

Protocols and procedures (part I)

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Abstract

- **This contribution introduces proposal on coexistence protocol and procedures**

Summary of procedures

- **Registration procedures**
- **Neighbour discovery procedures**
- **Get available channel list procedures**
- **Measurement procedures**
- **Information collection procedures**
- **Event procedures**
- **Reconfiguration procedures**
- **Session activity check procedures**

Registration procedures

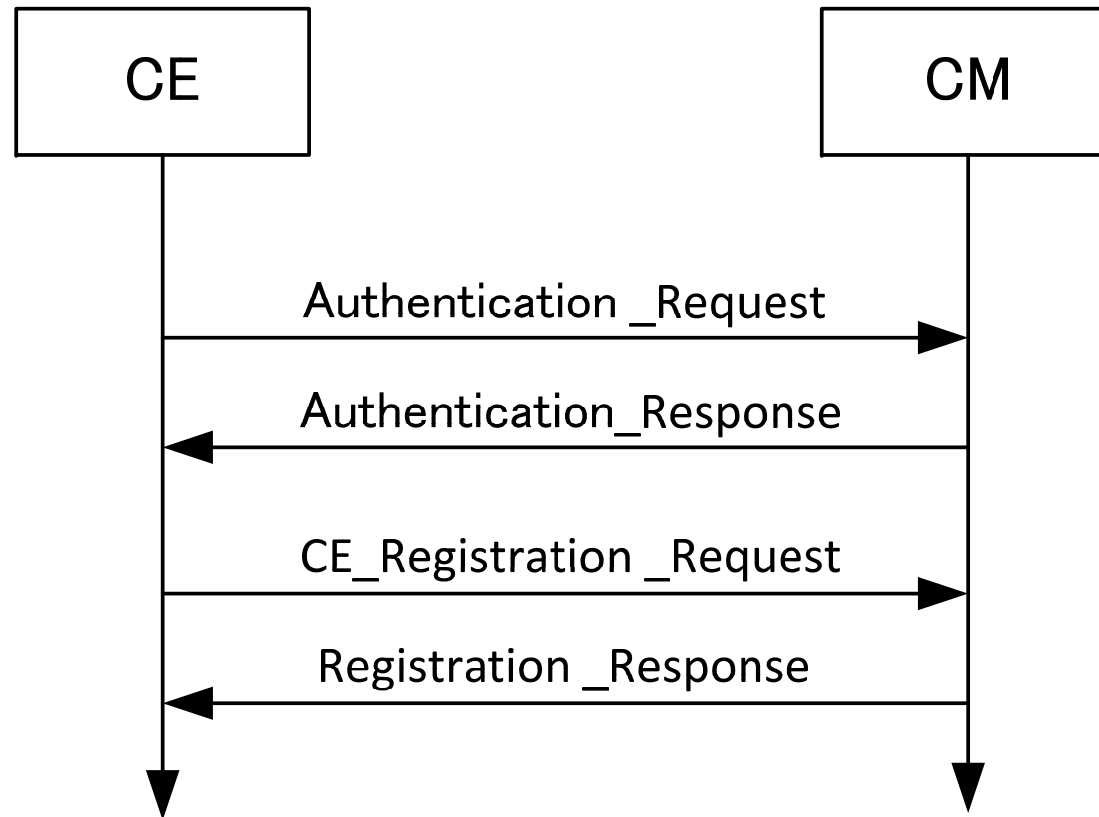
- **Outline**
 - Procedures
 - CE authentication and registration
 - CE registration update
 - CE deregistration and deauthentication
 - CM connection to CDIS
 - CM authentication and registration
 - CM registration update
 - CM deregistration and deauthentication

Registration procedures

- **Outline**
 - Messages
 - Authentication_Request
 - Authentication_Response
 - Deauthentication_Request
 - Deauthentication_Response
 - CE_Registration_Request
 - CM_Registration_Request
 - Registration_Response
 - Deregistration_Announcement
 - Deregistration_Request
 - Deregistration_Confirm
 - Connection_Request
 - Connection_Response

