# harmonic

## ProMedia<sup>™</sup> Carbon Carbon Server, Carbon Agent VERSION 3.20

Installation and User Guide

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### **Documentation Conventions**

This manual uses some special symbols and fonts to call your attention to important information. The following symbols appear throughout this manual:



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**CAUTION:** The Caution symbol calls your attention to information that, if ignored, can adversely affect the performance of your Harmonic product, or that can make a procedure needlessly difficult.

**NOTE:** The Note symbol calls your attention to additional information that you will benefit from heeding. It may be used to call attention to an especially important piece of information you need, or it may provide additional information that applies in only some carefully delineated circumstances.



**TIP:** The Tip symbol calls your attention to parenthetical information that is not necessary for performing a given procedure, but which, if followed, might make the procedure or its subsequent steps easier, smoother, or more efficient.

In addition to these symbols, this manual uses the following text conventions:

Convention	Explanation
Typed Command	Indicates the text that you type in at the keyboard prompt.
Buttons and Menus	Indicates a button to choose, or a menu item to select.
<ctrl>, <ctrl>+<shift></shift></ctrl></ctrl>	A key or key sequence to press.
Links	The <i>italics in blue</i> text to indicate Cross-references, and hyperlinked cross-references in online documents.
Bold	Indicates a new term. For example: <b>SpanWindow</b> - the transmission frequency along the 1GHz spectrum allocated for each RF Port. It spans across 384MHz.
LCD Screen Output	The text that is displayed on an LCD console output.
ScreenOutput	The text that is displayed on a computer screen.
Emphasis	The <i>italics</i> text used for emphasis and document references.



**NOTE:** You require Adobe Reader or Adobe Acrobat version 6.0 or later to open the PDF files. You can download Adobe Reader free of charge from www.adobe.com.

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Thank you for purchasing Harmonic ProMedia<sup>™</sup> Carbon (formerly Carbon Coder), Carbon Server, and Carbon Agent products. The boom in video consumption has resulted in an explosion in the number of formats that content creators and distributors must manage. Video may be captured in one format, edited in another, served live in a third, delivered on-demand via the Web and mobile in half a dozen more and then finally archived in yet another. Harmonic's products provide cost-effective and rapid transcoding across a wide range of applications from small studios to the largest enterprises.



**NOTE:** Although the new ProMedia Carbon name appears on the splash screen, some shortcuts, and in the About dialog, you will still see its previous name, Carbon Coder, referenced throughout the user interface.

### 1.1 About this User Guide

The *ProMedia Carbon User Guide* describes ProMedia Carbon products and explains how to use them to manage and deliver appropriate file formats to your consumers.

### 1.2 Related Documentation

Table 1–1: Related Documentation

Document	Description
Harmonic Carbon Coder API Guide	This document describes the API for the Harmonic Carbon range of products. When a ProMedia Carbon product is installed, it includes the installation of the Carbon Engine. Once the Carbon Engine is running, it can accept socket calls and COM commands through Nexus using the API described in this document, and can be controlled with the command-line interface. There is no additional fee for using the Harmonic SDK. No specific tools are required. A ProMedia Carbon installation installs everything necessary to use the API.

### 1.3 Components

**ProMedia™ Carbon** is a standalone application (engine) that handles transcoding between all major formats, as well as providing a host of additional functions like standards conversion, logo insertion, timecode burn-in, etc. It installs with Carbon Admin.

**Carbon Server** is a management tool that allows a network of Carbon Agents to accelerate transcoding for high-volume applications. Both ProMedia Carbon and Carbon Server have easy-to-use interfaces, and both can alternatively be managed via an XML-based SDK for absolute programmatic control. The SDK is installed automatically with a Carbon installation.

**Carbon Agent** is a "slave" transcoding process that runs under Carbon Server. Carbon Agent does not transcode independently of Carbon Server.

This manual will cover the installation, as well as the basic and advanced functions of ProMedia Carbon, Carbon Admin, and Carbon Server. For updates on the latest features and documentation please visit www.harmonicinc.com or www.rhozet.com.

### 1.4 What is New in this Release

Carbon 3.20 is a full Carbon release that extends Carbon 3.19 with new features described in this section.

### 1.4.1 Closed Captioning and Subtitling Support for Adaptive Streaming Formats

#### 1.4.1.1 Smooth Streaming Exporter – H.264

Carbon 3.20 adds Closed Captioning and subtitling to the H.264 Smooth Streaming Exporter by including support for CEA-708 Captions and for Cavena<sup>1</sup> Timed Text Markup Language (TTML) files. The 708 Captions are taken from the Carbon internal pipeline and converted to Caption streams in the form of ISMT files that are downloaded in fragments by the client. The process for TTML files is similar; they are also converted to ISMT files.

For Caption streams based on 708 Captions, a Service Number and a language tag, must be specified for each stream. The Service Number is the CEA-708 Service Number that identifies which service inside the 708 needs to be converted to ISMT. The language tag is used to let the user of the client choose the language they want to see displayed on the screen. This is additional functionality that needs to be implemented in the client.

For 708, the language tags are entered manually and used as part of the ISMT file names. They can also be used in the name parameters of the text streams in the .ismc client manifest files. Clients can use this information to let the user select the language they want.

**NOTE:** Use of 708 Captions is only allowed if the layers have a frame rate of 29.97 fps or 59.94 fps. Other frame rates are not supported.

For Caption streams based on TTML files. it is not necessary to indicate which language to convert the file. Each TTML file is only allowed to contain one language. Furthermore, specification of language tags is not required as those are included inside the files. ProMedia Carbon allows you to enter time offsets for each TTML file to counter a possible time offset.

Multiple languages can be supported with TTML files by creating multiple streams and selecting a different TTML file (representing a different language) for each stream.

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**NOTE:** <u>Use</u> of Caption streams based on TTML files does not allow for segmenting or stitching of source files.

<sup>1.</sup> Cavena Image Product AB, www.caven.se

BitRate (kbps)	128 kbps
Captioning	
Number Of Captioning Streams	3 streams
Captioning Stream 1	
Source	CEA-708 Closed Captions
Service Number	1
Language	eng
Captioning Stream 2	
Source	TTML File
Path and Name	
Time Offset	00:00:00.000
Captioning Stream 3	
Source	TTML File
Path and Name	
Time Offset	00:00:00.000
Target File Splitting	
Select Source Segment	Use entire Source
Start Time (Seconds)	0.00
Duration (Seconds)	0.00

Choose the source for this captioning stream: either CEA-708 Closed Captions in the pipeline or a T

#### 1.4.1.2 HTTP Live Streaming Exporter

Carbon 3.20 also adds Closed Captioning to the HTTP Live Streaming Exporter by including support for CEA-608 Captions. This support is only available if every layer has a frame rate of 59.94, 29.97, or 23.976 fps.

		· · · · · · · · · · · · · · · · · · ·
	Video Bitrate Mode	VBR
	Number of Passes	1 Pass
	Mod-16 Com-t	Mod 10 Compliants
	Include Closed Captioning	Include Closed Captioning
1	Audio Stream Type	,AAG
	Audio channels	Stereo
	Audio Sample size	16 bits
	Audio channels Audio Sample size	Stereo 16 bits

### 1.4.2 Splicer-compatible Content

ProMedia Carbon 3.20 can create content, such as advertising, that can be spliced into a network feed with the Harmonic ProSteam 2000 Ad Splicer. Both the content that is spliced, The network feeds into which they are spliced are Transport Streams containing H.264 video. The network feeds must be generated by a Harmonic Electra 5400, 7000, or 8000 Encoder.

This capability to create splicer-compatible content is controlled by a separate license, and it is enabled by a check box in the H.264 Exporter preset configuration. The check box is not displayed if the license is not present.

	Bitrate		
	Video Bitrate Mode	CBR	
	Number of passes	1 pass	
	Video Bitrate(kbps)	1200	
	Maximum bitrate [kbns]	8000	
<	Enforce Splicer Compatibility	Enforce Splicer Compatibility	
	VBV Buffer Size [bytes]		
	Use VBR Transport Stream Multiplexer Rate	Use VBR Transport Stream Multiplexer Rate	
	Use specific Transport Stream Multiplexer Rate	Use specific Transport Stream Multiplexer Rate	
	Transport Stream Multiplexer Rate [kbps]	0	

In addition to selecting the check box, you must configure the preset with specific values, depending on the network feed. ProMedia Carbon 3.20 includes a collection of factory presets for creating splicer-compatible content. It is recommended that you use one of these presets as a starting point, and then modify parameters as needed. To determine which parameters need to be modified, follow the instructions below that describe how to set up a new preset using the ProMedia Carbon GUI.

Load Target Prese	1			X
Category			Presets	
CD/DVD     Fast DVD VOB     Fast DVD VOB     Handheld     Image Sequence     Legacy     Storage     Storage     Storyboard     Video Server     H- Video	e		NTSC 1280x1080i 29.9 NTSC 1280x720p 59.94 NTSC 1440x1080i 29.9 NTSC 1920x1080i 29.9 NTSC 720x480i 29.97fp NTSC 720x480i 29.97fp PAL 1280x700b 25.00fp PAL 1280x720p 50.00fp PAL 1440x1080i 25.00f PAL 1920x1080i 25.00fp PAL 720x576i 25.00fps PAL 720x576i 25.00fps	7fps 16:9 6Mb/s 4fps 16:9 8Mb/s 7fps 16:9 8Mb/s 7fps 16:9 10Mb/s ps 16:9 2.5Mb/s ps 16:9 25Mb/s ps 16:9 8Mb/s ps 16:9 8Mb/s ps 16:9 10Mb/s 16:9 2.5Mb/s 4:3 2.5Mb/s
New Sub	. <u>R</u> ename	Delețe	Modify Preset	Delete Preset
Name				
Description				
			OK	Cancel

#### Configuring the H.264 Exporter Preset for Splicer-compatible Content

- 1. Load the H.264 Exporter preset located in the System preset category.
- 2. Open the Advanced Setup view by clicking on the Target button.
- 3. Set the Multiplexer Type to MPEG-2 Transport Stream (default).
- The Transport Stream Type can be Generic, ATSC, or DVB, depending on the primary network stream.
- 4. Set Multiple Video Pictures per PES packet to One AU per PES.
- 5. Select the check box labeled Uniform Packet Distribution.
- 6. Set the values for PCR PID, PMT PID, and Video PID to the same values used by the network feed.
- 7. Set the T-STD Delay for H.264 msl parameter to equal the maximum delay configured for the network feed encoder. For an Electra 8000 encoder, the value is typically 1000 ms.
- Set the video parameters, Width, Height, Aspect Ratio, Frame Rate, and Interlacing, to the same values as used by the network feed. For PAL or SECAM systems, it will typically be 720 x 576, 25 frames per second, with Upper (top) field first.
- 9. Set the Video Bitrate Mode to CBR.
- 10. Set the Number of passes to 1 pass.
- 11. Set the Video Bitrate value in kilobits/s. It must be less than or equal to the video bitrate of the network feed. It must also be less than the Transport Stream Multiplexer Rate (see below).
- 12. Select the check box labeled Enforce Splicer Compatibility. It is located underneath the Maximum bitrate, which is greyed out. If you do not see it, then you are using an earlier version of ProMedia Carbon, do not have the appropriate license for creating splicercompatible content, or are not in Advanced Setup mode.

13. Calculate and set the value for the parameter labeled VBV Buffer Size Ibytesl. This parameter determines the maximum delay in the video elementary stream according to the H.264 standard HDR buffer model. Because this parameter is expressed in bytes rather than in seconds, you must use the following formula:

```
VBV Buffer Size [bytes] = {maximum delay (in sec)} * {Video
Bitrate (in kilobits/s)} * 1000 / 8
```

Here, maximum delay is the maximum delay configured on the network stream encoder, and Video Bitrate is same as value for the Video Bitrate box, above.

For example, if maximum delay = 1 second and the Video Bitrate = 2000 kbits/s then the VBV Buffer Size =  $1 \times 2000 \times 1000$  / 8 = 250000 bytes.

- 14. Do NOT check the box labeled Use VBR Transport Stream Multiplexer Rate.
- 15. Select the check box labeled Use specific Transport Stream Multiplexer Rate.
- 16. Set the value of the Transport Stream Multiplexer Rate in kilobits/s. It must be set to a value less than or equal to the Transport Stream multiplex rate of the network feed. It must be greater than the sum of the bitrates of the H.264 video elementary stream and all audio streams combined, with some headroom added for Transport Stream multiplexing.
- 17. Set the Profile and Level parameters of the H.264 stream to the same values used by the network feed.
- 18. Leave all subsequent video stream encoder settings to their default values.
- 19. Configure the audio (Number Of Audio Programs, Audio Programs Type, Channel Configuration, Bitrate, etc,) to the same values as the network feed.
- 20. Save the preset by clicking the Save Preset button.

#### 1.4.3 Improved Video Quality for H.264 Dual-Pass Encoding

The internal rate control algorithm for H.264 dual-pass encoding has been improved to provide better video quality. The video quality gains are especially significant in VBR encoding mode although there are also gains for CBR.

	Bitrate	
	Video Bitrate Mode	VBR
k	Number of passes	2 pass
	Video Bitrate(kbps)	1200
	Maximum bitrate [kbps]	8000

#### 1.4.4 Dolby Parameters in the H.264 Exporter

Compared to earlier versions, ProMedia Carbon 3.20 provides an expanded set of configurable parameters in the H.264 Exporter for Dolby audio. With the exception of three, parameters, as noted below, the newly exposed parameters were all set to fixed values in earlier versions of ProMedia Carbon.

The new set is now compatible with what is available for the MPEG-2 Exporter. To maintain backwards compatibility for existing projects that use the H.264 Exporter, the defaults for the H.264 Exporter differ from those for the MPEG-2 Exporter.

The H.264 Exporter exposes three new parameters that were not used in earlier versions. These are:

- Line Mode Profile (Light Dynamic Compression)
- RF Mode Profile (Heavy Dynamic Compression)
- Preferred Stereo Downmix Mode

You need to configure these parameters according to your preference.

0307000	Cacin Load
Audio Programs	
Number Of Audio Programs	1
Select Audio Program	Audio Program 1
Audio Program Type	Dolby Digital (AC-3)
Audio PID	2068
Channel Configuration	Stereo
Bitrate (kbps)	128
Sample Rate	48.000
Sample Width	16
Language Descriptor	eng
Bandwidth Lowpass Filter	Bandwidth Lowpass Filter
LFE Lowpass Filter	🔲 LFE Lowpass Filter
DC Filter	DC Filter
Surround Channel Phase Shift	Surround Channel Phase Shift
Digital De-emphasis	🗖 Digital De-emphasis
Line Mode Profile (Light Dynamic Compr	No Compression
RF Mode Profile (Heavy Dynamic Compr	No Compression
3dB Surround Attenuation	3dB Surround Attenuation
Dialog Normalization	-27
Dolby Surround Mode	Not Indicated
Preferred Stereo DownMix Mode	Pro Logic Preferred
Bitstream Mode	Main Audio Service
Audio Production Information Exists	Audio Production Information Exists
Mixing Level	80
Room Type	Not Indicated
Audio-Advanced	
Dolby Multiplex Method	System-A

Set the audio program type and codec. All audio program types must have the same Sample Rate and Sar

### 1.4.5 Support for OP42 and OP47

ProMedia Carbon 3.20 introduces support for OP42 and OP47 standards that specify requirements for carrying Teletext data in VBI and ANC, respectively. The requirements are specific to the Australian market, although use of these standards in Europe is gaining popularity.

Pro Carbon 3.20 adds the following capabilities:

 Ability to insert Teletext from STL files and put it on the internal Teletext pipeline in an OP42-compliant format. To enable this feature, select the check the box labeled OP42 Compatibility in the Teletext inject from STL filter.

3 IL group to interpret	
Teletext Options	
Teletext Page Number	888
OP42 Compatibility	OP42 Compatibility
Teletext Page Header Tex	4
Character Subset	0

 A new and user-selectable filter that extracts OP42 Teletext data from VBI and puts it on the internal ANC (291M) pipeline, formatted according to OP47. The filter is called Teletext (OP42) to OP47 and should only be used for converting Teletext data that is OP42 compliant.

OP42 Configuration	
Line Detection Mode	Auto
OP47 Configuration	
Target Format	720p
Clear Mode	Delete all OP47 SDP packets (incl. SDP packets in Multi-Packets)
Coding Type	Luma Sample Coding
Default Lines	9-25
ANC Lines	•
Insertion Mode	Use first free ANC line in the given range, stop with error if none found.
Line Packing	Do not allow multiple packets per line.

A new user-selectable filter that does the reverse of the filter described above. This filter extracts OP47-compliant Teletext data from the internal ANC pipeline and - converts it to OP42 Teletext for inclusion in the VBI. This filter is called Teletext from OP47 and has no user-configurable parameters.

## 1.4.6 Flat Output Folder Structure for H.264 Smooth Streaming Exporter and PCM Audio Exporter

The H.264 Smooth Streaming Exporter and the PCM Audio Exporter can now export to a single folder, rather than to separate subfolders for each individual source clip. For the PCM Audio Exporter, this functionality is implemented for the case where the Exporter is configured to create a wave file for each channel<sup>1</sup>.

File Name	E:\120312 Delux\1argetsNew320\{Source}_SS		
General			
Asset Directory Structure	Asset Directory Structure		
Publish Moue	Miles On Demand (VOB)		
Stream Name			
Server Manifest Name			
Client Manifest Name			

<sup>1.</sup> In the case where the Exporter is configured to store all channels in a single file, the files were already written to a single folder.

To export all target files to the same folder, do not select the Asset Directory Structure check box.

For the PCM Audio Exporter, in the case of one wave file per channel, the mechanism that detects existing target files with conflicting names is limited to the first audio file in a set. A new, optional replacement string for the destination file base name has been added to help avoid potential file naming conflicts. This replacement string, %g, adds a globally unique GUID to the name of the destination files. This replacement string can also be used in the H.264 Smooth Streaming Exporter.

### 1.4.7 New Factory Presets for Formats with H.264 Video

The factory presets for all formats that use H.264 video have been updated and new ones have been added as well. Any old presets that have been replaced by new ones are still available, but have moved to a new Legacy preset category. Existing projects and API calls that use these presets will continue to use them without any changes.

The categories for the H.264 presets are now as follows.

- Adaptive Bitrate H.264. This category includes presets for Apple HTTP Live Streaming and Microsoft H.264 Smooth Streaming, as well as presets for MP4 files that can be packaged with the Adobe VOD file packager for delivery with the Adobe Dynamic Streaming protocol.
- Broadcast. This category contains presets for H.264 Transport Streams for use in broadcast delivery environments.
- Handheld \ H.264. This sub-category includes generic H.264 MP4 presets for delivery to handheld devices.
- Splicer Compatible. This category includes presets for creating content that can be spliced with the Harmonic ProStream 2000 into network feeds generated with Harmonic Electra encoders.
- Web \ H.264. This category contains H.264 MP4 presets, but with a larger variety of resolutions and bit rates than the Handheld category.

### 1.4.8 Support for Omneon MPEG-2 LGOP Pre-charge Frames

An Omneon MPEG-2 LGOP clip recorded with the Spectrum/MediaDeck family of on-air servers may contain extra frames at the start of the recording. These frames, called precharge frames, are added to assist with the recording process and are not part of the visible video when the clip is played back. Carbon 3.20 correctly ignores these frames, whereas earlier versions incorrectly treat them as if they are part of the visible video. A new Omneon Importer was implemented to support this functionality, that also allows Carbon to display more source properties for Omneon clips than it did previously.

### 1.4.9 RMP Proxy Preset – New Proxy Job Types and IPV Compliance

Carbon 3.20 adds new proxy job types and IPV<sup>1</sup> compliance to the RMP Proxy preset in WorkFlow System (in the RMP Transcode tab in Preset Editor).

The new proxy job types allow the user more flexibility in what the preset creates. Carbon versions older than 3.20 always create proxy as well as thumbnail and storyboard, but the new proxy job types allow for different combinations such as thumbnail only or thumbnail and storyboard. The choices are:

- All, meaning proxy plus thumbnail plus storyboard
- Proxy only

<sup>1.</sup> IPV Limited, www.ipv.com

- Thumbnail only
- Storyboard only
- Thumbnail and Storyboard

IPV compliance allows the proxy to be streamed with an IPV SpectreView server, for instance for browse or QC purposes. This functionality requires an IPV proxy player. The IPV streaming protocol provides operators with a responsive GUI experience, much more responsive than if a progressive download were used instead.

RMP Transcode QCS						
Presets	Preset Properties					
Audio Passthrough With TS Transcode	Preset ID					
HDS Packager	f9c423ce-ecde-46f9-a741-c959d6e12ffb					
ProRes Exporter	Name					
RMP Proxy	RMP Proxy					
Smooth Packager	Description					
	RMP Proxy Description					
	Settings	Search Settings				
	Proxy Job Type	Proxy, Thumbnail And StoryBoard				
	Enable IPV compliant Proxy	No				
	Video Encoder	AVC/H.264				
	Video Frame Size for HD clips	640 x 360				
	Video Frame Size for SD clips	320 x 240				
	Video Frame Rate	Same as source				
	Video Bit Rate [kbps]	2000				
	Audio Encoder	AAC LC				
	Audio Bit Rate [kbps]	96 kbps				
	Audio Sampling Rate	48 khz				
	Time Code Source	Use source time code				
	Burned-In Time Code Area	No Burned-In Time Code				
	Storyboard Image Interval [second]	3				
	Setting Description					

### **1.5** Format Support

This section lists the different formats supported by ProMedia Carbon.

### 1.5.1 Supported Video Codecs

- AVC-Intra
- DNxHD
- DPS
- DPX
- DV25, DV50, DVCPro, DVCPro100
- Flash 8 (VP6)
- H.264/AVC/MPEG-4 Part 10
- HDV
- Image Sequences
- JPEG-2000
- MPEG-1
- MPEG-2, D-10/IMX
- MPEG-4 Part 2
- ProRes
- RealVideo
- VC-1
- Windows Media

#### 1.5.2 Supported Audio Codecs

- AAC
- AC-3
- AMR-NB
- Dolby Digital
- Dolby E
- DTS
- MP3
- PCM
- RealAudio
- Windows Media Audio

#### **1.5.3** Supported Containers

- 3G2
- 3GPP
- ASF, WMA, WMV
- AVI
- HTTP Live Streaming (Apple)
- LXF, GXF
- Microsoft Smooth Streaming
- MP4, F4V
- MPEG-2 PS, MPEG-2 TS

- MXF (OP1a, OPAtom)
- QuickTime
- VOB
- WAV, Broadcast WAV

### **1.5.4** Supported Systems

- Adobe Premiere Pro
- Apple Final Cut Pro
- Avid Editing Systems
- Grass Valley Edius
- Grass Valley Profile, K2
- Leitch VR, Nexio
- Omneon Spectrum, MediaGrid
- Panasonic P2
- Quantel sQ
- Sony XDCAM

### 1.6 Basic Features

This section lists the basic features of ProMedia Carbon.

### 1.6.1 Video Operations

- Aspect ratio conversion
- Black/white correction
- Blur
- Color correction
- Color space conversion
- Cropping
- Fade in/out
- Frame rate conversion
- Frame size conversion
- Gamma correction
- Interlace/De-interlace conversion
- Median
- NTSC-safe
- PAL/NTSC conversion
- Rotate
- SD/HD conversion
- Sharpen
- Telecine / inverse telecine
- Temporal noise reduction
- Video Processing

### 1.6.2 Audio Processing

Dynamic range compressor

- Fade In/Out
- Low-pass
- Normalize
- Volume

### 1.6.3 Additional Operations

- 601/709 color space support
- Batch processing
- FTP delivery
- Line 21/CC preservation/conversion
- Logo insertion
- Metadata transport and conversion
- Multiple simultaneous target outputs
- Quality checking
- Remote job submission
- Segment extraction/insertion
- Subtitle/CC imprint
- Timecode imprint
- Unlimited number of encoding passes
- XML controllable titler

This chapter details system requirements and procedures for installing and upgrading ProMedia<sup>™</sup> Carbon 3.20, Carbon Server, Carbon Admin, and Carbon Agent. This chapter also includes optimizations to increase ProMedia Carbon's performance, and special requirements and rights for using third-party products included with the installation.

**NOTE:** Although the new ProMedia Carbon name appears on the splash screen, some shortcuts, and in the About dialog, you will still see its previous name, Carbon Coder, referenced throughout the user interface.

### 2.1 Software Versions

Application	Build Number
Carbon Coder	3.20.0.38542
Carbon Server	3.20.0.38542
Carbon Agent	3.20.0.38542

### 2.2 System Requirements

This section describes the recommended, minimum, and supported Microsoft<sup>®</sup> Windows<sup>®</sup> 32- or 64-bit operating system requirements for installing Carbon products.



