MPEGID

MPEG Stream Identifier

Version 5

Manzanita

MPEG Stream Identifier (MPEGID) User's Manual Version 5

MPEGID User's Manual, V 5

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Chapter I

Introduction

1 Introduction

Welcome to the Manzanita Systems MPEG Stream Identifier (MPEGID). MPEGID is an easy-to-use program with a full graphical user interface (GUI). It rapidly identifies and characterizes MPEG and related format media files that are commonly used in today's digital video and streaming applications. MPEGID tells you the format of the media file and displays important properties of its content. Both elementary stream files and multiplexed stream files can be identified with MPEGID. If the input file is a multiplexed stream, individual elementary streams within the multiplex will also be identified and their properties will be displayed.
MPEGID identifies all of the following types of media formats:

- MPEG-1 Video Elementary Stream
- MPEG-2 Video Elementary Stream
- MPEG-4 Part 2 Video Elementary Stream
- MPEG-4 AVC/H.264 Video Elementary Stream
- MPEG-H Part 2 HEVC/H.265 Video Elementary Stream
- MPEG Layer I Audio Elementary Stream
- MPEG Layer II Audio Elementary Stream
- MPEG Layer III (MP3) Audio Elementary Stream
- AC-3 (Dolby Digital) Audio Elementary Stream
- Enhanced AC-3 (Dolby Digital Plus) Audio Elementary Stream
- AAC Audio Elementary Stream (ADTS)
- AAC Audio Elementary Stream (ADIF)
- AAC Audio Elementary Stream (LOAS/LATM)
- AAC Audio Elementary Stream with Spectral Band Replication (SBR) (HE-AAC Version 1 Profile)
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- DTS Audio Elementary Stream
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- Manzanita Private Stream XML Data
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- Manzanita SCTE35 Splice Information Text Data
- Manzanita DVB Subtitle XML Data
- Manzanita DVB Teletext XML Data

- MPEG-1 System Stream
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- MPEG-2 Transport Stream
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- SMPTE 302M Elementary Stream in MPEG-1 System Stream
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- SMPTE 302M Elementary Stream in MPEG-2 Transport Stream
- Private Stream in MPEG-2 Program Stream
- User Private Stream in MPEG-2 Program Stream
- User Private Stream in MPEG-2 Transport Stream
- Private Stream 1 Data in MPEG-2 Transport Stream
- Private Stream 2 Data in MPEG-2 Transport Stream
- SCTE35 Splice Information in MPEG-2 Transport Stream
- DVB Subtitle Stream in MPEG-2 Transport Stream
- DVB Teletext Stream in MPEG-2 Transport Stream
- AAC Elementary Stream in MPEG-4 ISO Base Media File
- DTS Layered Audio Enhancement Stream in MPEG-4 ISO Base Media File
- PCM Audio Data in MPEG-4 ISO Base Media File

MPEGID also includes an integrated Demultiplexer tool, which allows you to extract and save video, audio, and data streams from existing multiplexed media files.

A command line executable is included with the MPEGID installation. It enables execution of MPEGID in batch files or scripts for high-volume applications.

The Demultiplexer tool and command line MPEGID are only available with the full, registered version of MPEGID, and not with the demo version.

1.1 New in MPEGID Version 5

MPEGID Version 5.0 is a major release that has the following new features:

- High Efficiency Video Coding (HEVC/H.265) video streams are identified
- SMPTE 302M audio streams are identified in MPEG-2 program streams and MPEG-1 system streams
- DTS Layered Audio enhancement streams are identified in MP4 files
- PCM audio data is identified in MP4 files
- Parametric Stereo (PS) extensions are detected in AAC streams for HE-AAC version 2 profile support
- Number of audio channels that are present in audio elementary streams is displayed
- Initial delay of video and audio streams that are multiplexed in system, program, and transport streams is diplayed
- Timecode value encoded in video elementary streams is displayed
- Bit rate of audio streams that is encoded in the 'esds' box of MP4 files is displayed
- Bit rate of AVC/H.264 streams that is encoded in the 'btrt' box of MP4 files is displayed
- Buffer size used in file identification can be set by the user
- Improved usage message for MPEGID command-line executable, including return value and Demultiplexer information
- Option to select hardware, software, or Manzanita license server-managed license key
- Demultiplexer can extract PCM audio data in MP4 files and save it as WAV/PCM

1.2 Overview

Identifying and characterizing a media file with MPEGID is as easy as dragging and dropping the file from a file browser/explorer window onto the MPEGID interface. If the input file is a video or audio elementary stream, MPEGID will display a list of properties that characterize its content. If the file is a multiplexed stream, a tree structure is shown that illustrates the hierarchy of components in the multiplex. The properties of each component in the multiplex, including audio and video elementary streams in the multiplex, are also displayed.

For video elementary streams, MPEGID displays the following properties when applicable:

- File Size
- Duration
- Bit Rate
- Frame Rate
- Profile
- Level
- Resolution
- Aspect Ratio
- Chroma Format
- Timecode

For audio elementary streams, MPEGID displays the following properties when applicable:

- File Size
- Duration
- Bit Rate
- Sample Rate
- Number of Substreams (Enhanced AC-3 and DTS-HD Master only)
- Number of Channels
- Audio Object Type (AAC LOAS/LATM only)
- Number of Subframes (AAC LOAS/LATM only)
- Spectral Band Replication (SBR) extension detected (AAC only)
- Parametric Stereo extension detected (AAC only)

For WAV audio files, MPEGID displays the following properties:

- File Size
- Duration
- Bit Rate

- Sample Rate
- Format
- Number of Channels
- Word Size

For SMPTE 302M audio elementary streams in a multiplex file, MPEGID displays the following properties:

- Bit Rate
- Number of Channels
- channel_id
- Sample Size
- Initial Delay

For MPEG-1 System streams, MPEGID displays the following properties:

- File Size
- Duration
- Mux Rate
- stream_id of each elementary stream
- Properties of each elementary stream

For MPEG-2 Program and VOB streams, MPEGID displays the following properties:

- File Size
- Duration
- Program Mux Rate
- Descriptors (if present) associated with the program
- stream_type of each elementary stream
- stream_id of each elementary stream
- VOB subtype of each AC-3 (Dolby Digital) elementary stream (VOB streams only)
- Properties of each elementary stream

For MPEG-4 ISO Base Media files, MPEGID displays the following properties:

- File Size
- Duration
- track_ID of each elementary stream
- Properties of each elementary stream

For MPEG-2 transport streams, MPEGID displays the following properties:

- File Size
- Transport Packet Size
- Duration
- Transport Rate
- program_number associated with each program
- PCR PID and PMT PID for each program

Descriptors (if present) associated with each program

- PID of each elementary stream
- stream_id and stream_type of each elementary stream
- Descriptors (if present) associated with each elementary stream
- Properties of each elementary stream

To give you the fastest results, MPEGID only inspects the beginning of the input file to determine its contents. Therefore, the characteristics that are displayed are those that are present initially in the stream. Any changes, for example, in the bit rate, that occur later in the stream will not be reported. The size of the buffer that is used to store the beginning of the file for inspection can be set by the user with the Buffer Size Preference 22.

1.3 About this Manual

This manual completely documents the use of MPEGID. The following chapters are presented:

- Getting Started 9 covers installation of MPEGID.
- The MPEGID User Interface 16 describes all menus, controls, and displays available in the MPEGID program.
- Using MPEGID 25 details how to identify media files with MPEGID. It describes the results that are displayed by MPEGID for each type of file.
- Additional Support 64 presents Frequently Asked Questions (FAQ) about MPEGID, a list of pertinent references, and tips for getting additional help and support.
- Purchasing and License Agreement 70 gives information for purchasing the full version of MPEGID and outlines the terms of the license agreement that covers the MPEGID software and associated documentation.

This manual assumes that you have familiarity with the basic MPEG syntax and semantics.

Chapter II

Getting Started

2 Getting Started

This chapter helps you install and start MPEGID. It contains the following sections:

- Installing MPEGID 9 describes installation of the MPEGID program on the supported operating systems.
- Starting MPEGID 12 explains how to start the MPEGID program on your computer.
- Licensing the Full Version 13 describes how to install the license key that allows you to run the full version of MPEGID, which allows you to use the Demultiplexer tool and command line version of MPEGID.

2.1 Installing MPEGID

The latest version of the MPEGID installation software for all supported platforms is available for download from the Manzanita Systems website at:

http://www.manzanitasystems.com/products/mpegid-demo.html

See below for more information on installing MPEGID on your operating system:

- Windows 9
- Linux 10
- Mac OS X 11

The MPEGID program will run as a demo version until you install a valid license key, The license key will unlock the full version of MPEGID, as described in the section, Licensing the Full Version 13.

2.1.1 Windows

MPEGID is provided in a single self-extracting executable for installation on Windows systems. Typically, the file name includes the version number, e.g., *mpegid-5.0.exe*.

The minimum system requirement for installing MPEGID on Windows is:

- 32-bit version of Windows® Server 2008, Vista, 7, or 8

MPEGID may work on old versions of Windows, but it is not officially supported on these platforms.

If you currently have an earlier version of the MPEGID software installed on your system, you should uninstall it before installing MPEGID V5.0.

To install MPEGID from the self-extracting installation file on the target Windows system:

1. Shut down all running programs.
2. Open the folder in which you downloaded the MPEGID installation file using My Computer or the Windows Explorer and double-click on it.

3. Follow the on-screen instructions to install MPEGID on your computer.

4. If you are going to use the command line version of MPEGID, make sure that the item labeled "Add to PATH variable" is checked in the checklist of components to install.

   If there are other versions of MPEGID installed on this same machine, then you must check the PATH environment variable and make sure that the newest version is the only one listed. If the old application is uninstalled, the path reference to the older version should have been removed.

5. The installer indicates when installation is complete.

For information about licensing the full version of MPEGID, see Licensing the Full Version 13.

2.1.2 Linux

The minimum system requirements for installing MPEGID on a Linux system are:

- i386+ compatible processor
- fontconfig 2.4.2 or later is needed to use the GUI

Both RPM and tar distributions are available for installation of MPEGID on Linux. The files will be named, for example, *mpegid-5.0-1.i386.rpm* and *mpegid-5.0.tgz*.

If you currently have an earlier version of the MPEGID software installed on your system, you should uninstall it before installing MPEGID V5.0.

To install MPEGID from the RPM package:

1. Use RPM per your normal procedure to install the MPEGID package.

   For example:

```
su
rpm -i mpegid-5.0-1.i386.rpm
```

2. The installer indicates when installation is complete.

For information about licensing the full version of MPEGID, see Licensing the Full Version 13.

To install MPEGID from the tar file:

1. Log in as root user and unpack the archive into */opt*.

   For example:

```
su
cd /opt
tar xzf /path/to/archive/mpegid-5.0.tgz
```

2. Create symbolic links from the MPEGID executables to a directory which is in your PATH variable, or include the location of the MPEGID executables in the PATH variable. The MPEGID GUI program is called *gmpegid*. The command line version of MPEGID is called *mpegid*.

For example:

```
ln -s /opt/manzanita/mpegid/gmpegid /usr/bin/gmpegid
ln -s /opt/manzanita/mpegid/mpegid /usr/bin/mpegid
```

or

```
export PATH=$PATH:/opt/manzanita/mpegid
```

3. If the system is running GNOME or KDE, a desktop entry can be created by making links to files in the */desktop* directory.

   For example:

```
ln -s /opt/manzanita/mpegid/desktop/mpegid.desktop /usr/share/applications/
mpegid.desktop
ln -s /opt/manzanita/mpegid/desktop/mpegid-32.png /usr/share/icons/
hicolor/32x32/apps/mpegid.png
ln -s /opt/manzanita/mpegid/desktop/mpegid-128.png /usr/share/icons/
hicolor/128x128/apps/mpegid.png
```

For information about licensing the full version of MPEGID, see Licensing the Full Version 13.

2.1.3 Mac OS X

The minimum system requirements for installing MPEGID on Mac OS X are:

- Mac OS X V10.7 or newer
- x86_64 compatible processor

MPEGID is provided as a disk image, e.g., *mpegid-5.0.dmg*, for installation on Mac OS X systems.

If you currently have an earlier version of the MPEGID software installed on your system, you should uninstall it before installing MPEGID V5.0.

To install MPEGID from the disk image:

1. Double-click the ***mpegid-5.0.dmg*** file icon to mount it as a disk image.
2. Drag the **MPEGID** application to your ***/Applications*** folder.
3. If you intend to run the command line version of MPEGID, the complete path of the MPEGID binary must be added to the PATH environment variable.

For information about licensing the full version of MPEGID, see Licensing the Full Version 13.

2.2 Starting MPEGID

After MPEGID is installed, it will run as a demo version until you unlock the full version with a license key.

The procedure for starting the GUI version of the MPEGID program is the same whether you are running the demo version or the full version. For a description of the command line version of MPEGID, see the section Identifying from the Command Line 54.

To start MPEGID on Windows:

1. Choose **Start > Programs > Manzanita Systems > MPEGID 5** from the Windows Start menu, or double-click the **MPEGID** desktop icon.

To start MPEGID on Linux:

1. If you have created a desktop entry for MPEGID, choose the **MPEGID** item from the **Sound & Video** (Multimedia) submenu of your **Start** (Launch) menu.

   or

   At a shell prompt, enter:

   ```
   gmpegid
   ```

   If you get a message that the name that you entered is not recognized as a command, then the MPEGID executable is not in a location that is recognized by the PATH environment variable. You should either create a symbolic link from the MPEGID program to a directory which is in your PATH variable or include the location of the MPEGID program in the PATH variable.

To start MPEGID on Mac OS X:

1. Double-click on the **MPEGID** application icon in your /**Applications** folder.

On all platforms, if a valid Manzanita software license key or dongle is not installed, a dialog box will be displayed that gives you information about the demo version. The **Enter License Key** button allows you to select a license option 13. Click **Use Demo** to open the MPEGID program in demo mode. You may now begin identifying your media files.

If your computer has a valid Manzanita software license key, has an installed hardware dongle for any Manzanita product, or is configured to use a Manzanita License Server, then the full version of MPEGID will immediately open when you start the program.

2.3 Licensing the Full Version

Without a valid license key, MPEGID will only run as a demo version with limited functionality. With the full version, you will have access to the Demultiplexer and command line execution.

You can acquire an MPEGID license key in one of the following ways:

- **Install a Manzanita Dongle** - Manzanita Systems offers the option of licensing its software with a USB device, or dongle, to authorize the program on the computer to which it is attached. The full version of MPEGID will automatically be unlocked if it is run on a computer with an installed Manzanita dongle.
- **Install a Manzanita Software Key** - In addition to supporting a USB dongle key, Manzanita's applications can also be licensed with a software key. The full version of MPEGID will run if it is on a computer that also has an installed Manzanita program that is licensed with a software key.
- **Use a Manzanita License Server** - The License Server is a network service that manages licenses for Manzanita programs. The full version of MPEGID will be unlocked if you configure it to connect to a Manzanita License Server on your network, as described in the section, Using a Manzanita License Server 13.
- **Register and Purchase an MPEGID License Key** - If you do not have a licensed Manzanita program installed on your computer, you can receive a license key by registering your copy of MPEGID with Manzanita Systems and paying a registration fee. The section in this manual, Purchasing a Registered License 71, gives instructions on how to register your copy. Once you acquire an MPEGID license key, installation instructions are given in the section, Installing an MPEGID License Key 14.

