedures

6.2.13.1 Event_Indication

This message is sent from a CE to a CM to indicate an event in its TVBD network or device. Also, this message is sent from a CM to another CM to indicate an event in its TVBD network or device.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CE_ID or CM_ID	CX_ID	Source identifier
destinationIdentifier = CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
eventParams	EventParams	List of event parameters

6.2.13.2 Event_Confirm

This message is sent from a CM to a CE to confirm reception of an Event_Indication message. Also, this message is sent from a CM to another CM to confirm reception of an Event_Indication message.

Header		
Information element	*Data type*	*Description*
sourceIdentifier = CM_ID	CX_ID	Source identifier
destinationIdentifier = CE_ID or CM_ID	CX_ID	Destination identifier
ACKPolicy	BOOLEAN	Request to send an acknowledgement of reception
Payload		
Information element	*Data type*	*Description*
None		

6.3 Data types

```
CX_ID ::= ENUMERATED{
    CE_ID,
    CM_ID,
    CDIS_ID,
    TVWSDB_ID
```

```
}
OperationCode ::= ENUMERATED{
    New,
    Add,
    Modify,
    Remove
}

SubscribedService::= ENUMERATED{
    information,
    management,
    interCMNeighbors,
    allNeighbors
}

NetworkID::= ENUMERATED{
    BSSID,
    …
}

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

NetworkType ::= ENUMERATED{
```

```
    fixed,
    mode2,
    …
}

DiscoveryInformation ::= SEQUENCE{
    coordinateX      REAL,
    coordinateY      REAL,
    coordinateZ      REAL,
    maxTxPower    REAL,
    rxSensitivity     REAL,
    antennaGain     REAL,
    minReqSNR     REAL,
    TolerableInterferenceLevel    REAL,
    antennaHeight   REAL,
    …
}
ListOfSupportedChNumber ::= SEQUENCE OF INTEGER

ListOfOperatingChNumber ::= SEQUENCE OF INTEGER

ListOfSupportedFrequencies ::= SEQUENCE OF SEQUENCE{
    startFreq    REAL,
    stopFreq    REAL
}

ListOfOperatingFrequencies ::= SEQUENCE OF SEQUENCE{
    startFreq             REAL,
```

```
    stopFreq            REAL,
    occupancy           REAL,
    totalOccupancy      REAL OPTIONAL
}

InterferenceDirection ::= ENUMERATED{mutual, source, victim}

FreqDescription ::= SEQUENCE{
    networkID               NetworkID    OPTIONAL,
    networkTechnology       NetworkTechnology    OPTIONAL,
    coexType                ENUMERATED{known, unknown},
    interferenceDirection   InterferenceDirection,
    occupancy               REAL OPTIONAL,
    totalOccupancy          REAL OPTIONAL
}

RadioEnvironmentInformation ::= SEQUENCE OF SEQUENCE{
    startFreq           REAL,
    stopFreq            REAL,
    state               ENUMERATED{free, occupiedKnown, occupiedUnknown, notMeasured},
    freqDescription     FreqDescription    OPTIONAL
}

NetworkGeometryClass ::= CHOICE{Class#1, Class#2, Class#3, Class#4}

DeviceLocation ::= SEQUENCE{
    coordinateX     REAL,
    coordinateY     REAL,
```

```
    coordinateZ     REAL
}

RequiredResource ::= SEQUENCE OF SEQUENCE{
    requiredBandwidth    REAL,
    expectedLoad         REAL
}

ListOfAllowedTVWSChNumber ::= SEQUENCE OF INTEGER

ConstOfChUseID :: = ENUMERATED{
                    regulationMaxTxPower,
                    regulationMaxAntGain,
                    regulationMaxAntHeight,
                    regulationTVDBUpdateTime,
                    OutOfBandEmissionLimit,
                    …
}

ConstOfChUseValue :: = CHOICE{
                    regulationMaxTxPower                    REAL,
                    regulationMaxAntMaxGain                 REAL,
                    regulationAntMaxHeight                  REAL,
                    regulationTVDBUpdateTime                REAL,
                    OutOfBandEmissionLimit                  REAL,
                    …
}

ConstOfChUse : : = SEQUENCE{
                    constOfChUseID              ConstOfChUseID,
                    constOfChUseValue           ConstOfChUseValue
}

ConstOfChUses : : = SEQUENCE OF ConstOfChUse

ListOfNeighborCEID ::= SEQUENCE OF CX_ID

OperatingChannelInfo :: =  SEQUENCE {
                    operatingChannelNumber      INTEGER,
                    listOfNetworkID             SEQUENCE OF NetworkID,
```

```
                    …
}

ChClassInfo :: = SEQUENCE {
                    availableChannelList            SEQUENCE OF INTEGER,
                    restrictedChannelList           SEQUENCE OF INTEGER,
                    protectedChannelList            SEQUENCE OF INTEGER,
                    unclassifiedChannelList         SEQUENCE OF INTEGER,
                    operatingChannelList            SEQUENCE OF OperatingChannelInfo,
                    coexistenceChannelList          SEQUENCE OF OperatingChannelInfo,
                    …

}

ReqInfoDescr ::= SEQUENCE OF ENUMERATED{
   SINR,
   desiredBandwidth,
   desiredOccupancy,
   desiredQoS,
   desiredCoverage,