NOTE: 64-bit Windows operating system recommended for multi-layer video exporters.

### 2.2.1 Recommended System Requirements

- Processor: Intel<sup>®</sup> Xeon 54xx; dual-processor configuration, 3.0 3.4 GHz processor clock
- Memory: 8- or 16-GB RAM
- Microsoft Windows Server 2008, 32- or 64-bit (recommended), Service Pack 2
- DirectX 9.0 or later
- USB 1.1 or 2.0 port for USB Hardware Key
- 500 MB free hard disk space

### 2.2.2 Minimum System Requirements

- Processor: Intel<sup>®</sup> or AMD Athlon 2.0GHz CPU or faster
- Memory: 2-GB RAM (4GB RAM for HD encoding)
- Microsoft Windows XP Service Pack 3
- USB 1.1 or 2.0 port for USB Hardware Key
- 500 MB free hard disk space

#### 2.2.2.1 Additional supported operating systems:

- Workstation OS versions:
  - □ Windows XP SP3
  - Windows Vista SP2
  - Windows 7
- Server OS versions:
  - □ Windows Server 2003 R2 AP1 or R2 SP2
  - □ Windows Server 2008 SP2
  - Windows Server 2008 R2

#### 2.2.3 Apple ProRes 422 Requirements

Apple ProRes 422 is a high-quality video format used in post-production. Carbon supports it as a target format for all 8-bit sources, and for 10-bit JPEG 2000 and 10-bit Avid AAF / DNxHD source materials. See *B.5.1 QuickTime 7 Exporter for Apple ProRes 422 (3.1.8.1)* on page 134 for more information on Apple ProRes 422.

Installing Apple ProRes 422 requires special installation requirements, detailed in the following sections.

#### 2.2.3.1 Transcoding from 8-bit sources to ProRes 422

- 1. The system must be a multi-node transcode farm of at least two transcode nodes under control of Carbon Server or Workflow System (WFS).
- 2. The transcode nodes that need to convert to ProRes 422 require a license to do so. Please contact your local Harmonic sales representative for information about this license.
- 3. The transcode nodes must run one of the following Windows Server Operating Systems:
  - Windows Server 2003 R2 SP1 or R2 SP2
  - Windows Server 2008 SP2
  - Windows Server 2008 R2

#### 2.2.3.2 Transcoding from10-bit JPEG 2000 and 10-bit AAF/DNxHD to ProRes 422

If the source format for transcoding to ProRes 422 is 10-bit AAF / DNxHD, then the following additional requirements must also be met:

- 1. The system must be a multi-node transcode farm of at least two transcode nodes under control of Workflow System (WFS).
- 2. The transcode nodes that need to convert to ProRes 422 require a license to do so. Please contact your local Harmonic sales representative for information about this license.
- 3. The transcode nodes must run one of the following Windows Server Operating Systems:
  - Windows Server 2003 R2 SP1 or R2 SP2
  - Windows Server 2008 SP2
  - Windows Server 2008 R2
- The DNxHD source files should be located on shared storage accessible by ProMedia Carbon and Workflow System. The feature has been qualified with network shares. Workflow System is required for transcoding from 10-bit JPEG 2000 or AAF / DNxHD to ProRes 422.
- 5. Frame rate, resolution and interlace mode of source and target files need to be the same. There is not yet support for setting In and Out points.

6. The AAF / DNxHD clips exported by Avid Media Composer workstations must use a Windows Operating System.

### 2.2.4 Maximizing ProMedia Carbon's Performance

ProMedia Carbon is a standalone product, and while upgrading the system is usually the best way to increase ProMedia Carbon's performance, there are a few optimizations that can increase ProMedia Carbon's speed without additional hardware or upgrades.

- Optimizing Drive Speed. Defragmenting the source and target hard drive(s) can significantly increase read and write speeds.
- Using Separate Source and Target Drives. Accessing source files and writing target files on separate physical disks will reduce seek data access times and improve ProMedia Carbon's performance.

### 2.3 Installing and Upgrading Carbon Products

New installation and upgrade instructions (for existing installations) appear in different sections of this chapter; make sure you review the correct section before beginning installation or upgrade procedures.

You will install the following Carbon products:

- ProMedia Carbon is a standalone application that runs on a single system, which can be used for production or for development purposes. ProMedia Carbon is installed with, and managed by, Carbon Admin; it cannot be controlled by Carbon Server. See 2.3.2 Installing ProMedia Carbon 3.20 on page 21.
- Carbon Server is a management application that allows you to control a farm of transcoders, each known as a Carbon Agent. See 2.3.3 Installing Carbon Server 3.20 - New Installation on page 25and 2.3.4 Upgrading Carbon Server on page 27.
- Carbon Agent is a "slave" transcoding process that runs under Carbon Server, with each agent managing a "farm" of transcoders. Carbon Agent does not transcode independently of Carbon Server. See 2.3.5 Installing Carbon Agent on page 28.
- Carbon Admin is used to configure and control Carbon Server and Carbon Agent.

### 2.3.1 Thomson MP3 Exporter Installs with ProMedia Carbon

Supply of the Thomson MP3 Exporter product with ProMedia Carbon does not convey a license, nor imply any right to distribute content created with this product in revenue-generating broadcast systems (terrestrial, satellite, cable and/or other distribution channels), streaming applications (pay-audio or audio-on-demand applications and the like) or on physical media (compact discs, digital versatile discs, semiconductor chips, hard drives, memory cards and the like). An independent license for such use is required. For details, please visit http://mp3licensing.com.

### 2.3.2 Installing ProMedia Carbon 3.20

This section provides ProMedia Carbon installation instructions.



**NOTE:** Prior to installing ProMedia Carbon, make sure that the USB hardware key that comes with your software is *not* plugged in.

- 1. Make sure that QuickTime version 7.6.8 is installed on your system. It is available from the ProMedia Carbon CD-ROM.
- Insert the ProMedia Carbon CD-ROM in your CD drive. The installer automatically launches if the Windows Autorun feature is enabled. If Autorun is not enabled, then go to My Computer, double-click the CD-ROM drive and run Setup.exe.
- 3. When the Welcome screen appears, click Next.
- 4. Select I do accept the term of the license agreement and click Next.
- 5. Enter your name and your company name on the **Customer Information** dialog box, then click **Next**.
- 6. When the **Install the Nexus Service** screen appears, select **Using the "Local System"** account or **Using a User Account** for domain users. Click **Next**.
- Choose a destination location for ProMedia Carbon. The ProMedia Carbon Installer automatically suggests a default location. If you want to change this location, select Browse and choose a new destination folder. Click Next.
- 8. On the Ready to Install the Program screen, then click Next.

The Setup Status screen opens and provides status on the installation. After installing ProMedia Carbon, the Windows Media software will be installed. If you already have the latest versions of the software on your machine, the installer will skip to the next step.

- 9. Click Yes, I want to restart my computer now and click Finish to restart your computer.
- 10. After your computer has restarted, plug-in the USB Hardware Key that comes with your software. You can use the computer's on-board USB ports, a USB PCI card, or a USB hub connected to either of these ports.
- 11. Start **ProMedia Carbon**. (The USB Hardware Key **must** be connected before starting ProMedia Carbon.)

#### 2.3.2.1 Installing to a Remote System (Command Line)

This section describes how to install ProMedia Carbon on a remote system from a network path.

 On one of the systems on which you would like to remotely install ProMedia Carbon, run the ProMedia Carbon setup locally from the command line using the /r parameter: P:\setup.exe /r.

This will create a setup.iss file in the windows directory.

- 2. Copy the Carbon Setup files to a directory on your network, in which all desired remote systems have *both* read and write access.
- 3. Copy the setup.iss file to the same location on the network as the Carbon Setup file.
- 4. Copy the file included with this setup, InstallCarbonCoder.bat, to the same network location as the Carbon Setup files.
- 5. Modify the InstallCarbonCoder.bat file by selecting it, and then Edit.
- 6. Replace **%CARBONCODER\_SETUP\_LOCATION%** with the full network path to the location of the Carbon Setup files.
- 7. Login to each remote system on which you would like to install ProMedia Carbon using an account with administrative privileges, usually using Remote Desktop.
- 8. Execute the InstallCarbonCoder.bat file. InstallCarbonCoder.bat:

```
@echo off
call net use P: "\\%CARBONCODER_SETUP_LOCATION%" /PERSISTENT:NO
P:
cd \
call P:\Setup.exe /s /f1"P:\setup.iss" /f2"C:\%COMPUTERNAME%.txt"
```

call copy C:\%COMPUTERNAME%.txt "P:\Logfile\%COMPUTERNAME%.txt"

**InstallCarbonCoder.ba**t will execute the ProMedia Carbon installation stored on a remote system. It also creates an install log file on the network location with the setup files for reference.

When you have completed installing ProMedia Carbon, see 3.2 Using the ProMedia Carbon Interface on page 30 or Chapter 4, Using Carbon Admin to learn how to load a source, select a target, and convert. See Chapter 3, Adding Source Files if you plan to process many files through Watch Folders.

#### 2.3.2.2 ProMedia Carbon Evaluation Versions

Included with the ProMedia Carbon evaluation package is a Harmonic USB Security Key that allows you to execute ProMedia Carbon for the duration of the evaluation period. Once the evaluation period expires, you can no longer run ProMedia Carbon.

When your evaluation period ends there are two things that you must do to extend your license. First, you must contact Harmonic to arrange for your evaluation to be extended. Second, you must update your current hardware security key to match your newly extended evaluation period.

Please be aware of the following conditions before updating your security key.

- The license file information you receive from Harmonic (in the following Update instructions, Step 6 on page 24) must be applied to the exact same key from which you will extract the status information (in Step 3 to Step 5). You cannot mix license files and apply them to keys other than the one they were generated for.
- For security reasons, you must run the update application on the same physical computer the security key is attached to. In the event this is not possible, you can use Windows Remote Desktop to connect to the computer, but you must do so in Console Mode. To run Remote Desktop in Console Mode, open a command prompt window and enter the following command: mstsc /v:hostname /console.
- It is very important to generate a completely new key status file (in Step 3 to Step 5) every time your key expires. You cannot reuse old status key files.

#### Update instructions

- 1. Download the USB Security Key update.zip from ftp://data.rhozet.com/ USBSecurityKeyUpdate.zip.
- 2. Using Windows Explorer, navigate to where you downloaded 'USB Security Key update.zip' and extract it. Once the files are extracted, run **KeyUpdate.exe**.
- 3. Once the program has launched, make sure the **Collect Key Status Information** tab is selected (if not, select it).
- 4. Select Collect information.

HASP SRM RUS
Collect Key Status Information Apply License Update
Rhozet Key Update System
This DEMO version of Carbon Coder can be converted to a full version by remotely updating your security key.
Please insert the key you want to update and press "Collect Information." After saving the information to a file, please email this file to <u>sales@rhozet.com</u> .
A sales representative will contact you to receive your order and deliver a license file to you that you can use to upgrade the security key.
Collect information

- 5. A **Save** dialog box will open, select a file name to save the key status information in, and select **Save**.
- 6. The USB Security Key will be read, information will be saved to the file you designated, and the screen will display a confirmation message like the following (the time and filename may be different): 19:41:49: Key status retrieved from HASP successfully. Information written to file c:\Temp\keystatus.c2v.
- Contact Harmonic support and obtain an email address to send your key status file to (this is the file you just generated, in the example above it's called "keystatus.c2v" and is located in the folder "c:\Temp").
- 8. Email the file to Harmonic and we will use your key status information file to generate a new license with the expiration date extended to be applied to your USB Security Key. We will then email a new license update file to you.
- 9. Once you receive the license update file, save it to disk, for example, with the filename "c:\Temp\newlicense.v2c". Make sure the "USB Security Key update.exe" program is still running, and make sure the **Apply License Update** tab is selected (if not, select it).

Collect Key St	atus Informatior	Apply Licer	ise Update	>
Update File			(	

- 10. Select Continue (...) to the right of the Update file field.
- 11. When the **Open** dialog box opens, navigate to the appropriate folder (in our example from above that would be "c:\Temp"), and select the file name to load the license information from (that was "newlicense.v2c" in our example), and select **Open**.
- 12. When the file name is shown in the Update file field, select Apply update.
- If the key is successfully updated, you should see a message like the following: 20:10:30: Applying update from file: c:\Temp\newlicense.v2c Update written successfully.

If you see this kind of message, then your evaluation period has been successfully extended and you can now close the **USB Security Key update.exe** program and start evaluating ProMedia Carbon again.

14. Contact Harmonic support if you receive an error messages similar to this one: 19:57:48: Applying update from file: c:\Temp\newlicense.v2c Update failed: Key with requested id was not found.

#### 2.3.2.3 Using Canopus Edius 4 or Adobe Premiere CS2

ProMedia Carbon automatically installs a direct print-to-file plug-in for both Canopus EDIUS and Adobe Premiere video editing suites. This powerful plug-in will utilize ProMedia Carbon's vast selection of codecs to save your file. To use the ProMedia Carbon plug-in, follow the instructions below:



- 1. In either Adobe Premiere or Canopus EDIUS, select File, then select Print to File.
- 2. Choose Rhozet ProMedia Carbon from the list.
- 3. ProMedia Carbon will start up automatically with the file from your editing program as the source.
- 4. Choose the target format(s) and then select the Convert tab to continue.

#### 2.3.3 Installing Carbon Server 3.20 – New Installation

If an earlier version of Carbon Server has previously been installed on this machine, please skip this section and go to 2.3.4 *Upgrading Carbon Server* instead.

**ATTENTION:** If you have any other Harmonic products, such as ProMedia Carbon (formerly known as Carbon Coder) or Carbon Agent installed on this machine, you must uninstall those products before installing a new installation of Carbon Server.

#### Installation instructions

1. Make sure that QuickTime version 7.6.8 (or later) is installed on your system. It is available from the ProMedia Carbon CD-ROM.

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**NOTE:** You must install Carbon applications using an account that has *administrative* rights. We strongly recommend using the "Administrator" account.

- 2. Install the Carbon Server Farm Manager software from the \Carbon Server\setup.exe path on the Carbon Server CD. This will install the core components of Carbon Server, the drivers for the USB security key (HASP dongle), and Windows Media components. It also creates the following shortcuts on the desktop:
  - ProMedia Carbon. The version of ProMedia Carbon that runs on the Carbon Server machine. You can use ProMedia Carbon to create jobs, manage presets, in the same way you can on a stand-alone ProMedia Carbon machine. Please see Chapter 3, Using ProMedia<sup>™</sup> Carbon for more details.
  - Carbon Admin. This tool lets you view and manage the transcoding jobs that are currently running on the server and agents. It also allows you to manage the server and agent parameters and modify advanced server options. You also use this to create, manage, and edit Watch Folders.
- Reboot the machine. Do not install any other applications before the machine is restarted.
- 4. Insert the Carbon Server USB security key into a USB port on the Carbon Server machine.

**NOTE:** In order for the Carbon Server to access Watch Folders, read source files, and write target files, it needs to be given the *correct permissions*. Permissions *must* be set correctly, or you may see errors such as "Can't read from source" when using Watch Folders or the API.

Because the Nexus Service runs on the Carbon Server machine, as well as on all the Carbon Agent machines, you must set the permissions on *each* machine: once for the Carbon Server machine, and once *per* each Carbon Agent machine. If you have purchased any Carbon Agent licenses, it is recommended that you finish installing the Carbon Server machine, and all the Carbon Agent machines before creating domain or workgroup accounts and setting service credentials.

- 5. Create the account that has permission to access the network resources. Options:
  - If running in a Windows Workgroup environment, create *identical* users on all the machines using Windows user management. Choose a user name, like cs\_service, and assign a password. Remember to use the exact same name and password on all the machines in the farm.
  - If all machines are part of a Windows Domain, just create one domain user account, like cs\_service.
- 6. Change the Nexus Service's *default* credentials, "Local System," to the user account you created earlier, like cs\_service.
- 7. Go to Start > Control Panel > Administrative Tools > Services.
- 8. Double-click Nexus Server (Carbon Server Farm) service.
- 9. Select the Log On tab.
- 10. Click OK.
- 11. Stop and restart the Nexus Service.

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12. Close the Services console.

### 2.3.4 Upgrading Carbon Server

Follow the upgrade installation instructions in this section if you already have a version of Carbon Server, and are upgrading to Carbon Server 3.20. Make sure to follow the installation steps order *exactly*, otherwise valuable data may be lost.

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**NOTE:** The old Carbon Server Web Interface does not work on any Windows Server 2008 or Windows 7 systems. The Web Interface is deprecated and is no longer being updated.

- 1. Exit any open Harmonic application.
- 2. Install Carbon Server 3.20 from the \Carbon Server\setup.exe path on the Carbon Server 3.20 CD.
- 3. **Reboot** the system when prompted by the Carbon Server installer.
- 4. Using Carbon Server Admin, verify that you can see all your old presets, Watch Folders, and retrievals & notifications.
- 5. Make sure you follow the instructions in *2.3.5 Installing Carbon Agent* on page 28 for information on how to install your Carbon Agent machine.

When you have completed installing or upgrading Carbon Server and Carbon Agent, see *Chapter 4, Using Carbon Admin* or *Chapter 5, Configuring Carbon Server* for setting up Carbon Server.

#### 2.3.4.1 Performing a Clean Uninstall of Carbon Server

Under normal conditions, the standard uninstall process of Carbon Server should be used. If you are experiencing problems, Harmonic support may ask you to perform a complete or 'Clean' uninstall.

**NOTE:** This clean uninstall will remove all your customizations from the Carbon Server machine, including Watch Folders and their configurations, jobs in progress, and any user-created presets. To avoid losing valuable information, follow the procedures below only as instructed by Harmonic support.

- 1. Exit any Harmonic application.
- Uninstall Carbon Server using Start > Programs > Rhozet > Carbon Server Farm > Uninstall Carbon Server Farm.
- 3. Delete the following folders:
  - Program File folder: c:\Program Files\Rhozet\
  - □ User presets & system presets folder: c:\Program Files\Common Files\Rhozet\
  - Watch folder information and job folder (jobs, completed and in progress, and Watch Folder information are stored here): c:\Documents and Settings\All Users\Application Data\Rhozet\
- Using the Registry Editor tool (select Start > Run... and enter regedit), delete the following registry keys (if present): HKCU\SOFTWARE\Rhozet and HKLM\SOFTWARE\Rhozet.
- 5. Restart the machine now.
- 6. If necessary, re-install Carbon Server normally, rebooting when prompted.

### 2.3.5 Installing Carbon Agent

This section provides step-by-step instructions for installing Carbon Agent.

**NOTE:** If you have *any* other Harmonic product (such as ProMedia Carbon or Carbon Server farm manager) installed on this machine, you must *uninstall* that product before installing Carbon Agent. Note that the USB security key provided with Carbon Agent allows you to install *either* Carbon Agent or ProMedia Carbon. You *cannot* have both products installed on the same machine simultaneously, because they each use a background Nexus Service and will conflict with each other.

1. Install QuickTime 7.6.8 from the \QuickTime folder on the Carbon Server CD.

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**NOTE:** From time to time, newer versions of QuickTime are released, and once they are verified to work correctly with Carbon Server, Harmonic will include those newer versions on the distribution CD. You should *not* independently update components that have not been verified with Harmonic. Please contact Harmonic if you are unsure. See *A.4 Contacting Harmonic Support*.

- If a previous version of Carbon Agent is installed, uninstall it by selecting Start > Programs > Rhozet > Carbon Agent > Uninstall Carbon Agent. Follow the on-screen instructions, and be sure to reboot after the un-installation completes.
- 3. Install the Carbon Agent software from the \Carbon Agent\setup.exe path on the CD. This will also install the drivers for the USB security key (HASP dongle), and Windows Media components. It also creates the Carbon Agent Admin shortcut, which enables you to view and manage the transcoding jobs that are running on the local agent.
- 4. **Reboot** the machine.

**NOTE:** In order for the Carbon Server Nexus Agent to access Watch Folders, read source files, and write target files, it needs to be given the *correct permissions*. Permissions *must* be set correctly or you may see errors such as "Can't read from source" when using Watch Folders or the API. Permissions should already have been set in *Step 5, 2.3.3 Installing Carbon Server 3.20 - New Installation* on page 25.

- 5. Create the account that has permission to access the network resources (if you did not do so during Carbon Server installation). Options are:
  - If running in a Windows Workgroup environment, create a user on this machine using Windows user management. Choose a user name like cs\_service and assign a password. Remember that this must be the same user name and password as you used on all the other machines in the farm, both the Carbon Server machine and other Carbon Agent machines.
  - If all the machines are part of a Windows Domain, create only one domain user account, like cs\_service. You only need to do this once, so if you already created the domain user account during the installation of the Carbon Server machine or one of the other Carbon Agent machines you don't need to do it again for this machine.
- 6. Make sure that the account you just created has permission to read files from and write files to all the network resources that Nexus needs to access.

**NOTE:** This includes the administrative shares (for example, "C\$", "D\$"), specifically on the drive(s) on the Carbon Server machine where the System Presets and User Presets are located. It also includes folders that contain source files, folders where target files will be written, program files, folders that contain presets (see below for locations of these), etc.

- 7. Go to the Carbon Server machine and select **Start > Run**... The Carbon Server System and User Presets are stored in the registry in two keys.
- 8. Enter **regedit** to start the Registry Editor tool to locate these keys:
  - HKLM\Software\Wow6432Node\Rhozet\CarbonServer Farm\Common\PresetCacheValidator\SysPresetDir

- HKLM\Software\ Wow6432Node\Rhozet\CarbonServer Farm\Common\PresetCacheValidator\UsrPresetDir
- HKLM\Software\ Wow6432Node\Rhozet\CarbonServer Farm\Common\PresetCacheValidator\WizPresetDir
- 9. Select Start > Control Panel > Administrative Tools > Services.
- 10. Double-click Nexus Server service.
- 11. Select the Log On tab.
- 12. Select **This account** and set the credentials for the service, user name and password (twice).
  - If running in a Windows Workgroup environment, enter the user name with a leading period character, but no domain name (for example, \cs\_service). You can also use Browse.

Nexus Server (Carbon Co	oder) Properties (Local Computer)
General Log On Rec	overy Dependencies
Log on as:	
Local System account Allow service to intervice to int	unt interact with desktop
This account:	.Vadministration Browse
Password:	•••••
Confirm password:	•••••
Help me configure user	account log on options.
	OK Cancel Apply

- If running as part of a Windows Domain, enter the user name with the domain name (for example, *domain*\cs\_service). You can also use **Browse**.
- 13. Select OK.
- 14. Close the **Services** console.
- 15. Insert the supplied Carbon Agent USB security key into a free USB port on the Carbon Agent machine.
- 16. Reboot the machine.

When you have completed installing ProMedia Carbon, see 3.2 Using the ProMedia Carbon Interface on page 30.

## Chapter 3 Using ProMedia<sup>™</sup> Carbon

This chapter provides information about using ProMedia<sup>™</sup> Carbon as a standalone application (on one computer, with Carbon Admin) to convert source files by assigning target formats and filters. The first section, *3.2 Using the ProMedia Carbon Interface*, provides a quick file conversion overview. The second section, *3.3 ProMedia Carbon Interface Options and Details* on page 37, provides many of the details and procedures for using ProMedia Carbon's interface to fine-tune your file transcoding.

### 3.1 Starting ProMedia Carbon

Double-click the ProMedia Carbon icon on your desktop.



### 3.2 Using the ProMedia Carbon Interface

Starting **ProMedia Carbon** opens the home screen, which shows three tabs on the left side of the screen: **Source**, **Target**, and **Convert**. These tabs control basic functions that allow you to add source files, set the target conversion format, modify input and output details, and begin the conversion processes.



**NOTE:** You can automate multiple file conversions using Carbon Admin and Watch Folders. See *4.1 Using the Carbon Admin Interface* on page 71.

Rhozet Carbon	Coder			
File View Opti	ons Tools Help			
	Source			
		Source List	Source Parameters	
	Add	No Source files	No parameters	
Source		Click the Add button to add a Source file.		
	<u>R</u> emove			
Target				
<b>b</b> .	Remove All			
Convert				
	Advanced			
aucuc				
	Stitch -			
	Duration:			
			- Description	
			-Description-	
9				
			Sour	ces: 0 Targets: 0 //

You will notice that the content in the center of the home screen changes depending on the tab you have selected, but generally this area displays the files you are working with. After selecting a particular file, you will see its properties on the right side of the screen. This is the **Source Parameters** dialog box, and it shows you the details of your original file and allows you to change certain aspects of that file.

And finally, if you need assistance or more information for any feature, there is a help icon on the bottom left that provides general instructions on each area of the product. There is also a Help menu item that has detailed, searchable information.

The basic process for performing a transcode:

- 1. Select the **Source** tab to add the file(s) you wish to convert.
- 2. Select the Target tab to choose which format(s) you want to encode to.
- 3. Select the **Convert** tab to encode your file(s) and complete the process.