After you have installed MPEGID on your computer, you can review or modify your license settings at any time with the License Settings Dialog Box 23.

2.3.1 Using a Manzanita License Server

If you would like to use the Manzanita License Server (MANZLSV) to provide a license for your MPEGID software, then you must configure MPEGID to connect to the server.

To use a License Server:

1. Select **Help > Configure License** on the **Menu Bar**.

   The **License Settings Dialog Box** will open.

2. Select the **License Server** option from the **License** drop-down list.

3. Enter the host name or IP address of your primary license server in the **Server** textbox. Enter the port on which the server communicates to the license clients in the **Port** textbox on the **Server** line. The port number should be provided with the server name/address.

4. If a Customer ID key was provided by Manzanita Systems, enter it in the **Customer ID** textbox. This key is only provided when multiple customers are potentially using the same license server.

5. After completing the configuration, the **Test Server** button should be pressed.

   The communications link between your computer and the license server will be verified. The test does not validate the license, just the communications link.

6. If the test was successful, press the **OK** button.

The MPEGID application will contact the license server for a license. If it is successful, the full version of MPEGID will run. If there is a problem, an error message will appear and the **License Setup** dialog will not close.

2.3.2 Installing an MPEGID License Key

You will receive a license key when you register your copy of MPEGID with Manzanita Systems and pay a registration fee. The section, Purchasing a Registered License 71, in this manual gives instructions on how to register your copy.

It is recommended that you record and save your license key. You will need it if you ever re-install MPEGID.

To install an MPEGID license key if you are running the demo version:

1. Start the MPEGID GUI program.

   A dialog box will be displayed that gives you information about the demo version.

2. Click the **Enter License Key** button.

   The **License Settings Dialog Box** will open.

3. Select the **Software / Eval Key** option from the **License** drop-down list, then click **Next**.

   The **Software Key Licensing** settings will be displayed.

4. Enter your license key in the labeled textbox. The license key will be 26 characters separated with dashes (-) into 6 groups, for example, “AAAAA-BBBBB-CCCCC-DDDDD-EEEEE-F”.

5. Enter your company name or organization in the textbox labeled **Company Name**.

6. Click the **Next** button.

   If the license key was successfully installed, a dialog box will appear informing you that the software license key has been accepted.

7. Click the **Finish** button.

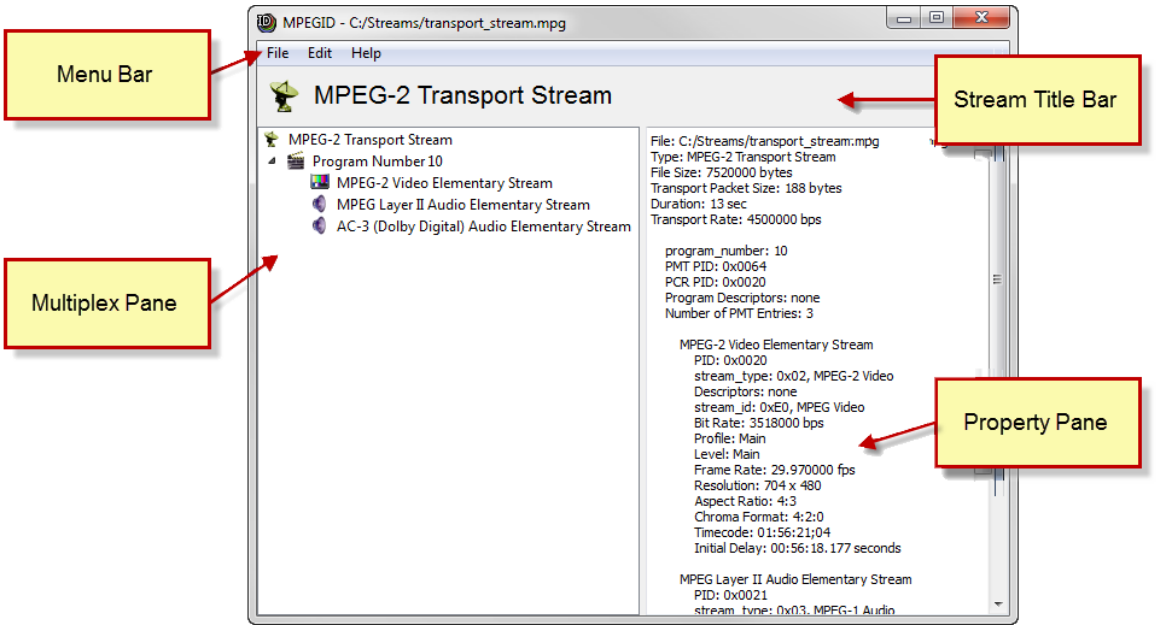
   You will have to restart MPEGID to activate the full version.

Chapter III

The MPEGID User Interface

3 The MPEGID User Interface

The MPEGID user interface consists of a single, simple window. It has the following components:



- **Menu Bar** 17 - The Menu Bar provides menus to open an input media file, save a report file, run the Demultiplexer, and set display and buffering preferences. It also provides access to the online help system and MPEGID licensing options.
- **Stream Title Bar** 18 - The Stream Title Bar tells you the type of the input media file.
- **Multiplex Pane** 20 - The Multiplex Pane shows a graphical representation of the contents of the input media file. It is only displayed if the input file is a multiplexed stream.
- **Property Pane** 22 - The Property Pane displays a list of stream properties and their values. If the input file is a multiplexed stream, the properties for the component that is currently selected in the Multiplex Pane are highlighted.

3.1 Menu Bar

The Menu Bar at the top of the interface gives you access to MPEGID's main functions.

The tables below summarize the commands on the Menu Bar and, if available, their associated keyboard shortcuts and hotkeys (mnemonics).

Use of the menu hotkeys, or mnemonics, are activated when the user presses the Alt key. The designated mnemonic letter for each command will be underlined in the menu.

File Menu

Menu Item	Description	Shortcut
Identify..	Opens the **Open** dialog box that allows you to specify a media file for identification and characterization.	Ctrl+O
Save Report As..	Opens the **Save As** dialog box which enables you to save the identification properties of the current input file in a text file.	Ctrl+S
Quit	Closes the MPEGID program.	Ctrl+Q

Edit Menu

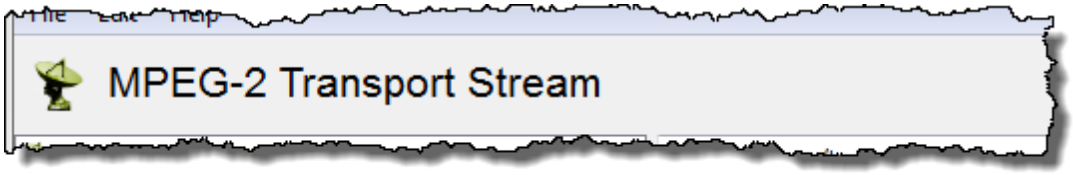
Menu Item	Description	Shortcut
Demux..	Executes the Demultiplexer 56 tool on the currently selected elementary stream to extract and save the stream from the input system, program, transport, or MP4 container file.	Ctrl+D
Preferences..	Open the Preferences Dialog Box 22.	

Help Menu

Menu Item	Description	Shortcut
Manual	Opens the online User's Manual.	F1
About	Displays information about your copy of the MPEGID program.	
Configure License..	Opens the License Settings Dialog Box 23, which is used to set the license type or to enter a license key value.	

3.2 Stream Title Bar

The Stream Title Bar spans the MPEGID interface just below the Menu Bar. When the MPEGID program initially starts, the Stream Title Bar will be a blank space. After you open an input file, its type will be displayed in the Stream Title Bar as both a description and an icon.



The following types may be displayed in the Stream Title Bar:

Icon	Description
	MPEG-1 Video Elementary Stream
	MPEG-2 Video Elementary Stream
	MPEG-4 Part 2 Video Elementary Stream
	MPEG-4 AVC/H.264 Video Elementary Stream
	MPEG-H Part 2 HEVC/H.265 Video Elementary Stream
	MPEG Layer I Audio Elementary Stream
	MPEG Layer II Audio Elementary Stream
	MPEG Layer III (MP3) Audio Elementary Stream
	AC-3 (Dolby Digital) Audio Elementary Stream
	Enhanced AC-3 (Dolby Digital Plus) Audio Elementary Stream
	AAC Audio Elementary Stream (ADTS)
	AAC Audio Elementary Stream (ADIF)
	AAC Audio Elementary Stream (LOAS/LATM)
	DTS Audio Elementary Stream
	DTS-HD Audio Elementary Stream
	DTS-HD Master Audio Elementary Stream
	WAV Audio Data
	Manzanita Private Stream XML Data

Icon	Description
	Manzanita SI Table XML Data
	Manzanita SCTE35 Splice Information XML Data
	Manzanita SCTE35 Splice Information Text Data
	Manzanita DVB Subtitle XML Data
	Manzanita DVB Teletext XML Data
	MPEG-1 System Stream
	MPEG-2 Program Stream*
	MPEG-2 Transport Stream
	MPEG-4 ISO Base Media File
	Unknown**

* Video Object (VOB) files are identified as MPEG-2 Program Streams.

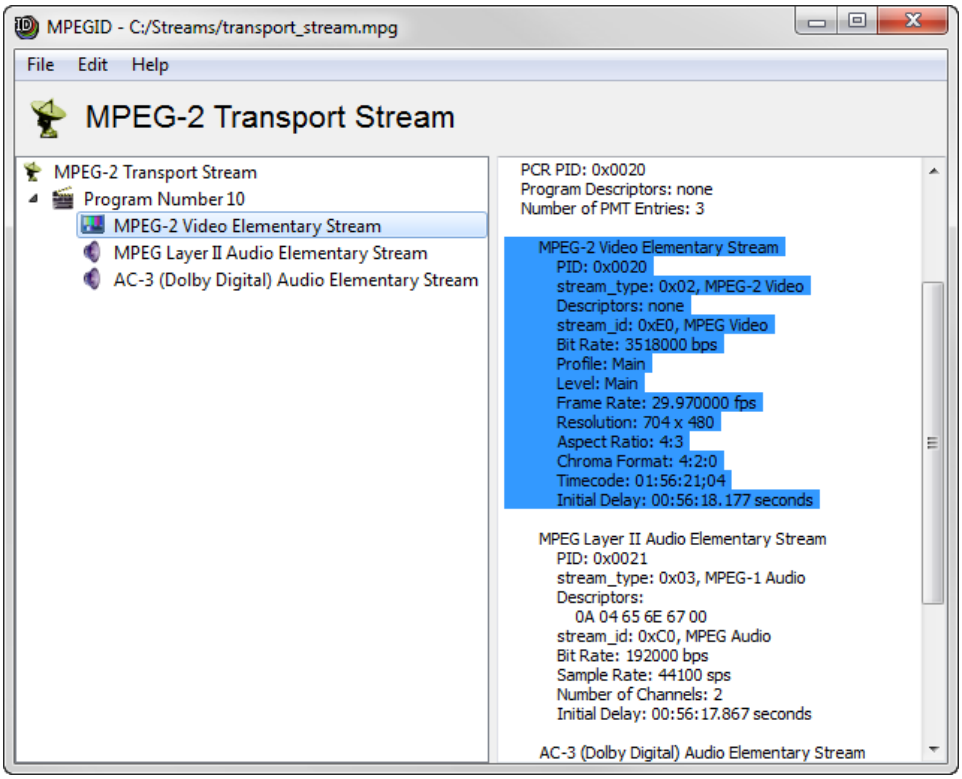
** The input file was not recognized by MPEGID.

3.3 Multiplex Pane

The Multiplex Pane occupies the panel on the left side of the MPEGID window below the Stream Title Bar when the input file is a multiplex of component streams (MPEG-1 System Stream, MPEG-2 Program Stream, VOB, MPEG-2 Transport Stream, or MPEG-4 ISO Base Media File). It is not present when the input file is a single elementary stream or data file.

The Multiplex Pane displays a tree structure that depicts the hierarchy of the multiplex. The root node of the tree signifies the multiplex file itself. Each node that branches from the root node represents a component of the multiplex. These branch nodes show the multiplexed video, audio, and data streams that are identified in the file. If the input file is an MPEG-2 Transport Stream, the Multiplex Pane will also display a Program node for each program that is found. In this case, the video, audio, and data streams that are assigned to a given program will branch from the associated Program node.

For example, the MPEG-2 transport stream in the figure below has one program, identified with Program Number 10. This program contains one video elementary stream and two audio elementary streams. The Multiplex Pane displays an MPEG-2 Transport Stream root node, and a Program Number 10 node with one video branch node and two audio branch nodes. When the MPEG-2 Video Elementary Stream node is selected in the Multiplex Pane as shown, its detailed properties are highlighted in the Property Pane.



The following types of root nodes may appear in the Multiplex Pane:

Icon	Description
	MPEG-1 System Stream
	MPEG-2 Program Stream[1]
	MPEG-2 Transport Stream
	MPEG-4 ISO Base Media File

[1] Video Object (VOB) files are identified as MPEG-2 Program Streams.

The following types of branch nodes may appear in the Multiplex Pane:

Icon	Description
	Program Number *N*[2]
	MPEG-1 Video Elementary Stream
	MPEG-2 Video Elementary Stream
	MPEG-4 Part 2 Video Elementary Stream
	MPEG-4 AVC/H.264 Video Elementary Stream
	MPEG-H Part 2 HEVC/H.265 Video Elementary Stream
	MPEG Layer I Audio Elementary Stream
	MPEG Layer II Audio Elementary Stream
	MPEG Layer III (MP3) Audio Elementary Stream
	AC-3 (Dolby Digital) Audio Elementary Stream
	Enhanced AC-3 (Dolby Digital Plus) Audio Elementary Stream
	AAC Audio Elementary Stream (ADTS)
	AAC Audio Elementary Stream (ADIF)
	AAC Audio Elementary Stream (LOAS/LATM)
	AAC Audio Elementary Stream (MP4)
	DTS Audio Elementary Stream
	DTS-HD Audio Elementary Stream
	DTS-HD Master Audio Elementary Stream
	DTS Layered Audio Enhancement Stream
	SMPTE 302M Elementary Stream
	PCM Audio Elementary Stream
	Private Stream

Icon	Description
	User Private Stream
	Private Stream 1 Data
	Private Stream 2 Data
	DVB Subtitle Stream
	DVB Teletext Stream
	SCTE35 Splice Information XML Data
	SCTE35 Splice Information Text Data
	Unrecognized stream content
	No data seen for this elementary stream

[2] *N* is the value of the program_number that is assigned to the program in the Program Association Table (PAT). The Program Number node will only be displayed if the input file is identified as a MPEG-2 Transport Stream.

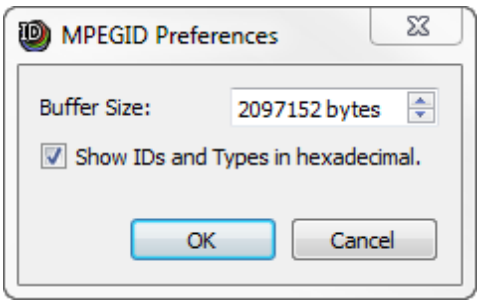
3.4 Property Pane

The Property Pane displays a list of properties that characterize the input file and each of its component streams. If the input file is a multiplexed stream (MPEG-1 System Stream, MPEG-2 Program Stream, MPEG-2 Transport Stream, or MPEG-4 ISO Base Media File), then the Property Pane occupies the panel to the right of the Multiplex Pane. In this case, the Property Pane displays all properties of the multiplex with indentation to distinguish individual components and to indicate hierarchy. When you click on a node in the Multiplex Pane, the properties of the corresponding component are highlighted in the Property Pane.