   channelNumber,
   …
}

ReqInfoValue ::= SEQUENCE OF SEQUENCE{
   reqInfoDescr   ReqInfoDescr,
   reqInfoValue   CHOICE{SINRValue   REAL, desiredBandwidthValue   REAL,
                         desiredOccupancyValue   REAL, desiredQoSValue   REAL,
                         desiredCoverageValue   REAL, channelNumberValue….REAL,
                         otherValue   ANY}
}
```

```
MeasSchedule ::= SEQUENCE {
    measStartTime                REAL,
    numberOfMeasurements         INTEGER,
    timeBetweenMeasurements      REAL
}
MeasFreq ::= SEQUENCE {
    measStartFreq                REAL OPTIONAL,
    measEndFreq                  REAL OPTIONAL,
    listOfChNumber               SEQUENCE OF INTEGER OPTIONAL
}

MeasurementDescription ::= SEQUENCE OF SEQUENCE{
    measDescr    ENUMERATED{SINR, BER, SensingLevel, PrimaryDetection, TVBDDetection,
                                ChannelLoadMeasurement…},
    measSchedule    MeasSchedule,
    measFreq        MeasFreq
}

MeasurementResult ::= SEQUENCE OF SEQUENCE{
    reqInfoDescr    ReqInfoDescr,
                        reqInfoValue        CHOICE{SINRValue        REAL,    BERValue
REAL,SensingLevelValue    REAL, PrimaryDetection BOOLEAN,
                    TVBDDetection BOOLEAN, ChannelLoadMeasurement REAL,
                    otherValue    ANY}
}

StartEndTime :: = SEQUENCE {
            startTime                    REAL,
```

```
        endTime                     REAL,
}

NegotiationStatus :: = SEQUENCE {
        negotiationSuccess          BOOLEAN,
        negotiationFailure          BOOLEAN,
        underNegotiation            BOOLEAN,.
        …
}

TimeSharingUnitInfo ::= SEQUENCE {
        referenceTime               REAL,
        windowTime                  StartEndTime,
        slotTime                    StartEndTime,
        …
}

NegotiationInformation :: = SEQUENCE {
        Mode                        BOOLEAN,
        listOfChNumber              SEQUENCE OF INTEGER
        timeSharingUnitInfo         TimeSharingUnitInfo,
        slotTimePosition            StartEndTime,
        numberOfSlots               INTEGER
        disallowedSlotTimePosition  StartEndTime,
        listOfContentionNumbers     SEQUENCE OF REAL
        …
}
```

```
ListOfWinnerCMID ::= SEQUENCE OF CX_ID

ListOfSlotTimePosition ::= SEQUENCE OF REAL

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

ReconfigurationRequest ::= SEQUENCE OF SEQUENCE {
   operatingFrequency    SEQUENCE{startFeq    REAL, stopFreq    REAL} OPTIONAL,
   listOfoperatingChNumber          SEQUENCE OF INTEGER OPTIONAL,

   txPowerLimit          REAL,
   channelIsShared       BOOLEAN,
   txSchedule            SEQUENCE OF TxSchedule OPTIONAL,
   networkTechnology     NetworkTechnology,
}

FailedParameterID : : = ENUMERATED {
                  operatingFrequency,
                  listOfoperatingChNumber,
                  txPowerLimit,
                  channelIsShared,
                  txSchedule,
}

FailedParameterValue : : = CHOICE{
                  operatingFrequency            SEQUENCE{startFeq    REAL, stopFreq    REAL},
                  listOfoperatingChNumber       SEQUENCE OF INTEGER,
                  txPowerLimit                  REAL,
```

```
                channelIsShared                 BOOLEAN,
                txSchedule                      SEQUENCE OF TxSchedule OPTIONAL
}

FailedParameter : : = SEQUENCE{
                failedParameterID               FailedParameterID,
                failedParameterValue            FailedParameterValue
}

FailedParameters : : = SEQUENCE OF FailedParameter


EventDescr ::= ENUMERATED{
   SINRThresholdReached,
   QoSDegradation,
   MisLocatedTVBDDetected,
   …
}

MisLocatedTVBDDetectedInfo ::= SEQUENCE{
   networkID    NetworkID,
   listOfoperatingFrequency    SEQUENCE OF SEQUENCE{startFeq    REAL, stopFreq    REAL}
                               OPTIONAL,
   listOfChannelNumber    SEQUENCE OF INTEGER OPTIONAL
}

AddInfo ::= CHOICE{
   misLocatedTVBDDetectedInfo    MisLocatedTVBDDetectedInfo,
   …
}

EventParams ::= SEQUENCE{
   eventDescr    EventDescr,
```

```
    addInfo         AddInfo OPTIONAL

}


GuranteedQoSOfWiredConnection:: = ENUMERATED{
                    CHOICE{xDSL, OpticalFibre, Others},
                    GuranteedMinimumBitRates,
                    GuranteedMaximumLatency OPTIONAL,
                    …
}

AggregatedInterferferenceControlParameters :: =  SEQUENCE{
  ReferencePointID                  INTEGER,
  Geolocation                       ReferencePointGeolocation,
  ACS                               REAL,
  Antenna height                    REAL,
  Antenna gain                      REAL,
  Protection ratio                  REAL,
…
}

ReferencePointGeolocation :: = ENUMERATED {
  Latitude                          REAL,
  Longitude                         REAL,
  Altitude                          REAL,
…
}
```