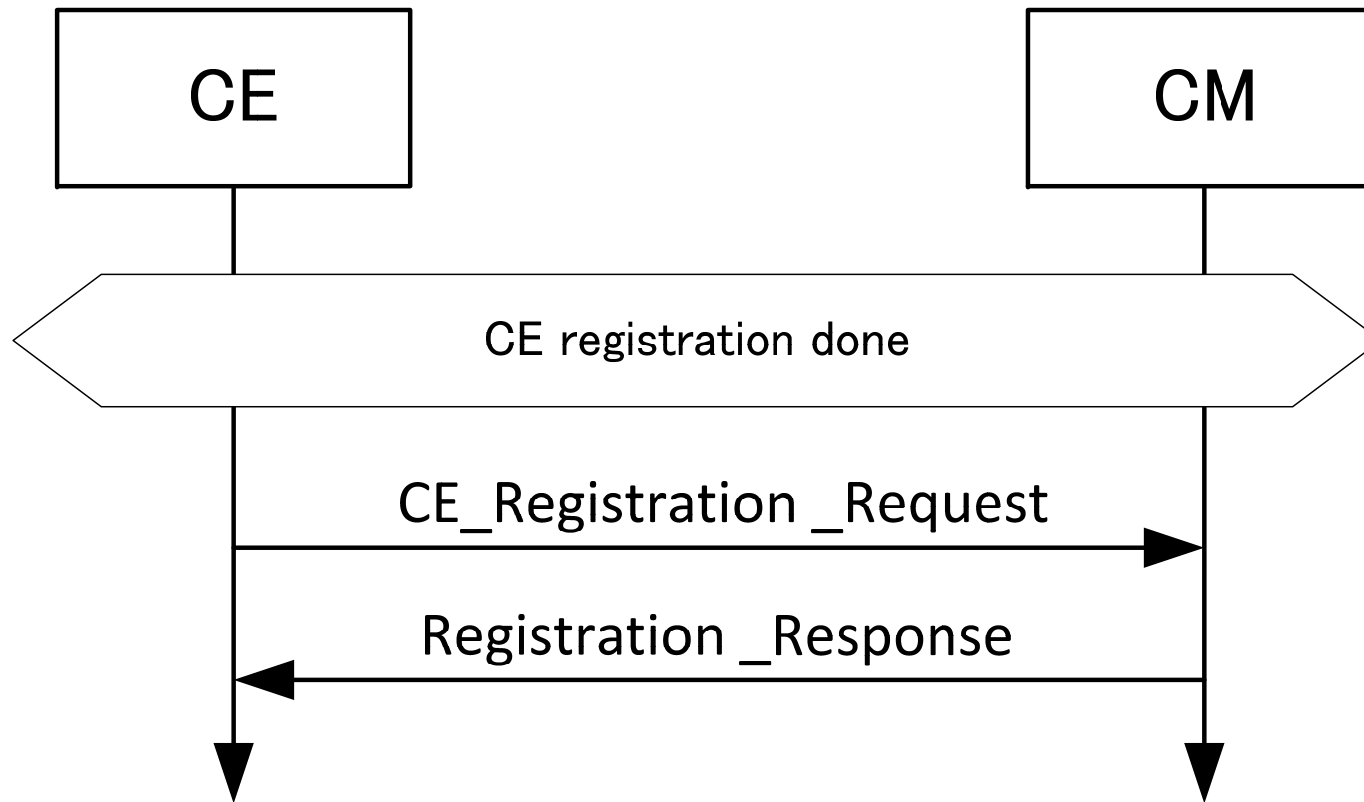
CE authentication and registration

This procedure is used by CE to authenticate itself to CM and to register information of its TVBD network or device to CM.



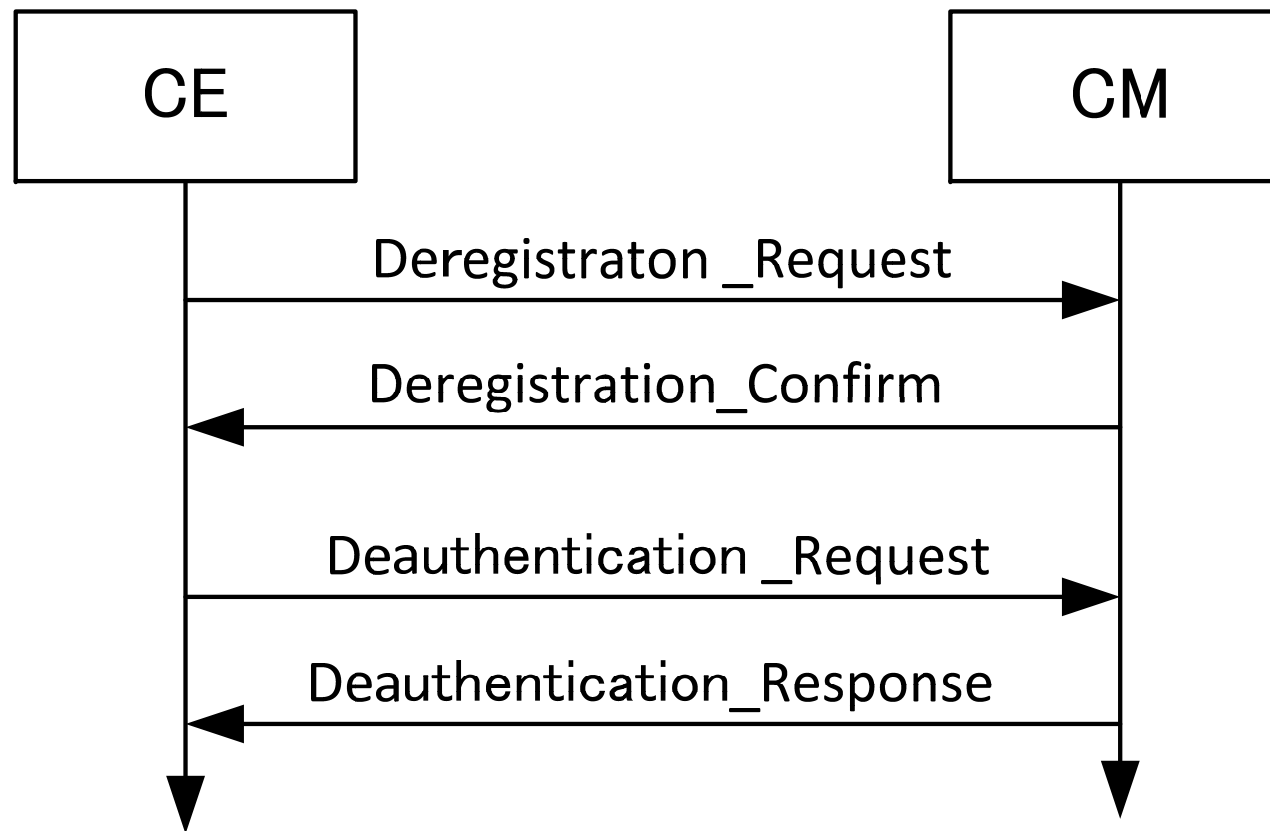
CE registration update

This procedure is used by CE to update information of its TVBD network or device to CM.



