



# GStreamer WebRTC Data Channels

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# Who Am I

- Australian
- Work - Centricular
- Graphics – OpenGL, Vulkan
- Multimedia
- WebRTC

# Data Channels

- Send+receive arbitrary data with WebRTC
- Peer-to-Peer
- Encrypted with DTLS
  - Using the same channel as RTP media
- SCTP transport

# Data Channels Uses

- File transfer
- Chat
- Multiplayer gaming
- Real-time data

# SCTP

- Stream Control Transmission Protocol

	TCP	UDP	SCTP
Reliability	reliable	unreliable	configurable
Delivery	ordered	unordered	configurable
Transmission	byte-orientated	message-orientated	message-orientated
Flow Control	yes	no	yes
Congestion Control	yes	no	yes

# WebRTCbin – Data Channels

- <https://www.w3.org/TR/webrtc/#peer-to-peer-data-api>

```
RTCDataChannel createDataChannel(USVString label,  
                                optional RTCDataChannelInit dataChannelDict);  
attribute EventHandler      ondatachannel;
```

- webRTCbin signals:

```
GstWebRTCDataChannel * "create-data-channel" (GstElement* webRTCbin,  
                                             gchararray label,  
                                             GstStructure* options);  
void "on-data-channel" (GstElement* webRTCbin,  
                       GstWebRTCDataChannel* label,  
                       gpointer user_data);
```

# RTCDataChannel Spec

```
interface RTCDataChannel : EventTarget {
  readonly attribute USVString label;
  readonly attribute boolean ordered;
  readonly attribute unsigned short? maxPacketLifeTime;
  readonly attribute unsigned short? maxRetransmits;
  readonly attribute USVString protocol;
  readonly attribute boolean negotiated;
  readonly attribute unsigned short? id;
  readonly attribute RTCPriorityType priority;
  readonly attribute RTCDataChannelState readyState;
  readonly attribute unsigned long bufferedAmount;
  attribute unsigned long bufferedAmountLowThreshold;
  attribute EventHandler onopen;
  attribute EventHandler onbufferedamountlow;
  attribute EventHandler onerror;
  attribute EventHandler onclose;

  void close();
  attribute EventHandler onmessage;
  attribute DOMString binaryType;

  void send(USVString data);
  void send(Blob data);
  void send(ArrayBuffer data);
  void send(ArrayBufferView data);
};
```

# WebRTCDataChannel in webrtcbin

- <https://cgit.freedesktop.org/gstreamer/gst-plugins-bad/tree/ext/webrtc/webrtcdatachannel.c?id=afb0c3a97ec391c6a582f3c746965fdc3eb3e1f3#n1141>
- Not enough room to go over details!



# Thanks!

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- @ystreet00 on twitter