Simple Discovery Protocol

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Intro

- SDP is a layer 2 protocol for performing device discovery
- Uses multicast 1722 control packets
- Three message types
  - “Hello” - DEVICEAVAILABLE
  - “Goodbye” - DEVICEDEPARTING
  - “Who is there” - DEVICESCOVER
### SDPDU Format

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Fields from 1722 Control Header

- subtype as assigned (7A?)
- sv is always 0
- version as per 1722/1722.1
- control_data is reused as message_type
- status is reused as time_to_live
- stream_id is reused as device_guid
New Fields

- vendor_id
- model_id
- device_capabilities
- talker_capabilities
- listener_capabilities
- controller_capabilities
- 4 reserved quadlets for future use
message_type

- DEVICE_AVAILABLE
  - The device is available for use, sent periodically

- DEVICE_DEPARTING
  - The device is performing a (clean) shutdown and is going away

- DEVICE_DISCOVER
  - Sent by “controller” to cause every device to send DEVICE_AVAILABLE message (and reset their TTL)
time_to_live

- Time to live is in units of 2 seconds
  - Field represents 2 - 62 seconds
- Default time to live is 62 seconds
device_capabilities

- Bit field describing general things about the device
  - 17221_IP - also supports IP versions of protocols
  - ZERO_CONF - also published via Zero-Conf
  - BRIDGED_DEVICE - device is a proxy for a bridged device (typically IEEE1394 device)
  - LEGACY_AVC - supports using IEEE1394 AV/C protocol (typically for a IEEE1394 bridged device)
  - NO_17221_CONTROL - does not understand the 1722.1 control protocol (e.g. a proxy for a IEEE1394 device may not provide control translation)
talker_capabilities

- Top N bits are the number of stream sources
  - The highest 8-16 bits of the capabilities field indicate how many stream sources there are.

- Lower 32-N are a bit map of talker capabilities
  - IMPLEMENTED - the device has stream sources

- Do we want audio and video flags
  - i.e. a flag indicating I have audio sources, and flag indicating I have video sources

- What other flags are needed?
 listener_capabilities

- Top N bits are the number of stream sinks
  - The highest 8-16 bits of the capabilities field indicate how many stream sinks there are.

- Lower 32-N are a bit map of talker capabilities
  - IMPLEMENTED - the device has stream sinks

- Do we want audio and video flags
  - i.e. a flag indicating I have audio sinks, and flag indicating I have video sinks

- What other flags are needed?
controller_capabilities

- Bit map of controller capabilities
  - IMPLEMENTED - the device has controller functionality
Sending a DEVICE_AVAILABLE

- Every device offering 1722.1 services (controller only devices excepted) sends a DEVICE_AVAILABLE message when they are ready to start offering services
  - Message contains their nominal time to live (62 seconds)
- At half of the nominal time to live, the device resets their time to live and sends another DEVICE_AVAILABLE message
When the device no longer wants to provide 1722.1 services, the device sends a DEVICE_DEPARTING message.
Sending a **DEVICE_DISCOVER**

- Sent when a device wants to immediately find all of the devices on the network (and doesn’t want to wait for a whole time to live period)
Handling a DEVICE_AVAILABLE

- If this is a GUID which you don’t know about, it’s a new device - do whatever you need to handle a new device
- If this is a GUID which you do know about, it’s an existing device - update the time to live with the new value
- Start counting down the time to live
  - If time to live ever reaches 0 without receiving another DEVICE_AVAILABLE then the device is considered to be gone.
Handling DEVICE_DEPARTED

- Immediately remove the device from list of known devices and consider the device gone.

- Do we want a DEVICE_WILL_DEPART message so that we can cleanly disconnect devices?
Handling DEVICE_DISCOVER

- All devices must handle a DEVICE_DISCOVER
- Device waits between 0 and 25ms (inclusive) before resetting their time to live and sending a DEVICE_AVAILABLE message
- Delay is based on the sum of each individual byte of the MAC address mod 26 (in ms)