

ID3 packaging in transport stream

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What is an ID3 tag?

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<https://id3.org/id3v2.4.0-structure>

- It is a data container standard
- It is useful to save metadata related to the content of the file
- It can be carried in elementary stream in transport stream





How do we package ID3 in transport stream?

How do we package ID3 in transport stream?

- Help feature of metadata PES support on mpegts
- Already in main branch

gst-inspect-1.0 mpegtsmux

```
mpegversion: { (int)1, (int)2, (int)4 }
systemstream: false
video/x-dirac
image/x-jpc
    alignment: frame
video/x-h264
    stream-format: byte-stream
    alignment: { (string)au, (string)nal }
video/x-h265
    stream-format: byte-stream
    alignment: { (string)au, (string)nal }
audio/mpeg
    parsed: true
    mpegversion: 1
audio/mpeg
    framed: true
    mpegversion: { (int)2, (int)4 }
    stream-format: { (string)adts, (string)raw }
audio/x-lpcm
    width: { (int)16, (int)20, (int)24 }
    rate: { (int)48000, (int)96000 }
    channels: [ 1, 8 ]
    dynamic_range: [ 0, 255 ]
    emphasis: { (boolean>false, (boolean>true }
    mute: { (boolean>false, (boolean>true }
audio/x-ac3
    framed: true
audio/x-dts
    framed: true
audio/x-opus
    channels: [ 1, 255 ]
subpicture/x-dvb
application/x-teletext
meta/x-klv
    parsed: true
meta/x-id3
    parsed: true
```

Elements

- Id3insert
- Id3Timestamp

```
Factory Details:
Rank                none (0)
Long-name           Id3 insert Source
Klass               Source/meta
Description          Insert ID3 tags
Author              genius sports

Plugin Details:
Name                id3_gst_plugin
Description          GeniusSports id3 gstreamer plugin
Filename            [REDACTED]
Version             0.1.0-95a57a000/
License             Proprietary
Source module       id3_gst_plugin
Source release date 2024-09-25
Binary package      id3_gst_plugin
Origin URL          [REDACTED]

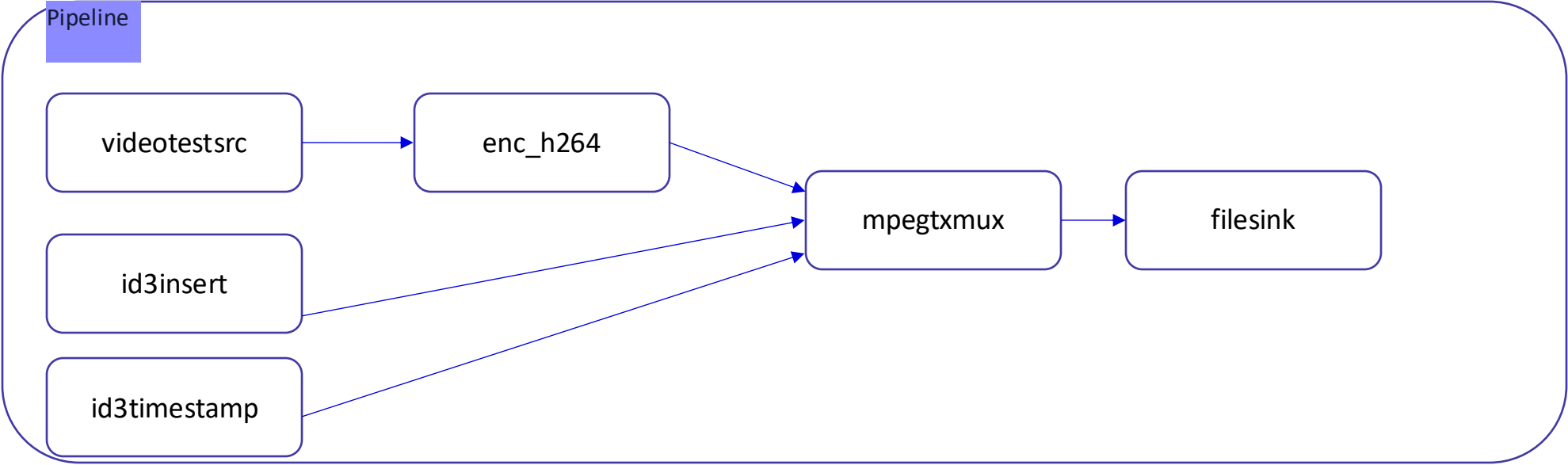
GObject
+----GInitiallyUnowned
  +----GstObject
    +----GstElement
      +----GstBaseSrc
        +----id3insert

Pad Templates:
SRC template: 'src'
Availability: Always
Capabilities:
  meta/x-id3
  parsed: true
```