#### 3.2.1 Adding Source Files

To begin, you will need to add a source file. A source file is the file you want to convert into another format type. You can add one source file for a single file conversion, or you can add multiple source files for easy batch conversions.

- 1. Select the **Source** tab.
- 2. Click **Add** to choose the file you want to convert. This will bring up the Open File dialog where you can select the file you want to convert.
- Select a single file, then click **Open**.
   You will now see the selected file in the **Source** List.

Rhozet Carbon Cod	er				
File View Options	Tools Help				
	Source - C:\_1Ca	arbonCoder3.19TestFiles\CarbonIn\cli	iffs.avi		
		Source List	Source Parameters		
	Add	C:\_1CarbonCod\cliffs.avi	Video		
Source		Duration:00:00:06;14	Select Video Stre	Original Video	
	Remove	720400, 23.371ps, 134italies	Source		
Target			Source File	C:\_1CarbonCoder3.19TestFiles\CarbonIn\cliffs.avi	
	Bemove All		Length DV/ Mode	00:00:06;14 Standard DV	
			DV Mode		
Convert	Advanced		Video		
	Agvancea		Video Frame Size	720 x 480	
Queue			Frame Rate(fps)	29.97	
			Video Codec	'CDVC'	
	Stitch —		Decoding Mode	29.97 Interlace	
	Duration:		Interlacing	Lower/Bottom Field First	
			Aspect Ratio	4x 3	
			Audio		
	r		Select Audio Stre	. Original Audio 🔽	
	+		Audio Stream So	C:\_1CarbonCoder3.19TestFiles\CarbonIn\cliffs.avi	
			Audio		
			Channels	Stereo	
			Sample Rate(kHz)	32.000	
			Bits / Sample	16	
			Audio Codec	Uncompressed	
$(\mathcal{D})$			Description		
			1		
				Sources: 1 Targets: 0	//,

The **Source Parameters** window on the right displays the properties for the source. The Source Parameters window is designed to show you the details of your original file and allow you to change certain aspects of that file. For example, you might want to change the interpreted pixel aspect ratio of the source or choose a different audio source file rather than the one embedded with the source file. If you select any item, you will see a more detailed description in the lower right window pane.

To the left of your source list, you will also see a button for advanced functions, as well as a **Stitch** check box. These functions provide controls that allow you to, for example, select only a segment of your video for transcoding or to "stitch" (combine) a number of input files into a single output file. These functions will be described in detail later in the manual.

You can add multiple source files for easy batch conversions or combine (stitch) multiple files together for one single output file. Stitching allows you to link multiple sources together to create a single seamless result, preventing you from having to combine the sources in an editor. Select the **Stitch** check box to link the multiple sources together to create a single seamless source file. Use the arrow keys to rearrange the order of each source.

### 3.2.2 Assigning a Target Format

The next step is to assign a target format for your files to be converted. You can select a single- or multiple-target formats. Select the **Target** tab, and then click **Add** to bring up the **Load Target Preset** dialog box.

Rhozet Carbon Coder			
File View Options Tools Help			
Target			
	Target List	Target Parameters	
Source Add	No Targets.	No parameters	
	Load Target Preset	X	
<u>Remove</u>	Category	Presets	
Remove All	Storage     Storyboard     Video Server	F4V 1296kbps 640x480 4x3 24fps F4V 1296kbps 640x480 4x3 25fps F4V 1296kbps 640x480 4x3 297fps F4V 1328kbps 852x480 16x9 24fps	
Save Profile	En web Flash	F4V 1328kbps 852x480 16x9 25fps F4V 1328kbps 852x480 16x9 29.97fps F4V 4160kbps 1280x720 16x9 24fps F4V 4160kbps 1280x720 16x9 24fps	
Queue Advanced	MPEG - DuickTime - RealMedia - Thumbnails - VC-1 - WindowsMedia <u>New New Sub.</u> Rename Delete	F4V 416Ukps 1280x720 15x3 25ps F4V 448kbps 320x20 4x3 24ps F4V 448kbps 320x20 4x3 24ps F4V 448kbps 320x240 4x3 225ps F4V 448kbps 320x240 4x3 29.57ps F4V 48kbps 432x240 15x3 24ps F4V 48kbps 432x240 15x3 24ps F4V 49kbps 432x240 15x3 24ps Modily Preset Delete Preset	
	Name F4V 4160kbps 1280x720 16x9 2	9.97fps	
	Description		
		OK Cancel	
?			
			Sources: 1 Targets: 0 //

The **Load Target Preset** dialog box has two columns. On the left side are categories of transcoding presets, and on the right are the actual presets. First select a category on the left and then select one of the available presets on the right. A category (like Web) can have several sub-categories (like QuickTime, Windows Media, etc.). ProMedia Carbon ships with over a hundred presets to help you get started. You can modify these presets and create your own. You can also create new categories for storing your own presets

- 1. In the Load Target Preset window, select a desired category on the left side.
- Select (+) next to a category (if needed) to display its sub-categories. The right side displays all the available presets for that category. When you have selected a preset, you will see complete details of the format settings in the description pane located in the bottom of the Load Target Preset dialog box. You can use SHIFT + SELECT or CTRL + SELECT to select multiple presets within a single category.
- 3. Click **OK** to add this preset to your Target window.
- 4. Repeat steps 1-3 to add multiple targets.

After you have added a target format to the Target List, you will see the specific encoding parameters on the right-hand side of the screen. You can modify every parameter, including output file naming, encoding parameters, audio processing, etc. After you have modified encoding parameters, you can save them to disk to be reused in the future by selecting Save Profile. Below the Save Profile button, there is also an Advanced button. This button allows you to access advanced codec encoding parameters, as well as add video and audio filtering to your video encoding.

### 3.2.3 Target Parameters

The **Target Parameters** window displays the properties of the currently selected target in the **Target** tab. All of the resources necessary for managing and modifying your target parameters are available in this window.

Destination		
Base Name	%s_H264_4160K_2997p	
Path	C:\Users\jlieber\Documents	
Use source filena	Use source filename if required	_
File Name	C:\Users\jlieber\Documents\{Source}_H264_4160K_2997p(f4v)	
Stream-Basic		
Multiplexer Type	F4V	•
Device Compatib	No particular Device	-
Video-Basic		
Use Video	Use if Exist	-
Width	1280	
Height	720	
Aspect Ratio	Video: [16 : 9], Pixel: [1 : 1]	
Frame Rate(fps)	29.97	
Interlacing	Non-Interlaced	-
Bitrate		
Video Bitrate Mode	CBR	-
Number of passes	1 pass	-
Video Bitrate(kbps)	4000	
Maximum bitrate [	8000	
H.264 Encoder S		
Profile	High	-
Level	3.1	-
Number of B-Pict	2	
H.264 Encoder S		
Active Format De	Dont Use	-
Audio-Basic		
Use Audio	Use if Exist	-
Audio Programs		
Number Of Audio	1	
Select Audio Pro	Audio Program 1	-
Audio Program T	MPEG-2 AAC-LC	-
Channel Configur	Stereo	-
Bitrate (kbps)	160	-
Sample Rate	48.000	•
Sample Width	16	-
Language Descri	eng	
CRC Check	CRC Check	

The target's basic parameters appear in the **Target Parameters** section. You can modify any of the parameters that aren't grayed out. Simply enter values in the fields, or use the drop-down menus to modify the default target parameters.

If you want to save the changes for a custom target, select **Save Profile**. Saved presets are visible in the **Custom** tab in the **Add Target** dialog box.

### 3.2.4 Adding Filters

Video and Audio filters can be added to either individual source or target files, depending on your workflow. Video and Audio filters allow you to manipulate the video/audio during the transcode to perform tasks such as logo insertion, audio normalization, and color correction.



- 1. Select **Advanced** from the **Source** or **Target** screens to see the advanced controls and select the **Video Filter** tab.
- 2. Click Add to add one or more video filters to your target.
- 3. Selected filters are applied from the list top-down, so the top-most filter in the list is applied first, and the bottom-most filter in the list is applied last.
- 4. To adjust the order of the filters in the list, select the filter in the list, then select **Up** or **Down** to move it up or down in the list.
- 5. Once you have added a filter, you can select the filter in the list to view and adjust its properties just below the video preview.



NOTE: From this view, you can also save Preset Video Filters.

6. Click OK.

### 3.2.5 Converting your Files

The last stage of the process is to convert (transcode) your files into their new formats. If you have chosen to convert one file into several output files, ProMedia Carbon will do each transcode simultaneously. You can view the output of the transcode during the transcoding process, and you can also play any transcoded file from the Output List on the right-hand side of the screen.



- 1. Select the **Convert** tab. The **Convert** tab will be greyed out until you have chosen a source file and a target format.
- 2. Click Convert to begin the encoding process.
- 3. Click **Pause** to temporarily halt the encoding process.
- 4. Click Stop to cancel the encoding process.
- 5. Select the Preview check box to turn on or off the video preview.

**NOTE:** The encoding process is faster when the preview is turned off. As each file is finished, it can be played from within the program (even if other transcoding conversions are still in process).

When the conversion is finished, the message "Conversion Finished" appears in the yellow description box at the bottom of the window.

≣
≣

6. In the **Output List**, select the file you would like to view and then click **Play File**, located on the bottom right of the screen.

**NOTE:** ProMedia Carbon automatically makes the necessary settings to be sure the source format transcodes properly to the target format.

# **3.3 ProMedia Carbon Interface Options and Details**

ProMedia Carbon's home screen tabs, **Source**, **Target**, and **Convert**, provide a host of additional preset, filter, job, capture, and conversion options detailed in the following sections.

# **3.3.1** Using the Source Tab

The Source Tab lets you add/remove source files, sort them, modify, enhance and repair source video settings prior to the conversion process

The Source List displays all of the source files you are planning to transcode. Use the buttons and options on the left to modify the list.

- Add. Click Add to add files to the list. You can also add files by dragging and dropping them onto the Source List.
- Remove. Click Remove to remove the currently selected file(s) from the list. You can also delete them using the delete key.
- Remove All. Click Remove All to remove all of files from the list.
- Advanced. Click Advanced to open the Advanced dialog box that will appear on top of the main ProMedia Carbon window. Double-clicking an item in the Source List also opens the Advanced dialog box. To close the Advanced dialog box, click Close.
- Stitch. Select this check box if you want ProMedia Carbon to connect all the items in the Source List into one logical source file. Stitching is useful if you want to connect multiple source segments. Use the arrow keys to reorder the Source List before the files are stitched together. By enabling the Stitching feature, you can encode multiple files into a single file.

# 3.3.1.1 Adding Source Files

- 1. Select the **Source** tab.
- 2. Click **Add** to choose the file you want to convert.
- 3. When the Open File dialog box opens, select the file you want to convert.
- Select a single file and click **Open**.
   You will now see the selected file in the **Source List**.

# 3.3.1.2 Choosing Source Parameters Settings

The **Source Parameters** window displays the properties of the currently selected source in the source tab. All of the resources necessary for managing and modifying your source parameters are available in this window.

When you add a file to the Source List, ProMedia Carbon automatically reads the file properties and analyzes its parameters. You can read more about each parameter by selecting it and referring to the **Description** section located in the bottom right-hand corners of the **Source** or **Target** tab windows.

For example, if you add an interlaced source file to the Source List, the Parameters section tells you if the **Bottom Field** or the **Top Field** appears first in the **Interlacing** field. While ProMedia Carbon does its best to make the correct assessment, it may incorrectly identify the field order. If this happens, you can use the Interlacing drop-down menu to override ProMedia Carbon and choose the correct setting.

The parameters that appear differ depending on the type of file selected. The parameters that you can change also differ depending on the type of file selected.

Select a parameter to view a description of its properties in the **Description** panel at the bottom of the screen.

Rhozet Carbon Cod	ler			
File View Options	Tools Help			
	Source - C:\User	s\jgerhold\Desktop\ProMedia Carbon 3.2	0.0\Source Video	Files\(1420)WAVYNBCPRIMETHUR1122_TelestreamTranscode.mpg
		Source List	Source Parameters	
	Add	\(1420)WAVYNBCPRIMETHU	Video	
Source		Duration:00:00:30;07	Select Video Stre	. Original Video
	Remove	720x460, 23.37/ps, 307/mailes	Basic Settings	
Target	_	L:\Users\jgern\Z sec clip.mov	Source File	C:\Users\(1420)WAVYNBCPRIMETHUR1122_TelestreamTranscode.mpg
	Bemove All	1440x1080, 25.00fps, 171frames	Length	00:00:30;07 MDEC:2 Terrenet Sterrer (ISO (IEC 12010 1.1000)
i des	1100001011	\160×112_64kvid_24kaud_15	Decement Number	MPEG2 Transport Stream (ISO/IEC 13818-1.1556)
Convert	Advanced	Duration:00:03:27:09	Program Number	
	Agvanceu	160x112, 14.33rps, 3114rrames	Timing Mode	Nomal
Queue		L:\Users\12345_UNxHU2.mxf Duration:00:00:21:24	Video	
		1920x1080, 29.97fps, 654frames	Video Stream	PID: 0x01E1
	Stitch	C:\Users\jgerhold\De\clip2.ts	Stream Type	MPEG2 Video Stream (ISO/IEC 13818-2:1996)
	Duration:	Duration:00:01:01:19	Video Frame Size	29.970 720 x 480
		1280x720, 53.541ps, 5675names	Use Progressive	Use Progressive Decode
		Duration:00:00:11:00	Interlacing	Upper/Top Field First (default)
	· ·	720x608, 25.00tps, 275trames	MPEG Aspect ratio	4 x 3 (default)
	-+	C:\Users\j\Munich29Nov.3GP	Video Bitrate(kbps)	5262 [Constant Bitrate Mode (CBR)]
		176x144	VBV Buffer Size (	. 224
	<u> </u>	C:\Users\igerh\Timecode.avi	Profile@Level	Main Profile @ Main Level
		E Duration:00:00:29;29	Audio	4:2:0
		720x480, 29.97fps, 899frames	Salact Audio Stra	Original Audio
			Audio Stream So	C:\U\(1420)WAVTNBCPRIMETHURT122_Telestream Transcode.mpg
			Addio	
			Description How timing (for in/o	ut points and audio/video sunctronization) should be bandled
			"Normal" uses PTS	values to set in/out points and allows automatic insertion of silent audio and
			repeating of frames "Imprecise" uses bi	in order to maintain synchronization according to PTS values. trate to set in/out points and allows automatic insertion of silent audio and
6			repeating of frames	in order to maintain synchronization according to PTS values.
			black frames should and black frames w	trate to set involut points and allows the user to set now much the stient audio of b e added to the start in order to synchronize the audio and video. Silent audio ill not be inserted automatically in order to maintain synchronization.
		,		
				Sources: 8 Targets: 0 //

# 3.3.1.3 Advanced Features Window

ProMedia Carbon's **Advanced** window offers three tabs, **Setup**, **Video Filter**, and **Audio Filter**, to allow you to optimize the source file prior to the encoding process. You can trim the file, add a video filter to clean up the image, or apply an audio filter to enhance the audio quality.

To access the Advanced window from the basic view, do one of the following:

- Click the Advanced button (on the left, under the Remove All button).
- Double-click the Source entry.
- Right-click the **Source** entry and choose **Advanced**.

### Setup

By selecting the Setup tab, you will be able to trim a segment of your video for transcoding.

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To trim a segment of your video, use the **Video Scrubber**, **Play**, or **Time Controls** to choose the desired **In** and **Out** points. The **In** button sets the **In Point** at the current displayed frame. The **Out** button sets the **Out Point** at the current displayed frame.

### Trimming a Segment

- 1. If you are using the video scrubber, move the cursor to the desired In point and select In.
- 2. Move the cursor to the desired Out point and select **Out**.

The selected video will appear on the video scrubber as a white bar.

- 3. To play the selected area, select the Play (icon) button.
- 4. Select **Add Current Segment** to add the new selection to the list of segments. Or you can select **Enter Segment** to directly enter an in/out point pair:
  - Scrubber/Play Controls. Use the scrubber or play controls to choose your In point and then select In. Then choose your Out point and select Out.
  - Trimming section

**In**. Sets the In Point at the currently displayed frame. The In Point's Time and Frame number are listed in their respective boxes.

**Out**. Sets the Out Point at the currently displayed frame. The Out Point's Time and Frame number are listed in their respective boxes.

Clip section

**Time**. Displays the time for the frame at which the scrubber is stopped. You can also use the arrow buttons to find a specific time at which you want to set the In or Out point, or simply enter a time in the Time field.

**Frames**. Displays the frame number at which the scrubber is stopped. You can also use the arrow buttons to find a specific frame at which you want to set the In or Out points. You can also simply enter a frame number in the Frame box.

**Total**. Displays the source file's total duration after the In and Out Points are set. This value is calculated automatically and cannot be modified by hand. It can only be modified by setting the In and Out points. Duration time is displayed in **hours:minutes:seconds:frames**.

# 3.3.1.4 Video Filter Tab

The Video Filter tab lets you apply filters to your video to help improve the image quality of your source files before they are converted. The filters can be previewed in this tab prior to the conversion process.

Rhozet Carbon Cod	ler			
File View Options	Tools Help			
	Source - C:\_1CarbonCoder3.19TestFiles\C	arbonIn\cliffs.avi		
Source	Advanced - Filter			M
	Filter List	Original	Result	
Target Connect	Add Broadcast Color Safe Bemove Remove All Save Preset Order ↓	+ - HI 1:1		Large Preview
		Correction Method Reduce Lur	ninance	
		Gamma		
		Gamma Correction Min:0.10	2.20	Max:3.00
?	<u>D</u> ose	-Description-		
9				
	1			Sources: 1 Targets: 0

- 1. Select **Advanced** from the Source screen to see the advanced controls and then select the **Video Filter** tab.
- 2. Click Add to add one or more video filters to your source. A brief description of each filter is listed in the Description box when the filter is highlighted. You can browse the different filter categories on the left and choose filters from the right. Holding down SHIFT or CTRL and selecting the desired filters lets you add multiple filters to the Filter list. Remember that you can add filters to both sources and targets, so you should only add a filter at the target to improve it, for example, a brightness filter to correct a dark target.

- 3. The filter name(s) will appear in the **Filter List.** To the right you will see a preview of how the filter changes your source file in the **Result** window.
- 4. To adjust the filter parameters, use the sliders below the preview pane to your desired specifications.
- 5. Selected filters are applied from the list top-down, so the top-most filter in the list is applied first, and the bottom-most filter in the list is applied last. To adjust the order of the filters in the list, select the filter in the list then select **Up** or **Down** to move it up or down in the list.

### **Previewing Video Filters**

The **Original** window displays what the original file looks like before filtering. The **Result** window displays the original file with the filters in the filter list applied.

The **Plus** button enlarges both preview images and the **Minus** button makes both preview images smaller. If the preview image is larger than the window, scroll bars appear allowing you to navigate through the entire image. You can also select and drag the image to navigate through the image.

The **Fit to Window** button resizes the preview images to fit inside the window's current size. No matter what size the window, this preview mode preserves the aspect ratio assigned to the file. This button is useful if you enlarged or reduced the preview image and want to view the whole image in the window again.

The 1:1 button displays the video at 1-to-1 pixel size. (1 monitor pixel = 1 video pixel)

Use the **Scrubber** bar to find specific frames in the source video that you want to use so you can see the effect of the filter(s) on the specific frame. You can either select and drag the scrubber or use your keyboard's arrow keys to step through the video's individual frames.

### Large Preview

Selecting the **Large Preview** button opens a floating window that allows you to modify the preview size. This helps scrutinize the finer details of your video. You can use the scrubber bar to find specific points in the video and resize the window as needed; it adjusts the size of the previews proportionally. It has the same controls as the **Video Filter** tab.



# **Video Filter Presets**

This section describes the video filter presets that are supplied with ProMedia Carbon.

• **601 Correction-Expand Color Space**. This filter expands the RGB range of the from 16-235 to 0-255. Use this filter to create output for a system that uses the full 0-255 range from input that uses 16-235.

- 601 Correction-Shrink Color Space. This video filter shrinks the RGB range of the video from 0-255 to 16-235. Use this filter when create output for a system that uses the 16-235 range from input that uses the full 0-255 range.
- 601 to 709 Color Correction-SD/HD Color Space. This video filter is used to convert video in the SD (601) colorspace to the HD (709) colorspace. Broadcast HD video uses yCbCr colors following Rec. ITU-R BT 709-5 whereas broadcast SD video follows ITU-R BT 601.
- 709 to 601 Color Correction. The inverse of the above.
- Adaptive De-Interlace. Perform custom de-interlacing of interlaced content for progressive targets, either using Adaptive De-Interlace, Interpolate from Dominant Field, or Discard Dominant Field. Use this filter only when you want to change the default deinterlacing behavior.
- Bitmap Keying. Superimpose a bitmap logo or graphic on the video. This is often used to watermark video so it can be personalized.
- Black/White Correction. This filter lets you adjust and control the levels of black and white pixels in your video. By adjusting the sliders, you can specify at which point a pixel will become black and/or white. The higher the setting, the more nearly black pixels will be converted to true black and vice versa. This works best if you are encoding video for the Web and need to adjust the black and/or white levels of broadcast video so that they are truly black or white. It's also useful for making white titles on a black background more legible when viewing on a computer monitor.
- Blur. This filter blurs the video in a rectangular pattern.
- Broadcast Color Safe. Restricts the color range of the video to broadcast-safe values. Some colors that can be displayed on a computer cannot be displayed on television or video output. This filter restricts the colors in the source to only colors that are safe for television and video broadcast.
- Caption 608 to 708 Conversion. Converts CEA-608B caption payload in the Carbon
  pipeline to CEA-708D format. The 708 payload is then available to Exporters and Filters, to
  be inserted into output files. Note that when this filter is applied, 708 captions will always
  be overwritten by converted 608 captions, even if the 608 caption payload was empty.
- Caption Convert 708 to Ancillary. Converts CEA-708 captions from the transcoder pipeline "708 caption payload" into caption data inside the "Ancillary data payload" compliant with SMPTE-291m. Other filters or exporters can then manipulate or consume the ancillary data.
- Caption Convert Ancillary to 708. Converts CEA-708 captions from the transcoder pipeline "Ancillary Data" payload into caption data inside the "708 caption payload". Other filters or exporters can then manipulate or consume the ancillary data.
- Caption Inject from .SCC file Caption. Inserts caption data from an SCC closed caption file into target files. This filter should be added on the side (source versus target) that has the same frame rate as used inside the SCC file.
- Circular Blur. This filter blurs the video in a circular pattern.
- Color Correction. This filter allows you to adjust the brightness, contrast, hue and saturation of your video image.
- **Deblocking Filter**. The deblocking Filter is used to smooth edges in the video, making the compression easier.
- DVD Subtitle/608 CC1 Imprint. Imprints either DVD subpicture subtitles, or 608-style captions from the CC1 line of the VBI section of sources that allow and carry content in the VBI.

- Fade In/Out. This filter applies a fade in and/or out to your video in order to aid the encoding process. You should use this filter if your source video has a lot of fast motion in the first few frames. The fade-in gives ProMedia Carbon a "running start" so it can encode your video more efficiently.
- Flexible-to-fixed Frame rate Conversion. Use this filter to correct jittery frame timestamps while decoding from flexible frame rate source video files.
- Gamma Correction. This filter adjusts your video's gamma settings.
- Gaussian Blur. This filter applies a Gaussian blur to the video.
- Line 21 Extraction and Line 21 Modulator. Allows the extraction and insertion of 608style closed captions from- and into- Line 21 of the VBI for sources and targets that have a VBI section. The Line 21 extraction filter now auto scans the VBI lines and places the data correctly into Line 21. The following SD video formats are supported: 720 X 512 for NTSC and 720 X 608 for PAL.
- Map Alpha to Target Y Channel. This filter takes the Alpha channel from the source and maps it into the Y channel of the target. All other source channels (R,G, & B) are discarded.
- Median. This filter is designed to improve picture quality by removing single-pixel defects without affecting the sharpness. This is similar to a despeckle filter.
- Motion Compensated Temporal Filter. Motion Compensated Temporal Filter (MCTF) has the ability to remove noise that may not be visible to the naked eye from input files with noisy video. Removing this noise makes the subsequent encode faster. It also allows the encoder to use a lower bit rate to generate the same quality, or to generate higher quality at the same bit rate.
- OP42 to OP47. Inserts OP42 compliant Teletext subtitles as OP47 packages into the SMPTE291m stream
- **OP47 to Teletext**. Copies OP47 packets from ANC space into the Teletext pipeline.
- Pulldown. This filter offers conversion without interpolation for progressive-to-interlaced (that is, film-to-video) file conversion. This preserves full spatial image quality and creates target fields that are selected from the nearest temporal source frame. Displaying the resulting file on a progressive display, such as a computer monitor, produces very noticeable interlacing artifacts. However, displaying this on an interlaced display, such as a television, produces very good image quality. This method is generally used when cinematographic footage is encoded to a DVD and played on a TV.
- Relative Crop. Allows for percentage-based cropping of sources. It is usually preferred to
  use the Video Source Properties filter to crop sources, since that crop filter can be applied
  to targets and can therefore also be used in Watch Folders. Relative Crop may be
  deprecated in future releases of Carbon.
- Rotate. This filter provides 90-degree rotation and axis-flipping for the video.
- Sharpen. This filter sharpens the video using the "Un-Sharp Mask" technique.
- STL Caption Burn-In. Imprints STL subtitles onto the video.
- Teletext Data Extraction. Extracts Teletext lines from VBI and makes them available for filter and target plugins. Used in combination with the Teletext Data Modulator filter.
- Teletext Data Modulator. Modulates Teletext data onto VBI lines. Used in combination with the Teletext Data Extraction filter.
- Teletext Inject from STL file. Imports an STL subtitle file, and converts the contents into a Teletext payload in the ProMedia Carbon pipeline. Several other filters and exporters are able to use or manipulate this Teletext payload or write it to output files.
- Teletext Subtitle Captioner. Imprints teletext subtitles onto the video frame.
- **Temporal Noise Reducer**. This filter removes noise by using temporal noise reduction. Temporal noise reduction is effective for removing analog noise.
- Timecode Display. Overlays the video with timecode.