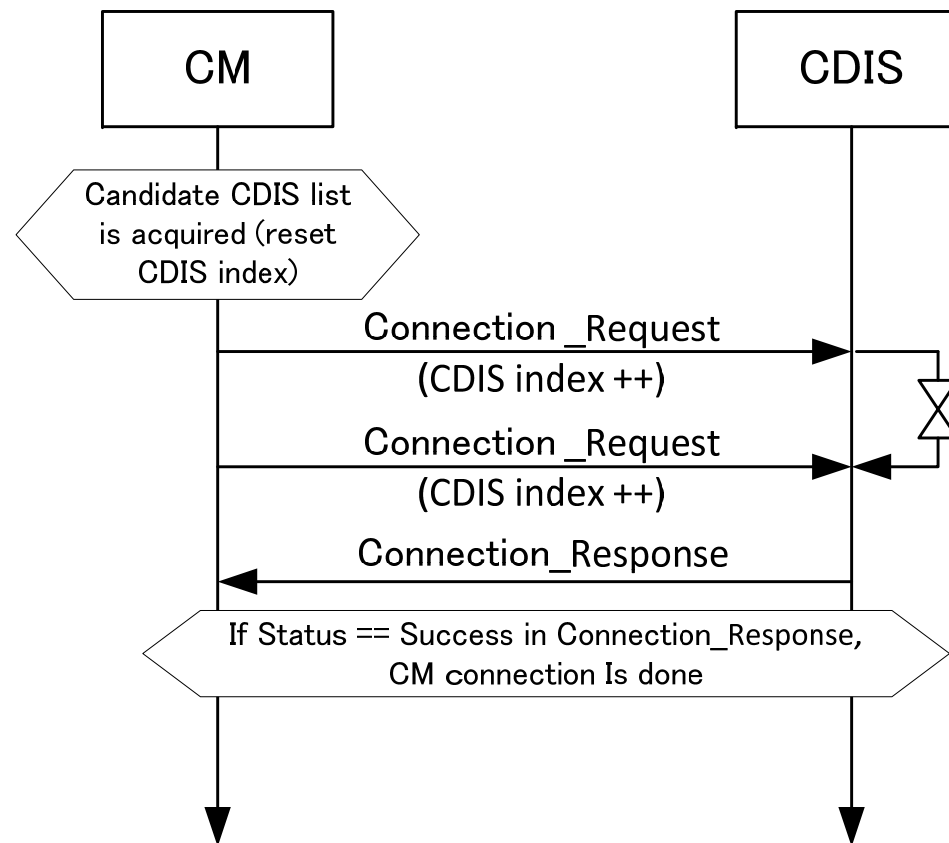
CE deregistration and deauthentication

This procedure is used by CE to deregister its TVBD network or device from CM and to deauthenticate itself from CM.



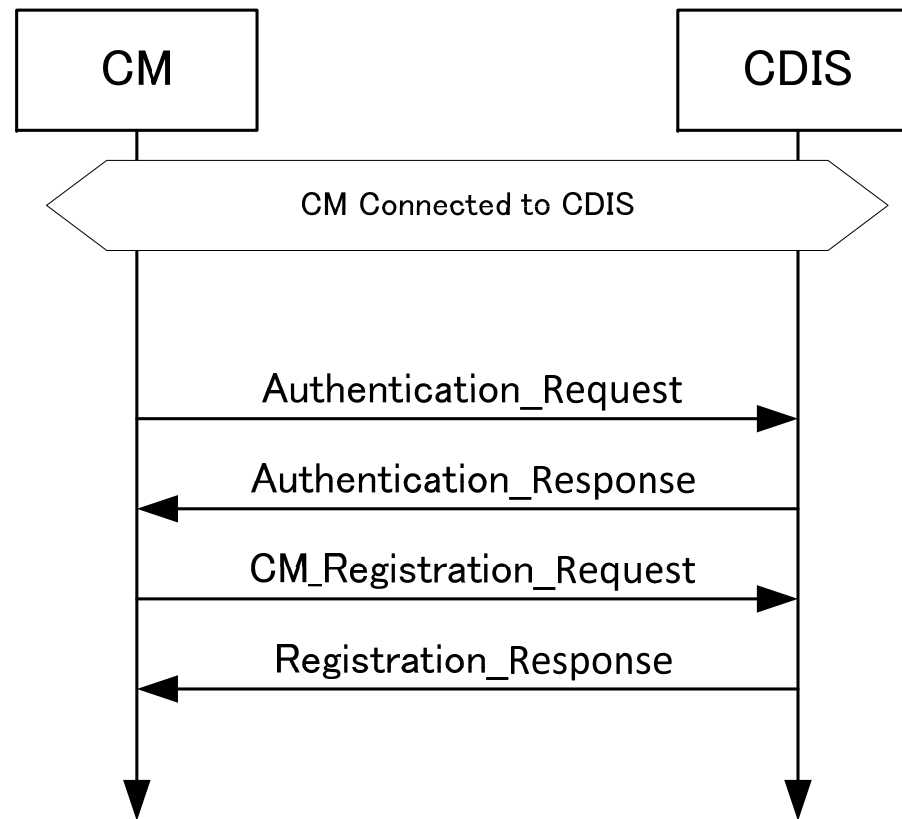
CM connection to CDIS

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.