The chapter, Using MPEGID 25, in this manual describes the properties for each stream and multiplex component that are displayed in the Property Pane.

3.5 Prefences Dialog Box

The Preferences dialog box is used to set user preferences for the MPEGID interface and to specify the size of the input file buffer. It is opened by selecting the **Preferences** option on the **Edit Menu** 17.

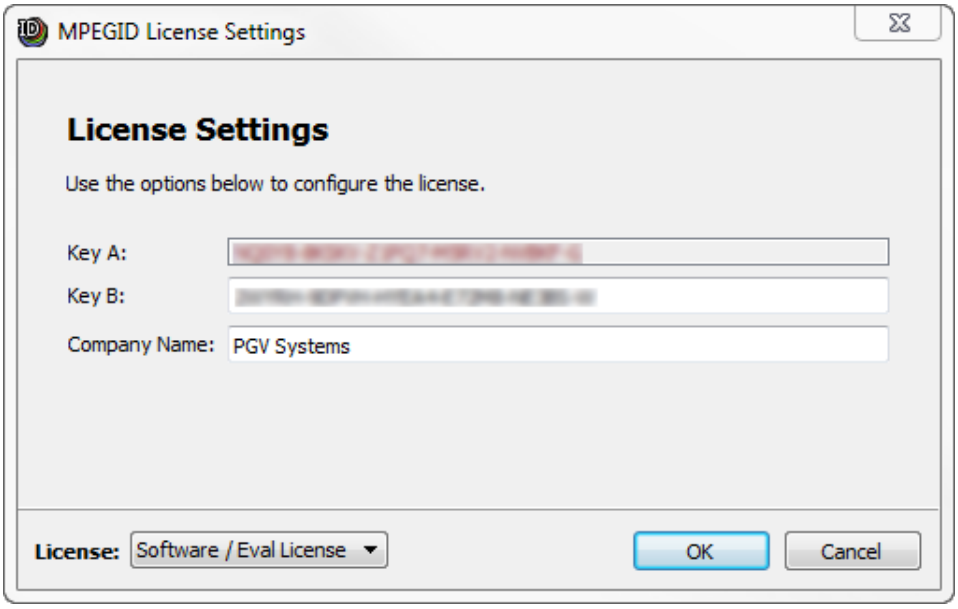


The following preferences can be set in the Preferences Dialog Box:

Menu Item	Description
Buffer Size	Specifies the number of bytes of data from the beginning of the input file that MPEGID inspects. If the input is a high-rate stream or if it begins with a long leader, it may be necessary to increase the Buffer Size for MPEGID to give an accurate identification.
Show IDs and Types in hexadecimal	When checked, PID, stream_ID, stream_type values are displayed in hexadecimal. When unchecked, the values will be displayed in decimal.

3.6 License Settings Dialog Box

After you have installed MPEGID, you can review or modify your license settings at any time with the License Settings Dialog Box. It is opened by selecting the **Configure License** option on the **Help Menu** 17.



The License Settings Dialog Box will be set for the type of license that is currently being used. Three settings are supported:

- **Dongle**
- **Software / Evaluation Key**
- **License Server**

Refer to the section, Licensing the Full Version 13, for a description of the options available to license the full version of MPEGID.

Chapter IV

Using MPEGID

4 Using MPEGID

Identifying and characterizing a media file is as simple as opening up the file in MPEGID. MPEGID will display important properties of the stream that the file contains. If the input file contains a multiplexed stream (MPEG-1 System Stream, MPEG-2 Program Stream, MPEG-2 Transport Stream, or MPEG-4 ISO Base Media File), MPEGID will also display a graphical representation of the multiplex.

This chapter contains the following sections:

- Identifying a Media File 25 explains how to open an input media file for identification and characterization.
- Viewing the Multiplex Structure 26 describes use of the graphical representation that is displayed for multiplexed streams.
- Interpreting Stream Properties 26 gives a detailed description of the properties that are displayed for each type of stream and multiplex component.
- Saving a Report File 53 tells how to save the stream properties in a text file.
- Identifying from the Command Line 54 describes the command line version of MPEGID.

4.1 Identifying a Media File

You can open a media file in MPEGID by dragging and dropping the file from a file browser/explorer window onto the MPEGID interface, or by using the Identify function on the File Menu. MPEGID will automatically identify the input file once it has been opened.

To open and identify an input media file using drag-and-drop:

1. Select the input file in a graphical file system browser/explorer. Drag and drop the file onto the **Stream Title Bar**, **Multiplex Pane**, or **Property Pane** of the MPEGID interface.

   MPEGID will open the input file and identify it. The **Stream Title Bar** will display the identity of the file. If the input file is an elementary stream, a list of properties will be displayed in the **Property Pane** below the **Stream Title Bar**. If the input file is a multiplexed stream, then both the **Multiplex Pane** and **Property Pane** will display the results of the identification.

To open and identify an input media file using the Identify function:

1. Choose **File > Identify..** from the **Menu Bar**. The **Open** dialog box will appear.
2. Browse your system to select the input file, then click the **Open** button.

   The **Open** dialog box will close, and MPEGID will open the input file and identify it. The **Stream Title Bar** will display the identity of the file. If the input file is an elementary stream, a list of properties will be displayed in the **Property Pane** below the **Stream Title Bar**. If the input file is a multiplexed stream, then both the **Multiplex Pane** and **Property Pane** will display the results of the identification.

4.2 Viewing the Multiplex Structure

If your input media file is an MPEG-1 System Stream, MPEG-2 Program Stream, VOB*, MPEG-2 Transport Stream, or MPEG-4 ISO Base Media File, MPEGID will display a tree diagram in the Multiplex Pane that represents the contents of the multiplexed stream. This tree illustrates the hierarchical structure of the multiplex, showing the individual elementary streams that are contained in it. If the input stream is an MPEG-2 Transport Stream, the tree will show all programs that are defined in the multiplex, and all elementary streams that are mapped to each program.

The root node of the tree represents the multiplexed stream itself. Each node that branches from the root node represents a component of the multiplex. For MPEG-1 System Streams, MPEG-2 Program Streams, and MPEG-4 ISO Base Media Files, only elementary stream nodes may branch from the root node. For MPEG-2 Transport Streams, one or more Program nodes branch from the root node. Each Program node may have one or more elementary stream nodes branching from it. See the section, Multiplex Pane 20, for a description of the types of nodes that may be depicted in the Multiplex Pane.

When you click on a node in the Multiplex Pane, the properties of the corresponding component are highlighted in the Property Pane.

* VOB files are identified by MPEGID as MPEG-2 Program Streams.

4.3 Interpreting Stream Properties

The Property Pane displays important properties of the input stream. If the input file is a multiplexed stream, then the Property Pane presents the properties hierarchically to mirror the graphical representation in the Multiplex Pane. When an individual node in the Multiplex Pane is selected, the properties of the corresponding component will be highlighted in the Property Pane.

Any portion of the results that are displayed in the Property Pane can be selected, copied to the clipboard, and pasted in a document. You can also save the entire contents of the Property Pane in a report file 53 for later reference.

This section gives detailed descriptions of the properties that are displayed for each type of stream and multiplex component.

It is important to remember that MPEGID only looks at the beginning of the input file to determine its identity and stream properties. Therefore, any changes that occur later in the file will not be reflected in the displayed properties. The Buffer Size 22 preference can be used to adjust the amount of data that MPEGID inspects.

The Property Pane displays the following types of properties:

4.3.1 General File Properties

For all supported types of media files, the Property Pane will display the following properties:

File

The File property is the full pathname of the input file.

Type

The Type property is the file format/type that was determined by MPEGID.

File Size

The File Size property gives the size of the input file in bytes.

Duration

The Duration property gives an estimate of the length of the stream in hours, minutes, and seconds. MPEGID bases this estimate on the **File Size** of the input file and the bit rate that is determined from the stream. For video and audio elementary streams, the **Bit Rate** is explicitly encoded in the stream syntax. For MPEG-1 System Streams and MPEG-2 Program Streams, the bit rate is the initial mux_rate value specified in the stream. For MPEG-2 Transport Streams, MPEGID estimates the bit rate from the PCR (Program Clock Reference) values in the beginning of the stream. Note that this property is only an estimate. The actual duration will be different if a bit rate change occurs in the stream, or if the actual rate varies from that encoded in the stream.

4.3.2 MPEG-1 Video Elementary Stream Properties

The following properties are displayed in the Property Pane for an MPEG-1 Video Elementary Stream:

PID (MPEG-2 Transport Stream only)

The PID property is the value of the transport stream PID that is associated with the video elementary stream. The PID value may be an integer between 16 and 8190 (0x0010 and 0x1FFE), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the PID property is displayed is set in the Preferences Dialog Box 22. The PID property is only displayed if the MPEG-1 Video Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_type (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The stream_type property is the value that is associated with the video elementary stream in the Program Map Table. Generally, MPEG-1 video elementary streams are assigned a stream_type value of 1. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_type property is displayed is set in the Preferences Dialog Box 22. The stream_type property is only displayed if the MPEG-1 Video Elementary Stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

Descriptors (MPEG-2 Transport Stream only)

Any descriptors that are associated in the PMT with the elementary stream are shown. The hexadecimal data bytes for each descriptor that is present are displayed on a separate line. The Descriptors property is only displayed if the MPEG-1 Video Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_id (MPEG-1 System Stream, MPEG-2 Program Stream, and MPEG-2 Transport Stream only)

The stream_id property is the value that appears in the PES headers for the video elementary stream. Generally, MPEG-1 video elementary streams are assigned a stream_id value from 224 to 239 (0xE0 to 0xEF). The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_id property is displayed is set in the Preferences Dialog Box 22. The stream_id

property is only displayed if the MPEG-1 Video Elementary Stream is a component of an MPEG-1 System Stream, MPEG-2 Program Stream, or MPEG-2 Transport Stream.

track_ID (MPEG-4 ISO Base Media File only)

The track_ID property is the value that identifies the elementary stream in the input MPEG-4 ISO base media file.

Bit Rate

The Bit Rate property is the rate in bits per second (bps) that is encoded in the video elementary stream syntax. The Bit Rate property will be set to "VBR" if the video stream is variable bit rate.

Frame Rate

The Frame Rate property is the frame rate in frames per second (fps) that is encoded in the video elementary stream syntax.

Resolution

The Resolution property is given as *width* x *height*, where *width* is the width in samples and *height* is the height in lines of the displayable part of a picture as specified by the horizontal_size and vertical_size fields in the video sequence header.

Aspect Ratio

The Aspect Ratio property is the value specified in the *aspect_ratio_information* field in the video sequence header.

Timecode

The Timecode property displays the value of the first timecode detected in the video stream. This encoded timecode is optional in MPEG-1 video elementary streams. The Timecode property is not displayed if there were no timecodes found in the stream.

Initial Delay (MPEG-1 System Stream, MPEG-2 Program Stream, and MPEG-2 Transport Stream only)

The Initial Delay parameter gives the time from the beginning of the stream to when this particular elementary stream is first presented. This time is useful when demultiplexing or remultiplexing a stream as differences in the initial delay value between different elementary streams within a multiplex need to be carried through to the new stream or audio/video sync issues will occur. Differences in this value between elementary streams can also indicate why one stream begins before another when the stream is played. The Initial Delay property is only displayed if the video stream is a component of an MPEG-1 System Stream, MPEG-2 Program Stream, or MPEG-2 Transport Stream

4.3.3 MPEG-2 Video Elementary Stream Properties

The following properties are displayed for an MPEG-2 Video Elementary Stream:

PID (MPEG-2 Transport Stream only)

This property is the value of the transport stream PID that is associated with the video elementary stream. The value may be an integer between 16 and 8190 (0x0010 and 0x1FFE), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the PID property is displayed is set in the Preferences Dialog Box 22. The PID property is only displayed if the MPEG-2 Video Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_type (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The stream_type property is the value that is associated with the video elementary stream in the Program

Map Table. Generally, MPEG-2 video streams are assigned a stream_type value of 2. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_type property is displayed is set in the Preferences Dialog Box 221. The stream_type property is only displayed if the MPEG-2 Video Elementary Stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

Descriptors (MPEG-2 Transport Stream only)

Any descriptors that are associated in the PMT with the elementary stream are shown. The hexadecimal data bytes for each descriptor that is present are displayed on a separate line. The Descriptors property is only displayed if the MPEG-2 Video Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_id (MPEG-1 System Stream, MPEG-2 Program Stream, and MPEG-2 Transport Stream only)

The stream_id property is the value that appears in the PES headers for the video stream. Generally, MPEG-2 video streams are assigned a stream_id value from 224 to 239 (0xE0 to 0xEF), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_id property is displayed is set in the Preferences Dialog Box 221. The stream_id property is only displayed if the MPEG-2 Video Elementary Stream is a component of an MPEG-1 System Stream, MPEG-2 Program Stream, or MPEG-2 Transport Stream.

track_ID (MPEG-4 ISO Base Media File only)

The track_ID property is the value that identifies the video elementary stream in the input MPEG-4 ISO base media file.

Bit Rate

The Bit Rate property is the rate in bits per second (bps) that is encoded in the video elementary stream syntax. If the video stream is variable bit rate, the Bit Rate property will be set to the maximum bit rate at which the stream is encoded.

Profile

The Profile property is determined from the *profile_and_level_indication* field in the video elementary stream syntax.

Level

The Level property is determined from the *profile_and_level_indication* field in the video syntax.

Frame Rate

The Frame Rate property is the frame rate in frames per second (fps) that is encoded in the video elementary stream syntax.

Resolution

The Resolution property is given as *width* x *height*, where *width* is the width in samples and *height* is the *height* in lines of the displayable part of a picture as specified by the *horizontal_size* and *vertical_size* fields in the video sequence header.

Aspect Ratio

The Aspect Ratio property is the value specified in the *aspect_ratio_information* field in the video sequence header.

Chroma Format

The Chroma Format property indicates the format of the chrominance information in the video and will be one of the following: 4:2:0, 4:2:2 or 4:4:4.

Timecode

The Timecode property displays the value of the first timecode detected in the video stream. This encoded timecode is optional in MPEG-2 video elementary streams. The Timecode property is not displayed if there were no timecodes found in the stream.

Initial Delay (MPEG-1 System Stream, MPEG-2 Program Stream, and MPEG-2 Transport Stream only)

The Initial Delay parameter gives the time from the beginning of the stream to when this particular elementary stream is first presented. This time is useful when demultiplexing or remultiplexing a stream as differences in the initial delay value between different elementary streams within a multiplex need to be carried through to the new stream or audio/video sync issues will occur. Differences in this value between elementary streams can also indicate why one stream begins before another when the stream is played. The Initial Delay property is only displayed if the video stream is a component of an MPEG-1 System Stream, MPEG-2 Program Stream, or MPEG-2 Transport Stream.