- Timecode Extraction-VITC. Extracts Vertical Interval Time Code (VITC) from NTSC and PAL input files with Vertical Blanking Interval (VBI) sections and makes the timecode available for other filters and targets.
- Timecode Insertion-VITC. Inserts Vertical Interval Time Code (VITC) into NTSC and PAL output files with Vertical Blanking Interval (VBI) sections.
- Timecode Processing. Processes and corrects sources with incorrect or undesirable timecode. Processed timecode is available to downstream Filters and Exporters.
- VBI Import from SMPTE 436M. Imports SMPTE 436M VBI from an MXF file and adds it to the video. This filter needs to be applied on the source side.
- VBI Mapper. This filter maps incoming VBI lines to output lines chosen by the user.
- V-Chip. V-Chip Filter. For insertion of V-Chip rating information into MPEG-2 Video User Data.
- Video Inverse Telecine Filter. Use this filter to apply inverse telecine to sources that have had 2-3 telecine applied.
- Video Metadata Inject. The current version of the filter allows the setting of the start timecode of the target file and setting chapter markers. The syntax of the XML input file for this filter is as follows:

- Video Source Properties. This filter allows you to crop the source file before transcoding it to the target file(s). It can also be used to force the aspect ratio of the source file, and the force the detection and handling of progressive vs. interlaced content. This filter can also be used when creating Watch Folders, which otherwise don't allow the manipulation of the properties of the source files. In the ProMedia Carbon application, it is possible to use this filter on a source as well as a target.
- Video Timecode Inject. Do not use this filter for new workflows. It will be deprecated in a
  future release. Use the Timecode Processor filter instead.
- XML Titler. This is an advanced, fully-featured filter that allows for a rich set of features when applying titles to target video files. The XML Titler video filter uses data from an XML file to add titles and images to a video stream. The syntax of the XML input file for this filter is discussed below.

The XML files to use with the XML Titler should look like this:

```
<?xml version="1.0"?>
<TitlerData>
<Data StartTime='0.5' EndTime='4.0' Title='First title'
CharSize='0.45' PosX='0.5' PosY='0.75'
ColorR='220' ColorG='220' ColorB='220' Transparency='0.0'
ShadowSize='0.5' />
<Data StartTime='4.5' EndTime='13.5' Title='This is the second
title' CharSize='0.25'/>
<Data StartTime='16.0' EndTime='21.0' Title='A third title' />
```

### </TitlerData>

See XML Elements and Attributes for Text Titles, XML Elements and Attributes for Image Titles, and XML Titler (Additional Notes) for more information.

### XML Elements and Attributes for Text Titles

If you selected the **XML Titler** video filter preset, the following XML elements and attributes for Text Titles apply:

- <?xml version="1.0"?>. This is the XML file header and must be present.
- <TitlerData>. This tag indicates the start of the titler data block. The block must be closed with the </TitlerData> entry. XML titler files must contain exactly one titler data block, in which there will be one data entry for each title to display.
- Data entries. Each data entry starts with the tag Data and describes one title to be displayed. It may contain several parameters:
  - Font. Specify the name of the font, for instance Arial. Only one font may be selected per titler project. If more than one font is present in the titler's XML data, only the first one will be used. If the specified font is not installed or cannot be loaded, the XML titler will fail (that is, a different font will not be used as a fallback).
  - FontCharSet. Specify the character set to use for the font. Allowed values are:

0: ANSI

- 1: BALTIC
- 2: CHINESEBIG5
- 3: DEFAULT
- 4: EASTEUROPE
- 5: GB2312
- 6: GREEK
- 7: HANGUL
- 8: MAC
- 9: OEM
- 10: RUSSIAN
- 11: SHIFTJIS
- 12: SYMBOL
- 13: TURKISH
- 14: VIETNAMESE
- 15: JOHAB
- 16: ARABIC
- 17: HEBREW
- 18: THAI
- **StartTime**. The time, in seconds, at which the display of this data entry's title will start.
- **StartTimecode**. An alternative to StartTime. Instead of using a floating-point value like '5.5' for 5.5 seconds, you can use a time code value ('00:00:05:15').
- **EndTime**. The time, in seconds, at which the display of this data entry's title will end.

- **EndTimecode**. An alternative to EndTime. Instead of using a floating-point value like '5.5' for 5.5 seconds, you can use a time code value ('00:00:05:15').
- **FadeInTime**. Duration, in seconds, for which the title or image will fade in.
- **FadeOutTime**. Duration, in seconds, for which the title or image will fade out.
- □ **Italics**. The italic function is used much like <i> and </i> in HTML. Within the Title string value, use ?ital;? to begin the italics section and ?/ital;? to end the italics.

#### Sample:

```
<?xml version="1.0">
<TitlerData>
<Data Title='ital;This text will be italic /ital;'/>
</TitlerData>
```

- Line Breaks. To insert a line break, within the Title string use the two bytes "OD OA" to mark the end of line, or if editing XML data with Notepad, simply press the Enter key at the desired location of the line break.
- **Title**. The title text to display.
- CharSize. Value between 0.0 and 1.0 which controls the size of the characters.
- PosX. Value between 0.0 (left of the screen) and 1.0 (right of the screen) used to position the title horizontally.
- Posy. Value between 0.0 (top of the screen) and 1.0 (bottom of the screen) used to position the title vertically.
- **ColorR, ColorG, ColorB**. Values between 0.0 and 255.0, which respectively describe the amount of Red, Green and Blue to use for the title's color.
- **Transparency**. Value between 0.0 (fully opaque) and 1.0 (fully transparent), which determines the title's transparency.
- □ **ShadowSize**. Value between 0.0 (no glow) and 1.0 (strongest glow), which determines the glow, or shadow, around the title used to enhance its readability.
- □ **HardShadow**. Binary value of 0 or 1. 0: normal shadow 1: shadow with a hard border
- BkgEnable. Set value to 1 to enable use of black background behind text area, otherwise set to 0.
- BkgSemiTransparent. Set value to 1 to make text background semi-transparent, otherwise set to 0. Only takes effect to BkgEnable to set to 1.
- BkgExtraWidth. Specifies how much wider than the text the background should be. This value is relative to the width of the image; so setting it to 0.05 would extend the background by 5% of the image's width.
- BkgExtraHeight. Specifies how much taller than the text the background should be. This value is relative to the height of the image; so setting it to 0.05 would extend the background by 5% of the image's height.
- **RightToLeft**. Set value to 1 for the text to be displayed in right-to-left order, otherwise set to 0.
- **HAlign**. Horizontal alignment of the title.
  - 0: Center
  - 1: Left
  - 2: Right

- **VAlign**. Vertical alignment of the title.
  - 0: Centered around the first line.
  - 1: Centered
  - 2: Top
  - 3: Bottom

### XML Elements and Attributes for Image Titles

If you selected the **XML Titler** video filter preset, the XML elements and attributes described in this section apply to Image Titles. When using image scripting, most of the XML tags previously defined for text (such as background, color, and position) do not apply to images. Supported image formats are tif, png, tga, and psd.

- <?xml version="1.0"?>. This is the XML file header and must be present.
- TitlerData>. This tag indicates the start of the titler data block. The block must be closed with the </TitlerData> entry. XML titler files must contain exactly one titler data block, in which there will be one data entry for each title to display.
- Data Entries
  - StartTime. The time, in seconds, at which the display of this data entry's title will start.
  - **StartTimecode**. An alternative to StartTime. Instead of using a floating-point value like '5.5' for 5.5 seconds, you can use a time code value ('00:00:05:15').
  - **EndTime**. The time, in seconds, at which the display of this data entry's title will end.
  - **EndTimecode**. An alternative to EndTime. Instead of using a floating-point value like '5.5' for 5.5 seconds, you can use a time code value ('00:00:05:15').
  - **Image**. The local path and filename for the image file to be used in the title.

Sample:

```
<?xml version="1.0">
?<TitlerData>
?<Data StartTime='0' EndTime='6.1' Image='E:\alphatest.tif'/>
?<Data StartTime='7' EndTime='26.1' Image='E:\betatest.png'/>?
</TitlerData>
```

- □ **ImageOffsetX**. Image horizontal offset, in pixels. Please note that "0" denotes the far left and increasing values will offset the image to the right.
- □ **ImageOffsety**. Image vertical offset, in pixels. Please note that ?0? denotes the top of the image and increasing values will offset the image towards the bottom.
- □ **ImageScaleX**. Image horizontal scale factor. Eg. 1.0 is actual size, 0.5 is half size, and 2.0 is double original size.
- ImageScaleY. Image vertical scale factor. Eg. 1.0 is actual size, 0.5 is half size, and 2.0 is double original size.
- **Transparency**. Value between 0.0 (fully opaque) and 1.0 (fully transparent), which determines the title's transparency.

# XML Titler (Additional Notes)

- The first data entry should define all the different parameters.
- □ If a data entry does not set a parameter, the last value set for this parameter will be used for that data entry. For instance, if you want a transparency value of 0.2, you may put Transparency='0.2' only in the first data entry and that value will be used for all other data entries.

- Denote the title's first line is always centered on the position described by PosX and PosY.
- The data entries must be sorted according to start time in the XML file.
- Unless specified, titles are displayed on a single line. The XML titler will not add a line break if a line is too long. It will be clipped from the left and right. Line break characters must be inserted in the Title in order for a line break to occur.
- Only one font may be used per XML titler filter instance.
- When using StartTime/EndTime for NTSC, in order to identify the start and end time of the titles, make sure to use drop-frame time code. Non-drop-frame time code approximates the real frame rate and will drift away from the actual time by a few frames every minute.
- When using StartTimecode/EndTimecode, both drop-frame and non-drop-frame time codes are supported. Drop-frame is in the format 'hh:mm:ss:ff', while non-drop-frame time code's format is 'hh:mm:ss;ff'. Notice that seconds and frames are separated by a semi-colon in non-drop-frame time code.
- □ When using StartTimecode/EndTimecode, the title display timing will not be accurate in the video filter's preview (Video Filter tab of Advanced > Filter).
- Jou can use Internet Explorer, or a number of other tools, to verify if your XML file has correct XML syntax. Simply open your file in Internet Explorer; if any errors related to the XML syntax exist, Internet explorer will display them.
- You can mix image data with regular data, but if a Data entry has an image, then its title will be ignored.
- The images should be the same size as the video you are rendering onto, otherwise they will be copied starting at the top-left corner of the image, with 1:1 pixel mapping.
- XYZ to RGB Video Filter. Converts video using the XYZ color model to the RGB color model. The XYZ color space is an international standard developed by the CIE (Commission Internationale de l'Eclairage).

# Saving Custom Video Filter Presets

A custom preset saves the customized settings of the selected filter. Saving a custom preset is useful if you plan on reapplying the same filter settings in the future. Custom presets are stored with the default presets and can be categorized into folders and subfolders.

- 1. Select the filter you would like to modify from the Filter list.
- 2. Modify the filter's properties according to your specifications.
- 3. Select Save Preset. The Save Video Filter Preset window will appear.
- 4. At the bottom of the **Save Video Filter Preset** dialog box, enter a name and a personalized description for the preset that will remind you of your custom settings.
- 5. After you have saved a customized filter preset, select **Add** and load it the same way you would load a default preset.
- 6. To remove a customized filter preset, select **Add** to open the **Load Video Filter Preset** dialog box. Select the filter preset you want to remove and click **Delete Preset**.



**NOTE:** You cannot delete the default system presets.

# 3.3.1.5 Audio Filter Tab

The Audio Filter tab lets you add audio filters to your source file to help improve the audio quality of your target files. These filters can be previewed in this tab and are applied to the source audio before any target audio filters are processed.

- 1. Click **Advanced** from the Source dialog box. When you will see the advanced controls, select the **Audio Filter** tab to add a variety of filters.
- 2. Click Add to add one or more audio filters to your source. A brief description of each filter is listed in the Description box when the filter is highlighted. You can browse the different filter categories on the left and choose filters from the right. Holding down SHIFT or CTRL and selecting the desired filters lets you add multiple filters to the Filter list. Remember that you can add filters to both sources and targets, so you should only add a filter at the source to improve it, for example, a low pass filter to remove a whine or hiss.
- 3. Once you have added a filter, you can select the filter in the list to view and adjust its properties.
- 4. Selected filters are applied from the list top-down, so the top-most filter in the list is applied first, and the bottom-most filter in the list is applied last.
- 5. To adjust the order of the filters in the list, select the filter in the list then click **Up** or **Down** to move it up or down in the list.

### **Previewing Audio Filters**

You can compare and preview the effect of audio filters by selecting **Play Original** followed by **Play Result**.

🙆 Rhozet Carbon Cod	ler				
File View Options	Tools Help				
	Source - C:\_1CarbonCoder3.19Tes	Files\CarbonIn\cliffs.avi			
Source	Advanced - Filter				M
	Setup Video Filter	udio Filter			
Target	<u>F</u> ilter List	Preview			
	Add Dynamic Ran	Decition			
Convert	<u>R</u> emove	Eostion. I			
		Duration: 2(sec)	Play Result		
Queue					
	Save Preset				
		Auto Desta			
	Order	Audio-Basic Attack Time 100			
		Release Time 100			
		Ratio 6:1			
	*	Threshold Value			
		Min:-40.00		-20.00	Max:-10.00
		Gain , Min:0.00		3.00	Max:6.00
		-Description			
(?)	Close				
9					
					Sources: 1 Targets: 1 //

Use the **Position** scrubber bar to select the area of the file you want to preview. Use the **Duration** drop-down menu to select the length of the preview from 2 to 15 seconds.

# Audio Filters

The following audio filters are included:

- Channel Mixer. Use this filter to interchange and map audio channels.
- **DVD to PC Converter**. Adjusts volume and dynamic range of DVD audio for PC playback.
- Dynamic Range Compressor. Audio Dynamic Range Compression Filter. Use this filter for compressing the dynamic range of audio.
- Fade In/Out. The Audio Fade In/Out filter is used to add a fade in and/or fade out to the audio. Use this filter in conjunction with the Video Fade In/Out filter for an audio/video/fade in/out.
- Lowpass. The Lowpass filter removes high-frequency signals, such as electrical noise and hiss, from the audio.
- Normalize. The Normalize filter raises the audio to maximize volume without clipping. This
  is a dual-pass filter and will increase your source file's overall conversion time. This filter is
  useful when performing a batch conversion or stitching various sources together so all the
  sources are at the same level.
- Normalize-TU 1770. This ITU 1770 Audio Normalization Filter provides very good performance compared to other peak sample meters so it has generally more accuracy then these meters that perform a similar function as the ITU 1170 Filter. It has also been determined that the ITU 1770 algorithm was more effective in determining appropriate levels for non-speech-based material, such as music and soundtrack material then other peak sample filters.
- Parametric 5.1 to Stereo Converter. This filter is used instead of the built-in converter, if access to the conversion parameters is needed.
- Track Offset. Adjusts the time offset between audio and video tracks.
- Volume. Lets you adjust the overall volume of the audio.

# Saving Custom Audio Filter Presets

A custom preset saves the customized settings of the selected filter. Saving a custom preset is useful if you plan on reapplying the same filter settings in the future. Custom presets are stored with the default presets and can be categorized into folders and subfolders.

- 1. Select the filter you would like modify from the Filter list.
- 2. Modify the filter's properties according to your specifications.
- 3. Click Save Preset. The Save Audio Filter Preset dialog box will appear.

Save Audio F	ilter Preset		K
Category		Presets Channel Mixer DVD to PC Converter Dynamic Range Compressor Fade In/Out Lowpass Normalize Normalize - ITU 1770 Parametric 5.1 to Stereo Converter Track Offset Volume	
<u>N</u> ew	New Sub. Rename Delete		
Description	Preset based on: Fades audio to	and from silence.	
		0K Cancel	1

- 4. At the bottom of the dialog box, enter the name of the preset and a personalized description that will remind you about your custom settings.
- 5. After you have saved a customized filter preset, click **Add** and load it the same way you would load a default preset.
- 6. To remove a customized filter preset, click **Add** to open the **Load Audio Filter Preset** dialog box. Then select the filter preset you want to remove and click **Delete Preset**. You cannot delete the default system presets.

# 3.3.2 Using the Target Tab

The **Target** tab lets you assign a "target" format for your source file to be converted to. You can assign multiple targets to a single source file that lets you create different formats of the same source file in one process.



# 3.3.2.1 Modifying the Target List

The Target List displays all of the target files you are planning to transcode. Use the buttons and options on the left to modify the list.

- Add. Click Add to add target formats to the list.
- **Remove**. Click **Remove** to remove the currently selected target format(s) from the list. You can also delete them using the delete key.
- Remove All. Click Remove All to remove all the targets from the list.
- Save Profile. Click Save Profile to save all target outputs in the target list, their customized settings, and their associated filter settings. A profile will typically be used to save a complex task that includes multiple targets and filters. The profile can then easily be reapplied to different sources.
- Advanced. Click Advanced to open the Advanced dialog box. This window will appear on top of the main ProMedia Carbon window. Double-clicking an item in the Source List also opens the Advanced window. To close the Advanced dialog box, click Close.

# 3.3.2.2 Assigning Targets

After clicking Add, you will need to assign a target format.

Load Target Preset	X
Category  Category  G-Storage  Storyboard  Cuteo Server	Presets         F4V 1296kbps 640x480 4x3 24fps         F4V 1296kbps 640x480 4x3 25fps         F4V 1296kbps 640x480 4x3 29 97fps         F4V 1298kbps 852x480 16x9 24fps         F4V 1298kbps 852x480 16x9 25fps         F4V 1328kbps 852x480 16x9 25fps         F4V 1328kbps 852x480 16x9 25fps         F4V 1328kbps 852x480 16x9 25fps         F4V 1406kbps 1280x720 16x9 24fps         F4V 4160kbps 1280x720 16x9 25fps         F4V 4160kbps 1280x720 16x9 25fps         F4V 448kbps 320x240 4x3 24fps         F4V 448kbps 320x240 4x3 25fps         F4V 448kbps 432x240 16x9 24fps         F4V 448kbps 432x240 4x3 25fps         F4V 448kbps 432x240 4x3 25
<u>New New Sub.</u> <u>R</u> ename De	telete Modify Preset Delete Preset
Name	
Description	A
	0K Cancel

- 1. In the **Load Target Preset** dialog box, select a desired category on the left side.
- 2. Select (+) next to a category (if needed) to display its sub-categories. The available presets for that category are displayed on the right.
- 3. When you have selected a preset, you will see complete details of the format settings in the description pane located in the bottom of the Load Target Preset dialog box.
- You can use SHIFT+SELECT or CTRL+SELECT to grab multiple presets within a single category
- 5. Click **OK** to add this preset to your Target window.

### 3.3.2.3 Preset Target Types

- System. Contains base settings for all the formats ProMedia Carbon produces. These settings are a good starting point for creating a custom setting.
- Application Specific. Contains Editing Software, DVD production/ authoring, Hardware, and STB profiles.
- Audio. Contains PCM and MP3 settings for audio-only output formats. These settings are good for exporting audio for use in other applications and for conforming audio files.
- CD/DVD. Contains DivX, Computer, VCD, DVD and SVCD useful for video on CD and DVD media.
- Distribution Formats. Contains ATSC and CableLabs profiles.
- DV. Contains AVI, QuickTime and Raw DV profiles for different DV standards.
- Fast DVD VOB. High speed creation of DVD VOB files for preview purposes.
- H.264. Contains a collection of popular formats based on H.264, including Transport Streams. In ProMedia Carbon 3.20, users can override the default VUI color signaling (H.264 Encoder Settings – Advanced > Colour Description). Also, a new and recommended simpler AQM complexity mode is available that produces better results (H.264 Encoder Settings – Advanced > Use Simple Adaptive Quant Strength). Select the check box and set the new mode to a recommended value of 50 (a non-zero value in the range [1 .. 100]).

- Handheld. Contains DivX, 3GPP and RealMedia 10 for video files that are compatible with handheld devices, such as PDAs and cell phones.
- HD. Contains DivX, MPEG and Windows Media HD settings.
- Image Sequence. Exports a series of still images.
- IPTV Services. H.264-based presets for acTVila.
- Mobile. Collection of presets for 3GPP compliant mobile devices.
- MXF. Contains presets for production formats based on MXF.
- Storage. Contains AVI, DivX, MPEG, or Windows Media targets for use as archival storage formats.
- Storyboard. Presets for storyboards, that is, sequences of poster frames (JPEG).
- Video Server. Contains profile categories with broadcast servers from Grass Valley, Leitch / Harris, Omneon and Quantel.
- Web. Contains MPEG, QuickTime, RealMedia, and Windows Media profiles suitable for Web delivery.

# 3.3.2.4 Modifying Target Parameters

The Target Parameters window displays the properties of the currently selected target in the target tab. All of the resources necessary for managing and modifying your target parameters are available in this window.

The target's basic parameters appear in the **Target Parameters** section. You can modify any of the parameters that aren't grayed out. Simply enter values in the fields or use the drop-down menus to modify the default target parameters.

If you want to save the changes for a custom target, click **Save Profile**. Saved presets are visible in the **Custom** tab in the **Add Target** dialog box.

### Setup Tab

The Setup tab allows you to modify the parameters for each of the default encoding targets. By using the tree-based option list, you can navigate through the available settings. Select a parameter in the tree to display its parameters on the right of the screen in the Target Parameters section. Properties that have white backgrounds can be modified. Properties that have blue backgrounds are disabled for modification in order to maintain the format's particular specifications. A description of the parameter is displayed in the yellow box at the bottom of the screen.

🙆 Rhozet Carbon Code	r		
File View Options	Tools Help		
	Target - F4V 1328kbps 852x480 16x9 29.97fps		
Source	Advanced - Setup		
300/06	Setup Video Filter Audio Filter		
		Parameter	
larget	Apply Preset 📮 🗂 Destination	Destination	
	Base Name	Base Name	%s_H264_1328K_2997p
Convert	Save Preset	Path	C:\Users\jlieber\Documents
	Tile Name	Use source filename if required	✓ Use source filename if required
Оцеце	🛱 🗂 Target File Splitting	File Name	C:\Users\jlieber\Documents\{Source}_H264_1328K_2997p(f4v)
Gucuc	Choose Splitting Method     Interval Time for Splitting (Minute	Target File Splitting	
	Select Source Segment	Choose Splitting Method	No Splitting
	🗂 Start Time (Seconds)	Interval Time for Splitting (Min	. 10
	Duration (Seconds)	Select Source Segment	Use entire Source
	- D Multiplexer Type	Start Time (Seconds)	0.00
	🗂 Use streaming mode	Duration (Seconds)	0.00
	I Device Compatibility	Stream-Basic	
	⊢ Mueu	Multiplexer Type	F4V
	- 🗖 Use Video	Use streaming mode	✓ Use streaming mode
	- 🗁 Width	Device Compatibility	No particular Device
	- Height	Video-Basic	
	- Frame Rate(fps)	Use Video	Use if Exist
	- 🗀 Interlacing	Width	852
	Bitrate	Height	480
	Number of passes	Aspect Ratio	Video: [639 : 400], Pixel: [9 : 10]
	🗂 Video Bitrate(kbps)	Frame Rate(fps)	29.97
	Maximum bitrate [kbps]     Maximum bitrate [kbps]	Interlacing	Non-Interlaced
	H.264 Encoder Settings-Basic	Bitrate	
	Profile	Video Bitrate Mode	CBR
	🔁 Level	Number of passes	1 pass
	Enable Scene Unange detection     Number of B-Pictures	Video Bitrate/khoe)	1200
	H.264 Encoder Settings-Advanced		<b>_</b>
	Closed Caption Mode	Sets the base name of the output	ut file. Special substitution strings can be used and will be replaced with:
		%s: source rile %n: file-splitting segment number	r (0 if no splitting).
2	Close		
6	•	)	
			Sources: 1 Targets: 1

### **Parameter Definitions Example**

Depending on the circumstances of transcode, the parameters settings may not appear in certain targets, may be in different locations or may only appear under certain option choices. Some parameters settings may be disabled when using some target presets.