Example

```
gst-launch-1.0 videotestsrc ! x264enc ! queue ! h264parse ! mpegtsmux name=mux_ts !  
filesink location=gstreamer.ts id3insert message="{ \"frameType\": \"TXXX\", \"info\":  
\"2024\", \"data\": \"Gstreamer_conf_2024\"}" ! mux_ts.
```


Example



Example

The screenshot shows the DVB Inspector interface for a transport stream. The left pane displays the tree structure of the stream, with the selected packet [42] highlighted. The right pane shows the detailed structure of the selected packet, including the adaptation field and the PES header. Two orange arrows point to specific elements: one to the 'Video H.264 (AVC) - Service 1' entry in the PID list, and another to the 'Data' section of the selected packet.

Transport Stream 1

- file: /Users/sbd/Documents/dotGstreamer/gstreamer_conf/gstreamer.ts
- size: 0x1A7763C (27751996)
- modified: Mon Oct 07 10:43:39 EDT 2024
- TS packets: 0x240A1 (147617)
- packet size: 0xBC (188) => (detected)
- Error packets: 0x0 (0)
- Sync Errors: 0x0 (0)
- bitrate: 0x18359B (1586587)
- length (secs): 0x8B (139)
- PSI
- PIDs
 - pid: 0x0 (0) => PAT
 - pid: 0x20 (32) => PMT - Service 1
 - pid: 0x41 (65) => Video H.264 (AVC) - Service 1
 - pid: 0x42 (66) => Metadata in PES packets - Service 1
 - packets: 0x1 (1)
 - duplicate packets: 0x0 (0)
 - continuity errors: 0x0 (0)
 - transport_scrambling_control: false
 - type: PES
- Transport packets [42..42]
 - transport_packet [42] (adaptation field) (payload) (payload start)
- Transport packets [0..147616]

transport_scrambling_control: 0 (not scrambled)
adaptation_field_control: 3 (adaptation field followed by payload)
continuity_counter: 0x1 (1)

adaptation_field:

- adaptation_field_length: 0x7C (124)
- discontinuity_indicator: 0
- random_access_indicator: 0
- elementary_stream_priority_indicator: 0
- PCR_flag: 0
- OPCR_flag: 0
- splicing_point_flag: 0
- transport_private_data_flag: 0
- adaptation_field_extension_flag: 0

Pes Header:

- stream_id: 0xBD (189) => private_stream_1
- PES_packet_length: 0x35 (53)
- markerBits: 0x2 (2)
- pes_scrambling_control: 0x0 (0) => Not scrambled
- pes_priority: 0x0 (0) => normal
- data_alignment_indicator: 0x1 (1) => PES packet header is immediately followed by the video start code or audio syncword indicated in the data_stream_alignment_descriptor
- copyright: 0x0 (0) => not defined whether the material is protected by copyright
- original_or_copy: 0x1 (1) => contents of the associated PES packet payload is an original
- pts_dts_flags: 0x2 (2) => PTS fields shall be present in the PES packet header
- esr_flag: 0x0 (0) => no ESCR fields are present
- es_rate_flag: 0x0 (0) => no ES_rate field is present
- dsm_trick_mode_flag: 0x0 (0) => 8-bit trick mode field is not present
- additional_copy_info_flag: 0x0 (0) => additional_copy_info field is not present
- pes_crc_flag: 0x0 (0) => CRC field is not present
- pes_extension_flag: 0x0 (0) => extension field is not present
- pes_header_data_length: 0x5 (5)
- pts: 0x134FD900 (324000000) => 1:00:00.0000

Data:

Offset	Hex	ASCII
0x000000	4740 4231 7C00 FFFF FFFF FFFF FFFF FFFF	@B1
0x000010	FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
0x000020	FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
0x000030	FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
0x000040	FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
0x000050	FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
0x000060	FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
0x000070	FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
0x000080	FF00 0001 BD00 3585 8005 214D 3FB2 01495...!M?..I
0x000090	4433 0400 0000 0000 2354 5858 5800 0000	D3.....#TXXX...
0x0000a0	1900 0003 3230 3234 0047 7374 7265 616D	...2024.Gstream
0x0000b0	6572 5F63 6F6E 665F 3230 3234	er_conf_2024



Thanks!