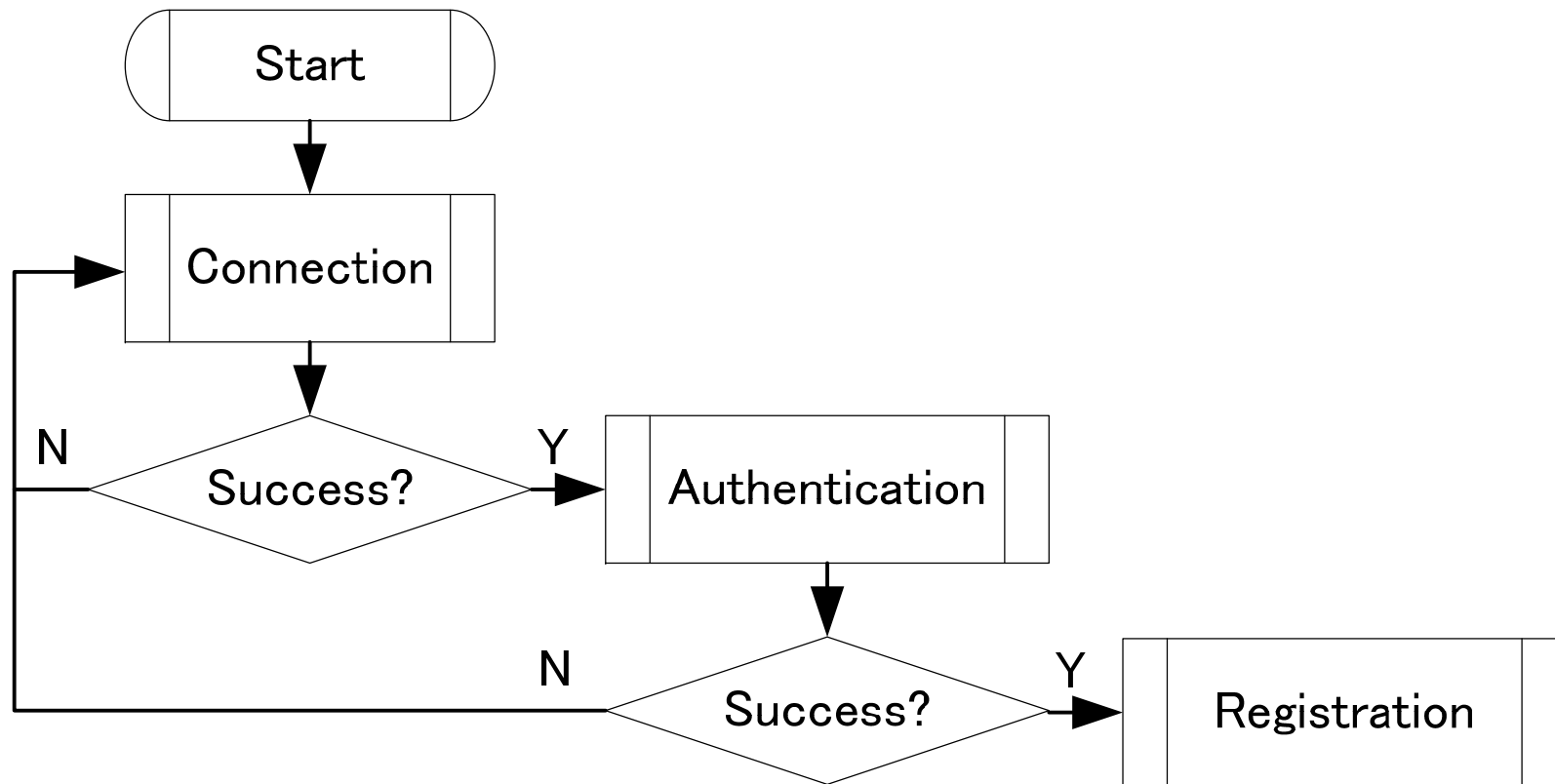
CM authentication and registration

This procedure is used by CM to authenticate itself to CDIS and to register information of its TVBD networks and devices to CDIS.



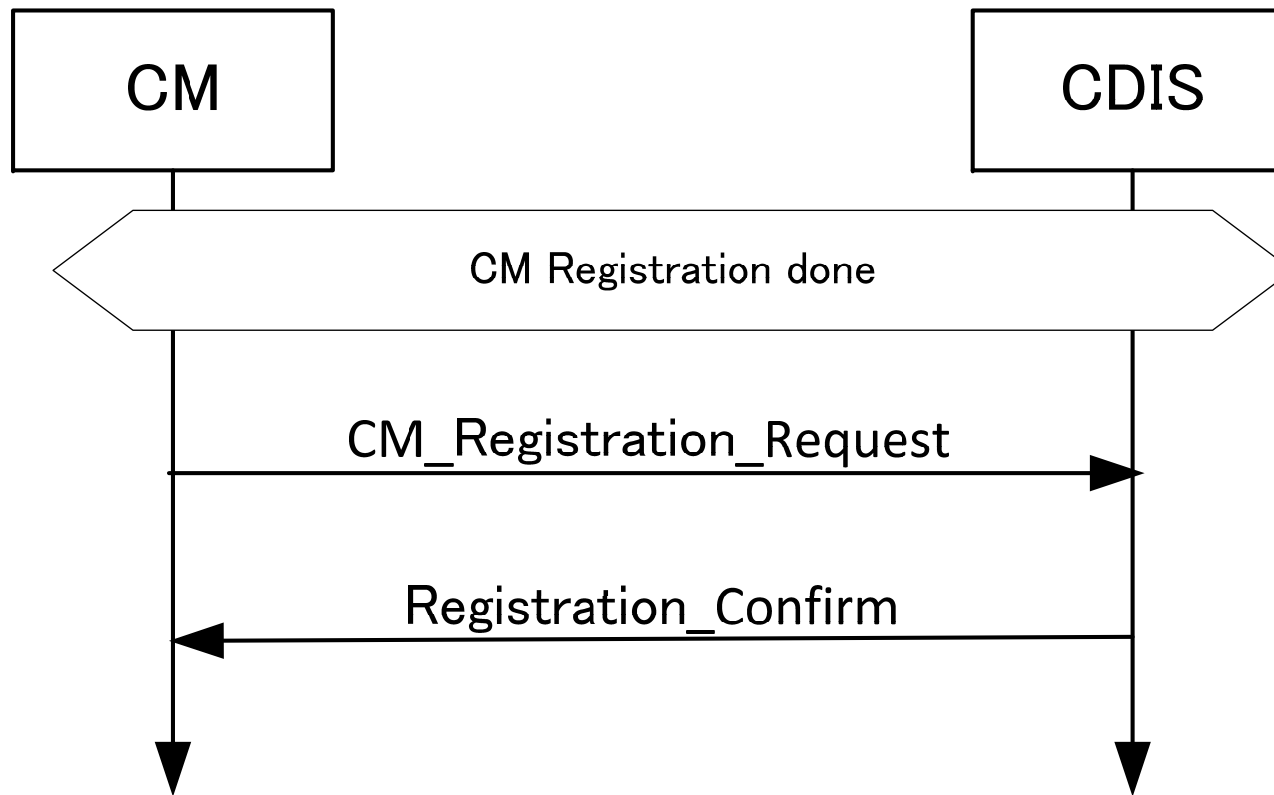
CM authentication and registration

Relation between CM connection to CDIS and CM authentication/registration.