### Destination

**Base Name**. Sets the name of the file excluding the extension. A few special substitution strings can be used in the Base Name and ProMedia Carbon will replace them with the values during its processing. Periods are not allowed in the base name.

- %s is replaced by the name of the source file (without extension) unless the Stitch function is used, in which case %s will be replaced by {Stitched Sources}.
- %n is replaced by the file-splitting segment number of the output file. If file-splitting is disabled, %n will be 0.
- %% is replaced by a percent-sign (%).
- Path. Sets the output location for the target file(s). Select Continue (...) to set the output folder.
- File Name. Displays the output file name or an example, if one of the substitution strings is used.

### Target file splitting

**Choose Splitting Method**. Selects the automatic file-splitting method. Automatic file-splitting can divide output files into separate files for easier archiving or transport. File-splitting is not related to multiplexing. File-splitting cannot be used with multi-pass encoding. Not all formats support file splitting or all options available for file splitting.

**Interval Time for Splitting (Minutes).** Sets the time interval to split output files at (in minutes). For example, if the interval time is set to 10 minutes, a 35-minute source will be split into 4 output files.

**Select Source Segment**. If **Use Source Segment** is selected, the Target only encodes a segment, specified by start and duration, from the source. This is designed for example for producing trailers.

**Start Time ISecondsI**. Specifies how many seconds in the Source Stream the Target shall discard before starting encoding.

**Duration [Seconds]**. Specifies how many seconds the Target shall encode from the Source stream.

**Max. File Size for Splitting (MB).** Sets the size to split output files at in megabytes. For example, if the max file size is set to 650 MB and the total output size is 1.5 GB, there will be 3 output files.

Quality/Size. Select Continue Splitting. Do not automatically split output files.

**Split using Time Interval.** Starts a new output file when the current output's video length reaches the specified maximum time.

**Split using max. Size**. Starts a new output file when the current output's file size reaches the specified maximum size.

(...) to bring up the **Quality/Size Configuration** dialog box. The Quality/Size Configuration dialog box displays the media requirements for your conversion parameters and can set the bit rate to an appropriate value-based on the number of media you want to output.

For example, if your target media is a single CD-R (650MB) and your current setting will output 800 MB, the Number of media will be 2. You can then adjust the Quality slider until the Number of media reads 1. Alternatively, you can enable the Fill Media if possible option, then set the number of media to 1. ProMedia Carbon will automatically calculate an appropriate bit rate to fit within the media requirements, if possible.

This option is only available under the following circumstances:

- The target supports a user-specified bit rate for encoding
- Split using max. Size is enabled
- There is only a single source or the **Stitch** function is enabled.

#### Video Basic

- Use Video. Choose how ProMedia Carbon will output video for the target.
  - Use Always. A video track is always output. If the source has no video, a black video track is generated.
  - Use if Exist. If the source has video, that video will be output. If the source has no video, no video track is generated.
  - Don't Use. A video track is not generated, even if the source contains video.
- Video Encoder. Select the video encoder (codec) to be used.
- Width. Sets the horizontal size of the video in pixels.
- Height. Sets the vertical size of the video in pixels.

- Video Bitrate (kpbs). Displays the video data rate in kilobits per second for this Target.
- Frame rate. Specifies the frame rate of video. An image becomes smooth, although many bit rates are needed, if a high value is specified.
- Interlacing. Determines how video frames are stored in the stream. If the Interlacing mode is set improperly, the video may not play back smoothly.
  - Non-interlaced (progressive) mode stores frames instead of fields.
  - Lower/Bottom Field First mode stores frames instead of fields.
  - **Upper/Top Field First mode** stores frames as separate fields, with the upper field first.
- Aspect Ratio. Specifies the width-to-height ratio of the video frame and its pixels in the file.
- Video Encoder Option. Displays the setting dialog of a video codec.

### Video Advanced

- Color Format. Specifies the color format to be used.
- Use Default Quality. Uses the codec. default quality value.
- Use Default Keyframe Interval. Uses the default keyframe interval.

### Audio Basic

- Use Audio. Selects whether the target will contain an audio track.
  - **Use Always**. The target will always contain an audio track, even if the source does not contain audio.
  - Use if Exist. The target will contain an audio track if the source contains audio. If the source does not contain audio, the target will not have an audio track.
  - **Don't Use**. The target will not have an audio track, even if the source contains audio.
- Audio Encoder Type. Specifies DirectShow or Audio Compression Manager (ACM).
- Format. Specifies the frequency and sample size of PCM (non-compressed audio).

### Multiplexer

- A/V interleaving period. Specifies the period of each audio/video chunk. The AVI multiplexer interleaves audio chunk with video chunk into one AVI program stream.
- Index Format. Determines whether the output file will be compatible or incompatible (AVI 2.0) index format.
  - **Compatible format** is for both Video for Windows and DirectShow applications.
  - Non-compatible (AVI 2.0 only) format is compatible with DirectShow applications only.

# **3.3.3 Presets and Profiles**

ProMedia Carbon includes over a hundred presets to simplify choosing transcoding settings for your job. There will be times, however, where you will be making changes to the supplied presets for a particular requirement. If you need to reapply the same settings in the future, you can save your own preset. ProMedia Carbon also includes the concept of a profile. Unlike a preset, a profile can include multiple target outputs. For example, you could save a profile called "Web Outputs" that creates five separate output files in different web formats. This profile could then be applied to any source file(s) in the future.

- A preset saves the settings for a single codec or filter. Use it to reapply a particular set of parameters for future projects. As an example, you could have a preset called "Windows Media for Streaming" that saves the Windows Media parameters used for streaming output at your company. The Apply Preset and Save Preset buttons are available in the Advanced section for a particular codec or filter.
- A profile saves the settings for all the targets and filters in a particular project. For example, you could save a profile called "Web Outputs" that creates 5 separate output files in different web formats. This profile could include the "Windows Media for Streaming" preset described above. The Save Profile button is on the main target tab.



**NOTE:** A preset will not include the target file name and target folder. This is on purpose: a target preset is considered a group of encoding parameters, not file system locations. A profile will save the target file name and target folder.

# 3.3.4 Background Transcoding

In addition to its normal conversion processes, ProMedia Carbon also provides job queuing capabilities. Instead of waiting for the ProMedia Carbon application to finish a conversion, you can queue jobs to a background transcoding process that takes over and performs conversion of queued jobs, much like a print spooler handles printing jobs. In this manner, the ProMedia Carbon application serves as a job set-up tool and you can queue multiple jobs with different priorities and continue working with ProMedia Carbon.

The background transcoding process that is installed with Carbon is called 'Nexus' and is installed as a Windows operating system service. The various job queues that Nexus manages can be viewed by the management application called Carbon Admin. Carbon Admin is available whenever any version of ProMedia Carbon 3.x is installed (ProMedia Carbon or Carbon Server). Using Carbon Admin, you can see all jobs that have been queued for background transcoding when using ProMedia Carbon, as well as jobs that have been created by Watch Folders. Please see *4.1 Using the Carbon Admin Interface* on page 71 for more information.

# 3.3.4.1 Queuing a Job

You have two ways to render a job: click Convert, and you'll encode the files serially with ProMedia Carbon's main interface. You can also click Queue to encode the files, which opens the job queuing window.

To queue a job, set up the conversion in the ProMedia Carbon application as you normally would, but instead of selecting the **Convert** tab and starting conversion, select **Queue** below the **Convert** tab.



- 1. In the **Job Name** field, enter a name for the job. The name will be displayed when the job is viewed in one of the job queues. If logging of jobs is enabled the name will also appear in the log.
- Enter a description of the job in the Job Description field. The description will be displayed when the job is viewed in one of the job queues. If logging is enabled the description will also appear in the log.
- 3. Choose a Job Priority from the drop-down box. The higher the job priority is, the sooner the Queue Manager will start the job. Higher-priority jobs are started before lower-priority jobs. The highest priority is 9, which means the job will be started as soon as any currently jobs are complete, unless there are more priority 9 jobs already waiting.
- 4. On a multicore system, click the **One Job for Each Target** check box in the middle of the window. This enables ProMedia Carbon to more efficiently assign processor cores to the encoding job.
- 5. Virtual Source Name: Read-only parameter.
- 6. From the **Target File Name** drop-down menu, select the appropriate action to take if an output file already exists:
  - **Rename if exists**. Rename the output file if a file of the same name already exists.
  - **Overwrite if exists**. Overwrite the output file if a file of the same name already exists.
- 7. Select the **Execution Machine**, either **Local** or *WFS*.
- 8. If your version of ProMedia Carbon is part of a rendering farm, click the **Render in Network Grid** check box to send the files to the rendering farm.
- 9. Enter the WFS Controller IP Address.
- 10. Enter the WFS Controller Port.
- 11. If your network contains a Carbon Server machine in the same TCP/IP subnet as the machine ProMedia Carbon is operating on, you may queue this job to this farm for remote execution. You can then continue working on your local machine, for example, configuring your next job.
- 12. Click **Queue** to add the job to the queue. This sends the encoding jobs to the encoding engine.
- 13. Go to **Options > Transcoding Settings** to open the Transcoding Settings dialog box.
- 14. To watch your progress, open the **Carbon Administrator** application, the other program installed when you set up ProMedia Carbon.

# 3.3.5 Application Options

### 3.3.5.1 Transcoding Settings

The Transcoding Settings window allows you to set target folders to save encoded files and specify processing options for the application. Setting these parameters is useful if you are going to be dealing with many source files from a single or similar sources.

The Transcoding Settings window contains the following tabs:

- Processing Options
- Conversion Options
- Default Target Folder
- Capture Options
- Carbon Farm Options

### 3.3.5.2 Processing Options Tab

The **Processing Options** tab controls both Frame Rate Conversion, Scaling, and Letterboxing preferences.

<ul> <li>Always pick nearest frame Always interpolate Automatic selection</li> <li>Enable Source Playback Speed Adjustment Max. Adjustment (%):</li> <li>Set Chapter Point at Source Stitch Points</li> <li>Use NTSC Drop Frame Time Code</li> <li>Scaling and Letterboxing</li> <li>Add Letterbox</li> <li>Crop/Adjust when converting between VBI containing formats (480/512, 576/608 Lines)</li> <li>Crop when scaling D1 to DV (NTSC)</li> <li>Enable MPEG1 compliant scaling</li> <li>Discard field when scaling height by 1/2</li> <li>Use NTSC safe colors for letterboxes</li> <li>Active line length 704 pixels</li> </ul>	-Frame Bate Conversion	<b>o</b> , , , , , ,	
<ul> <li>Set Chapter Point at Source Stitch Points</li> <li>Use NTSC Drop Frame Time Code</li> <li>Scaling and Letterboxing</li> <li>Add Letterbox</li> <li>Add Letterbox</li> <li>Scale &amp; Crop</li> <li>100 % Letterbox, 0 % Cropping</li> <li>Allow anamorphic scaling</li> <li>Max. Aspect Ratio Distortion (%):</li> <li>Crop/Adjust when converting between VBI containing formats (480/512, 576/608 Lines)</li> <li>Crop when scaling D1 to DV (NTSC)</li> <li>Enable MPEG1 compliant scaling</li> <li>Discard field when scaling height by 1/2</li> <li>Use NTSC safe colors for letterboxes</li> <li>Active line length 704 pixels</li> </ul>	<ul> <li>Always pick nearest frame</li> <li>Always interaction</li> <li>Enable Source Playback Speed Adjustment</li> <li>Note: The selections in this box are not affecting content</li> </ul>	erpolate C Automatic selection Max. Adjustment (%): priversions between NTSC and PAL	5
Scaling and Letterboxing       Scale & Crop         Add Letterbox       100 % Letterbox, 0 % Cropping         Image: Allow anamorphic scaling       Max. Aspect Ratio Distortion (%):         Image: Crop/Adjust when converting between VBI containing formats (480/512, 576/608 Lines)         Image: Crop when scaling D1 to DV (NTSC)         Image: Enable MPEG1 compliant scaling         Image: Discard field when scaling height by 1/2         Image: Use NTSC safe colors for letterboxes         Image: Active line length 704 pixels	Set Chapter Point at Source Stitch Points		
<ul> <li>Allow anamorphic scaling</li> <li>Max. Aspect Ratio Distortion (%):</li> <li>Crop/Adjust when converting between VBI containing formats (480/512, 576/608 Lines)</li> <li>Crop when scaling D1 to DV (NTSC)</li> <li>Picture scale method</li> <li>Picture scale method</li> <li>Method for scaling image up</li> <li>Legacy</li> <li>Method for scaling image down</li> <li>Legacy</li> <li>Active line length 704 pixels</li> </ul>	Scaling and Letterboxing Add Letterbox 100 % Letterb	bax, 0 % Cropping	Scale & Crop
<ul> <li>Crop/Adjust when converting between VBI containing formats (480/512, 576/608 Lines)</li> <li>Crop when scaling D1 to DV (NTSC)</li> <li>Enable MPEG1 compliant scaling</li> <li>Discard field when scaling height by 1/2</li> <li>Use NTSC safe colors for letterboxes</li> <li>Active line length 704 pixels</li> </ul>	🗔 Allow anamorphic scaling	Max. Aspect Ratio Distortion (%):	5
Crop when scaling D1 to DV (NTSC)       Picture scale method         Enable MPEG1 compliant scaling       Method for scaling image up         Discard field when scaling height by 1/2       Legacy         Use NTSC safe colors for letterboxes       Method for scaling image down         Active line length 704 pixels       Legacy	Crop/Adjust when converting between VBI cont	aining formats (480/512, 576/608 Lines)	
Enable MPEG1 compliant scaling     Method for scaling image up       Discard field when scaling height by 1/2     Legacy       Use NTSC safe colors for letterboxes     Method for scaling image down       Active line length 704 pixels     Legacy	Crop when scaling D1 to DV (NTSC)	Picture scale method	
Discard field when scaling height by 1/2       Legacy       Image: Comparison of the scaling image down         Use NTSC safe colors for letterboxes       Method for scaling image down         Active line length 704 pixels       Legacy	C Enable MPEG1 compliant scaling	Method for scaling image u	р
Use NTSC safe colors for letterboxes Active line length 704 pixels Method for scaling image down Legacy	Solution State Sta	Legacy	-
Active line length 704 pixels	Use NTSC safe colors for letterboxes	Method for scaling image d	own
	Active line length 704 pixels	Legacy	-

## Frame Rate Conversion

If your source and your target have different frame rates, there are many different ways to convert the source frame rate to the target frame rate.

- Always Pick Nearest Frame. This option creates a target frame by picking the nearest temporal frame from the source stream. This preserves full spatial source image quality. However, depending on the ratio between the source and target frame rates, movement in the video may appear jerky.
- Always Interpolate. This option creates a target frame interpolating between the two nearest temporal source frames. This guarantees smooth movement. However, since every target frame is an interpolation between source frame, the spatial quality is degraded and "ghost" images may appear.
- Automatic Selection. When the source or target frame rate is below approximately 23 fps, ProMedia Carbon will pick the nearest frame instead of interpolating in order to avoid ghosting. If ProMedia Carbon needs to interpolate frames for doing frame rate conversions, ghost images might appear. Use the Automatic selection option to avoid ghosting. If ghosting still occurs, then use the Always pick nearest frame option.
- Enable Source Playback Speed Adjustment. ProMedia Carbon normally does not alter the playback rate of sources in order to preserve the source's original speed and visual intent. In other words, objects always move at the same speed through video regardless of the target frame rate and a 10-second source always converts to a 10-second target.

However, in some circumstances, it is advantageous to slightly alter the source playback rate by a very small amount in order to aid conversion. For example, a 29.97fps source can be sped up to 30fps playback for conversion to a 15 fps output, removing the possibility of interpolation artifacts and making the conversion faster.

It is also standard that 24fps film transfers to PAL DVD-Video are not put through frame rate conversions. Instead, the 24fps film content is encoded and authored as if it was 25fps content, resulting in a 4% speed-up. This eliminates any interpolation or pulldown but makes PAL DVDs of film transfers slightly shorter in length.

Check this box to allow ProMedia Carbon to alter the playback speed of sources up to the percentage in the **Max. Adjustment (%)** box.

### **Chapter Points**

Chapter points are metadata information that can be embedded in the source or output file. These chapter points are generally used to allow jumping to different sections within a video.

 Set Chapter Point at Source Stitch Points. This option can be used when stitching together multiple files into single output file. Chapter points will be set at each joining point. An example use of this would be merging the multiple chapters of a movie into a single output file.

### Time Code

This is used to represent the temporal location of a particular frame of video. The time code may be embedded in the source video or it may be imputed from the video itself. Time code may be discontinuous in a particular piece of video.

 Use NTSC Drop Frame Time Code. In the NTSC video world, time code can be represented in two modes, drop frame and non-drop frame. Drop frame time code compensates for the difference between wall clock time and the time code generated by the 29.97 frame rate of NTSC video. Choose this option to make all time code display in drop frame mode.

# Scaling and Letterboxing

If your source and your target have different frame sizes, there are two different ways to handle this scenario. For example, you may have a 16:9 source file that needs to be encoded to a target file with a 4:3 aspect ratio frame size. Because of the different frame sizes, you either have to scale and crop your Source file, or add black bars to the video to compensate for the difference.

- Add Letterbox/Scale & Crop Slider. Use the slider to adjust the desired percentages or cropping. Select 100% letterbox, by sliding the adjustment bar to all the way to the left will leave the source frame completely visible, with letterbox bars added if necessary. If the slider is at 0% letterbox (100% Scale and Crop), the image will fill the entire space without letterboxing, but the sides will be chopped off. Leaving the letterbox slider in the middle (50%) is a mixture of adding letterbox bars and scaling the file to fit the space. If you know you can afford to cut off a little of the video, then you should have the bar more toward the middle. Experiment with these settings to determine the correct settings for your source files.
- Allow anamorphic scaling. This setting allows scaling the pixel aspect ratio non-proportionally (horizontal and vertical scaling are different). Next to this check box is a field called Max. Aspect Ratio Distortion (%) for entering the maximum aspect ratio distortion percentage allowed during the anamorphic scaling process.
- Crop/Adjust when converting between VBI containing formats (480/512, 576/608 Lines). This option can be used for certain transcodes between broadcast formats where either the source or target contain Vertical Blanking Interval (VBI) information and the other format does not. With this option checked, ProMedia Carbon will either strip out the extra 32 lines of VBI data when going from a VBI source to a non-VBI target or add 32 lines of blank VBI data when going from a non-VBI source to a VBI target.
- Crop when scaling D1 to DV (NTSC). Enable this option when converting a NTSC D1 (720x486) source to NTSC DV (720x480). ProMedia Carbon will crop 4 lines from the top and 2 lines from the bottom of the source frame during conversion. This results in faster processing and higher quality since scaling is not performed.
- Enable MPEG-1 compliant scaling. ProMedia Carbon normally converts full-D1 sources to MPEG-1 SIF using the Scaling and Letterboxing slider setting. However, the MPEG specification states that to convert a full-D1 (720x480) source to MPEG-1 SIF (352x240), crop 8 pixels from the left and right sides of the source to create a 704x480 frame then scale it to 50% for a 352x240 frame. Checking this box forces ProMedia Carbon to use the MPEG-1 specification method.
- Discard field when scaling height by ½. When using full-size interlaced source files, this
  option discards one of the fields if you are scaling the file to half-size. In some cases, this
  eliminates the need for applying deinterlacing filters to your source file since discarding a
  field effectively deinterlaces the video.
- Use NTSC safe colors for letterboxes. Safe colors refer to those that are inside the safe region for NTSC television video. Title colors that are outside of this range can display badly and "bleed" on NTSC televisions.
- Active line length 704 pixels. Select this option to avoid having black bars down each side when equating to the full 4x3 or 16x9 picture.
- Picture Scale Method. Different methods can be available for scaling video up and down. There is a trade off between processing speed and video quality, and in general the slower the processing the better the quality. The "Best Quality" setting produces the best quality but is generally not the fastest. The "Legacy" and "Linear Interpolation" settings are typically the fastest and the produced quality can be considered good. The "Legacy" setting uses the Harmonic proprietary scaling algorithm of ProMedia Carbon versions 3.16 and earlier.

# 3.3.5.3 Conversion Options Tab

The Conversion Options tab controls various preview, loading and system preferences.

	Conversion	ptions Welauit Larget Folder   Capture Of	
Preview Options -			
Always Scal	e/Shrink To As	bect Ratio Correct Full Screen Display	
Preview Devices			
🔽 Use Overlay	on Desktop (d	sable for remote desktop or if your preview st	ays blank)
<sub>-</sub> Source Loading C	ptions		
🔲 Apply modifi	ed Source opt	ons to similar Sources	
🔽 Force interna	al DirectShow I	PEG Decoder	
MPEG Timestar	np Mode:	Automatic	-
Default Subtitle I	_anguage:	English	
System			
Temp. Dir :	C:\Progra	Data\RhozetTemp	Browse
Cache Dir :	C:\Progra	Data\RhozetTemp	Browse

### **Preview Options**

 Always Scale/Shrink To Aspect Ratio Correct Full Screen Display. Enable this option to have ProMedia Carbon always compensate for pixel aspect ratio differences and provide an accurate on-screen display. It is recommended to keep this option enabled.

### **Preview Devices**

Use Overlay on Desktop. Enable this option to use video overlay for preview. Video
overlay is faster than standard video and therefore uses less system resources. You should
disable this option for remote desktop or if your preview stays blank.

### Source Loading Options

Apply modified Source options to similar Sources. Enable this option to use modified source options on subsequent source files. With this option enabled, subsequent sources of similar types will be loaded with the same source parameters as the previous source of the same file type. This is useful for Watch folders because it allows source files to be adjusted automatically without the need for the user to interact with the software. For example, let's say you have an AVI file that does not have square pixels and you set it so the pixel aspect ratio isn't square (that is, DV NTSC). If Apply modified Source options to

**similar Sources** is enabled, the next AVI source file you load will retain the same settings used before, and will load the file with the pixel aspect ratio set to DV NTSC, instead of the default setting.

- Force Internal DirectShow MPEG Decoder. This forces ProMedia Carbon to use the builtin decoder, even when using DirectShow graphs.
- MPEG Timestamp Mode. Sets the default timing mode for MPEG Transport Streams, where the timing mode defines how in and out points and audio / video synchronization are handled.
- Default Subtitle Language. Select what subtitle language should be pre-selected when loading a VOB.

### System

- Temp. Dir. Some conversions need to save temporary files. Select Browse to choose a location for your temporary directory.
- Cache Dir. ProMedia Carbon retains some information in order to speed certain types of conversions. Select Browse to select the location to use for ProMedia Carbon's cache files.

### 3.3.5.4 Default Target Folder Tab

The **Default Target Folder** tab allows you to specify where you transcoded files should be stored.

Always use the Global Default Folder for all Targets	Browse
Local Default Target Folder	
3GPP H.264 320x240 128Kbps 15fps AAC-LC w Streaming         3GPP H.264 320x240 128Kbps 15fps AAC-LC w Streaming         3GPP MPEG-4176x144 64Kbps 15fps AMR-NB         3GPP MPEG-4176x144 64Kbps 15fps AMR-NB         3GPP MPEG-4176x144 64Kbps 15fps AMR-NB w Streaming         3GPP MPEG-4176x144 64Kbps 15fps AMR-NB w Streaming         3GPP MPEG-4176x144 64Kbps 15fps AMR-NB w Streaming         3GPP MPEG-4120x240 64Kbps 15fps AMR-NB w Streaming         3GPP MPEG-4 320x240 64Kbps 15fps AMR-NB         3GPP MPEG-4 320x240 64Kbps 15fps AMR-NB w Streaming         3GPP MPEG-4 320x240 64Kbps 15fps AMR-NB w Streaming	
C:\Users\jgerhold\Documents	Browse

### Global Default Target Folder

- Global Default Target Folder. This option sets the output location for all formats and targets. Select Browse to select the folder you want to use.
- If you want the global settings to apply to all target folders, select Always use the Global Default Folder for all Targets. Checking this option disables and overrides any local settings you may specify in the next section.

### Local Default Target Folder

Local Default Target Folder. Sets the output location for specific target presets. The local defaults override the global defaults. This is helpful for separating files that go to different projects or can be used to separate different target formats from each other.