4.3.4 MPEG-4 Part 2 Video Elementary Stream Properties

The following properties are displayed for an MPEG-4 Part 2 Video Elementary Stream:

PID (MPEG-2 Transport Stream only)

The PID property is the value of the transport stream PID that is associated with the video elementary stream. The value may be an integer between 16 and 8190 (0x0010 and 0x1FFE), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the PID property is displayed is set in the Preferences Dialog Box 22. The PID property is only displayed if the MPEG-4 Part 2 Video Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_type (MPEG-2 Transport Stream only)

The stream_type property is the stream_type value that is associated with the video elementary stream in the Program Map Table. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_type property is displayed is set in the Preferences Dialog Box 22. The stream_type property is only displayed if the MPEG-4 Part 2 Video Elementary Stream is a component of an MPEG-2 Transport Stream.

Descriptors (MPEG-2 Transport Stream only)

Any descriptors that are associated in the PMT with the elementary stream are shown. The hexadecimal data bytes for each descriptor that is present are displayed on a separate line. The Descriptors property is only displayed if the MPEG-4 Part 2 Video Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_id (MPEG-2 Transport Stream only)

The stream_id property is the value that appears in the PES headers for the video stream. Generally, video streams are assigned a stream_id value from 224 to 239 (0xE0 to 0xEF), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the property is displayed is set in the Preferences Dialog Box 22. The stream_id property is only displayed if the MPEG-4 Part 2 Video Elementary Stream is a component of an MPEG-2 Transport Stream.

track_ID (MPEG-4 ISO Base Media File only)

The track_ID property is the value that identifies the video elementary stream in the input MPEG-4 ISO base media file.

Bit Rate

The Bit Rate property is the rate in bits per second (bps) that is encoded in the video elementary stream

syntax. If the video stream is variable bit rate, the Bit Rate property will be set to the maximum bit rate at which the stream is encoded.

Profile & Level

The Profile & Level property gives the profile and level of the video stream as encoded in the syntax.

Frame Rate

The Frame Rate property is the frame rate in frames per second (fps) if it is encoded in the video elementary stream syntax.

Resolution

The Resolution property is given as *width* x *height*, where *width* is the width in samples and *height* is the *height* in lines of the displayable part of a picture as encoded in the video stream syntax.

Chroma Format

The Chroma Format property indicates the format of the chrominance information in the video and will be one of the following: 4:2:0, 4:2:2 or 4:4:4.

Initial Delay (MPEG-2 Transport Stream only)

The Initial Delay parameter gives the time from the beginning of the stream to when this particular elementary stream is first presented. This time is useful when demultiplexing or remultiplexing a stream as differences in the initial delay value between different elementary streams within a multiplex need to be carried through to the new stream or audio/video sync issues will occur. Differences in this value between elementary streams can also indicate why one stream begins before another when the stream is played. The Initial Delay property is only displayed if the video elementary stream is a component of an MPEG-2 Transport Stream.

4.3.5 MPEG-4 AVC/H.264 Video Elementary Stream Properties

The following properties are displayed in the Property Pane for an MPEG-4 AVC/H.264 Video Elementary Stream:

PID (MPEG-2 Transport Stream only)

The PID property is the value of the transport stream PID that is associated with the video elementary stream. The PID value may be an integer between 16 and 8190 (0x0010 and 0x1FFE), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the PID property is displayed is set in the Preferences Dialog Box 22. The PID property is only displayed if the MPEG-4 AVC/H.264 Video Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_type (MPEG-2 Transport Stream only)

The stream_type property is the value that is associated with the video elementary stream in the Program Map Table. Generally, H.264 / AVC / MPEG-4 part 10 video streams are assigned a stream_type value of 27 (0x1B). The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_type property is displayed is set in the Preferences Dialog Box 22. The stream_type property is only displayed if the MPEG-4 AVC/H.264 Video Elementary Stream is a component of an MPEG-2 Transport Stream.

Descriptors (MPEG-2 Transport Stream only)

Any descriptors that are associated in the PMT with the elementary stream are shown. The hexadecimal data bytes for each descriptor that is present are displayed on a separate line. The Descriptors property is only displayed if the MPEG-4 AVC/H.264 Video Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_id (MPEG-2 Transport Stream only)

The stream_id property is the value that appears in the PES headers for the video elementary stream. Generally, video elementary streams are assigned a stream_id value from 224 to 239 (0xE0 to 0xEF), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_id property is displayed is set in the Preferences Dialog Box 22. The stream_id property is only displayed if the MPEG-4 AVC/H.264 Video Elementary Stream is a component of an MPEG-2 Transport Stream.

track_ID (MPEG-4 ISO Base Media File only)

The track_ID property is the value that identifies the video elementary stream in the input MPEG-4 ISO base media file.

Bit Rate

The Bit Rate property is the rate in bits per second (bps) that is encoded in the video elementary stream syntax. If the video stream is variable bit rate, the Bit Rate property will be set to the maximum bit rate at which the stream is encoded.

Profile

The Profile property is determined from the *profile_idc* field in the video elementary stream syntax.

Level

The Level property is determined from the *level_idc* in the video elementary stream syntax.

Frame Rate

The Frame Rate property is the frame rate in frames per second (fps). It is calculated from the time_scale and num_units_in_tick fields when they are present in the video stream.

Resolution

The Resolution property is given as *width* x *height*, where *width* is the width in samples and *height* is the *height* in lines of the displayable part of a picture as encoded in the video stream syntax.

Chroma Format

The Chroma Format property indicates the format of the chrominance information in the video and will be one of the following: 4:2:0, 4:2:2 or 4:4:4.

Timecode

The Timecode property displays the value of the first timecode detected in the video stream. This encoded timecode is optional in AVC/H.264 video elementary streams. The Timecode property is not displayed if there were no timecodes found in the stream.

Initial Delay (MPEG-2 Transport Stream only)

The Initial Delay parameter gives the time from the beginning of the stream to when this particular elementary stream is first presented. This time is useful when demultiplexing or remultiplexing a stream as differences in the initial delay value between different elementary streams within a multiplex need to be carried through to the new stream or audio/video sync issues will occur. Differences in this value between elementary streams can also indicate why one stream begins before another when the stream is played. The Initial Delay property is only displayed if the video elementary stream is a component of an MPEG-2 Transport Stream.

4.3.6 MPEG-H Part 2 HEVC/H.265 Video Elementary Stream Properties

The following properties are displayed for an MPEG-H Part 2 HEVC/H.265 Video Elementary Stream:

PID (MPEG-2 Transport Stream only)

The PID property is the value of the transport stream PID that is associated with the video elementary stream. The value may be an integer between 16 and 8190 (0x0010 and 0x1FFE), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the PID property is displayed is set in the Preferences Dialog Box 221. The PID property is only displayed if the MPEG-H Part 2 HEVC/H.265 Video Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_type (MPEG-2 Transport Stream only)

The stream_type property is the value that is associated with the video elementary stream in the Program Map Table. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_type property is displayed is set in the Preferences Dialog Box 221. The stream_type property is only displayed if the MPEG-H Part 2 HEVC/H.265 Video Elementary Stream is a component of an MPEG-2 Transport Stream.

Descriptors (MPEG-2 Transport Stream only)

Any descriptors that are associated in the PMT with the elementary stream are shown. The hexadecimal data bytes for each descriptor that is present are displayed on a separate line. The Descriptors property is only displayed if the MPEG-H Part 2 HEVC/H.265 Video Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_id (MPEG-2 Transport Stream only)

The stream_id property is the value that appears in the PES headers for the video stream. Generally, video streams are assigned a stream_id value from 224 to 239 (0xE0 to 0xEF), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the property is displayed is set in the Preferences Dialog Box 221. The stream_id property is only displayed if the MPEG-H Part 2 HEVC/H.265 Video Elementary Stream is a component of an MPEG-2 Transport Stream.

track_ID (MPEG-4 ISO Base Media File only)

The track_ID property is the value that identifies the video elementary stream in the input MPEG-4 ISO base media file.

Bit Rate

The Bit Rate property is the rate in bits per second (bps) that is encoded in the video stream syntax. If the video stream is variable bit rate, the Bit Rate property will be set to the maximum bit rate at which the stream is encoded.

Profile

The Profile property is the profile supported by the video stream as encoded in the syntax.

Level

The Level property is the level supported by the video stream as encoded in the syntax.

Frame Rate

The Frame Rate property is the frame rate in frames per second (fps) if it is encoded in the video stream syntax.

Resolution

The Resolution property is given as *width* x *height*, where *width* is the width in samples and *height* is the *height* in lines of the displayable part of a picture as encoded in the video stream syntax.

Aspect Ratio

The Aspect Ratio property is the video aspect ratio if it is encoded in the video elementary stream syntax.

Chroma Format

The Chroma Format property indicates the format of the chrominance information as encoded in the video stream syntax.

Initial Delay (MPEG-2 Transport Stream only)

The Initial Delay parameter gives the time from the beginning of the stream to when this particular elementary stream is first presented. This time is useful when demultiplexing or remultiplexing a stream as differences in the initial delay value between different elementary streams within a multiplex need to be carried through to the new stream or audio/video sync issues will occur. Differences in this value between elementary streams can also indicate why one stream begins before another when the stream is played. The Initial Delay property is only displayed if the video elementary stream is a component of an MPEG-2 Transport Stream.

4.3.7 MPEG Audio Elementary Stream Properties

The following properties are displayed in the Property Pane for an MPEG Layer I Audio Elementary Stream, MPEG Layer II Audio Elementary Stream, or MPEG Layer III (MP3) Audio Elementary Stream:

PID (MPEG-2 Transport Stream only)

The PID property is the value of the transport stream PID that is associated with the audio elementary stream. The PID value may be an integer between 16 and 8190 (0x0010 and 0x1FFE), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the PID property is displayed is set in the Preferences Dialog Box 22. The PID property is only displayed if the MPEG Audio Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_type (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The stream_type property is the value that is associated with the audio elementary stream in the Program Map Table. Generally, MPEG audio Layer I and II elementary streams are assigned a stream_type value of 3, and Layer III streams have a stream_type value of 4. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_type property is displayed is set in the Preferences Dialog Box 22. The stream_type property is only displayed if the MPEG Audio Elementary Stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

Descriptors (MPEG-2 Transport Stream only)

Any descriptors that are associated in the PMT with the elementary stream are shown. The hexadecimal data bytes for each descriptor that is present are displayed on a separate line. The Descriptors property is only displayed if the MPEG Audio Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_id (MPEG-1 System Stream, MPEG-2 Program Stream, and MPEG-2 Transport Stream only)

The stream_id property is the value that appears in the PES headers for the audio elementary stream. Generally, MPEG audio (all Layers) streams are assigned a stream_id value from 192 to 223 (0xC0 to 0xDF). The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_id property is displayed is set in the Preferences Dialog Box 22. The stream_id property is only displayed if the MPEG Audio Elementary Stream is a component of an MPEG-1 System Stream, MPEG-2 Program Stream, or MPEG-2 Transport Stream.

track_ID (MPEG-4 ISO Base Media File only)

The track_ID property is the value that identifies the elementary stream in the input MPEG-4 ISO base media file.

Bit Rate

The Bit Rate property is the rate in bits per second (bps) that is encoded in the audio stream syntax.

Sample Rate

The Sample Rate property is the sampling frequency in samples per second (sps) that is encoded in the audio elementary stream syntax.

Number of Channels

The Number of Channels property is the number of audio channels that are present in the audio elementary stream.

Initial Delay (MPEG-1 System Stream, MPEG-2 Program Stream, and MPEG-2 Transport Stream only)

The Initial Delay parameter gives the time from the beginning of the stream to when this particular elementary stream is first presented. This time is useful when demultiplexing or remultiplexing a stream as differences in the initial delay value between different elementary streams within a multiplex need to be carried through to the new stream or audio/video sync issues will occur. Differences in this value between elementary streams can also indicate why one stream begins before another when the stream is played. The Initial Delay property is only displayed if the audio stream is a component of an MPEG-1 System Stream, MPEG-2 Program Stream, or MPEG-2 Transport Stream.

4.3.8 AC-3 Audio (Dolby Digital) Elementary Stream Properties

The following properties are displayed in the Property Pane for an AC-3 (Dolby Digital) Audio Elementary Stream:

PID (MPEG-2 Transport Stream only)

The PID property is the value of the transport stream PID that is associated with the audio elementary stream. The PID value may be an integer between 16 and 8190 (0x0010 and 0x1FFE), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the PID property is displayed is set in the Preferences Dialog Box 22. The PID property is only displayed if the AC-3 Audio Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_type (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The stream_type property is the stream_type value that is associated with the audio elementary stream in the Program Map Table. Generally, AC-3 audio streams are assigned a stream_type value of 129 (0x81). The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_type property is displayed is set in the Preferences Dialog Box 22. The stream_type property is only displayed if the AC-3 Audio Elementary Stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

Descriptors (MPEG-2 Transport Stream only)

Any descriptors that are associated in the PMT with the elementary stream are shown. The hexadecimal data bytes for each descriptor that is present are displayed on a separate line. The Descriptors property is only displayed if the AC-3 Audio Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_id (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The stream_id property is the value that appears in the PES headers for the AC-3 audio elementary stream. Generally, AC-3 audio streams are assigned a stream_id value of 189 (0xBD). The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_id property is displayed is set in the Preferences Dialog Box 22. The stream_id property is only displayed if the AC-3 Audio Elementary Stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

VOB Subtype (VOB only)

The VOB Subtype property is the value of the identifier encoded in the stream syntax that is unique for this AC-3 stream in the VOB file. The VOB Subtype property is only displayed if the AC-3 Audio Elementary Stream is a component of a VOB-type MPEG-2 Program Stream.

track_ID (MPEG-4 ISO Base Media File only)

The track_ID property is the value that identifies the elementary stream in the input MPEG-4 ISO base media file.

Bit Rate

The Bit Rate property is the rate in bits per second (bps) that is encoded in the audio elementary stream syntax.

Sample Rate

The Sample Rate is the sampling frequency in samples per second (sps) that is encoded in the audio elementary stream syntax.

Number of Channels

The Number of Channels property is the number of audio channels that are present in the audio elementary stream.

Initial Delay (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The Initial Delay parameter gives the time from the beginning of the stream to when this particular elementary stream is first presented. This time is useful when demultiplexing or remultiplexing a stream as differences in the initial delay value between different elementary streams within a multiplex need to be carried through to the new stream or audio/video sync issues will occur. Differences in this value between elementary streams can also indicate why one stream begins before another when the stream is played. The Initial Delay property is only displayed if the audio stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

4.3.9 Enhanced AC-3 (Dolby Digital Plus) Audio Elementary Stream Properties

The following properties are displayed in the Property Pane for an Enhanced AC-3 (Dolby Digital Plus) Audio Elementary Stream:

PID (MPEG-2 Transport Stream only)

The PID property is the value of the transport stream PID that is associated with the audio elementary stream. The PID value may be an integer between 16 and 8190 (0x0010 and 0x1FFE), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the PID property is displayed is set in the Preferences Dialog Box 22. The PID property is only displayed if the Enhanced AC-3 Audio Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_type (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The stream_type property is the value that is associated with the audio elementary stream in the Program Map Table. Generally, Enhanced AC-3 audio streams are given a value of 135 (0x87). The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_type property is displayed is set in the Preferences Dialog Box 22. The stream_type property is only displayed if the Enhanced AC-3 Audio Elementary Stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

Descriptors (MPEG-2 Transport Stream only)

Any descriptors that are associated in the PMT with the elementary stream are shown. The hexadecimal data bytes for each descriptor that is present are displayed on a separate line. The Descriptors property is only displayed if the Enhanced AC-3 Audio Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_id (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The stream_id property is the value that appears in the PES headers for the Enhanced AC-3 audio elementary stream. Generally, Enhanced AC-3 audio streams are assigned a stream_id value of 189 (0xBD). The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_id property is displayed is set in the Preferences Dialog Box 22. The stream_id property is only displayed if the Enhanced AC-3 Audio Elementary Stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

VOB Subtype (VOB only)

The VOB Subtype property is the value of the identifier encoded in the stream syntax that is unique for this Enhanced AC-3 Audio Elementary Stream in the VOB file. The VOB Subtype property is only displayed if the Enhanced AC-3 Audio Elementary Stream is a component of a VOB-type MPEG-2 Program Stream.

track_ID (MPEG-4 ISO Base Media File only)

The track_ID property is the value that identifies the elementary stream in the input MPEG-4 ISO base media file.

