Intro

- SCMP is a transaction based protocol which implements one thing - connecting talker stream sources with listener stream sinks

- Uses multicast 1722 control packets
  - Doesn’t require device MAC lookup
  - Allows controllers to update connection map without polling for changes

- SCMP does not attempt to verify stream ends have the same format, that is up to the enumeration/control protocol
Timeouts

- 2000ms for connect TX stream command
  - allows for MAAP allocation period
- 4500ms for connect RX stream command
  - allows for connect TX command, retry of connect TX command and some processing time
- 200ms for all other TX commands and RX state command
- 500ms for all other RX commands
Connection Modes

- Saved state loading and restore
  - Fast Connect
  - Fast Disconnect

- Controller directed connections
  - Controller Connect
  - Controller Disconnect
Connection Entities

- The Talker
- The Listener
- The Controller

- A device can be one or more of these, it doesn’t have to implement them all
End Stations

- SCMP is an implied service of 1722.1
- Has one or more of the 3 SCMP entities as appropriate for it’s functions
  - A microphone may have just a talker entity, or may have all 3
  - A control device may have just the controller
SCMPDU Format

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<th>subtype (7C16)</th>
<th>SV version (0)</th>
<th>message_type</th>
<th>status</th>
<th>control_data_length (40)</th>
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- subtype data
- Stream ID
- SCMP Data
- subtype (7C16)
- SV version (0)
- message_type
- status
- control_data_length (40)
- flags
- controller_guid
- talker_guid
- listener_guid
- dest_mac
- listener_unique_id
- talker_unique_id
- connection_count
- sequence_id
SCMPDU Fields

- sv
- version
- message_type
- status
- stream_id
- controller_guid
- talker_guid
- listener_guid
- talker_unique_id
- listener_unique_id
- dest_mac
- connection_count
- sequence_id
- flags
Connection command flow

- Controller sends message to listener to connect/disconnect talker
  - Only in Controller Connect/Disconnect mode
- Listener sends message to talker to connect/disconnect itself
  - Sent in all modes
Listener RX Commands

- CONNECT_RX
- DISCONNECT_RX
- GET_RX_STATE
CONNECT_RX

- Establish a connection from the talker to the listener
- Command is sent by the controller
- Triggers sending a CONNECT_TX to the talker to establish the details for the connection
- On successful response from CONNECT_TX triggers MSRP listener registration
DISCONNECT_RX

- Remove listener from connection
- Command is sent by the controller
- Triggers sending a DISCONNECT_TX to the talker
- Listener uses this to remove the MSRP listener registration
GET_RX_STATE

- Get the current state of the RX side of the connection
- Command is sent by a controller
- Returns the connection status and if connected the stream ID and destination multicast MAC.
Talker TX Commands

- CONNECT_TX
  - Sent by the listener

- DISCONNECT_TX
  - Sent by the listener

- GET_TX_STATE
  - Sent by the listener or controller

- GET_TX_CONNECTION
  - Sent by the listener or controller
CONNECT_TX

- Establishes a connection from a talker to a listener
- Command is sent by the listener
- Provides the listener with the stream’s ID and destination multicast MAC
- Talker uses this to trigger MSRP talker registration (if necessary) (and optionally also MAAP allocation for the stream)
**DISCONNECT_TX**

- Removes a listener from an established connection
- Command is sent by the listener
- Talker uses this to deregister MSRP talker (if there are no other connections)
GET_TX_STATE

- Gets the current state of the talker side of the connection
- Command is sent by a controller
- Returns the number of connected listeners, the stream ID and destination multicast address if connected
GET_TX_CONNECTION

- Gets the details of a specific connection from talker to listener
- Command is sent by a controller
- Returns the listener_guid and listener_unique_id for an indexed connection
Status Codes

- SUCCESS
- LISTENER_UNKNOWN_ID
- TALKER_UNKNOWN_ID
- TALKER_DEST_MAC_FAIL
- TALKER_NO_STREAM_INDEX
- TALKER_NO_BANDWIDTH
- TALKER_EXCLUSIVE
- LISTENER_TALKER_TIMEOUT
- LISTENER_EXCLUSIVE
- STATE_UNAVAILABLE
- NOT_CONNECTED
- NO_SUCH_CONNECTION
- NOT_SUPPORTED
- UNABLE_TO_SEND_MESSAGE
Flags

- 16-bit bitfield
- 3 defined flags
  - CLASS_B
  - FAST_CONNECT
  - SAVED_STATE
    - Talker/Listener has saved state in non-volatile memory
Controller Connect Message Flow

Audio Device 1
Talker
Listener

Audio Device 2
Talker
Listener

Control Device
Controller
Controller Connect Message Flow

CONNECT_RX Command
Controller Connect Message Flow

CONNECT_TX Command

Audio Device 1
Talker
Listener

Audio Device 2
Talker
Listener

Control Device
Controller
Controller Connect Message Flow

CONNECT_TX Response
Controller Connect Message Flow

CONNECT_RX Response

Audio Device 1
- Talker
- Listener

Audio Device 2
- Talker
- Listener

Control Device
- Controller
Controller Connect Message Flow

CONNECT_RX Command
Controller Connect Message Flow

CONNECT_TX Command
Controller Connect Message Flow

Audio Device 1
Talker
Listener

Audio Device 2
Talker
Listener

CONNECT_TX
Response
Controller Connect Message Flow

CONNECT_RX Response
Fast Connect Message Flow

Audio Device 1
Talker
Listener

Control Device
Controller

Audio Device 2
Talker
Listener
Fast Connect Message Flow

CONNECT_TX Response
Fast Connect Message Flow

CONNECT_TX Command
Fast Connect Message Flow

CONNECT_TX Response