To set the Local Default Target folder:

- 1. Uncheck Always use the Global Default Folder for all Targets.
- 2. Select the desired target from the list by selecting it.
- 3. Select **Use Local Default Folder** for the selected target option.
- 4. Select Browse to choose the folder to use.
- 5. Select Apply or OK.

### 3.3.5.5 Capture Options Tab

The **Capture Options** tab allows you to specify video and audio capture settings. A DirectShow compliant hardware capture device must be installed in your computer.

Transcoding Settings	X
Processing Options Conversion	on Options Default Target Folder Capture Options Carbon Farm Options
Capture Settings	
System:	Fast System
TC Offset:	3
Reduce Preview Refres	sh (advisable to avoid frame drops)
Stop Capturing on Fram	e Drop
Use Source HD Buffer:	Automatic (controlled by Target)
	OK Cancel Apply

# Capture Settings

- System. While capturing video, ProMedia Carbon attempts to transcode directly from the input video into the target formats. If the performance of the system is not fast enough to enable immediate encoding, ProMedia Carbon will generate an intermediate file on disk and then transcode asynchronously from this temporary file into the target formats. If your encode stops during capture or has dropped frames, select a lower system speed. This will force ProMedia Carbon to generate the temporary file.
- **TC Offset**. Time Code offset is used when there is a difference between the time code displayed by the tape deck and the display in ProMedia Carbon.
- Reduce preview refresh. Previewing video during capture uses CPU cycles that could be used for transcoding. Selecting this option will reduce the rate of frames displayed and will increase the processing power available for encoding. On faster machines this option is not necessary.
- Stop Capturing on Frame Drop. If your machine is not fast enough to perform encoding during the capture, it may drop some video frames. Select this option to stop the capture process if there is a frame dropped.
- Use Source HD Buffer. Some encoding functions, such as frame rate conversions, are computationally intensive. ProMedia Carbon has the ability to perform partial transcodes and then write temporary data to the hard drive to ensure that there are no dropped frames during the transcode. Writing this temporary data will slow down the encoding process, but guarantees successful capture. You may select from one of three options: Never, Automatic, and Always. The Never option will never write intermediate data to the hard drive, the Always options always will, and the Automatic will write data depending on the target parameters. You can tune the settings depending on your system performance.

# 3.3.5.6 Carbon Farm Options Tab

The Carbon Farm Options tab allows you to specify and set up the Carbon Farm settings. ProMedia Carbon can be used as a front-end to a "farm" of transcoders under the control of Carbon Server. If you do not have a Carbon Server system, then these settings are not used. If you are using a Carbon Server system, you can set up transcoding jobs and then queue them up for processing on the farm. These settings allow you to control interactions with the farm.

Transcoding Settings		X
Processing Options Conversion	on Options \ Default Target Folder \ Capture Options \ C	arbon Farm Options
	Summer Street Stre	
Carbon Farm Options		
🔽 Use local Presets		
Use hosted Presets		Browse
Connect To Carbon Ser	ver	
	Carbon Server Selection:	Status
	2	
	OK	el Apply

### **Carbon Farm Options**

- Use Local Presets. If you would like to use presets that have been developed on the local machine, choose this option.
- Use hosted Presets. If you would like to use presets that are on the Carbon Server machine (or some other machine in your network), choose this option. After choosing this option, you can browse to select the machine and file location for the presets that you would like to have available. By hosting presets on a central machine, all of the users in your environment can share the same presets.
- Connect to Carbon Server. Choose this option to initiate connection to a Carbon Server machine. After choosing this option, you will select from the available Carbon Servers in the drop-down selection box. The Status window to the right of the selection box shows the status of the selected Carbon Server.

# **3.3.6** Application Settings

The Application Settings window lets you enable or disable application-specific behaviors. To open the Application Settings, choose **Options > Application Settings**.

pplication Settings ? X
Settings Window animation (slide windows) Show "Save Project" dialog on exit Disable Sound on "Conversion finished" Show Advanced options in basic view
Show "Custom Folder Browse Dialog" for Target Path
Disable confirmation when removing Eilter
Disable confirmation when removing Source
Disable confirmation when removing <u>T</u> arget

### 3.3.6.1 Settings

- Window Animation. This toggles whether or not the windows slide into place when they open or close.
- Show "Save Project" Dialog on exit. This toggles whether or not ProMedia Carbon prompts you to save your projects when you exit the application.
- Disable Sound on "Conversion finished". This option disables the exuberant "Done" sound that plays when ProMedia Carbon finishes a foreground conversion.
- Show Advanced options in basic view. This option includes all advanced options within the basic view. When the advanced options are included in the basic view, the advanced view is only necessary for source trimming and adding filters to sources and targets.
- Show "Custom Folder Browse Dialog" for Target Path. Enabling this will make Carbon use the standard Windows Explorer type browse window for selecting the target path rather than the default, less elaborate browse window.

### 3.3.6.2 Confirmation

- **Disable confirmation when removing Filter.** This option disables the prompt that appears when you remove a filter(s) from targets or sources.
- Disable confirmation when removing Source. This option disables the prompt that appears when you remove a source file(s) from the Source List.
- Disable confirmation when removing Target. This option disables the prompt that appears when you remove a target(s) from the Target List.

# 3.3.6.3 Changing the Default MPEG Export File Extension

You can change the export extension on any MPEG file through the MPEG Exporter. This can be changed to meet extension requirements of specialized systems. To change the extensions, add the MPEG exporter as a Target. Depending on the Stream Type, you can choose the extension of the Elementary, Program, or Transport streams.

The following instructions explain how to change the default output file extension for MPEG files. For example, by default ProMedia Carbon uses the file extension .m2t for all MPEG-2 transport streams. If your situation calls for an MPEG-2 transport stream with the file extension of .mpg, you can use the following instructions so that all MPEG-2 transport streams created by ProMedia Carbon will use the .mpg extension.

1. Run regedit.

🖅 Run	
	Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
Open:	regedit
	OK Cancel Browse

- 2. Browse to HKEY\_LOCAL\_MACHINE\Software\Rhozet\Carbon Coder\{A7264AEF-FF57-42E0-BBAD-CCF546CD515F}.
- 3. Make a new subkey in this folder and name it file\_ext.
- 4. Right-click the new key and select New > String Value.
- 5. Rename the new string to one of the following formats. You can add an individual key for each of the format types listed, but we recommend changing only those that you have to.

String Name	File Type Changed
MPEG1_MUX	Mpeg-1 System Stream
MPEG1_ELM_VIDEO	Mpeg-1 Elementary Stream—Video Portion
MPEG1_ELM_AUDIO	Mpeg-1 Elementary Stream—Audio Portion
MPEG2_MUX	Mpeg-2 Program Stream
MPEG2_ELM_VIDEO	Mpeg-2 Elementary Stream—Video Portion
MPEG2_ELM_AUDIO	Mpeg-2 Elementary Stream—Mpeg-2 Audio
WAVE	Mpeg-2 Elementary Stream—PCM Audio
MPEG2_TS	Mpeg-2 Transport Stream

Table	3-1:	String	Value	Formats
-------	------	--------	-------	---------

6. Change the value of the new string to the file extension you would like the stream type to have (for example, mpg).

- 7. Close regedit.
- 8. Restart ProMedia Carbon.

This chapter's first section provides an overview of Carbon Admin and describes using Carbon Admin to set up Watch Folders, view jobs' status, create presets, and configure transcoding parameters of local and remote systems. The second section, *4.2 Carbon Admin Interface Options and Details* on page 79, provides a detailed description of Carbon Admin's many menu options to customize and manage conversion settings.



NOTE: Use Carbon Admin to automate multiple file conversions through Watch Folders.

# 4.1 Using the Carbon Admin Interface

Carbon Admin does not work by itself, but is used to configure and control other Carbon products: ProMedia Carbon, Carbon Server, and Carbon Agent (a farm of transcoders). Carbon Admin includes all the features (and more) of the Carbon Server web-based user interface, which is still available. You can access Carbon Admin from the desktop or from the web-based user interface.

Carbon Admin can be used to:

- Set up Watch Folders, automated processes that transcode any source file dropped or copied into the folder.
- View transcoding jobs and their status. This includes jobs that are currently running, jobs that have been previously run and are now finished, and jobs that are waiting (queued-up) to be run.
- Create new presets and manage existing ones. Presets describe the kinds of output files you need to create, and are a convenient way to recreate the same kinds of files over and over, instead of having to enter the parameters again. For example, such as codec (Flash, H.264, etc.), file type (FLV, MP4), frame size (320x240 pixels), bit rate (300 Kbits/second), and frame rate (25 frames/second) every time you want to create a new output file.
- Configure Carbon Server transcoding parameters.
- When applicable, view transcoding jobs and configure transcoding parameters of remote systems.

The following sections describe how to use Carbon Admin's basic features to create Watch Folders, and how to customize presets to match your specific requirements. For a detailed description of Carbon Admin's menu options, see *4.2 Carbon Admin Interface Options and Details* on page 79.

# 4.1.1 Setting Up a Watch Folder

- 1. Double-click the **Carbon Admin** application short cut on the desktop. The opening screen appears, showing the **Active Jobs**, **Queued Jobs**, **Completed Jobs**, **Failed Jobs**, and **Watch Folders** tabs.
- 2. Select the Watch Folders tab.

	·					
Carbon	Coder Admin					
File Vi	ew Tools Help					
Application	Status	Job Status	Enilady 0	Watch Status		
Product: R	hozet Carbon Coder	Queued: 0	Total Jobs: 5	Active: 1		
Version: 3.	19.0.33260	Completed: 4		Inactive: 0		
Active Jobs	Queued Jobs Comple	eted Jobs Failed Jobs W	/atch Folders			
Active	Name	Folder	Pric	onity #of Ta	rgets # of Retrievals	
Property		Value				
				Delete Watch	Edit Watch	Add Watch
				Delete Watch		
Connected						.::

3. On the Watch Folders tab, select Add Watch to define a new Watch Folder on the Watch Folder Setup dialog.

Delete Watch	Edit Watch	Add Watch
On the Watch Folder Setup dialog, type a Watch Folder name and select Browse to, specify where to save the Watch Folder, then click OK. Alternatively, click Browse (directly to the right of the Watch Folder field) to select an existing Watch Folder to drag (or copy) source files to, then click OK.

Carbon Watch Folder Setup	
General Properties General Properties Gener	Required Settings         Name:         Watch Folder:         Browse         If Target File Exists:         Create New File         Include Files:         Job Priority:         5         Image:         Note: Click on the "Add" link under "Target File" in the hierarchy view at the left to choose a target.
	Leading Clip:     Browse       Trailing Clip:     Browse
	Advanced Settings         Watch Sub-Folders       Accept Folders as Assets         Append Source Sub-Folder to Target Path       Retrieve Sources to Agent Machines         Create One Job for each Target       Enable Segmented Grid Transcoding         Delete Local Source after Conversion       Maximum Segments:         Delete Source File Shortcut Links to
	A Watch Folder automatically transcodes any "source" file that is placed in it into one or more "target" output types. The source file may be an actual media file or just a shortcut to a media file. At a minimum, a Watch Folder must have a name, a location, and at least one target. Below is a list of the basic properties of a Watch Folder and their description. Name: this is the name of the watch folder, which helps you manage your watch folders. As an example, you could use the names of projects or customers as the names of your watch folders. Watch Folder: this is the location of the watch folder. You can choose any local or remote folder location. If
	Save Watch Cancel

5. To add presets, on the left side of the screen, under **Target Files**, select **Add**. This changes the selections on the right side of the screen.

General Properties	Required Settings			
Watch Rules	Preset:	Click on Browse to choose a preset		
Add			Browse	Edit Preset
·· Source Notifiers ·· Remote Retrievals	Target Folder:			Browse
- Target Files	Target File Name:	%s		
Add	Note: always includ	le %s as part of the name to insert the	source file name	
	Optional Settings			
	Delete Local T	arget File after Delivery		
	Target Tags:			

6. To add a preset, find the **Preset** field, then select **Browse** *below and to the right* of the **Preset** field. This opens the **Select Preset** dialog.

Select Preset	
System     Application Specific     Audio     Audio     CD/DVD     Distribution formats     DV     Fast DVD VOB     H + 264     Handheld     HD     Image Sequence     Mobile     MXF     Storage     Storyboard     Vdeo Server     Web     Rash     MP4 (H.264)     MP4G     Quick Time     RealMedia     Thumbnails     VC-1     WindowsMedia	MP4 1296kbps 640x480 4x3 24fps           MP4 1296kbps 640x480 4x3 25fps           MP4 1328kbps 852x480 16x9 24fps           MP4 1328kbps 852x480 16x9 23fps           MP4 160kbps 1280x720 16x9 24fps           MP4 4160kbps 1280x720 16x9 24fps           MP4 448kbps 320x240 4x3 24fps           MP4 449kbps 432x240 16x9 29 57ps           MP4 449kbps 432x240 16x9 29 57ps           MP4 449kbps 432x240 16x9 29 57ps           MP4 496kbps 432x240 16x9 29 57ps           MP4 496kbps 432x240 16x9 29 57ps           MP4 496kbps 512x344 4x3 229 57ps           MP4 780kbps 512x384 4x3 22fps           MP4 780kbps 512x384 4x3 22fps           MP4 780kbps 640x352 16x9 24fps           MP4 896kbps 640x352 16x9 24fps           MP4 896kbps 640x352 16x9 25fps           MP4 896kbps 640x352 16x9 29.7ps           MP4 896kbps 640x352 16x9 29.7ps           MP4 896kbps 640x352 16x9 29.7ps           MP4 896kbps 640x352 16x9 29.97ps           MP4 896kbps 640x352 16x9 29.97ps
	Description
	View Preset Select Preset

- For our example, on the left, in the tree-list of preset categories, select Web > MP4 (H.264) category. This selection displays the MP4 H.264 factory default presets made available during installation.
- 8. On the right, select **MP4 448kbps 320x240 4x3 29.97fps**, then select **View Preset**. You can see that the MP4 H.264 preset creates .mp4 target (output) files 320 pixels wide by 240 pixels high, with a frame rate of 30 frames per second. The target file is created from the source file by transcoding from the source format to the format (codec) specified in the preset.
- 9. Select Cancel, then select Select Preset to add the preset to your Watch Folder.

- Destination	_ E	Destination			
Base Name		Base Name	%s_H264_448K_2997p		
Path		Path	C:\Temp\WatchSource		
		Use source filename if required	True		
- Target File Splitting		File Name			
Choose Splitting Method	E	Target File Splitting			
Interval Time for Splitting (Minutes)		Choose Splitting Method	No Splitting		
Select Source Segment		Interval Time for Splitting (Minutes)	10		
Duration (Seconds)		Select Source Segment	Use entire Source		
- Stream-Basic		Start Time (Seconds)	0		
Multiplexer Type		Duration (Seconds)	0		
Use streaming mode	E	Stream-Basic			
		Multiplexer Type	MPEG-4 System		
Basic		Use streaming mode	True		
Use Video		Device Compatibility	No particular Device		
Width	E	Video-Basic			
- Aspect Ratio		Use Video	Use if Exist		
Frame Rate(fps)		Width	320		
Interlacing		Height	240		
Wideo Bitrate Mode		Aspect Ratio	Video: [4 : 3], Pixel: [1 : 1]		
- Number of passes		Frame Rate(fps)	29.970001		
···· Video Bitrate(kbps)		Interlacing	Non-Interlaced		
Maximum bitrate [kbps]		Ritrata			
		Base Name Sets the base name of the output file. Sp replaced with: %s: source file%n: file-split	ecial substitution strings can be used and will be ting segment number (0 if no splitting).		

- 10. To select the folder to which the H.264 .mp4 files will be written, on the **Carbon Watch Folder Setup** dialog, to the right of the **Target Folder** field, select **Browse**.
- 11. When the folder selection dialog box opens, navigate to the target output folder and select **OK**. Once you have selected your output folder, you are now finished with this target.
- 12. Select **Save Watch** to add the H.264 target to the Watch Folder. Notice in the Watch Folders properties list on the left side of the screen that a new target has been added to the Watch Folder. For this example, although we could add more targets to this Watch Folder, we will only add the H.264 target.
- 13. Now open the input and output folders you specified (in the examples above, the input folder where you drop the source files is c:\Temp\WatchSource, and the output folder for the H.264 target file is c:\Temp\WatchTarget.).
- 14. Drop a video file into the Watch Folder (the input folder). Instead of dropping the file itself, you can also create a shortcut to the file by right-clicking and dragging the file, then releasing the right mouse button when the file is over the Watch Folder.
- 15. Select **Create Shortcuts Here** to create a shortcut to the input file inside the Watch Folder.

To see the progress as the source file is transcoded into the target H.264 .mp4 file, go back to the Carbon Admin application and select the **Active Jobs** tab. You should now see a display like the following screenshot, in this example 47% of the input file has been transcoded.

Carbon Coder Ad	lmin								x
File View To	ols Help								
Application Status Connected To: HQ-F Product: Rhozet Cart Version: 3.19.0.3326	RND-9K859P1.hlit.local oon Coder 0	Job Status Active: 1 Queued: 0 Completed: 4	Failed: 1 Total Jobs: 6		Watch Status Total Watches: Active: Inactive:	2 2 0			
Active Jobs Queued	Jobs Completed Jobs	Failed Jobs Wate	ch Folders						10
Name	Description			Priority	Progress	Progress Bar	Status	Checked In Time	Ma
Job (09/23/11 09	:27:02) Source C:\dell	\PSPWatch\horses	- Copy.avi	4	23%		Started	09/23/11 09:27:	loc

After a while, the progress bar will reach 100%, indicating that the job has finished transcoding, and you will see the status change to "Completed". You should now be able to find the new file with the .mp4 file extension in the output folder (c:\Temp\WatchTarget in our example).

Feel free to explore a little more on your own and create another few Watch Folders, using different presets.

The handling of presets is discussed in detail in the following section, *4.1.2 Creating New Presets* on page 76; we suggest you review it after you feel comfortable creating Watch Folders and transcoding files by yourself.

**NOTE:** If you create a Watch Folder that reads source files or writes target files to a network drive, you cannot use mapped drives such as M:\NetworkWatchInput, you must use UNC paths such as \\SERVERNAME\SharedFolder\NetworkWatchInput. If you do not do this, ProMedia Carbon and Carbon Admin will not be able to read the files or write the files, since it does not understand or have access to mapped drives, only UNC paths.

# 4.1.2 Creating New Presets

≣

ProMedia Carbon includes hundreds of presets to simplify choosing settings for your transcoding jobs. There will be times; however, where you will be making changes to the supplied presets for a particular requirement. If you need to reapply the same settings in the future, you can save your own preset that restores all the codec parameters you configured.

A preset saves the settings for a single codec. Use it to reapply a particular set of parameters for future projects. As an example, you could have a preset called "QuickTime MP4 with H.264 for Streaming" that saves the H.264 and QuickTime parameters used for streaming output from your web server. Each time you have a new source file that needs to be transcoded for streaming, you can apply this saved preset instead of having to re-enter all of the settings again, such as frame size, frame rate, file wrapper (.mp4), and many more.

If you completed the earlier section, *4.1.1 Setting Up a Watch Folder* on page 72, you already used the "H.264 (.mp4) 320x240 30fps" preset. This preset describes how to create a QuickTime file with the .mp4 extension, which contains video information encoded according to the H.264 specification. The video created using this preset will be 320 pixels (width) and 240 pixels (height), with 30 frames of video displayed every second.

We're going to use that preset to create a new customized preset, one that makes video with frames that are 400 by 300 pixels instead of 320x240. We're only going to change the frame size, and no other parameters, but the principle of creating new presets remains the same, no matter how few or how many parameters you change.

- 1. Make sure that Carbon Admin has been opened and select the **Preset Editor** option from the **Tools** menu.
- 2. When the Preset Editor dialog box opens, on the left side you can see the list of preset categories. When you save a new preset, you can choose a category to save it under so it's easier to find in the future, and you can group it with other, similar presets.

When you select a category (in this example the "H.264" top level category and the "Web" sub-category), the list of presets stored under that category appears. In this example, the two presets that are installed with ProMedia Carbon are displayed. We're going to take one of those presets and modify it to create our own, new customized preset.

C Preset Editor		_ • •
— System     Application Specific     Adio     CD/DVD     Distribution formats     DV     — Fast DVD VOB     H_264     Handheld     H HD     — Image Sequence     Mobile     MXF     Storage     Storyboard     Video Server     Web     — Flash     — MP4 (H.264)     — MPEG     _ Quick Time     RealMedia     — Thumbnails     — VC-1     WindowsMedia	F4V 1296kbps 640x480 4x3 24fps         F4V 1296kbps 640x480 4x3 25fps         F4V 1298kbps 852x480 16x3 25fps         F4V 1328kbps 852x480 16x3 25fps         F4V 11296kbps 1280x720 16x9 24fps         F4V 4160kbps 1280x720 16x9 24fps         F4V 4160kbps 1280x720 16x9 24fps         F4V 448kbps 320x240 4x3 22fps         F4V 448kbps 320x240 4x3 22fps         F4V 496kbps 432x240 16x9 23fps         F4V 496kbps 432x240 16x9 23fps         F4V 496kbps 432x240 16x9 23fps         F4V 780kbps 512x384 4x3 22fps         F4V 780kbps 512x384 4x3 22fps         F4V 780kbps 512x384 4x3 22fps         F4V 780kbps 640x352 16x9 24fps         F4V 980kbps 640x352 16x9 24fps         F4V 1298kbps 640x352 16x9 24fps         F4V 1298kbps 640x352 16x9 24fps         F4V 888kbps 320x240 4x3 29.97fps <tr< td=""><td>Delete View Preset</td></tr<>	Delete View Preset

3. Select the H.264 (.mp4) 320x240 30fps preset and double-click the Preset.

When the preset parameter list appears, all the parameters that can be changed for this codec are listed on the left in a tree listing, the description of the parameters and the current value for the parameter in this preset is shown on the right.

- 4. In the tree in the left panel, scroll the list until you see **H.264 Encoder Settings-Basic** category. Select the **Profile** parameter that appears under this list.
- 5. In the **Destination** panel on the right, scroll down to the **Width** parameter, and change it to 400. Change the **Height** parameter to 300, and select **Save As**.

C Setup - MP4 448kbps 320x240 4x3 29.97fps							
<b>S</b> t							
<mark>⊫</mark> -• <mark>Destination</mark>	*		Start Time (Seconds)	0	*		
Base Name			Duration (Seconds)	0			
···· Path		Ξ	Stream-Basic				
			Multiplexer Type	MPEG-4 System			
	_		Use streaming mode	True			
···· Choose Splitting Method	=		Device Compatibility	No particular Device	E		
Interval Time for Splitting (Minutes)			3 Video-Basic				
			Use Video	Use if Exist			
Duration (Seconds)		P	Width	320			
Stream-Basic			Height	240			
···· Multiplexer Type			Aspect Ratio	Video: [4 : 3], Pixel: [1 : 1]			
···· Use streaming mode ···· Device Compatibility			Frame Rate(fps)	29.970001			
			Interlacing	Non-Interlaced			
Basic		Ξ	Bitrate				
Use Video			Video Bitrate Mode	CBR			
vvian Height			Number of passes	1 pass			

6. When the preset **Save As** dialog box appears, enter a name for the preset and a custom description. The description is a useful place to make note of any specifics about the preset, such as the intended use of the output target files.

You can also select the category under which the preset will be saved from the tree on the left. It's a good idea to group new presets together in the category that already has similar presets, although you can create new categories and sub-categories if you want.

7. When you're done with the name and the description, select OK.

Carbon Admin now validates the parameters in the preset, and adds it to the list of existing presets. You might have to wait a while for the preset to be validated. The preset editor screen now appears again, and the preset you just created is shown in the "H.264\Web" category.

You can now use your new preset when you create a Watch Folder. There are many more parameters you can change, and there are many existing presets you can customize, so feel free to experiment. The default set of presets that is installed when ProMedia Carbon is installed can't be accidentally deleted using the Carbon Admin user interface, so feel free to experiment.

# 4.2 Carbon Admin Interface Options and Details

Each time you start Carbon Admin you will begin at the home screen. The home screen contains a number of different areas that all display information about the current state of Carbon Server. First, there is the menu bar, then a number of areas that supply general information about the Carbon Server transcoder, then the **Job** and **Watch Folder** tabs, then the area that displays Job and Watch Folder lists, then the Job/Watch detail and preview areas, and finally the status bar at the bottom.

Carbon Cardan Admin				
File View Teels Help				
Application Status Connected To: HQ-RND-9K859P1 bit local	Job Status Active: 0 Failed: 0	Watch Status Total Watches	2	
Product: Rhozet Carbon Coder	Queued: 0 Total Jobs: 6	Active:	2	
Version: 3.19.0.33260	Completed: 5	Inactive:	0	
Active Jobs Queued Jobs Completed Jobs	Failed Jobs Watch Folders			
Name Description		Priority Progress	Progress Bar Status	Checked In Time Ma
· · · · · · · · · · · · · · · · · · ·				
Property Value				
			Full Size Preview	v - slow 🔻
Connected.				.:!