Bit Rate

The Bit Rate property is the rate in bits per second (bps) that is encoded in the audio elementary stream syntax. Note that the Bit Rate property is the total bit rate of all substreams in the Enhanced AC-3 Audio Elementary Stream.

Sample Rate

The Sample Rate is the sampling frequency in samples per second (sps) that is encoded in the audio elementary stream syntax.

Number of Substreams

Indicates the total number of substreams that are embedded in the Enhanced AC-3 stream. This property is only displayed if there are substreams present. Note that the Bit Rate property is the total bit rate of all substreams.

Number of Channels

The Number of Channels property is the number of audio channels that are present in the audio elementary stream.

Initial Delay (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The Initial Delay parameter gives the time from the beginning of the stream to when this particular elementary stream is first presented. This time is useful when demultiplexing or remultiplexing a stream as differences in the initial delay value between different elementary streams within a multiplex need to be carried through to the new stream or audio/video sync issues will occur. Differences in this value between elementary streams can also indicate why one stream begins before another when the stream is played. The Initial Delay property is only displayed if the audio stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

4.3.10 AAC Elementary Stream (ADTS) Properties

MPEGID identifies Advanced Audio Coding (AAC) data in Audio Data Transport Stream (ADTS) container format.

The following properties are displayed in the Property Pane for an AAC Elementary Stream (ADTS):

PID (MPEG-2 Transport Stream only)

The PID property is the value of the transport stream PID that is associated with the audio elementary stream. The PID value may be an integer between 16 and 8190 (0x0010 and 0x1FFE), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the PID property is displayed is set in the Preferences Dialog Box 22. The PID property is only displayed if the AAC Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_type (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The stream_type property is the value that is associated with the AAC elementary stream in the Program Map Table. Generally, AAC streams are assigned a stream_type value of 15 (0x0F). The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_type property is displayed is set in the Preferences Dialog Box 22. The stream_type property is only displayed if the AAC Elementary Stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

Descriptors (MPEG-2 Transport Stream only)

Any descriptors that are associated in the PMT with the elementary stream are shown. The hexadecimal data bytes for each descriptor that is present are displayed on a separate line. The Descriptors property is only displayed if the AAC Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_id (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The stream_id property is the value that appears in the PES headers for the AAC elementary stream. Generally, AAC streams are assigned a stream_id value from 192 to 223 (0xC0 to 0xDF), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_id property is displayed is set in the Preferences Dialog Box 22. The stream_id property is only displayed if the AAC Elementary Stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

Bit Rate

AAC (ADTS) streams are always encoded at a variable bit rate. For the Bit Rate property, MPEGID estimates the bit rate (in bps) from the audio frames in the initial buffer.

Sample Rate

The Sample Rate is the sampling frequency in samples per second (sps) that is encoded in the audio elementary stream syntax.

Number of Channels

The Number of Channels property is the number of audio channels that are present in the audio elementary stream.

Spectral Band Replication (SBR)

The Spectral Band Replication property will only be displayed if an SBR extension is detected in the AAC stream. When the SBR extension is present, the AAC stream is coded as HE-AAC version 1.

Parametric Stereo

The Parametric Stereo property will only be displayed if a Parametric Stereo extension is detected in the AAC stream. When the SBR extension and Parametric Stereo extension are present, the stream is coded

as HE-AAC version 2.

Initial Delay (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The Initial Delay parameter gives the time from the beginning of the stream to when this particular elementary stream is first presented. This time is useful when demultiplexing or remultiplexing a stream as differences in the initial delay value between different elementary streams within a multiplex need to be carried through to the new stream or audio/video sync issues will occur. Differences in this value between elementary streams can also indicate why one stream begins before another when the stream is played. The Initial Delay property is only displayed if the audio stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

4.3.11 AAC Elementary Stream (ADIF) Properties

MPEGID identifies Advanced Audio Coding (AAC) data in Audio Data Interchange Format (ADIF) container format.

AAC data cannot be multiplexed while in the ADIF container format. As such, MPEGID will never identify an AAC Elementary Stream (ADIF) as a component of a multiplexed data file.

The following properties are displayed in the Property Pane for an AAC Elementary Stream (ADIF):

Bit Rate

AAC (ADIF) streams can be either variable or constant bit rate. If it is variable bit rate, the Bit Rate property will be set to VBR. If the stream is constant bit rate, the Bit Rate property will be set to the rate in bits per second (bps) that is encoded in the audio elementary stream syntax.

Sample Rate

The Sample Rate is the sampling frequency in samples per second (sps) that is encoded in the audio elementary stream syntax.

Spectral Band Replication (SBR)

The Spectral Band Replication property will only be displayed if an SBR extension is detected in the AAC stream. When the SBR extension is present, the AAC stream is coded as HE-AAC version 1.

4.3.12 AAC Elementary Stream (LOAS/LATM) Properties

MPEGID identifies Advanced Audio Coding (AAC) data in both Low Overhead Audio Stream (LOAS) and Low Overhead MPEG-4 Audio Transport Multiplex (LATM) formats.

The following properties are displayed in the Property Pane for an AAC Elementary Stream (LOAS/LATM):

PID (MPEG-2 Transport Stream only)

The PID property is the value of the transport stream PID that is associated with the audio elementary stream. The PID value may be an integer between 16 and 8190 (0x0010 and 0x1FFE), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the PID property is displayed is set in the Preferences Dialog Box 22. The PID property is only displayed if the AAC Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_type (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The stream_type property is the value that is associated with the AAC elementary stream in the Program Map Table. Generally, AAC Elementary Stream (LOAS/LATM) are assigned a stream_type value of 17 (0x11), 14496-3 MPEG-4 Audio. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_type property is displayed is set in the Preferences Dialog

Box 221. The stream_type property is only displayed if the AAC Elementary Stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

Descriptors (MPEG-2 Transport Stream only)

Any descriptors that are associated in the PMT with the elementary stream are shown. The hexadecimal data bytes for each descriptor that is present are displayed on a separate line. The Descriptors property is only displayed if the AAC Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_id (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The stream_id property is the value that appears in the PES headers for the elementary stream. Generally, audio streams are assigned a stream_id value from 192 to 223 (0xC0 to 0xDF), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_id property is displayed is set in the Preferences Dialog Box 221. The stream_id property is only displayed if the AAC Elementary Stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

Audio Object Type

MPEG-4 audio support many different audio codecs. The Audio Object Type describes the codec used to create this MPEG-4 audio stream.

Number of Subframes

This property gives the number of subframes contained in each AAC audio frame. Subframes are used to expand the number of channels supported by the audio stream.

Bit Rate

The Bit Rate for AAC LOAS/LATM streams comes from *aac_getinfo* field, which is an estimate of the bit rate (in bps) from all audio frames in the initial buffer.

Sample Rate

The Sample Rate is the sampling frequency in samples per second (sps) that is encoded in the audio elementary stream syntax.

Number of Channels

The Number of Channels property is the number of audio channels that are present in the audio elementary stream.

Spectral Band Replication (SBR)

The Spectral Band Replication property will only be displayed if an SBR extension is detected in the AAC stream. When the SBR extension is present, the AAC stream is coded as HE-AAC version 1.

Initial Delay (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The Initial Delay parameter gives the time from the beginning of the stream to when this particular elementary stream is first presented. This time is useful when demultiplexing or remultiplexing a stream as differences in the initial delay value between different elementary streams within a multiplex need to be carried through to the new stream or audio/video sync issues will occur. Differences in this value between elementary streams can also indicate why one stream begins before another when the stream is played. The Initial Delay property is only displayed if the audio stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

4.3.13 AAC Elementary Stream (MP4) Properties

When AAC audio data in ADTS or LOAS/LATM container format is multiplexed in an MPEG-4 ISO Base Media File, the headers are stripped off and the data is multiplexed as raw AAC frames. MPEGID identifies this multiplexed AAC data as AAC Elementary Stream (MP4).

The following properties are displayed in the Property Pane for an AAC Elementary Stream (MP4):

track_ID

The track_ID property is the value that identifies the AAC elementary stream in the input MPEG-4 ISO base media file.

Bit Rate

AAC elementary streams that are multiplexed in MPEG-4 ISO base media files are encoded at a variable bit rate. For the Bit Rate property, MPEGID estimates the bit rate (in bps) from the audio frames in the initial buffer.

Sample Rate

The Sample Rate is the sampling frequency in samples per second (sps) that is encoded in the audio elementary stream syntax.

Number of Channels

The Number of Channels property is the number of audio channels that are present in the AAC stream.

Spectral Band Replication (SBR)

The Spectral Band Replication property will only be displayed if an SBR extension is detected in the AAC stream. When the SBR extension is present, the AAC stream is coded as HE-AAC version 1.

4.3.14 DTS Audio Elementary Stream Properties

The following properties are displayed in the Property Pane for a DTS Audio Elementary Stream:

PID (MPEG-2 Transport Stream only)

The PID property is the value of the transport stream PID that is associated with the audio elementary stream. The PID value may be an integer between 16 and 8190 (0x0010 and 0x1FFE), inclusive. The value may be specified in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the PID property is displayed is set in the Preferences Dialog Box 221. The PID property is only displayed if the DTS Audio Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_type (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The stream_type property is the value that is associated with the DTS Audio Elementary Stream in the Program Map Table. Generally, DTS audio streams are assigned a stream_type value of 0x06. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_type property is displayed is set in the Preferences Dialog Box 221. The stream_type property is only displayed if the DTS Audio Elementary Stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

Descriptors (MPEG-2 Transport Stream only)

Any descriptors that are associated in the PMT with the elementary stream are shown. The hexadecimal data bytes for each descriptor that is present are displayed on a separate line. The Descriptors property is only displayed if the DTS Audio Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_id (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The stream_id property is the value that appears in the PES headers for the audio elementary stream. Generally, DTS audio streams are assigned a stream_id value of 189 (0xBD). The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_id property is displayed is set in the Preferences Dialog Box 221. The stream_id property is only displayed if the DTS Audio Elementary Stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

track_ID (MPEG-4 ISO Base Media File only)

The track_ID property is the value that identifies the elementary stream in the input MPEG-4 ISO base media file.

Bit Rate

The Bit Rate property is the rate in bits per second (bps) that is encoded in the audio stream syntax.

Sample Rate

The Sample Rate is the sampling frequency in samples per second (sps) that is encoded in the audio stream syntax.

Number of Channels

The Number of Channels property is the number of audio channels that are present in the audio elementary stream.

Initial Delay (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The Initial Delay parameter gives the time from the beginning of the stream to when this particular elementary stream is first presented. This time is useful when demultiplexing or remultiplexing a stream as differences in the initial delay value between different elementary streams within a multiplex need to be carried through to the new stream or audio/video sync issues will occur. Differences in this value between elementary streams can also indicate why one stream begins before another when the stream is played. The Initial Delay property is only displayed if the audio stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

4.3.15 DTS-HD and DTS-HD Master Audio Elementary Stream Properties

The following properties are displayed in the Property Pane for a DTS-HD Audio Elementary Stream or DTS-HD Master Audio Elementary Stream:

PID (MPEG-2 Transport Stream only)

The PID property is the value of the transport stream PID that is associated with the DTS-HD or DTS-HD Master audio elementary stream. The PID value may be an integer between 16 and 8190 (0x0010 and 0x1FFE), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the PID property is displayed is set in the Preferences Dialog Box 221. The PID property is only displayed if the DTS-HD or DTS-HD Master audio elementary stream is a component of an MPEG-2 Transport Stream.

stream_type (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The stream_type property is the stream_type value that is associated with the audio elementary stream in the Program Map Table. Generally, DTS-HD or DTS-HD Master audio streams are assigned a stream_type value of 0x06. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_type property is displayed is set in the Preferences Dialog Box 221. The stream_type property is only displayed if the DTS-HD or DTS-HD Master audio stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

Descriptors (MPEG-2 Transport Stream only)

Any descriptors that are associated in the PMT with the elementary stream are shown. The hexadecimal data bytes for each descriptor that is present are displayed on a separate line. The Descriptors property is only displayed if the DTS-HD or DTS-HD Master audio stream is a component of an MPEG-2 Transport Stream.

stream_id (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The stream_id property is the value that appears in the PES headers for the audio stream. Generally, DTS-HD or DTS-HD Master audio streams are assigned a stream_id value of 189 (0xBD). The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_id property is displayed is set in the Preferences Dialog Box 22. The stream_id property is only displayed if the DTS-HD or DTS-HD Master audio stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

track_ID (MPEG-4 ISO Base Media File only)

The track_ID property is the value that identifies the DTS-HD or DTS-HD Master audio stream in the input MPEG-4 file.

Bit Rate

The Bit Rate property is the rate in bits per second (bps) that is encoded in the audio stream syntax.

Sample Rate

The Sample Rate is the sampling frequency in samples per second (sps) that is encoded in the DTS-HD or DTS-HD Master audio stream syntax.

Number of Substreams

The Number of Substreams property indicates the total number of substreams embedded in the audio stream. Note that the Bit Rate property is the total bit rate of all substreams.

Number of Channels

The Number of Channels property is the number of audio channels that are present in the audio stream.

Initial Delay (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The Initial Delay parameter gives the time from the beginning of the stream to when this particular elementary stream is first presented. This time is useful when demultiplexing or remultiplexing a stream as differences in the initial delay value between different elementary streams within a multiplex need to be carried through to the new stream or audio/video sync issues will occur. Differences in this value between elementary streams can also indicate why one stream begins before another when the stream is played. The Initial Delay property is only displayed if the audio stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

4.3.16 DTS Layered Audio Enhancement Stream

DTS-HD® Layered Audio technology supports multiple bit rates in an MP4 container file by encoding the audio data as multiple "layers". MPEGID will detect layered audio data in an MP4 file and identify it as a DTS Layered Audio Enhancement Stream.

The following properties are displayed in the Property Pane for a DTS Layered Audio Enhancement Stream:

track_ID

The track_ID property is the value that identifies the layered audio stream in the input MPEG-4 ISO base media file.

Bit Rate

The Bit Rate property is the rate in bits per second (bps) that is encoded in the layered audio stream.

Sample Rate

The Sample Rate is the sampling frequency in samples per second (sps) that is encoded in the audio stream syntax.

4.3.17 WAV Audio Data Properties

MPEGID identifies Waveform (WAV) audio format files. WAV audio data is never found multiplexed in MPEG-1 System Stream, MPEG-2 Program Stream, MPEG-2 Transport Stream, or MPEG-4 ISO Base Media File.