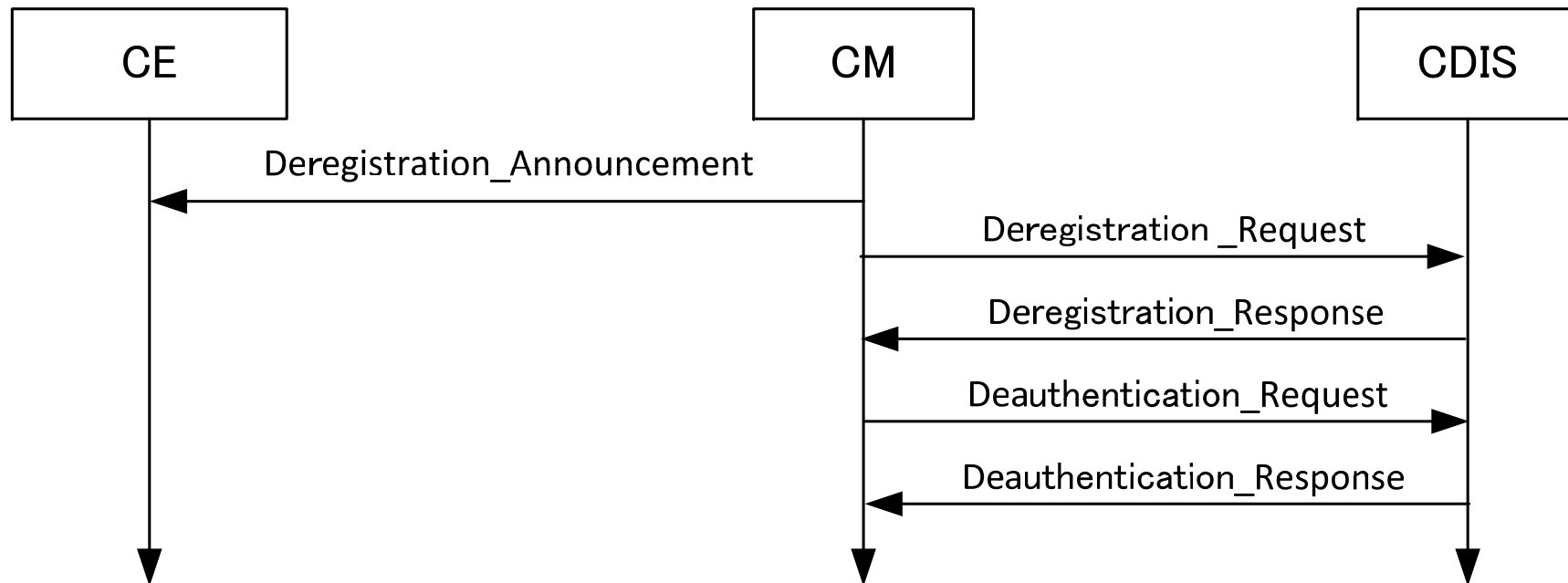
CM registration update

This procedure is used by CM to update information of its TVBD networks and devices to CDIS.



CM deregistration and deauthentication

This procedure is used by CM to deregister its TVBD networks and devices from CDIS and to deauthenticate itself from CDIS.



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>Value</i>	<i>Description</i>
Source Identifier	CE/CM ID	Source identifier
Destination Identifier	CM/CDIS ID	Destination identifier
ACK Policy	ACK required / ACK not required	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
TBD	TBD	Authentication related data

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>Value</i>	<i>Description</i>
Source Identifier	CM/CDIS ID	Source identifier
Destination Identifier	CE/CM ID	Destination identifier
ACK Policy	ACK required / ACK not required	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
TBD	TBD	Authentication related data
Status	Success / Failure	Status

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>Value</i>	<i>Description</i>
Source Identifier	CE/CM ID	Source identifier
Destination Identifier	CM/CDIS ID	Destination identifier
ACK Policy	ACK required / ACK not required	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
TBD	TBD	Authentication related data
TBD	TBD	Reason

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>Value</i>	<i>Description</i>
Source Identifier	CM/CDIS ID	Source identifier
Destination Identifier	CE/CM ID	Destination identifier
ACK Policy	ACK required / ACK not required	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
TBD	TBD	Authentication related data
Status	Success / Failure	Status

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>Value</i>	<i>Description</i>
Source Identifier	CE ID	Source identifier
Destination Identifier	CM ID	Destination identifier
ACK Policy	ACK required / ACK not required	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
Operation code	New / Update	Indicates whether this is new registration or registration update
Network ID	TBD	E.g., FCC ID of TVBD network or device
Network Type	TBD	E.g., 802.11af, 802.22
Subscribed coexistence service	TBD	Coexistence service to which TVBD network or device served by this CE is subscribed
TBD	TBD	Operating channels if any
TBD	TBD	Coverage related information

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>Value</i>	<i>Description</i>
Source Identifier	CM ID	Source identifier
Destination Identifier	CDIS ID	Destination identifier
ACK Policy	ACK required / ACK not required	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
Note: For each TVBD network or device, the information elements below are repeated.		
Operation code	New / Add / Modify / Remove	Indicates whether this is new registration, adding registration, modifying registration, or removing registration
Network ID	TBD	E.g., FCC ID of TVBD network or device
Network Type	TBD	E.g., 802.11af, 802.22
Subscribed coexistence service	TBD	Coexistence service to which TVBD network or device served by this CE is subscribed
TBD	TBD	Operating channels if any
TBD	TBD	Coverage related information

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>Value</i>	<i>Description</i>
Source Identifier	CM/CDIS ID	Source identifier
Destination Identifier	CE/CM ID	Destination identifier
ACK Policy	ACK required / ACK not required	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
Status	Success / Failure	Status

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>Value</i>	<i>Description</i>
Source Identifier	CM ID	Source identifier
Destination Identifier	CE ID	Destination identifier
ACK Policy	ACK required / ACK not required	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
None	None	None

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>Value</i>	<i>Description</i>
Source Identifier	CE/CM ID	Source identifier
Destination Identifier	CM/CDIS ID	Destination identifier
ACK Policy	ACK required / ACK not required	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
TBD	TBD	Reason

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>Value</i>	<i>Description</i>
Source Identifier	CM/CDIS ID	Source identifier
Destination Identifier	CE/CM ID	Destination identifier
ACK Policy	ACK required / ACK not required	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
Status	Success / Failure	Status

Connection_Request

This message is sent from CM to CDIS to check CDIS availability.

Header		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
Source Identifier	CM ID	Source identifier
Destination Identifier	CDIS ID	Destination identifier
ACK Policy	ACK required / ACK not required	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
None	None	None

Connection_Response

This message is sent from CDIS to CM to indicate CDIS availability to provide service for the CM.