The version of Carbon Admin installed with Carbon Server (Carbon Server Admin), has one additional tab called **Carbon Machines** (not shown in the illustration). This tab displays all the Carbon Agent machines that are known to this Carbon Server machine.

The rest of this section describes each area in general terms. Where there is more detailed information available, sections later on in this document provide it.

# 4.2.1 Menu Bar

The Carbon Admin menu bar provides the File, View, Tools, and Help options described in the following sections.

# 4.2.1.1 File

The only option in the File menu is Exit, this will end the Carbon Admin program.

#### 4.2.1.2 View

- **Refresh**. Re-display the jobs or Watch Folders in the current tab.
- Preview Style. Change whether a preview is shown in the preview window in the bottom right of the Carbon Admin ('Single Preview'), or for every currently transcoding job in the Active Jobs tab ('Preview in List'), or not at all ('No Preview'). If Single Preview is selected, the preview window is only visible when the Active Jobs tab has been selected. If Preview in List or No Preview is selected, the preview window disappears from the bottom right of the Carbon Admin window. If Preview in List is selected, every active job that is visible in the Active Jobs tab will show a small preview of the current output file.

#### 4.2.1.3 Tools

**Preset Settings**. Manage existing presets, and create new ones. See *4.1.2 Creating New Presets* on page 76 for some information to get you familiar with the creation of presets.

**Kernel Settings**. Edit less-frequently used configuration parameters for Carbon Server. See *4.2.13 Kernel Settings Configuration* on page 100 for more information.

### 4.2.1.4 Help

This section is fairly self-explanatory. The **About Carbon Admin** option will display the Carbon Admin version number and legal and copyright information.

# 4.2.2 Carbon Server Information Areas

The following sections describe the status area displayed directly under Carbon Admin Menu bar.

#### 4.2.2.1 Application Status

Describes the machine for which Carbon Admin is displaying the status. Currently, Carbon Admin can only display the status of the local machine (the machine on which it is running), but in the future may be able to select and display the status of other machines running Carbon Server.

**Connected to**. The name of the selected machine (or IP address if the name cannot be found). The IP address "127.0.0.1" is reserved for the local machine, that is, the machine that Carbon Admin is currently running on.

Version. The version of Carbon Server that is running on the selected machine.

#### 4.2.2.2 Job Status

Lists the total number of jobs in each job category.

- Active. The number of transcoding jobs that are currently in the process of being transcoded.
- Queued. The number of transcoding jobs that have been requested to transcode, but that are waiting for a transcoding "slot" to free up. A machine running Carbon Server can be configured to have a user-specified number of Transcoding Slots, which indicates how many transcoding jobs that machine can execute simultaneously. If a machine has three transcoding slots and is already executing three transcoding jobs, that machine cannot accept any new jobs until one of the three jobs completes or fails. Once that happens, a transcoding slot becomes available, and one of the jobs in the Queued status now becomes Active.
- Completed. The number of transcoding jobs that have been transcoded successfully.
- Failed. The number of transcoding jobs that have encountered an error somewhere during transcoding.

• Total Jobs. The number of all jobs in the four preceding categories combined.

#### Watch Status

This area lists the numbers of Watch Folders and their state of activity.

- Total Watches. The total number of Watch Folders that have been configured on this machine.
- Active. The number of Watch Folders that have been marked as Active. When a source file
  is dropped into the input folder of a Watch Folder marked as "Active", it will be transcoded
  according to the Watch Folder settings.
- Inactive. The number of Watch Folders that have not been marked as "Active". When a
  source file is dropped into the input folder of a Watch Folder not marked as "Active", it will
  be ignored, it will not be queued, and no transcoding will take place.

## 4.2.2.3 Connected Machine Status

This informational area displays the status of Carbon Server systems, and is not displayed for ProMedia Carbon or Carbon Agent machines.

- Total Machines. The number of Carbon Agent machines that are under the control of the Carbon Server machine.
- Active. The number of machines that are under the control of the Carbon Server machine and that have been marked as "Active". Active machines are configured to accept jobs dispatched by the Carbon Server machine.
- Inactive. The number of machines that are under the control of the Carbon Server machine and that have not been marked as "Active". Inactive machines will not accept jobs dispatched by the Carbon Server machine.
- Total Slots. The sum of transcoding slots on all active machines. A machine running Carbon Server can be configured to have a user-specified number of Transcoding Slots, which indicates how many transcoding jobs that machine can execute simultaneously. If a machine has three transcoding slots and is already executing three transcoding jobs, that machine cannot accept any new jobs until one of the three jobs completes or fails. Once that happens, a transcoding slot becomes available, and one of the jobs in the Queued status now becomes Active.
- Slots Used. The sum of the number of transcoding jobs that are currently being executed simultaneously on all active machines.

# 4.2.3 Job and Watch Folder Tabs

## 4.2.3.1 Active Jobs

Selecting this tab will display a list of transcoding jobs that are currently in the process of being transcoded. Right-clicking a job in this tab will display the following options:

- **Stop**. Terminate transcoding, and move the jobs to the "Failed Jobs" tab. From there it can be re-submitted for transcoding at a later time if desired.
- Remove. Terminate transcoding and remove the transcoding job from this tab.
- Select All. Selects all jobs and runs the selected option.

## 4.2.3.2 Queued Jobs

Selecting this tab will display a list of transcoding jobs that have been requested to transcode, but that are waiting for a transcoding "slot" to free up. A machine running Carbon Server can be configured to have a user-specified number of Transcoding Slots, which indicates how many transcoding jobs that machine can execute simultaneously. If a machine has three transcoding slots and is already executing three transcoding jobs, that machine cannot

accept any new jobs until one of the three jobs completes or fails. When a job is completed or fails, a transcoding slot becomes available, and one of the jobs in the Queued status now becomes Active and is moved to the Active Jobs tab. Right-clicking a job in this tab will display the following options:

- **Remove**. Terminate transcoding and remove the transcoding job from this tab.
- Re-queue. Resubmit this transcoding job and move it to the Queued Jobs tab.
- Start Now. Immediately moves the job to the Active Jobs tab and starts transcoding it, regardless of the number of transcoding jobs already in progress and the maximum number of Transcoding Slots configured for this machine.
- Set Priority. Set a priority for this job, between 1 (lowest) and 10 (highest). The highest priority jobs will be transcoded next once a transcoding slot is freed up. Selecting Start Now immediately moves the job to the Active Jobs tab and starts transcoding it, regardless of the number of transcoding jobs already in progress and the maximum number of Transcoding Slots configured for this machine.
- Select All. Selects all jobs and runs the selected option.

## 4.2.3.3 Completed Jobs

Selecting this tab will display a list of transcoding jobs that have been transcoded successfully. Right-clicking a job in this tab will display the following options:

- **Remove**. Terminate transcoding and remove the transcoding job from this tab.
- Re-queue. Resubmit this transcoding job and move it to the Queued Jobs tab.
- Same Priority. Set a priority for this job, between 1 (lowest) and 10 (highest). The highest priority jobs will be transcoded next once a transcoding slot is freed up. Selecting Start Now immediately moves the job to the Active Jobs tab and starts transcoding it, regardless of the number of transcoding jobs already in progress and the maximum number of Transcoding Slots configured for this machine.
- Select All. Selects all jobs and runs the selected option.

## 4.2.3.4 Failed Jobs

Selecting this tab will display a list of transcoding jobs that have encountered an error somewhere during transcoding. Right-clicking a job in this tab will display the following options:

- Remove. Terminate transcoding and remove the transcoding job from this tab.
- **Re-queue**. Resubmit this transcoding job and move it to the Queued Jobs tab.
- Same Priority. Set a priority for this job, between 1 (lowest) and 10 (highest). The highest priority jobs will be transcoded next once a transcoding slot is freed up. Selecting Start Now immediately moves the job to the Active Jobs tab and starts transcoding it, regardless of the number of transcoding jobs already in progress and the maximum number of Transcoding Slots configured for this machine. This does set a priority for the job, but doesn't have any effect if the job is in the Failed Jobs tab until and unless the job is requeued.
- Select All. Selects all jobs and runs the selected option.

## 4.2.3.5 Watch Folders

Selecting this tab will display a list of Watch Folders that have been created on this machine. To the left of every Watch Folder is a check box in the 'Active' column. For more information, see the 'Active' paragraph in section *4.2.4 Job and Watch Folder Lists* on page 84 a little later on in this manual.

Carbon (	Coder Admin								
File Vie	w Tools	Help							
Application S Connected Product: Rh Version: 3.1	Status To: HQ-RND-9k nozet Carbon Coo 9.0.33260	(859P1.hlit.local der	Job Status Active: Queued: Completed:	: 0 Faile : 0 Total Job : 5	ed: 0 ps: 6	Watch Status Total Watches: Active: Inactive:	2 2 0		
Active Jobs	Queued Jobs	Completed Jobs	Failed Jobs	Watch Folders					
Active N	lame	Fold	ler		Priority	# of	f Targets	# of Retrievals	
V F	SP Test	C:\	dell\PSPWatch	n	4	1		0	
V (	:\dell\PSPWatc	h C:\r	dell\PSPWatch	ı	5	1		0	
Property		Valu	Je						
Watched Fe	older	C:\v	dell\PSPWatch	ı					
Watch Stat Target 0 File	us e	List C:\v	ening to File Sy dell\PSPTarge	vstem notifiers t,QuickTime 6 - I	Movie Trailer -	Small , %sgarden	.avi		
						Delete Wat	tch	Edit Watch	Add Watch
Connected.		]							.:

Selecting this tab also displays the **Delete Watch**, **Edit Watch**, and **Add Watch buttons** at the bottom of the tab. The **Delete Watch** and **Edit Watch** options only become enabled when you select a Watch Folder from the list, otherwise these two buttons stay greyed-out.

- Delete Watch. Removes an existing Watch Folder and it's files. This is not the same as making a Watch Folder active or inactive by checking or un-checking the 'Active' check box, but rather removes the Watch Folder permanently. If you want the Watch Folder back some time in the future, you will have to completely recreate it. Be careful with this option, once a Watch Folder is deleted it cannot be undeleted, only recreated.
- Edit Watch. Change the parameters of an existing Watch Folder. See 4.1.1 Setting Up a Watch Folder on page 72 for information to get you familiar with the creation of Watch Folders, and see 4.2.6 Watch Folder Management on page 92 for detailed information.
- Add Watch –Create and configure a new Watch Folder. See 4.1.1 Setting Up a Watch Folder on page 72 for information to get you familiar with the creation of Watch Folders, and section 4.2.6 Watch Folder Management on page 92 for detailed information.

Right-clicking a Watch Folder in this tab will display the following options:

- Edit. Edit this Watch Folder.
- Delete. Remove this Watch Folder.
- Clone. Make a copy of this Watch Folder, but give it a different name.
- Go To Folder. Open the Watch Folder on your desktop.

# 4.2.4 Job and Watch Folder Lists

Selecting one of the job or Watch Folder tabs will display a list of jobs or Watch Folders.

## 4.2.4.1 Job lists

In the Active Jobs, Queued Jobs, Completed Jobs, and Failed Jobs tabs, details about the jobs in the various job states are displayed.

Tab	Name	(Prev)	Desc	Prior	Prog	Progress Bars	Status	Check- in Time	Machine	Warn
Active Jobs	у	у	у	у	у	у	у	у	у	у
Queued Jobs	у	n	у	у	n	n	n	у	n	n
Completed Jobs	у	n	у	n	n	n	n	у	у	n
Failed Jobs	у	n	у	n	n	n	n	у	у	n

Table 4–1: Job Lists

- Name. The name assigned to the job. Jobs created by dropping source files in Watch Folders will usually have a name of the form "Job (date time)". A more custom name can be specified when submitting a job using the API.
- Description. A description of the job. Jobs created by dropping source files in Watch Folders will usually have a description of the form "Source path\_to\_source\_file". A more custom description can be specified when submitting a job using the API.
- Priority. For queued and active jobs, this lists the job priority, from lowest (1) to highest (10). A job that has been forced to transcode immediately without needing to be queued first (also referred to as "Start Now" or "Render Now") will be listed with priority 255.
- **Progress**. Percentage of completion of the transcoding job.
- Progress Bar. Percentage of completion of the transcoding job, expressed as a progress bar.
- Status. Active jobs can be Starting, Started, Error, or Completed. If the job fails with the
  Error status, it will be moved to the Failed Jobs tab, so the status may not be visible for
  long. When the job is completed it will be moved to the Completed Jobs tab so the status
  may not be visible for long.
- Check In Time. The time when the Watch Folder queued the job.
- Machine. For active, completed, or failed jobs, on which machine the job was executed.
- Warnings. For active or failed jobs, any warnings or errors that were generated during the execution of the job.

## 4.2.4.2 Watch Folder lists

- Active. Whether the Watch Folder will act on source files dropped into the input folder. When a source file is dropped into the input folder of a Watch Folder marked as "Active", it will be transcoded according to the Watch Folder settings. If this box is unchecked, then source files dropped into the input folder this Watch Folder will be ignored, will not be queued, and no transcoding will take place.
- Name. The user-specified name that was give to the Watch Folder when it was created.
- Folder. The input folder of the Watch Folder. When a source file is dropped into this folder, it will be transcoded according to the Watch Folder settings.

- **Priority**. Jobs created will by this Watch Folder will have this job priority by default.
- # of Targets. Number of different output files that will be created for each source file dropped into the input folder.
- **# of Retrievals**. Number of network shared storage locations or FTP servers this Watch Folder scans for source files.

### 4.2.4.3 Job and Watch Folder Details

When a job or a Watch Folder is selected in one of the tabs, the details of that job or Watch Folder become visible in the Details area.

#### Job Details

Selecting a job in one of the job tabs, displays the details pertaining to that job, depending on the status of the job (that is, what tab it's listed in). Jobs don't all have the same details to display. The table below lists details that apply to jobs in selected tabs.

Tab	Source File	Target Preset	Target File	Checked In	Started	Completed	Duration	Job GUID	Touched Source
Active Jobs	у	у	у	у	у	у	у	у	у
Queued Jobs	у	у	у	у	n	n (y if jobs were re- queued)	у	У	n
Completed Jobs	у	у	у	у	у	n (y if jobs were re- queued)	у	у	у
Failed Jobs	у	n	у	у	у	n	у	у	n

#### Table 4–2: Job Lists Details

Property	Value
Source File (multi) 0	C:\Users\Desktop\ProMedia Carbon 3.20.0\Source Video Files\160X112 6
Target Preset	H.264 NTSC HD 1080p MPEG-4 - 10Mbps - High4.2
Target File	C:\Users\Documents\%s_H264
Target Preset	AVI - Cinepak
Target File	C:\Users\Documents\%s_AVI_CINEPAK
Checked in	2012-01-23 16:52:40
Started	2012-04-25 15:18:19
Completed	2012-01-23 17:06:44
Duration	-92.22:11:35
Touched Source 0	C:\Users\Desktop\ProMedia Carbon 3.20.0\Source Video Files\160X112_6
Target 0 File 0	C:\Users\Documents\160X112_64kvid_24kaud_15fps_H264.mp4
Target 1 File 0	C:\Users\Documents\160X112_64kvid_24kaud_15fps_AVI_CINEPAK.avi
Job GUID	{3D2A0760-274C-44B3-BE52-8866F4B835A2}

- Source File. The source file that was dropped into the Watch Folder's input folder. This can be the actual source file, or the shortcut to the source file.
- Target Preset. The preset used to create an output file. This may appear multiple times, once for each output file the Watch Folder creates.

- Target File. The folder to which an output file is written. This may appear multiple times, once for each output file the Watch Folder creates.
- Checked In. The time that the transcoding job was queued.
- Started. The time that the job actually started transcoding.
- **Completed**. For completed or re-queued jobs, the time that the job finished transcoding.
- Duration. The time it took to transcode the job.
- Target 0 File. The output folder, preset name, and filename ('%s' represents the source file name) for the first target.
- Target 1 File. The output folder, preset name, and filename ('%s' represents the source file name) for the next target. There may be many more 'Target X File" details, depending on how many targets this Watch Folder is configured to create from every source file.
- Job GUID. The Globally Unique Identifier of the job. This can be used in API jobs to identify jobs uniquely for logging, accounting, or performance measurement purposes.

#### Watch Details

Selecting a Watch Folder in the Watch Folders tabs displays the details pertaining to that Watch Folder.

- Watched Folder. The input folder for the Watch Folder. Files dropped into this folder are automatically transcoded.
- Watch Status. The current activity of the Watch Folder process.
- Retrieval 1 Status. This detail is visible when a Remote Retrieval such as a network share or FTP is being checked for the arrival of new source files.
- Target O File. The output folder, preset name, and filename ('%s' represents the source file name) for the first target.
- Target 1 File. The output folder, preset name, and filename ('%s' represents the source file name) for the next target. There may be many more 'Target X File" details, depending on how many targets this Watch Folder is configured to create from every source file.

#### 4.2.4.4 Carbon Server Machines

Selecting this tab will display a list of Carbon Agent machines that are known to this Carbon Server machine. The listed Carbon Agent machines can be selected or de-selected for accepting transcoding jobs from this Carbon Server machine by checking or un-checking the check boxes in the 'Active' column.

You can also right-click the machine name, and select **Edit Node Settings** to change settings on the individual Carbon Agent machines.

#### Server Setting for Node

- Enable. When checked, the selected Carbon Agent is available for this Carbon Server and can be sent transcoding jobs. When unchecked, this Carbon Server will not send new jobs to the selected Carbon Agent. The Carbon Agent will complete its assigned jobs but new jobs will not be sent to it by this Carbon Server, although it may continue receiving new jobs from other Carbon Servers if present.
- Slots. Refers to how many jobs sent by this Carbon Server can be simultaneously executed on the selected Carbon Agent.
- Priority. This Carbon Server will send new jobs to Carbon Agent machines in order of decreasing priority levels. The higher the priority, the more likely it is that a new job will be sent to a Carbon Agent. If two Carbon Agents have free transcoding slots, and one has priority "7" and the other has priority "4", the Carbon Agent with priority "7" will be sent jobs until it has no more free transcoding jobs. Only then will the Carbon Agent with priority "4" be sent new jobs by this Carbon Server. If two Carbon Agents have the same priority, "4" be sent new jobs by this Carbon Server.

jobs will first be sent to the Carbon Agent with the highest number of empty slots. Only when the two Carbon Agents have the same number of empty slots will jobs be sent to them on a 'Round-Robin' basis.

#### **Global Node Settings**

- Enable. When checked, the Carbon Agent is available for any Carbon Server and may be sent transcoding jobs. When unchecked, the selected Carbon Agent will not accept jobs from any Carbon Server, such as for situations where the Carbon Agent machine needs configuration or maintenance. The Carbon Agent will complete its assigned jobs but it will not accept any new jobs.
- Version. This is the version number of the Carbon Agent software running on the selected Carbon Agent machine.
- Tag. Used to create sets of Carbon Agents with specific attributes (such as hardware acceleration) in a farm network. When a Watch Folder is created, you can assign tags to all jobs that come from that Watch Folder. Jobs with a tag will only be assigned to Carbon Agents whose tags match the tags of the job. Tags supersede priorities, so when a job has a tag assigned to it, it will be sent only to those Carbon Agents with the matching tag, even if there are higher priority Carbon Agents without the tag. Within the set of Carbon Agents with a matching tag, Carbon Server farm manager does consider the priorities.
- Mandatory Tag. (This is not yet implemented.) A Mandatory Tag indicates that this Carbon Agent machine will only accept jobs from Watch Folders configured with this tag, no other jobs will be accepted.
- Total Slots. Sets the total number of jobs that can be executed by the selected Carbon Agent, for all Carbon Servers combined.
- Failed Count. ((This is not yet implemented.) This is the number of jobs that have failed on this Carbon Agent machine.
- Kernel Properties. Use this to change the kernel properties of the individual Carbon Agent machines. This saves the trouble of using Windows remote desktop to log in to each Carbon Agent machine and using Carbon Agent Admin to adjust the settings on the machine directly.
- Reboot Agent. Allows you to send a reboot request to the Carbon Agent machine. The machine will reboot immediately and running jobs will be terminated.
- View Log. (This is not yet implemented.) View the log file of the Carbon Agent machine.

#### 4.2.4.5 Preview

This window is only visible when the **Active Jobs** tab has been selected. It can show a preview of the output file as it is being transcoded. Note that, whereas the actual effect on the transcoding job you are previewing is low (even large and fast previews won't really slow down the actual transcoding job), there is overhead on the Carbon Admin application, and on the Carbon Server system when using it. For some extremely large previews, hundreds of kilobytes need to be transferred and displayed, so use this feature wisely.

- Preview off. No preview is shown.
- Thumbnail Preview-slow. A small fixed-size preview is displayed, the preview is updated slowly.
- Thumbnail Preview-fast. A small fixed-size preview is displayed, the preview is updated quickly.
- Full Size Preview-slow. A scalable preview is displayed. It can be scaled by dragging the
  edges of the preview window or dragging the edges or corners of the Carbon Admin
  window itself. The preview updates slowly.

• Full Size Preview-fast. A scalable preview is displayed. It can be scaled by dragging the edges of the preview window or dragging the edges or corners of the Carbon Admin window itself. The preview updates quickly.

## 4.2.4.6 Status Bar

The Status Bar area displays when Carbon Admin can communicate properly with the Nexus background transcoding service. It needs to be able to perform certain tasks, such as manage and create presets. If Carbon Admin is able to connect to Nexus, it will display the message "Connected."

If Carbon Admin cannot connect to Nexus for any reason, it will display the message "Not Connected." When this happens, it is often a problem with the USB key, perhaps it is not inserted properly or the temporary/evaluation license has expired. Try removing and re-inserting the USB key, and restart the machine to see if that makes the problem go away. If not, you may need to contact Support for more help.

One other thing to watch out for in this context is the behavior when the machine has just started, or when Nexus has just been restarted. Every time Nexus starts, it verifies all the presets on the machine and builds a list of the ones that have been correctly verified. It takes a while for Nexus to do this, so you may see the **Building Preset** dialog box below while Carbon Admin waits for Nexus to finish. This should never take more than 2 or 3 minutes unless you have a huge list of custom presets. If this dialog never seems to finish, you may have a problem and should restart the machine to see if that fixes the problem.

# 4.2.5 Preset Management

Carbon Server includes hundreds of presets to simplify choosing settings for your transcoding jobs. There will be times, however, where you will be making changes to the supplied presets for a particular requirement. If you need to reapply the same settings, like codec parameters and target file handling options, in the future, you can save your own preset that restores all the codec parameters you configured.

A preset saves the settings for a single codec. Use it to reapply a particular set of parameters for future projects. As an example, you could have a preset called "QuickTime MP4 with H.264 for Streaming" that saves the H.264 and QuickTime parameters used for streaming output from your web server. Each time you have a new source file that needs to be transcoded for streaming, you can apply this saved preset instead of having to re-enter all the setting such as frame size, frame rate, file wrapper (.mp4) and many more.

The "Quick Start Guide" of this document gives an overview of the preset management process to get you familiar with the creation of presets, and is recommended reading if you're not familiar with the concept of presets, or if you haven't used the ProMedia Carbon User Interface or Carbon Admin to create and manage presets before. This section will discuss the details of preset creation and management, and present you with all the available options.

To help explain how presets work in Carbon Server, you need to know about the **three different types of presets**, explained as follows in *4.2.5.1 System Presets*.

# 4.2.5.1 System Presets

System presets are displayed when the **System** category is selected in the list of categories on the left side of the window. System Presets are the basic building blocks of every other type of preset. Both the Factory Default Presets and the User Presets are created by taking one of the System Presets, modifying it, and saving it under a different name and a different category. These presets can never be modified, renamed, or deleted since they are not really separate preset files but are built into and are part of Carbon Server.

# 4.2.5.2 Factory Default Presets

These are specializations and customizations of the System Presets, either according to industry standards (for example, "CableLabs HD 1080i 18.1 Mbps") or according to Harmonic recommendations (for example, "3GPP2 H.264 320x240 128Kbps 15fps AAC-LC"). The Factory Default Presets are created by Harmonic and are automatically installed when a Carbon Server product is installed. They are installed under many different category names. They cannot be deleted or modified by the end user when using the ProMedia Carbon User Interface or Carbon Admin. In custom installations where these presets are not used for Watch Folders or API jobs, they can be removed from the file system from the folder where they are installed by default (usually in the folder named "c:\Program Files\Common Files\Rhozet\ProMedia Carbon\System Presets," this name is slightly confusing in this context but is maintained for backwards compatibility with earlier Carbon Server versions). This is best done only under controlled circumstances and in consultation with Harmonic Support.

