



# Simple Discovery Protocol

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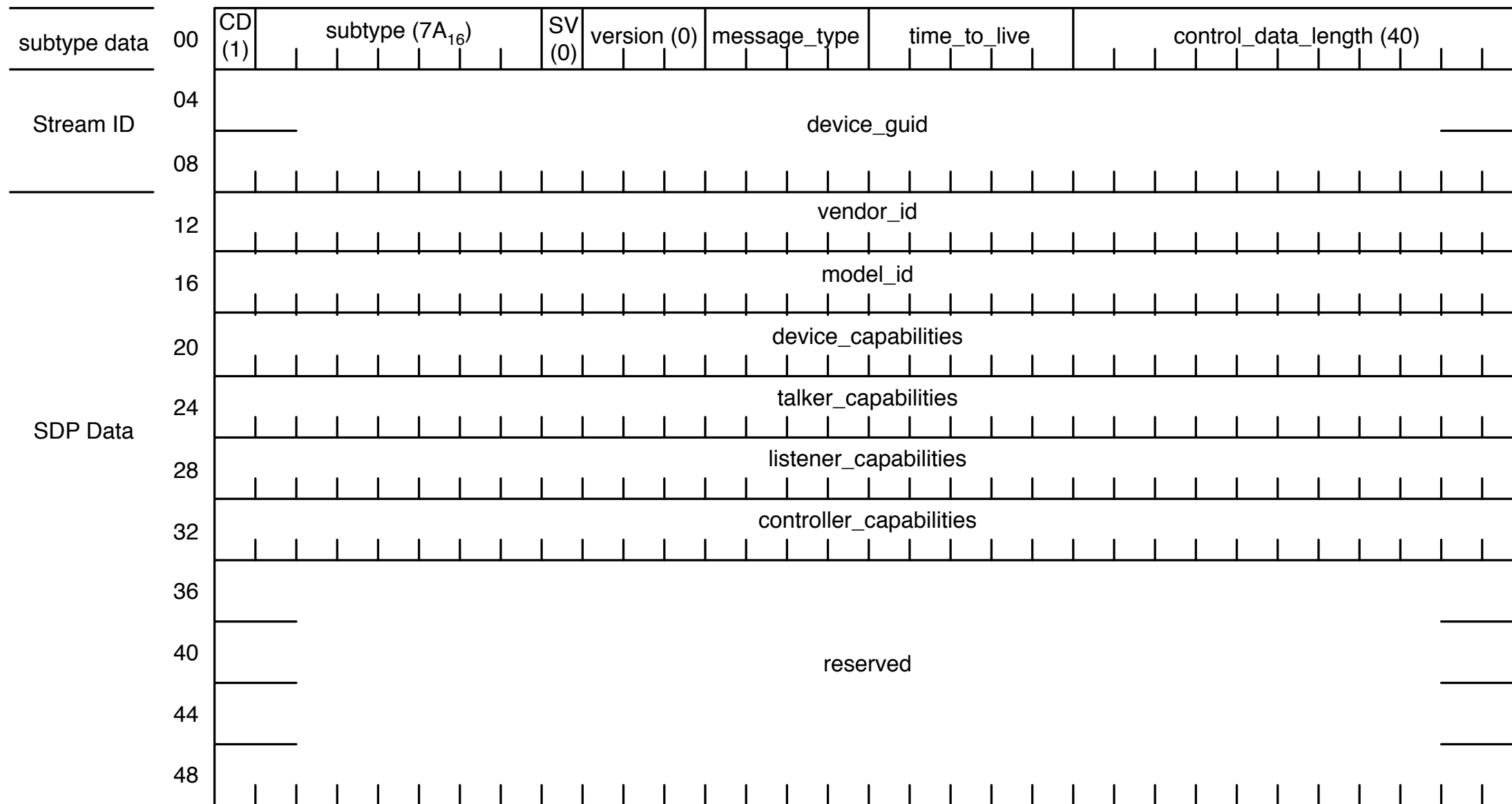
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# Intro

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- SDP is a layer 2 protocol for performing device discovery
- Uses multicast 1722 control packets
- Three message types
  - “Hello” - DEVICE\_AVAILABLE
  - “Goodbye” - DEVICE\_DEPARTING
  - “Who is there” - DEVICE\_DISCOVER

# SDPDU Format



# Fields from 1722 Control Header

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- 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

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- vendor\_id
- model\_id
- device\_capabilities
- talker\_capabilities
- listener\_capabilities
- controller\_capabilities
- 4 reserved quadlets for future use

# message\_type

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- **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

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

# device\_capabilities

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- 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

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- 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

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- 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

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- Bit map of controller capabilities
  - IMPLEMENTED - the device has controller functionality

# Sending a DEVICE\_AVAILABLE

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- 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

# Sending a DEVICE\_DEPARTING

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- When the device no longer wants to provide 1722.1 services, the device sends a **DEVICE\_DEPARTING** message

# Sending a DEVICE\_DISCOVER

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- 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

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- 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

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- 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

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- 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)