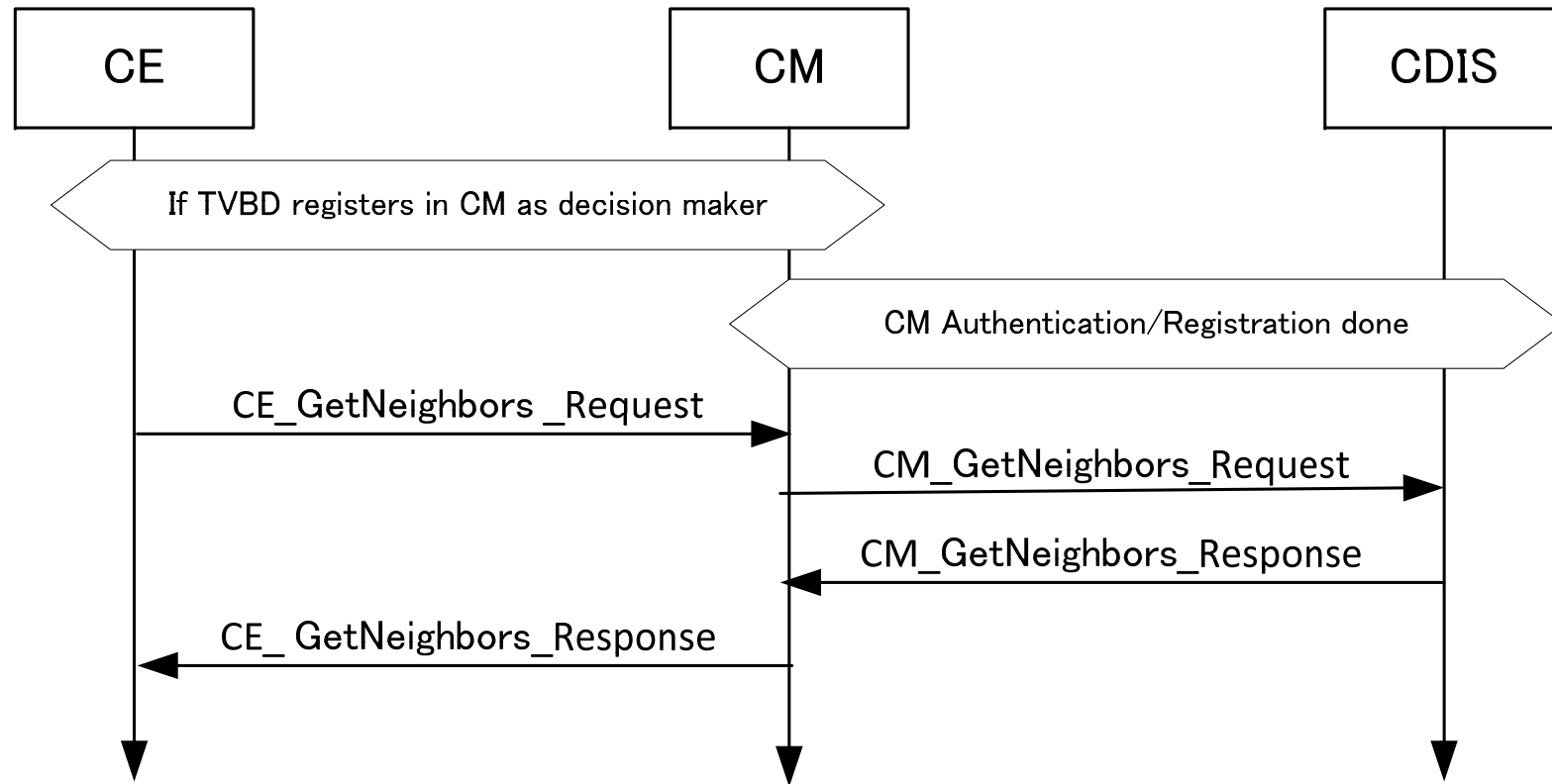
Header		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
Source Identifier	CDIS ID	Source identifier
Destination Identifier	CM ID	Destination identifier
ACK Policy	ACK required / ACK not required	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
Status	Success / Failure	Status

Neighbour discovery procedures

- **Outline**
 - Procedures
 - CE neighbour discovery
 - CM neighbour discovery
 - Messages
 - CE_GetNeighbors_Request
 - CE_GetNeighbors_Response
 - CM_GetNeighbors_Request
 - CM_GetNeighbors_Response

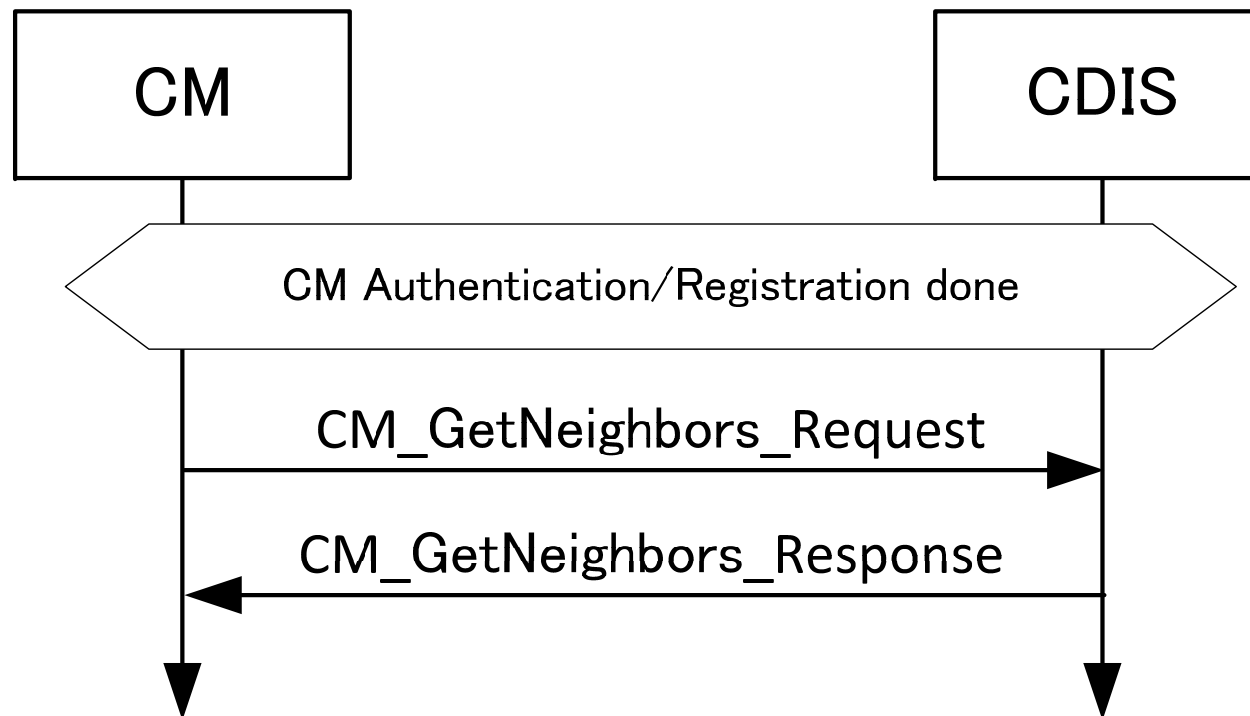
CE neighbour discovery

This procedure is used by CE to obtain information on neighbours for TVBD network or device served by this CE.



CM neighbour discovery

This procedure is used by CM to obtain information on neighbours for one TVBD network or device served by this CM.