In addition to General File Properties 28, the following properties are displayed in the Property Pane for a WAV Audio Data file:

Bit Rate

The Bit Rate property is the number of bits per second (bps) of audio PCM samples.

Sample Rate

The Sample Rate property is the number of audio samples per second (sps) for each channel .

Format

The Format property identifies the audio codec used to code the WAV audio file.

Number of Channels

The Number of Channels property is the number of audio channels present in the file.

Word Size

The Word Size property is the number of bits and bytes used to store each sample in the WAV file.

4.3.18 PCM Audio Elementary Stream (MP4)

MPEGID identifies PCM audio data that is contained in an MPEG-4 ISO Base Media file as PCM Audio Elementary Stream (MP4).

The following properties are displayed in the Property Pane for a PCM Audio Elementary Stream (MP4):

track_ID

The track_ID property is the value that identifies the PCM Audio Elementary Stream in the input MPEG-4 ISO base media file.

Sample Rate

The Sample Rate is the sampling frequency in samples per second (sps) that is encoded in the audio elementary stream syntax.

Number of Channels

The Number of Channels property is the number of audio channels that are present in the PCM Audio Elementary Stream.

Sample Size

The Sample Size property is the number of bits used to store each sample in the PCM Audio Elementary Stream.

4.3.19 SMPTE 302M Audio Elementary Stream Properties

The SMPTE 302M standard specifies the transport of digital audio, such as PCM data, AES3 data, or WAV audio, in MPEG-2 transport streams. MPEGID will detect elementary streams that are encoded and multiplexed according to this standard in system streams, program streams, and transport streams and identify them as SMPTE 302M Audio Elementary Streams.

The following properties are displayed in the Property Pane for a SMPTE 302M Audio Elementary Stream:

PID (MPEG-2 Transport Stream only)

The PID property is the value of the transport stream PID that is associated with the audio elementary stream. The PID value may be an integer between 16 and 8190 (0x0010 and 0x1FFE), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the PID property is displayed is set in the Preferences Dialog Box 221. The PID property is only displayed if the SMPTE 302M Audio Elementary Stream is a component of an MPEG-2 Transport Stream.

stream_type (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The stream_type property is the stream_type value that is associated with the audio elementary stream in the Program Map Table. Generally, SMPTE 302M audio streams are assigned a stream_type value of 6. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_type property is displayed is set in the Preferences Dialog Box 221. The stream_type property is only displayed if the SMPTE 302M Audio Elementary Stream is a component of an MPEG-2 Program Stream or MPEG-2 Transport Stream.

Descriptors (MPEG-2 Transport Stream only)

Any descriptors that are associated in the PMT with the elementary stream are shown. The hexadecimal data bytes for each descriptor that is present are displayed on a separate line. The Descriptors property is only displayed if the elementary stream is a component of an MPEG-2 Transport Stream.

stream_id (MPEG-1 System Stream, MPEG-2 Program Stream, and MPEG-2 Transport Stream only)

The stream_id property is the value that appears in the PES headers for the audio elementary stream. Generally, SMPTE 302M audio streams are assigned a stream_id value of 189 (0xBD). The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_id property is displayed is set in the Preferences Dialog Box 221. The stream_id property is only displayed if the SMPTE 302M Audio Elementary Stream is a component of an MPEG-1 System Stream, MPEG-2 Program Stream, or MPEG-2 Transport Stream.

Bit Rate

The Bit Rate property is the rate in bits per second (bps) that is computed from the sample rate, sample size, and number of channels.

Number of Channels

The Number of Channels property is the number of audio channels that are present in the audio elementary stream.

Channel ID

SMPTE 302M supports up to eight channels in one elementary stream. The Channel ID is the channel number of the first data channel in this stream. This feature allows more than eight channels to be carried using multiple elementary streams.

Sample Size

SMPTE 302M supports 16-, 20-, and 24-bit word size. This Sample Size property gives the size of the samples in this stream.

Initial Delay (MPEG-1 System Stream, MPEG-2 Program Stream, and MPEG-2 Transport Stream only)

The Initial Delay parameter gives the time from the beginning of the stream to when this particular elementary stream is first presented. This time is useful when demultiplexing or remultiplexing a stream as differences in the initial delay value between different elementary streams within a multiplex need to be carried through to the new stream or audio/video sync issues will occur. Differences in this value between elementary streams can also indicate why one stream begins before another when the stream is played. The Initial Delay property is only displayed if the audio stream is a component of an MPEG-1 System Stream, MPEG-2 Program Stream, or MPEG-2 Transport Stream.

4.3.20 Manzanita XML Data Properties

The Manzanita Systems MPEG-2 Transport Stream Multiplexer supports insertion of many types of data into transport streams, including Private Stream 1, Private Stream 2, System Information (SI), SCTE Splice Information, DVB Subtitle Stream, and DVB Teletext Stream. To control multiplexing of the data, the input files must be in a specific XML format that has been defined by Manzanita Systems.

MPEGID identifies the following types of files that use a Manzanita-specific XML format:

- Manzanita Private Stream XML Data
- Manzanita SI Table XML Data
- Manzanita SCTE35 Splice Information XML Data
- Manzanita SCTE35 Splice Information Text Data
- Manzanita DVB Subtitle XML Data
- Manzanita DVB Teletext XML Data

MPEGID only reports General File Properties 28 for the Manzanita XML Data file, and does not inspect the content.

4.3.21 Private Stream Properties

MPEG-2 program streams can contain privately defined data streams in addition to audio and video elementary streams. Like audio and video, these streams are segmented in PES packets, however, their stream_id identifies them as Private Streams. MPEGID reports the presence of Private Streams, however, it does not inspect the content.

The following property is displayed in the Property Pane for a Private Stream:

stream_id (MPEG-2 Program Stream only)

The stream_id property is the stream_id value that appears in the PES headers for the Private Stream.

Private Streams are identified by the stream_id values of 189 (0xBD) (private_stream_1) and 191 (0xBF) (private_stream_2). The value may be specified in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_id property is displayed is set in the Preferences Dialog Box 22.

4.3.22 User Private Stream Properties

MPEG-2 program streams and MPEG-2 transport streams can contain privately defined data streams in addition to audio and video elementary streams. Each data stream is carried by a unique PID and is identified in the transport stream's Program Map Table as a User Private Stream. User Private Streams may or may not be contained in the PES packets. MPEGID reports the presence of User Private Streams, however, it does not inspect the content.

The following properties are displayed in the Property Pane for a User Private Stream:

PID (MPEG-2 Transport Stream only)

The PID property is the value of the transport stream PID that is associated with the User Private stream. The PID value may be an integer between 16 and 8190 (0x0010 and 0x1FFE), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the PID property is displayed is set in the Preferences Dialog Box 22.

stream_type (MPEG-2 Program Stream and MPEG-2 Transport Stream only)

The stream_type property is the value that is associated with the User Private Stream in the Program Map Table. User Private Streams are identified by the stream_type values of 128 through 255 (0x80 through 0xFF), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_type property is displayed is set in the Preferences Dialog Box 22.

Descriptors (MPEG-2 Transport Stream only)

Any descriptors that are associated in the PMT with the data stream are shown. The hexadecimal data bytes for each descriptor that is present are displayed on a separate line.

4.3.23 Private Stream 1 Data and Private Stream 2 Data Properties

Private Stream 1 Data and Private Stream 2 Data are data streams that are contained in the PES packets. They are specifically identified by their stream_id in the PES packet header. MPEGID reports the presence of Private Stream 1 Data and Private Stream 2 Data in MPEG-2 transport streams, however, it does not inspect the content.

The following properties are displayed in the Property Pane for Private Stream 1 Data and Private Stream 2 Data:

PID (MPEG-2 Transport Stream only)

The PID property is the value of the transport stream PID that is associated with the Private Stream 1 Data or Private Stream 2 Data. The PID value may be an integer between 16 and 8190 (0x0010 and 0x1FFE), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the PID property is displayed is set in the Preferences Dialog Box 22.

stream_type (MPEG-2 Transport Stream only)

The stream_type property is the stream_type value that is associated with the Private Stream 1 Data or Private Stream 2 Data in the Program Map Table. Private Stream 1 Data and Private Stream 2 Data are assigned a stream_type value in the User Private range of 128 through 255 (0x80 through 0xFF), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_type property is displayed is set in the Preferences Dialog Box 22.

Descriptors (MPEG-2 Transport Stream only)

Any descriptors that are associated in the PMT with the data stream are shown. The hexadecimal data bytes for each descriptor that is present are displayed on a separate line.

stream_id (MPEG-2 Transport Stream only)

The stream_id is the value that identifies the stream in PES headers. Generally, Private Stream 1 Data is assigned a stream_id value of 189 (0xBD), and Private Stream 2 Data is assigned a stream_id of 191 (0xBF). The value may be specified in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_id property is displayed is set in the Preferences Dialog Box 22.

4.3.24 SCTE35 Splice Information Properties

The transport method for carrying information about upcoming splice points in MPEG-2 transport streams is defined in the SCTE standard, "Digital Program Insertion Cueing Message for Cable" (ANSI/SCTE 35 2007). MPEGID reports that a data stream is SCTE35 Splice Information if it is identified in the program's PMT as an SCTE35 Splice Information Table stream. MPEGID does not, however, inspect the content of the stream.

The following properties are displayed in the Property Pane for SCTE35 Splice Information:

PID (MPEG-2 Transport Stream only)

The PID property is the value of the transport stream PID that is associated with the SCTE35 Splice Information stream. The PID value may be an integer between 16 and 8190 (0x0010 and 0x1FFE), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the PID property is displayed is set in the Preferences Dialog Box 22.

stream_type (MPEG-2 Transport Stream only)

The stream_type property is the value that is associated with the SCTE35 Splice Information stream in the Program Map Table. SCTE35 Splice Information streams are assigned the value 134 (0x86), or "SCTE35 Splice Information Table". The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_type property is displayed is set in the Preferences Dialog Box 22.

Descriptors (MPEG-2 Transport Stream only)

Any descriptors that are associated in the PMT with the SCTE35 Splice Information stream are shown. The hexadecimal data bytes for each descriptor that is present are displayed on a separate line.

4.3.25 DVB Subtitle Stream Properties

DVB subtitling systems are specified in ETSI EN 300 743 for carrying program related subtitles and other graphical elements in MPEG-2 transport streams. MPEGID reports that a data stream is a DVB Subtitle Stream if it is associated in the program's PMT with a DVB Subtitle descriptor. MPEGID does not, however, inspect the content of the stream.

The following properties are displayed in the Property Pane for a DVB Subtitle Stream:

PID (MPEG-2 Transport Stream only)

The PID property is the value of the transport stream PID that is associated with the DVB Subtitle Stream. The PID value may be an integer between 16 and 8190 (0x0010 and 0x1FFE), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the PID property is

displayed is set in the Preferences Dialog Box 221.

stream_type (MPEG-2 Transport Stream only)

The stream_type property is the value that is associated with the DVB Subtitle Stream in the Program Map Table. DVB Subtitle Streams are assigned the value 6 (0x06), or "PES Private Packets". The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_type property is displayed is set in the Preferences Dialog Box 221.

Descriptors (MPEG-2 Transport Stream only)

Any descriptors that are associated in the PMT with the DVB Subtitle Stream are shown. The hexadecimal data bytes for each descriptor that is present are displayed on a separate line.

stream_id (MPEG-2 Transport Stream only)

The stream_id is the value that identifies the stream in the PES headers. Generally, DVB Subtitle Streams are assigned a stream_id value of 189 (0xBD), or "Private Stream 1". The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_id property is displayed is set in the Preferences Dialog Box 221.

4.3.26 DVB Teletext Stream Properties

The transport method for conveying System B Teletext in DVB transport streams is specified in ETSI EN 300 472. MPEGID reports that a data stream is a DVB Teletext Stream if it is associated in the program's PMT with a DVB Teletext descriptor. MPEGID does not, however, inspect the content of the stream.

The following properties are displayed in the Property Pane for a DVB Teletext Stream:

PID (MPEG-2 Transport Stream only)

The PID property is the value of the transport stream PID that is associated with the DVB Teletext Stream. The PID value may be an integer between 16 and 8190 (0x0010 and 0x1FFE), inclusive. The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the PID property is displayed is set in the Preferences Dialog Box 221.

stream_type (MPEG-2 Transport Stream only)

The stream_type property is the value that is associated with the DVB Teletext Stream in the Program Map Table. DVB Teletext Streams are assigned the value 6 (0x06), or "PES Private Packets". The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_type property is displayed is set in the Preferences Dialog Box 221.

Descriptors (MPEG-2 Transport Stream only)

Any descriptors that are associated in the PMT with the DVB Teletext Stream are shown. The hexadecimal data bytes for each descriptor that is present are displayed on a separate line.

stream_id (MPEG-2 Transport Stream only)

The stream_id is the value that identifies the stream in the PES headers. Generally, DVB Teletext Streams are assigned a stream_id value of 189 (0xBD), or "Private Stream 1". The value may be displayed in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_id property is displayed is set in the Preferences Dialog Box 221.

4.3.27 MPEG-1 System Stream Properties

In addition to General File Properties 28 and individual elementary stream properties, the following property is displayed if the input media file is an MPEG-1 System Stream:

Mux Rate

The Mux Rate property is the rate in bits per second (bps) that is encoded in the initial *mux_rate* field in the stream syntax.

4.3.28 MPEG-2 Program Stream Properties

In addition to General File Properties 28 and individual elementary stream properties, the following properties is displayed if the input media file is an MPEG-2 Program Stream:

Video Object (VOB) files are identified as MPEG-2 Program Streams.

Program Mux Rate

The Program Mux Rate property is the rate in bits per second (bps) that is encoded in the initial *program_mux_rate* field in the stream syntax.

Descriptors

Any descriptors that are defined at the program level of the Program Stream Map are shown. The hexadecimal data bytes for each descriptor that is present are displayed on a separate line.

4.3.29 MPEG-2 Transport Stream Properties

In addition to General File Properties 28, MPEG-2 Program Properties, and individual elementary stream properties, the following properties are displayed if the input media file is an MPEG-2 Transport Stream:

Transport Packet Size

The Transport Packet Size property is the number of bytes between successive transport packet sync bytes. This interval is assumed to be constant over the length of the transport stream.

Transport Rate

The Transport Rate property is the rate in bits per second (bps) that is computed from the PCRs in the beginning of the transport stream. Note that the Transport Rate value is only an estimate. The actual transport rate may change later in the stream.

4.3.30 MPEG-2 Program Properties

An MPEG-2 Transport Stream generally contains one or more programs. For each program in the input transport stream, MPEGID displays a set of MPEG-2 Program properties.

The following properties are displayed for each MPEG-2 Program in an MPEG-2 Transport Stream:

program_number

The program_number property is the value that is associated with this program in the transport stream's Program Association Table (PAT). It is the same as the Program Number that identifies the program in the Multiplex Pane.

PMT PID

The PMT PID property is the PID value of the stream that carries the Program Map Table (PMT) associated with this program. The PID value may be an integer between 16 and 8190 (0x0010 and 0x1FFE), inclusive. The value may be specified in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_type property is displayed is set in the Preferences Dialog Box 22. 16 to 8190 (0x0010 to 0x1FFE)

PCR PID

The PCR PID property is the PID value of the stream that carries the Program Clock Reference (PCR) for this program. The PID value may be an integer between 16 and 8190 (0x0010 and 0x1FFE), inclusive. The value may be specified in decimal, or if prefixed with a "0x", in hexadecimal. The base in which the stream_type property is displayed is set in the Preferences Dialog Box 22.

Program Descriptors

Any descriptors that are defined in the PMT for this program are shown. The hexadecimal data bytes for each descriptor that is present are displayed on a separate line.

Number of PMT Entries

The Number of PMT Entries is the number of elementary stream and data PIDs that are designated to be part of this program in the PMT.

4.3.31 MPEG-4 ISO Base Media File Properties

In addition to General File Properties 28, the properties of each individual elementary stream contained in the media file will be displayed in the Property Pane for an MPEG-4 ISO Base Media File.

4.4 Saving a Report File

After you have identified a media file, you can save the results in a report file for future reference. The report file is a simple text file that contains all of the information displayed in the Property Pane.

If you just want part of the Property Pane results in a document, you can select the area that you want, copy it to the clipboard, and paste it in the document.

To save a report file:

1. Choose **File > Save Report As..** from the Menu Bar. The **Save As** dialog box will appear.
2. Browse your system to select the desired location to save the report file, enter the report name in the **File Name** box, then click the **Save** button.

4.5 Identifying from the Command Line

The MPEGID installation includes a command line version that enables execution of MPEGID in a command prompt or shell window. The output of the command line version is identical to the results that are displayed in the Property Pane of the GUI version. The command line MPEGID can be run in batch files or scripts for high-volume or automated applications. Its output can be directed to a file for a saved text report.

The command line executable is not available with the demo version of MPEGID.

To run the command line version of MPEGID:

1. (Windows only) Open an "MS-DOS" Command Prompt window.
2. At the command prompt or in a script, enter the line:

```
mpegid [-b buffer_size] input_file
```

Options and Arguments	
input_file	The name of the input media file. The name may be specified by full path, relative path, or by filename only. If only the filename is given, then MPEGID will look for the input file in the current directory.
-b *buffer_size*	Optional. The amount of data from the beginning of the input file that MPEGID should inspect, where *buffer_size* is a number of kilobytes.

Return Values	
0	Execution was successful
255	Execution failed

If you get a message that the name that you entered is not recognized as a command, then the MPEGID command line executable is not in a location that is recognized by the PATH environment variable. On a UNIX system (Linux or Mac OS X) you should either create a symbolic link from the MPEGID program to a directory that is in your PATH variable or include the location of the MPEGID program in the PATH variable. On a Windows system, you need to add the path of the MPEGID application folder to the PATH variable.

Chapter V

Demultiplexer

5 Demultiplexer

The MPEGID program includes a tool that will extract any identified elementary stream from an input multiplexed media file and save it as a binary file. The Demultiplexer can extract and save data from the following types of input files:

- **MPEG-1 System Stream**
- **MPEG-2 Program Stream**
- **MPEG-2 Transport Stream**
- **MPEG-4 ISO Base Media File**

The demultiplexer function is not available with the demo version of MPEGID.

Use of the Demultiplexer is documented in the following sections:

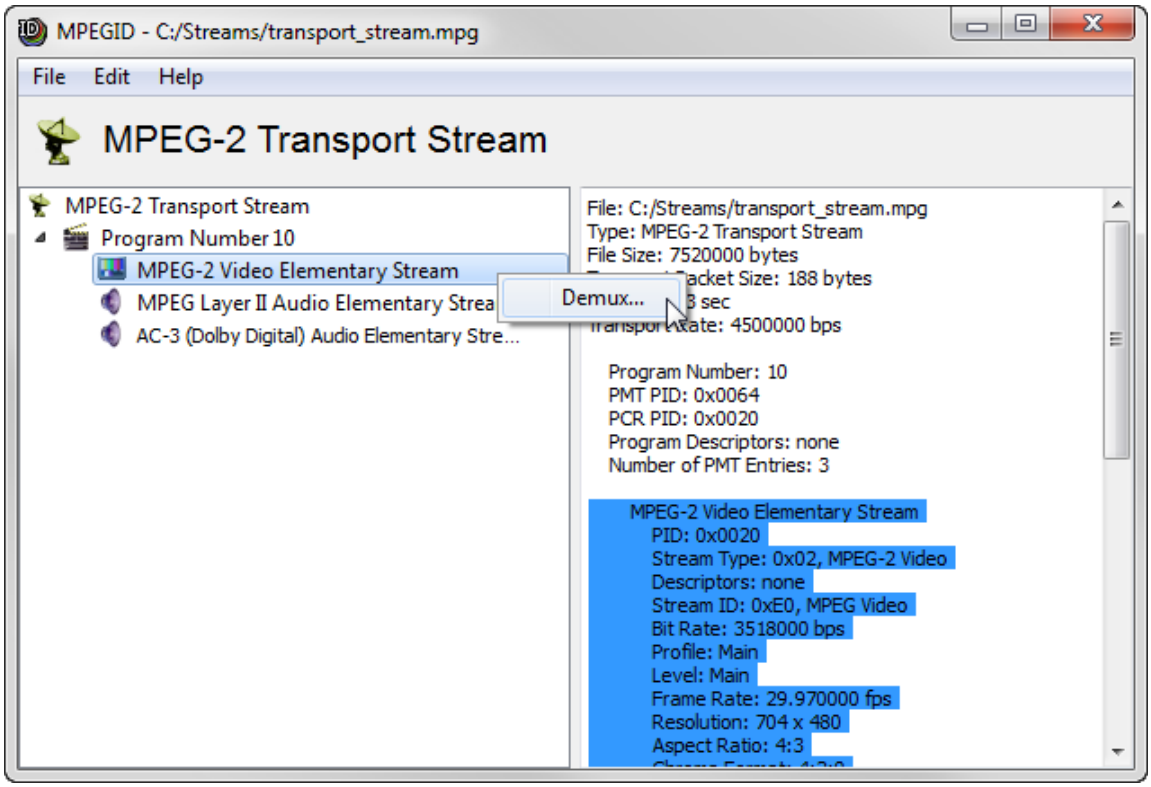
- Demultiplexing Elementary Streams 57
- Demultiplexing SMPTE 302M Audio 58
- Demultiplexing from the Command Line 61

5.1 Demultiplexing Elementary Streams

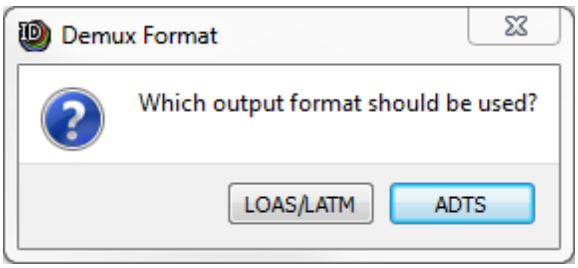
MPEGID's integrated Demultiplexer tool can extract elementary streams that have been identified in an input multiplexed media file. With the exception of an SMPTE 302M Audio Elementary Stream, demultiplexing of an identified elementary stream is a simple process.

To demultiplex an Elementary Stream (non-SMPTE 302M):

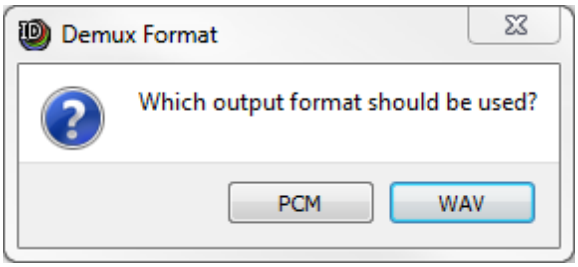
1. Open and identify 25 the input file in MPEGID. The file must be an MPEG-1 system stream, MPEG-2 program stream, VOB, MPEG-2 transport stream, or MPEG-4 ISO base media file.
2. Select the node in the Multiplex Pane that represents the elementary stream you wish to demultiplex.
3. Choose **Edit > Demux..** from the Menu Bar, or click the right mouse button on the node and then click on the **Demux..** function in the submenu.



If the selected stream is an AAC Elementary Stream in an MPEG-4 ISO Base Media File, then the **Demux Format** dialog box will open that allows you to select between saving the output file in **LOAS/LATM** format or **ADTS** format.



If the selected stream is a PCM Audio Elementary Stream in an MPEG-4 ISO Base Media File, then the **Demux Format** dialog box will open that allows you to select between saving the output file in **PCM** format or **WAV** format.



4. In the **Demultiplex as** dialog box, browse your system to select the desired location to save the demultiplexed stream, enter the output file name in the **File name** box, then click the **Save** button.

   Depending upon the size of the input file, it may take several minutes for the stream to be demultiplexed. A dialog box will display the progress of the demultiplex operation. When demultiplexing is complete, a dialog box will display the name and final size of the output file.

   If your input file is on a remote location on a network, the demultiplexing progress may not be displayed, or it may not be accurately updated because of network latency.

   If the selected stream is encrypted, an error will be displayed. MPEGID does not support demultiplexing of encrypted streams.

5.2 Demultiplexing SMPTE 302M Audio

If the stream to be demultiplexed is SMPTE 302M audio, there are several ways the output data can be saved:

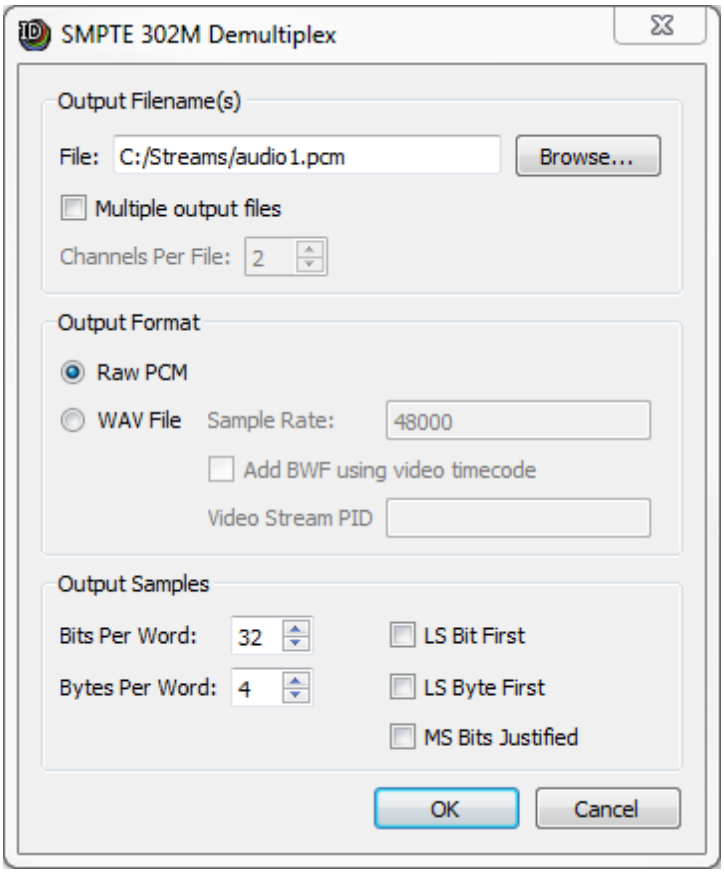
- The extracted data can be saved in a single file, or if the SMPTE 302M stream consists of more than two channels, the output can be split into multiple output files that contain between 2 to 8 channels each.
- The data can be saved in raw PCM format.
- The data can be saved in WAV format at a specified sample rate.
- The data can be saved as a WAV file in Broadcast Wave Format (BWF) that includes timecodes based on a reference video stream.
- The data samples can be saved with between 1 to 32 bits per word.
- The data samples can be saved with between 1 to 4 bytes per word.
- The least significant bit in the samples can be written in the high or low bit position.
- The least significant byte in the samples can be written first or last.
- If the sample bits do not fill the output word, the valid bits may be written with the least significant bit justified or most significant bit justified.

These options are controlled by a set of secondary parameters that are set specifically for demultiplexing SMPTE 302M data.

To demultiplex a SMPTE 302M audio stream:

1. Open and identify 25 the input file. The file should be an MPEG-2 transport stream.
2. Select the SMPTE 302M stream that you wish to demultiplex in the Multiplex Pane.
3. Choose **Edit > Demux..** from the Menu Bar, or click the right mouse button on the node and then click on the **Demux..** function in the submenu.

   The **SMPTE 302M Demux Output** dialog box will open.



4. Enter the desired name of the output file in the **File** textbox or click the **Browse** button to select a destination folder and specify a file name.
5. If you would like the extracted data to be saved in multiple files, check the **Multiple output files** box and set the **Channels Per File** spinner to the number of channels you would like in each file.

   If the 302M stream has more than two channels, they may be split into multiple output files. For example, if the 302M stream carries English on the first two channels and Spanish on the second two, the output can be split into two files by setting **Channels Per File** to 2.

   When the multiple output files option is enabled, a '#' character will be added to the base output filename. The '#' character is replaced by a number that increments with each file. For example, if the name appears as *file#.wav*, a four channel 302M stream would be split into *file1.wav* and *file2.wav* when demultiplexed with 2 channels per file selected.

6. To save the output as a raw PCM file, select the **Raw PCM** option for **Output Format**. To save the output as a WAV audio file, select the **WAV File** option for **Output Format**.

7. If the **WAV File** option was selected for the **Output Format**, enter the desired sample rate in the **Sample Rate** textbox.

8. If the **WAV File** option was selected and BWF time codes are desired in the output, check the **Add BWF using video timecode** checkbox. Enter the PID of the reference video elementary stream in the **Video PID** textbox. The PID value may be specified in decimal, or if prefixed with a "0x", in hexadecimal.

9. Set the **Bits Per Word** spinner to the desired number of bits per word saved from each data sample. The allowable range is 1 to 32

10. Set the **Bytes Per Word** spinner to the desired number of bytes per word for each data sample. The allowable range is 1 to 4. The number of bytes per word must be large enough to hold the number of bits per word that is specified. Any additional bits in the word are zero filled

11. Check the **LS Bit First** checkbox if the least significant bit in the samples is to be written in the high bit position. Leave the checkbox unchecked if the least significant bit is to be written in the low bit position.

12. Check the **LS Byte First** checkbox if the least significant byte in the samples is to be written first. Leave the checkbox unchecked if the least significant byte is to be written last.

    Some Windows applications require the least significant byte to be written first, so this should be the default for WAV files.

13. Check the **MS Bits Justified** if the data should be written shifted to the most significant bit position when the number of sample bits is less than the length of the output word. Leave the checkbox unchecked if the data should be written in the least significant bit position.

14. Click on the **OK** button at the bottom of the window.

    A dialog box will be displayed that indicates the progress of the demultiplexing process. All streams that are selected in the multiplex display will be demultiplexed, including any SMPTE 302M streams. When the streams have been demultiplexed, a summary dialog box will be displayed that indicates the names and sizes of the output files.

    Depending upon the size of the input file, it may take several minutes for the stream(s) to be demultiplexed.

    If your input file is in a remote location on a network, the demultiplexing progress may not be displayed, or it may not be accurately updated because of network latency.

5.3 Demultiplexing from the Command Line

You may also extract and save an elementary stream from an input MPEG-1 system stream, MPEG-2 program stream, MPEG-2 transport stream, or MP4 container file using the command line version of MPEGID.