CE_GetNeighbors_Request

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

Header		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
Source Identifier	CE ID	Source identifier
Destination Identifier	CM ID	Destination identifier
ACK Policy	ACK required / ACK not required	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
None	None	None

CE_GetNeighbors_Response

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

Header		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
Source Identifier	CM ID	Source identifier
Destination Identifier	CE ID	Destination identifier
ACK Policy	ACK required / ACK not required	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
Note: Information elements below are repeated for each neighbour network.		
Network ID	TBD	E.g., FCC ID of TVBD network or device
Network Type	TBD	E.g., 802.11af, 802.22
TBD	TBD	Operating channels if any

CM_GetNeighbors_Request

This message is sent from CM to CDIS for CM to request neighbour information for particular TVBD network or device.

Header		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
Source Identifier	CM ID	Source identifier
Destination Identifier	CDIS ID	Destination identifier
ACK Policy	ACK required / ACK not required	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
Network ID	TBD	E.g., FCC ID of TVBD network or device

CM_GetNeighbors_Response

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.

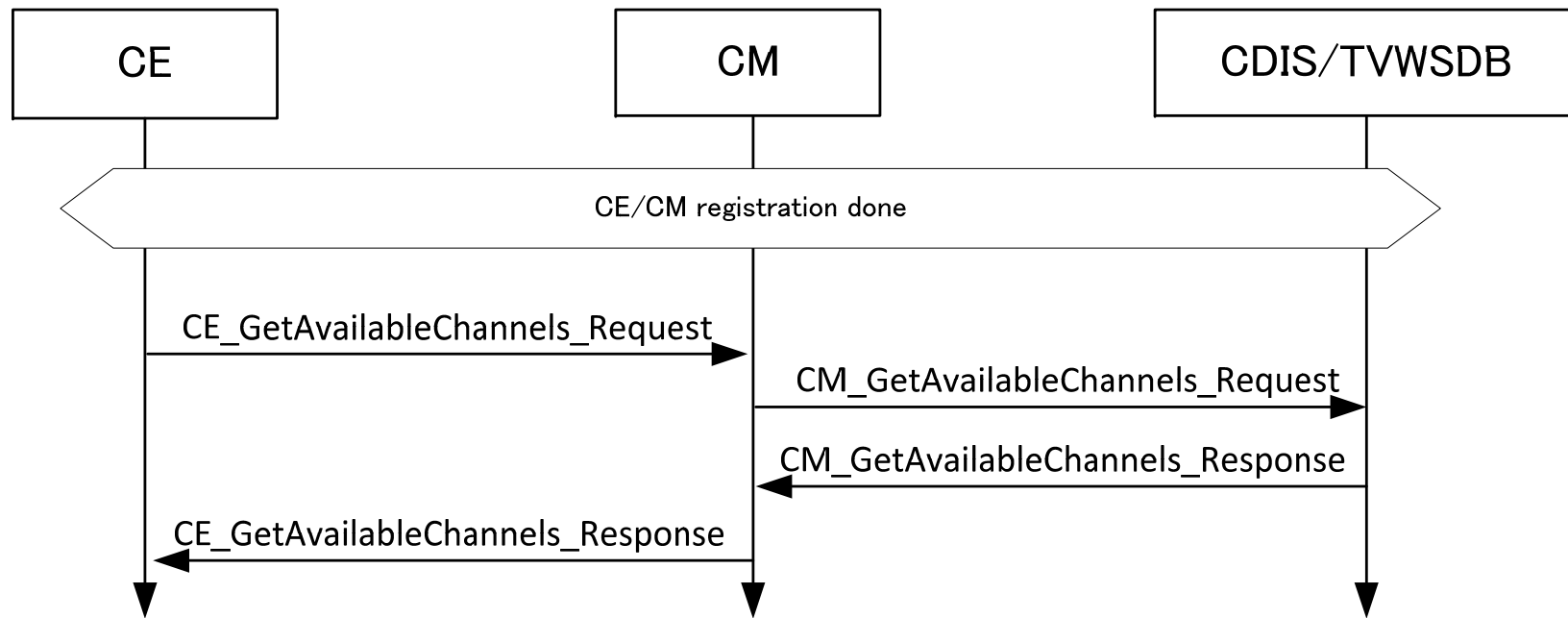
Header		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
Source Identifier	CDIS ID	Source identifier
Destination Identifier	CM ID	Destination identifier
ACK Policy	ACK required / ACK not required	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
Note: Information elements below are repeated for each neighbour CM.		
Neighbour CM ID	CM ID	Neighbour CM ID
Note: Information elements below are repeated for each neighbour network.		
Network ID	TBD	E.g., FCC ID of TVBD network or device
Network Type	TBD	E.g., 802.11af, 802.22
TBD	TBD	Operating channels if any

Get available channel list procedures

- **Outline**
 - Procedures
 - CE acquires available channel list from CM
 - CM acquires available channel list from CDIS or TV WS database
 - CM acquires available channel list from CE
 - Messages
 - CE_GetAvailableChannels_Request
 - CE_GetAvailableChannels_Response
 - CM_GetAvailableChannels_Request
 - CM_GetAvailableChannels_Response