To demultiplex a single elementary stream from the command line:

1. (Windows only) Open an "MS-DOS" Command Prompt window.
2. At the command prompt or in a script, enter the line:

```
mpegid -d id [-l] [-v vob] [-w] input_file
[output_file]
```

Options and Arguments	
`-d` *`id`*	Option to run the Demultiplexer. If the input file is a system stream, program stream, or VOB file, then *`id`* is the value of the stream_id that identifies the elementary stream that is to be demultiplexed. If the file is a transport stream, then *`id`* is the value of the PID that is associated with the elementary stream. If the file is an MP4 container file, then *`id`* is the value of the track_ID that identifies the elementary stream.
`-l`	Option to demultiplex an AAC audio stream from the input MP4 file and save it in LOAS/LATM format. The stream identified with *`id`* argument must be an AAC audio stream and the input file must be an MP4 file. If the `-l` argument is not specified, then the AAC audio stream will be saved in ADTS format.
`-v` *`vob`*	Option to demultiplex an AC-3 audio stream from a VOB file. The *`vob`* argument is the subtype that identifies the AC-3 stream in the VOB file. The stream identified with *`id`* argument must be an AC-3 audio stream and the input file must be an MPEG-2 program stream file in VOB format.
`-w`	Option to demultiplex PCM audio from the input MP4 file and save it as a WAV file. The stream identified with *`id`* argument must be a PCM audio elementary stream and the input file must be an MP4 container file. If the `-w` argument is not specified, then the data will be saved in raw PCM format.
`input_file`	The name of the input media file. The name may be specified by full path, relative path, or by filename only. If only the filename is given, then MPEGID will look for the input file in the current directory.
`output_file`	The name of the output file. The name may be specified by full path, relative path, or by filename only. If only the filename is given, then MPEGID will look for the input file in the current directory.
`-b` *`buffer_size`*	Optional. The amount of data from the beginning of the input file that MPEGID should inspect, where *`buffer_size`* is a number of kilobytes.

Chapter VI

Additional Support

6 Additional Support

This chapter includes more information about using the MPEG Stream Identifier and where to go if you have additional questions. It has the following sections:

- Frequently Asked Questions (FAQ) 64 is a list of questions and answers that includes tips for using MPEGID.
- References 66 is a reference list of MPEG standards documents.
- Technical Support 68 tells you how to contact Manzanita Systems for technical support assistance.

6.1 Frequently Asked Questions (FAQ)

Before reporting any problems, please check this list to see if there is a known solution:

- *Why does MPEGID identify Video Objects (VOBs) as MPEG-2 Program Streams?*

  VOB files used in DVD-Video are just MPEG-2 Program Streams with additional data streams that contain navigation and search information. MPEGID displays the VOB subtype that uniquely identifies each AC-3 (Dolby Digital) audio stream in the program stream.

- *MPEGID cannot identify a stream that I believe is an MPEG stream. Why not?*

  The stream may be corrupted or may not be using a valid format. However, if you think MPEGID is incorrect in its identification, contact our technical support (email support@manzanitasystems.com). We would be interested in analyzing your stream to see why it cannot be identified.

- *MPEGID reports a Duration for my stream that seems wrong. When I play the stream, the duration is longer than the one given by MPEGID. Why?*

  Your stream may be variable bit rate or there may be a rate change somewhere in the stream. For all input streams except transport streams, MPEGID gets the bit rate from the stream syntax, which for variable rate streams is usually the maximum bit rate. For transport streams, MPEGID determines the bit rate from the initial PCRs in the stream. Because the Duration is calculated from the input file size and the bit rate, it may be different from the actual duration.

- *I have transport stream files that I know contain System Information data streams. These streams do not appear in the Multiplex View. Why not?*

  For transport streams, MPEGID only identifies elementary streams that are listed in a Program Map Table. System Information PIDs that are not defined in a PMT will not be shown.

- *I have installed MPEGID on my Linux system and I tried running the command line version. I get a "command not found" message. What is wrong?*

  If you get a message that the name that you entered is not recognized as a command, then the MPEGID executable is not in a location that is recognized by the PATH environment variable. You should either create a symbolic link from the MPEGID program to a directory which is in your PATH variable, or include the location of the MPEGID program in the PATH variable.

- *I find MPEGID to be very useful, but I frequently use files that are in a standard format that is not supported by MPEGID. Can you add this format? It would be helpful to me.*

  We are very interested in getting input from our customers. We would definitely like to add new formats to future releases of MPEGID. Please send your request to support@manzanitasystems.com. Any information, e.g., specifications and references, about your format is helpful.

- *MPEGID identifies the output of my encoder as a transport stream. When I try to play it on a decoder, it does not play correctly. What is wrong?*

  MPEGID does not verify input streams for compliance. Manzanita Systems offers a compliance and verification program, the MPEG-2 Transport Stream Analyzer (MP2TSAE). MP2TSAE will perform a full analysis on your transport streams. Please visit our website, www.manzanitasystems.com, for more information about MP2TSAE.

- *The output in the Multiplex Pane indicates "No data seen for this elementary stream" but I know that that elementary stream exists. Also, in the Property Pane, there is a description of the stream. Why is that?*

  This is because MPEGID only looks at a limited portion of the beginning of the file. If the elementary stream data does not occur in that portion of the stream, i.e., its first occurrence is later in the stream than what was analyzed, then MPEGID will indicate that it did not see the data for this stream. However, because the stream was listed in the PMT, it will be acknowledged in the Property Pane as being defined in the multiplex.

- *When I demultiplex a Private Stream such as subtitles or teletext, why does MPEGID say that XXX bytes were written, but the actual file size is larger?*

  This is because the XXX number is the size of the actual data, but the file also includes XML code that will enable the file to be inputted to the Manzanita Multiplexer for multiplexing as Private Stream 1 into a transport stream.

- *I ran MPEGID on an MP4 media file with one MPEG-2 video stream on track 1. The report did not show the aspect ratio of the video. Why not?*

  The aspect ratio information in an MPEG-4 ISO Base Media file will only be reported if it is present in a 'moov' box, otherwise MPEGID does not display this parameter.

- *I demultiplexed a PCM audio from an MP4 file. When I opened the file in MPEGID, they are Unknown. Why is that?*

  PCM audio by itself has no headers so it cannot be identified.

6.2 References

The following list of documents is the primary references used by MPEGID:

1. ISO/IEC 11172-1:1993: Information technology -- Generic coding of moving pictures and associated audio for digital storage media at up to about 1.5 Mbits/s - Part 1 : Systems.
2. ISO/IEC 11172-2:1993: Information technology -- Generic coding of moving pictures and associated audio for digital storage media at up to about 1.5 Mbits/s - Part 2 : Video.
3. ISO/IEC 11172-3:1993: Information technology -- Generic coding of moving pictures and associated audio for digital storage media at up to about 1.5 Mbits/s - Part 3 : Audio.
4. ISO/IEC 13818-1:2013(E) Information technology -- Generic coding of moving pictures and associated audio information -- Part 1: Systems.
5. ISO/IEC 13818-2:2000: Information technology -- Generic coding of moving pictures and associated audio information -- Part 2: Video.
6. ISO/IEC 13818-3:1998: Information technology -- Generic coding of moving pictures and associated audio information -- Part 3: Audio.
7. ISO/IEC 13818-7:2006: Information technology -- Generic coding of moving pictures and associated audio information -- Part 7: Advanced Audio Coding (AAC).
8. ISO/IEC 14496-10:2005(E) Information Technology - Coding of audio-visual objects - Part 10: Advanced Video Coding.
9. ISO/IEC 14496-10:2005/Cor.2:2006(E) Information technology -- Coding of audio-visual objects -- Part 10: Advanced Video Coding.
10. ISO/IEC 14496-12:2012(E) Information technology -- Coding of audio-visual objects -- Part 12: ISO base media file format.
11. ISO/IEC 14496-12:2012/Amd.2:2014(E) Information technology -- Coding of audio-visual objects -- Part 12: ISO base media file format, AMENDMENT 2: Carriage of timed text and other visual overlays.
12. ISO/IEC 14496-14:2003: Information technology -- Coding of audio-visual objects - Part 14: MP4 file format.
13. ISO/IEC 14496-15:2004: Information technology -- Coding of audio-visual objects - Part 15: Advanced Video Coding (AVC) file format.
14. Advanced Television Systems Committee: ATSC Digital Television Standard, Document A/53 Revision E, with Amendments No. 1 and 2.
15. Advanced Television Systems Committee: Guide to the Use of the ATSC Digital Television Standard, Document A/54.
16. Advanced Television Systems Committee: Digital Audio Compression (AC-3, E-CA-3) Standard, Document A/52 Revision B.
17. Advanced Television Systems Committee: Program and System Information Protocol for Terrestrial Broadcast and Cable, Document A/65 Revision C with Amendment No. 1.
18. ETSI EN 300 472 V1.31 (2003-05) Digital Video Broadcasting (DVB); Specification for conveying ITU-R System B Teletext in DVB bitstreams.
19. ETSI EN 300 743 V1.31 (2006-11) Digital Video Broadcasting (DVB); Subtitling systems.

20. SCTE 35 2013a: Digital Program Insertion Cueing Message for Cable.

21. ITU-R Rec. H.265 (04/2013) High efficiency video coding.

22. ETSI TS 102 114 V1.3.1 (2011-08) Technical Specification DTS Coherent Acoustics; Core and Extensions with Additional Profiles.

23. SMPTE 302M-2007 Revision of SMPTE 302M-2002 for Television, Mapping of AES3 Data into an MPEG-2 Transport Stream.

24. ANSI/SCTE 35 2004 Digital Program Insertion Cueing Message for Cable.

25. IBM and Microsoft, (1991) Multimedia Programming Interface and Data Specification 1.0, August

6.3 Technical Support

Manzanita Systems provides this online User's Manual with your copy of MPEGID as the first level of support. If you do not find an answer to your question in the User's Manual, contact Manzanita Systems technical support by phone or email. Manzanita Systems technical support is available as follows:

Phone

1-858-679-8990 ext. 2
Monday through Friday
9:00 AM - 5:00 PM PST

Email

support@manzanitasystems.com

Web Site

www.manzanitasytems.com

Chapter VII

Purchasing and License Agreement

7 Purchasing and License Agreement

This chapter tells you how to register your copy of MPEGID and acquire a license key to unlock the full version. It contains the following sections:

- Registration Benefits 70 gives the benefits to which you are entitled as a registered user of MPEGID.
- Purchasing a Registered License 71 gives the pricing and ordering instructions for MPEGID.
- Unregistered User License Agreement 72 is the legal agreement to which you are bound when you install and run the demo version of the MPEGID program.
- Registered User License Agreement 73 is the legal agreement to which you are bound when you install and run the full, registered version of the MPEGID program.

7.1 Registration Benefits

As a registered user, you will receive the following benefits:

- An activation key to unlock the full version of MPEGID. The full version entitles you to run your copy of MPEGID for an unlimited time.
- An integrated demultiplexer to extract video, audio, and data streams from input system stream, program stream, transport stream, and MPEG-4 ISO base media files.
- Access to a command line version of MPEGID.
- A software license that entitles you to update your copy of MPEGID with future patches and releases*.
- Limited free technical support by email or phone for at least 90 days starting from your registration date.

* Manzanita Systems reserves the right to introduce an upgrade charge for major new releases.

7.2 Purchasing a Registered License

When you register your copy of MPEGID with Manzanita Systems, you will be given a license key that will enable you to unlock the full version. The MPEGID license agreement [73] entitles no more than one user to use a single registered copy at a time.

Pricing

- The registration fee for MPEGID is $49.95 USD per single user license.

Purchasing by Credit Card

- You must contact Manzanita Systems to register and pay your MPEGID registration fee. You can use your MasterCard, VISA, or American Express card.
- Your order can be placed 24 hours a day, 7 days a week by fax at 1-858-679-8991 or by email to sales@manzanitasystems.com.
- You can also call 1-858-679-8990 between the hours of 8:00 AM and 5:00 PM (Pacific Time), Monday through Friday (except US holidays).
- Please provide your name, credit card number, expiration date, billing address, telephone number, and email address when you order.
- Your license key will be emailed to you within one (1) business day. Therefore, it is important that you provide your valid email address.

Submitting a Purchase Order

- We can accept purchase orders from government and accredited educational institutions and major corporations. Please address questions to sales@manzanitasystems.com, or call us at 1-858-679-8990.

7.3 Unregistered User License Agreement

BY CLICKING ON THE "I AGREE" BUTTON AND INSTALLING, COPYING, DOWNLOADING, OR OTHERWISE USING THE MANZANITA SYSTEMS LLC ("***MANZANITA***") MPEGID SOFTWARE ("***MPEGID***"), YOU AGREE TO BE BOUND BY THE TERMS OF THIS END USER LICENSE AGREEMENT ("***EULA***"). IF YOU DO NOT AGREE TO THE TERMS OF THIS EULA, DO NOT CLICK ON THE "I AGREE" BUTTON AND DO NOT INSTALL OR USE THE MPEGID PROGRAM.

This is the legal agreement to which you are bound when you install and run the demo version of the MPEGID program. Subject to your compliance with the terms of this EULA, Manzanita grants you a non-exclusive, non-transferable, non-sublicensable, conditional, personal license to install and use the demo version of MPEGID for your evaluation.

As an unregistered user of MPEGID you agree to the following:

1. You may not alter the software in any way.

2. You may not sell copies of MPEGID, as it is licensed to you, or you may not otherwise distribute it for profit.

3. You may not:

a. reverse engineer, decompile, disassemble, modify, or attempt to reveal the sources code of the MPEGID program;

b. create derivative works of the MPEGID program

4. By installing and using MPEGID, you acknowledge that you have read this license, understand it, and agree to be bound by all of its terms.

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LIMITED WARRANTY Manzanita Systems, LLC warrants that the MPEGID program will perform substantially in accordance with the accompanying printed material and on-line documentation for a period of 90 days from the date of purchase. Manzanita Systems, LLC additionally warrants that the MPEGID program is believed to be free from defect of workmanship and material or viruses. Manzanita Systems, LLC will provide limited technical support to investigate and resolve any problems reported by you within the warranty period.

CUSTOMER REMEDIES Manzanita Systems' entire liability and your exclusive remedy shall be, at Manzanita Systems' option, either (a) return of the price paid or (b) repair or replacement of the MPEGID software that does not meet this Limited Warranty and that is returned to Manzanita Systems with a copy of your receipt. This Limited Warranty is void if failure of the MPEGID software has resulted from accident, abuse, or misapplication. Any replacement MPEGID software will be warranted for the remainder of the original warranty period or 90 days from the date of purchase, whichever is longer.

NO OTHER WARRANTIES To the maximum extent permitted by applicable law, Manzanita Systems, LLC disclaims all other warranties, either express or implied, including but not limited to implied warranties of merchantability and fitness for a particular purpose, with respect to the MPEGID software and any accompanying documentation.

NO LIABILITY FOR CONSEQUENTIAL DAMAGES To the maximum extent permitted by applicable law, in no event shall Manzanita Systems, LLC be liable for any damages whatsoever (including, without limitation, damages for loss of business profits, business interruption, loss of business information, or other pecuniary loss) arising out of the use or inability to use the MPEGID software, even if Manzanita Systems, LLC has been advised of the possibility of such damage.

INDEMNIFICATION You agree to indemnify, defend, and hold Manzanita harmless from and against any claims or liabilities arising from your use of the MPEGID program.

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