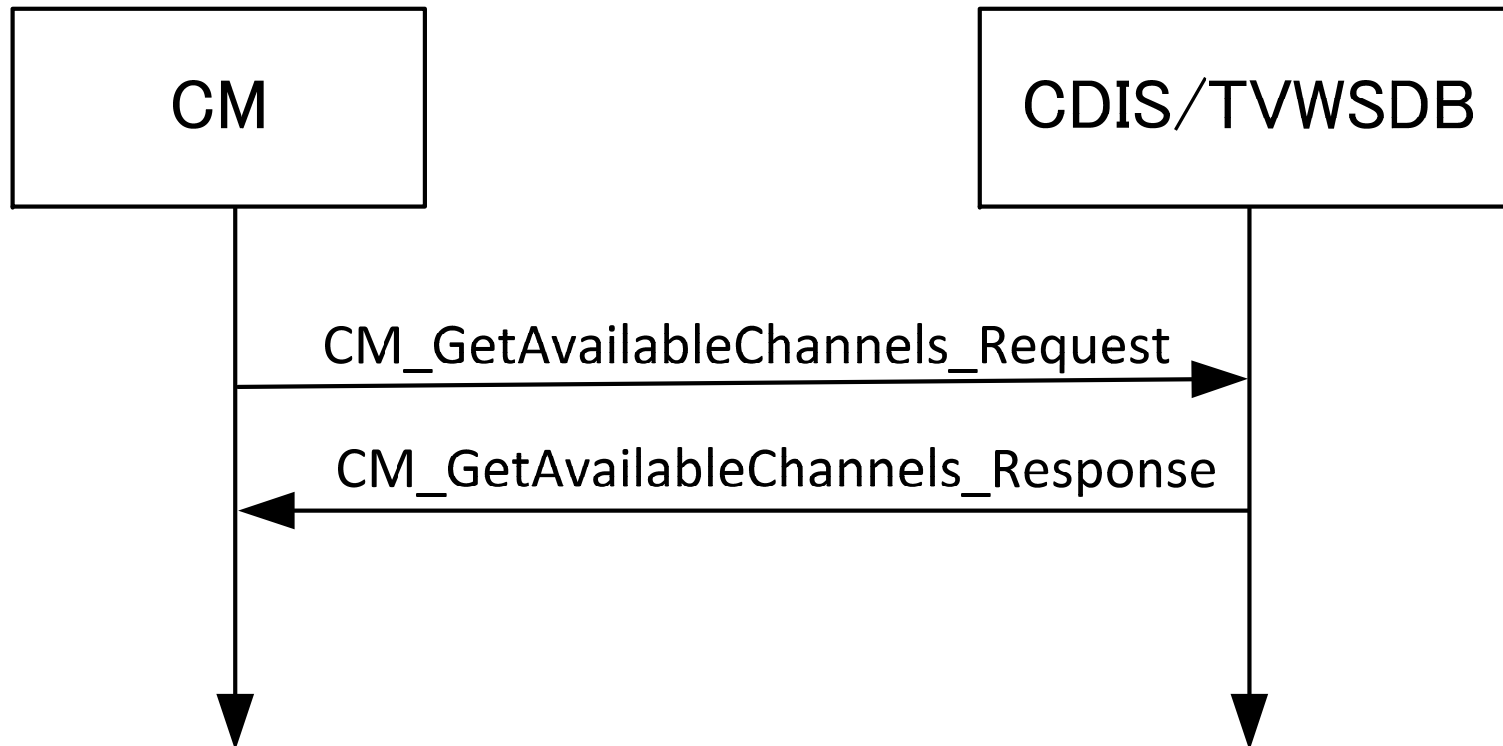
CE acquires available channel list from CM

This procedure is used by CE to obtain available channel list from CM.



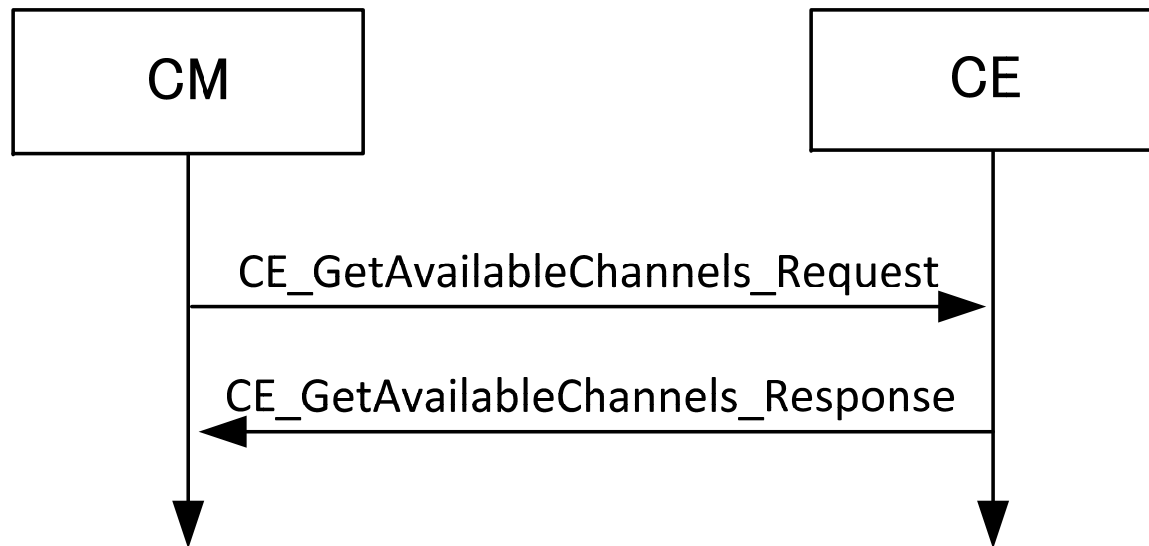
CM acquires available channel list from CDIS or TVWS database

This procedure is used by CM to obtain available channel list from CDIS or TVWS database.



CM acquires available channel list from CE

This procedure is used by CM to obtain available channel list from CE.



CE_GetAvailableChannels_Request

This message is sent from CE to CM for CE to request available channel list from CM. This message does not have payload.

Header		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
Source Identifier	CE ID	Source identifier
Destination Identifier	CM ID	Destination identifier
ACK Policy	ACK required / ACK not required	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
None	None	None

CE_GetAvailableChannels_Response

This message is sent from CM to CE for CM to provide available channel list to CE.

Header		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
Source Identifier	CM ID	Source identifier
Destination Identifier	CE ID	Destination identifier
ACK Policy	ACK required / ACK not required	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
Number of available channels	Integer	Number of available channels
TBD	TBD	Regulatory domain
Note: Information elements below are repeated for each available channel.		
Channel number	Integer	Channel number
Transmit power limit	Real	Transmit power limit

CM_GetAvailableChannels_Request

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.

Header		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
Source Identifier	CM ID	Source identifier
Destination Identifier	CDIS/TVWSDB ID	Destination identifier
ACK Policy	ACK required / ACK not required	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
Network ID	TBD	E.g., FCC ID of TVBD network or device
TBD (optional)	TBD	Coverage related information. Used only if request is sent to TVWSDB.

CM_GetAvailableChannels_Response

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>Value</i>	<i>Description</i>
Source Identifier	CDIS/TVWSDB ID	Source identifier
Destination Identifier	CM ID	Destination identifier
ACK Policy	ACK required / ACK not required	Request to send acknowledgement of reception
Payload		
<i>Information element</i>	<i>Value</i>	<i>Description</i>
Number of available channels	Integer	Number of available channels
TBD	TBD	Regulatory domain
Note: Information elements below are repeated for each available channel.		
Channel number	Integer	Channel number
Transmit power limit	Real	Transmit power limit