## 4.2.5.3 User Presets

These are presets created by the end user, either by modifying a System Preset or a Factory Default Preset. These can be deleted and renamed at will, and can be stored under any category, those created by the end user, in any of the Factory Default Preset categories, or even in the System category. It may sometimes be difficult to tell User Presets from System Presets and Factory Default Presets, but selecting a User Preset will show the **Remove** button, whereas System Presets and Factory Default Presets can't be removed using Carbon Admin. User Presets are usually stored in the "c:\Documents and Settings\All Users\Application Data\Rhozet\Carbon Coder\User Presets" folder on Windows XP or Windows Server 2003. There is an equivalent folder on Windows Vista, but that name can vary per installation so you may need to search for the folder name "User Presets" to see where Vista placed it.

## 4.2.5.4 Preset Editor Window

When you are in the main Carbon Admin window and you select the **Preset Editor** option from the **Tools** menu, the **Preset Editor** dialog box opens. From this window, you can manage, create, copy, and delete presets. Do not save User Presets in the System category, but instead, create a separate folder.

C Preset Editor		- • ×
System         Application Specific         Audio         CD/VD0         Distribution formats         DV         Fast DVD VOB         Handheld         HD         Image Sequence         Mobile         Storage         Storage         Storage         Storage         Storage         Odde         Web         PEG         OutckTime         RealMedia         Tumbnalis         VC1         WindowsMedia	F4V 1296kbps 640x480 4x3 24fps         F4V 1296kbps 640x480 4x3 24fps         F4V 1296kbps 640x480 4x3 25fps         F4V 1238kbps 852x480 16x6 24fps         F4V 1328kbps 852x480 16x6 24fps         F4V 15128kbps 852x480 16x6 24fps         F4V 1618kbps 128kbr20 16x6 24fps         F4V 1618kbps 128kbr20 16x6 24fps         F4V 1618kbps 320x200 4x3 24fps         F4V 4180kbps 320x201 4x3 24fps         F4V 4180kbps 320x201 4x3 24fps         F4V 4180kbps 320x201 16x3 23fps         F4V 4180kbps 512x384 4x3 24fps         F4V 780kbps 512x384 4x3 23 7fps         F4V 780kbp 512x384 4x3 23 7fps         F4V 780kbp 512x384 4x3 23 7fps         F4V 898kbps 640x521 16x3 23 7fps         F4V 488kbps 20kx240 4x3 24fps         Peeter         Preset Description         (A9E83	View Preset

#### **Category List**

On the left side you can see the list of preset categories. When you save a new preset, you can choose a category to save it under, so that it's easier to find in the future, and you can group it with other, similar presets. Categories can be stored in a hierarchy, so you can have a top level category called 'Flash' and then create two sub-categories under that called 'Flash 8–Streaming' and 'Flash 8–Download' that contain presets to create Flash-8 output files optimized for streaming and downloading, respectively.

#### Preset List

When you select a category, the top right shows the list of presets stored under the selected category.

#### Preset List buttons

The four buttons in the Preset Editor window that pertain to managing individual presets provide the following functions:

- Refresh. Sometimes changes that have been made to presets aren't immediately displayed, select this button to refresh the display and display the changes.
- Copy. Copy the selected preset, naming it "Copy of NAME". This is very useful when creating a lot of presets that differ in only one or two parameters, you can create the first preset and then copy it multiple times, modifying the copies quickly for those few parameters that are different.
- Delete. If a User Preset is selected, this button will be enabled and allow you to
  permanently delete the selected preset. If you want the preset back some time in the
  future, you will have to completely recreate it. Be careful with this option, once a preset is
  deleted it cannot be undeleted, only recreated.
- Edit Preset. Allows the editing of an existing User Preset, or allows you to open a System Preset or Factory Default Preset, edit it, and save the result as a new User Preset. If you edit a System Preset or a Factory Default Preset, and you change any parameters, then you cannot save the preset with the same name as the original, since you cannot change or

overwrite System Presets or Factory Default Presets. You can, however, save the modified preset under a different name, which will create a new User Preset. See *Editing Individual Preset Parameters* on page 91 for details on editing presets and changing settings.

#### **Preset Description**

When you select an individual preset you can see the preset details, including the description, at the bottom right of the window. If you have selected a User Preset, you can change the Name of the preset, the Category under which the preset is saved, and the Description of the preset.

The Globally Unique Identifier (GUID) of the preset is useful when creating API jobs.

#### **Preset Description Buttons**

The two buttons in the Preset Editor that pertain to the editing of preset details provide the following functions:

- Save. If you make any changes to the Name, Category, or Description of a preset, select Save to accept the changes. Your changes may not always be reflected immediately, you may have to select **Refresh** and wait while Carbon Admin and the Nexus background service exchange details about the updated preset.
- Cancel. Reject the changes you've made in the Name, Category, or Description fields.

#### **Editing Individual Preset Parameters**

When you have selected an individual preset of any type and selected **Edit Preset**, the **Preset Setup** dialog box will open.

	*	Start Time (Seconds)	0	
- Base Name		Duration (Seconds)	0	
Path		Stream-Basic		
		Multiplexer Type	MPEG-4 System	
Target File Splitting		Use streaming mode	True	
Choose Splitting Method	=	Device Compatibility	No particular Device	
···· Interval Time for Splitting (Minutes)		Video-Basic		
Start Time (Seconde)		Use Video	Use if Exist	
Duration (Seconds)		Width	320	
- Stream-Basic		Height	240	
Multiplexer Type		Aspect Ratio	Video: [4 : 3], Pixel: [1 : 1]	
Use streaming mode		Frame Rate(fps)	29.970001	
- Video		Interlacing	Non-Interlaced	
Basic		Bitrate	1	
···· Use Video		Video Bitrate Mode	CBR	
Width		Number of passes	1 pass	
- Aspect Ratio		Video Bitrate(kbps)	400	
···· Frame Rate(fps)		Maximum bitrate [kbps]	8000	
Interlacing		VBV Buffer Size [bytes]	0	
Bitrate		H.264 Encoder Settings-Basic	1	
		Profile	High	
Video Bitrate(kbps)		Level	3.0	
···· Maximum bitrate [kbps]		Enable Scene Change detection	True	
→ VBV Buffer Size [bytes] → H.264 Encoder Settings-Basic → Profile		Width The horizontal size of the video, in pixe	els.	
Level	*		Save As Save	Canaal

All the parameters that can be changed for this preset are listed on the left in a hierarchical tree listing, and on the right in a list. You can either navigate the tree and select a parameter, or you can scroll down the list to find the same parameter, there is no difference between the two displays in terms of functionality.

The parameters can include codec settings (such as bit rate), file handling settings (such as how to name target files), and other settings (such as whether to split a target file into segments).

The current value of the parameter in this preset is shown on the right side of this list. When you select an individual parameter, explanatory text for that specific parameter will appear in the preset help text area below the list to assist you in choosing an appropriate value for the parameter.

Note that the type and number of parameters you can change depends on the codec, device, and file format selected. For example, the preset selected in the H.264 System Preset has almost 60 available parameters. There may be many other presets that do not offer the same variety and choice of parameters, such as the Factory Default preset in the second image, which offers only 18 parameters.

In many cases, the specific codec only supports a few parameters. In the case of presets that target specific hardware, such as video playout servers or handheld devices, there may be limitations on frame size, bit rate, etc.

#### Managing and Backing Up Preset Files

As discussed earlier (4.2.5.3 User Presets on page 89), User Presets are usually stored in the c:\Documents and Settings\All Users\Application Data\Rhozet\Carbon Coder\User Presets folder on Windows XP or Windows Server 2003. There is an equivalent folder on Windows Vista, but that name can vary per installation so you may need to search for the folder name "User Presets" to see where Vista placed it.

Preset files in that folder are XML files, with names like "fdst\_H\_264 (\_mp4) 400x300 30fps.cpf". The latter part of the file name will reflect the name you gave to the preset, with some characters replaced by underscore characters (for example, "H.264 (.mp4)" becomes "H\_264 (\_mp4)").

Preset files can be backed up by copying all files with the ".cpf" file extension to a backup folder.

# 4.2.6 Watch Folder Management

A Watch Folder is defined as a folder on a Windows system that automatically converts source video files that have been dropped into it, to different types of video output files. Any video source files written or dropped into this "Input" folder are converted (transcoded) to the one or more types of output files. The format of the output files is specified by the end user when the Watch Folder is created.

#### 4.2.6.1 How Watch Folders Work

A Watch Folder consists of three parts:

- A folder on a Windows system that is designated as the Watch Folder Input Folder when the Watch Folder is created.
- A Windows operating system service installed when Carbon Server is installed ("Nexus") that continually monitors the Watch Folder's Input Folder for new files.
- The output file formats and other settings and configuration information entered by the user when the Watch Folder is created.

#### Input folder for Watch Folders

When a Watch Folder is created, one of the things the user must do is designate an Input Folder. This is a normal folder on a Windows system, and once the Watch Folder has been created and is active, this folder will be monitored for the presence of new files. When a new file is created in this folder, the Windows operating system and the component of Carbon Server called the "Nexus" background service will work together to transcode this source file. Carbon Server will transcode the source file into the various output file formats also specified at the time the Watch Folder is created.

#### The Nexus Background Service

When Carbon Server is installed on a Windows system, a part of Carbon Server called "Nexus" is installed as a Windows service. The Nexus background service runs continuously and handles API jobs, maintains the various queues of transcoding jobs, and also monitors Watch Folders.

When a file is created inside a Watch Folder's input folder, the Nexus Service is notified by the Windows operating system that a new file has been detected. Nexus checks to make sure that the format of that source file is supported by Carbon Server, and then creates one or more new Windows Processes that handle the actual transcoding of the source file into one or more different output files.

**NOTE:** When using the Windows Task Manager application, the Nexus process can be found by looking for a process named "PNXSERVR.exe". The processes that create and transcode are named "PNXKERNL.exe."

#### Watch Folder configuration

Creating a Watch Folder requires the user to specify which kinds of output files should be created once a source file has been found in the input folder. This can include the kinds of file formats the output files should have, the compression type or encoder (sometimes known as "codec") to use, how large the frame should be, how many frames per second the output file should display, etc.

There are also many options for where and how to deliver the output files, as well as options for what kinds of other actions to take when output files are ready.

Step-by-step instructions for creating a simple Watch Folder have been given in the Quick Start part of this document, in the *4.1.1 Setting Up a Watch Folder* on page 72 section. The next section, *4.2.7 Watch Folder Setup Properties*, will discuss all of the individual settings that can be applied to a Watch Folder, and show how to configure complex Watch Folders.

# 4.2.7 Watch Folder Setup Properties

When either the **Add Watch** or **Edit Watch** button is selected on the **Watch Folders** tab, the Watch Folder Setup dialog box appears. The sections below describe the **general** parameters that can be entered or modified for Watch Folders.

#### 4.2.7.1 Name

This is the name of the Watch Folder, which helps you manage your Watch Folders. As an example, you could use the names of projects or customers as the names of your Watch Folders.

#### 4.2.7.2 Watch Folder

This is the location of the Watch Folder. You can choose any local or remote folder location. If choosing a remote location, make sure that the Nexus process has the required permissions to access that remote location.

#### 4.2.7.3 If Target File Exists

This allows you to either overwrite an existing file or to rename to a new file name if one already exists with your target name.

# 4.2.7.4 Job Priority

Since you can have many Watch Folders operating at the same time, you can set the priority of each. As an example, you may have a news folder that is set to a higher priority than an archive task. A priority 8 job will be executed before a priority 3 job if they both arrive at the same time.

## 4.2.7.5 Leading/Trailing Clips

If you would like to have a video "stitched" to the beginning or end of each file that is transcoded, then you would select that option in video these settings. The leading and trailing clips do not have to match the source or target settings—they will be automatically converted to the appropriate target format. Leading and trailing clips are often used for automatic advertising insertion.

## 4.2.7.6 Watch Folder Setup Advanced Settings

If the Watch Folder contains sub folders, checking this option will look in those sub folders for source files and transcode them the same way as source files in the Watch Folder itself.

### Watch Sub Folders

For example, if the Watch Folder "c:\MyWatchInput\" contains a sub folder "\FromEditor2\", then any source files dropped into the "c:\MyWatchInput\FromEditor2\" folder will be processed just like source files dropped into the "c:\MyWatchInput\" folder.

If this option is unchecked, then the source files dropped into the "c:\MyWatchInput\FromEditor2\" folder will never be processed nor removed, but just remain in that folder until manually removed.

## Append Source Sub Folder to Target Path

This option is only meaningful if 'Watch Sub Folders' is checked. If this option is checked, and the Watch Folder contains sub folders, then target files created from source files dropped into a sub folder will be created in an identically-named sub folder inside the target folder.

For example, if the Watch Folder "c:\MyWatchInput\" contains a sub folder "\FromEditor2\", and the target folder is "c:\MyWatchOutput\", then any source files dropped into the "c:\MyWatchInput\FromEditor2\" folder will be processed and create target files in a new folder "c:\MyWatchOutput\FromEditor2\". If this option is unchecked, and the 'Watch Sub Folders' option is checked, then the source files dropped into the "c:\MyWatchInput\FromEditor2\" folder will be processed and create target files in the "c:\MyWatchInput\FromEditor2\" folder will be processed and create target files in the "c:\MyWatchOutput\FromEditor2\" folder.

If this option is unchecked, then the source files dropped into the "c:\MyWatchInput\FromEditor2\" folder will never be processed nor removed, but just remain in that folder until manually removed.

## Create One Job for Each Target

If a Watch Folder is configured to create multiple target files from each source file, then checking this option will create a separate transcoding job for every target file.

For example, if a Watch Folder is configured to create an H.264 target and an MXF output, then two transcoding jobs will be visible in the **Active Jobs** tab every time a source file is dropped into the Watch Folder.

If this option is unchecked, then one job will be created, and that one job will create both target files. This can be faster because the source file only needs to be transcoded once, but the job will take more memory, and may sometimes exceed the memory limitations of the

operating system and thus actually slowing down the job. In addition, if it takes much less time to create one target than the other, then the processor will not be used optimally while Carbon Server is working to finish the slower target.

#### **Delete Local Source After Conversion**

If this option is checked, any local source files dropped into the Watch Folder will be deleted after they have been successfully transcoded. They will not be deleted if the transcoding failed and generated an error.

#### Delete Source File Shortcut Links to

If this option is checked, any shortcuts to the deleted source file are also deleted.

#### Accept Folders as Assets

This feature will allow you to use Carbon Server to automate other, third-party processes using notifiers (see 4.2.9 Creating Source Notifiers on page 97). If this option is checked, and a folder is dropped into the Watch Folder, then Carbon Server will not attempt to transcode the contents of the folder, but will pass the folder name to any notifiers attached to the Watch Folder.

For example, this function could be used to pass the name of the folder that contains transcoded target files to a Command Line notifier (see *4.2.10.3 Command Line Notifier* on page 98). The command line can then launch a third-party process that encrypts or adds DRM to all the files in the folder.

If this option is unchecked, and a folder is dropped into the Watch Folder, Carbon Server will attempt to transcode source files contained in the folder only if the Watch Sub Folders option is checked (see *Watch Sub Folders* on page 94).

#### **Retrieve Sources to Agent Machines**

For Carbon Server systems, checking this option will allow individual Carbon Agent machines to retrieve source files over FTP or from network storage systems themselves. If this is unchecked, Carbon Agent machines have to wait for the Carbon Server machine to retrieve the source files over FTP and store them on the local storage of the Carbon Server machine. Carbon Server will then send the transcoding job to the Carbon Agent machines, and the Carbon Agents will then have to retrieve the source files from the local storage of the Carbon Server machine.

#### **Enable Segmented Grid Transcoding**

For Carbon Server systems, checking this will allow source files to be split into segments and have each segment be processed by a different Carbon Agent machine. The **Maximum Segments** value determines into how many segments the source file can be split, don't make this too high for smaller source files, since the overhead of splitting the source file and stitching the target segments back together may negate the segmenting advantage.



**NOTE:** Even if this option is checked, it will only work for some types of target files and under some circumstances.

# 4.2.8 Audio and Video Source Filters

Audio and video filters can be applied to a source file before it is transcoded into the various target file formats. See the lists below for the available audio and video filters. These filters can be found under the Source Folders category in the tree on the left.

If a filter is added as a source filter, then all output will have that effect applied. For example, if a crop is applied to the source via the Relative Crop filter, then all targets will have the same cropping applied. If you wanted to crop only one of your targets, then you would apply the Relative Crop filter as a target filter.

If you would like to use settings, other than the default for each filter, then you need to edit the preset and save a new preset with its own name. You can create your own categories for presets. After choosing a new preset, you will need to select "Update" to update your Watch Folder with the new settings.

# 4.2.8.1 Audio Filters

- Channel Mixer
- DVD to PC Converter
- Dynamic Range Compressor
- Fade In/Out
- Lowpass
- Normalize
- Normalize—ITU 1770
- Parametric 5.1 to Stereo Converter
- Track Offset
- Volume

# 4.2.8.2 Video Filters

- 601 Correction—Expand Color Space
- 601 Correction—Shrink Color Space
- 601 to 709 Color Correction
- 709 to 601 Color Correction
- Adaptive De-Interlace
- Bitmap Keying
- Black/White Correction
- Blur
- Broadcast Color Safe
- Caption 608 to 708 conversion
- Caption convert 708 to Ancillary
- Caption convert Ancillary to 708
- Caption Inject From .SCC File
- Circular Blur
- Color Correction
- Deblocking Filter
- DVD Subtitle/608 CC1 Imprint
- Fade In/Out
- Flexible-to-fixed frame rate conversion

- Gamma Correction
- Gaussian Blur
- Line 21 Extraction
- Line 21 Modulator
- Map Alpha to Target Y channel
- Median
- Motion Compensated Temporal Filter
- Pulldown
- Relative Crop
- Rotate
- Sharpen
- STL Caption Burn-in
- Teletext Data Extraction
- Teletext Data Modulator
- Teletext inject from STL file
- Teletext Subtitle Captioner
- Temporal Noise Reducer
- Timecode Display
- Timecode Extraction—VITC
- Timecode Insertion—VITC
- Timecode Processing
- VBI Import from SMPTE 436M
- VBI Mapper
- V-Chip
- Video Inverse Telecine Filter
- Video Metadata Inject
- Video Source Properties
- Video Timecode Inject
- XML Titler
- XYZ to RGB video filter

# 4.2.9 Creating Source Notifiers

A Source Notifier lets you know when a source file starts or finishes transcoding, of if an error occurs during transcoding.

Source Notifiers cause Carbon Server to execute a notification (send an email message, post a Web Service URL, or execute a Windows command line) whenever a job event (job starts, job finishes, or job encounters an error) occurs.

# 4.2.10 String Replacement Tokens

You can use the following string replacement tokens in notifications:

- %jobguid%. Unique GUID for this task
- %jobname%. Unique name for this task
- %source%. Full source path and name

- %destinationname%. Result destination file name (only valid in completion notifications)
- **%errormessage**%. Error message (only valid in error notifications)

## 4.2.10.1 Email Notifier

An Email Notifier can be used to send emails on job start, completion, or error. You can use string replacement tokens in your email subject and body.

- **Recipient**. To whom the email should be sent, this is a normal email address.
- **Subject**. Subject line of the email.
- **Body**. Body text of the email.

Example: The file %source% has generated error message %errormessage%

## 4.2.10.2 Web Notifier

A Web Service Notifier can be used to trigger external web services on job start, completion, or error. You can use string replacement tokens in your web service call.

• Web Service URL. The URL to execute when the job event (start, finish, or error) occurs.

Example: http://myserver.com/script.aspx?Source =%source%

## 4.2.10.3 Command Line Notifier

- Command Line: Command to execute.
- External process shown as new job: Check this option to show the command line as a separate job in the Carbon Admin job queue.

Example: c:\myprog.exe %source%

## 4.2.10.4 On Start

Send a notification when a job is started.

## 4.2.10.5 On Completion

Send a notification when a job is finished.

## 4.2.10.6 On Error

Send a notification when a job encounters an error.

# 4.2.11 Remote File Retrieval

A Watch Folder can actively look for files to transcode on remote storage systems or FTP locations. When a file is detected at this remote location, it will be moved to the local Watch Folder and then transcoded. This is called a "remote retrieval". A remote retrieval is used when the Watch Folder can't transcode directly from the desired location, such as with an FTP site or shared storage that has a different password than the local system.

## 4.2.11.1 File Retrieve: Remote Connection

 Remote Path (UNC). The folder on the remote storage where Carbon Server will look for new files to copy to the local Watch Folder for transcoding. You MUST use a UNC path, you cannot use a mapped drive since Windows processes like the Carbon Server background process Nexus are unable to access mapped drives.

- User (optional). If you need to log in to the remote storage to access the source files, enter the name here.
- Password (optional). If you need to log in to the remote storage to access the source files, enter the password here.

### 4.2.11.2 File Retrieve: Retrieval Settings

- Wildcard. File mask to retrieve. Files that do not match the wildcard will not be retrieved.
- Watch Interval (sec.). Interval in seconds between checking the remote location for new files.
- Minimum File Size (KB). Minimum file size in Kilo-bytes. Files smaller than this will not be retrieved.
- Delete Source Upon Completion. Whether to delete the file from the remote location once it has been retrieved.
- Watch Sub Folders. If the Watch Folder contains sub folders, checking this option will look in those sub folders for source files and transcode them the same way as source files in the Watch Folder itself.
- Propagate Sub Folders. This option is only meaningful if 'Watch Sub Folders' is checked. If this option is checked, and the Watch Folder contains subfolders, then target files created from source files dropped into a subfolder will be created in an identically named subfolder inside the target folder.
- Retrieve Sources to Agent. Only useful in a Carbon Server transcoding network. Checking
  this option will cause Carbon Agent machines to retrieve the source file directly, without
  Carbon Server having to retrieve the file first and then pass it to Carbon Agent. This can
  significantly improve transcoding and file transfer speeds.

### 4.2.11.3 FTP Retrieve: Server Connection

- Current Server. Server name to connect to.
- Server Status. Display whether Carbon Admin is currently connected to the FTP server.
- **Current Folder**. The folder on the FTP server that is currently being browsed. Choose **Select** to browse into this folder.

## 4.2.11.4 FTP Retrieve: Retrieval Settings

- Selected Folder. The folder on the FTP to retrieve files from.
- Wildcard. File mask to retrieve. Files that do not match the wildcard will not be retrieved.
- Watch Interval (sec.). Interval in seconds between checking the remote location for new files.
- Minimum File Size (KB). Minimum file size in kilobytes. Files smaller than this will not be retrieved.
- Delete Source Upon Completion. Whether to delete the file from the remote location once it has been retrieved.
- Watch Sub Folders. If the Watch Folder contains subfolders, checking this option will look in those subfolders for source files and transcode them the same way as source files in the Watch Folder itself.
- Propagate Sub Folders. This option is only meaningful if Watch Sub Folders is checked. If this option is checked, and the Watch Folder contains subfolders, then target files created from source files dropped into a subfolder will be created in an identically named subfolder inside the target folder.

Retrieve Sources to Agent. Only useful in a Carbon Server transcoding network. Checking
this option will cause Carbon Agent machines to retrieve the source file directly, without
Carbon Server having to retrieve the file first and then pass it to Carbon Agent. This can
significantly improve transcoding and file transfer speeds.

# 4.2.12 Target File

- Preset Category. Presets are divided into categories for easier selection.
- Select Preset. Select the preset to use for this target.
- **Target Folder**. The folder to write the target file to.
- **Target File Name**. The name to give the target file. Make sure to always at least include %s which represents the source file name.
- **Delete Local Target File after Delivery**. Whether to delete the file from the local Target Folder once the file has been delivered using either the File Delivery or FTP delivery.

# 4.2.12.1 Target File: Filters

See 4.2.8.1 Audio Filters on page 96 and 4.2.8.2 Video Filters on page 96 for a list of filters that can be applied to audio and video source files.

# 4.2.12.2 Target File: Notifiers

When notifiers are added to a Watch Folder, those notifiers will be activated either the moment a source file is dropped in the Watch Folder, or when any one of the targets creates an error, or when all the targets from the Watch Folder have been created. Just like it is possible to add notifiers to the Watch Folder, it is also possible to add notifiers to individual targets. This way, the notifiers will be activated when the individual target is started, creates an error, or is finished.

See 4.2.9 Creating Source Notifiers on page 97Notifiers for more information on the kinds of notifiers that can be attached to this specific target.

# 4.2.12.3 Target File: Delivery—File Delivery

- Delivery Path (UNC). The folder on the remote storage where this target files will be written. You MUST use a UNC path, you cannot use a mapped drive since Windows processes like the background transcoding process Nexus are unable to access mapped drives.
- User (optional). If you need to log in to the remote storage to access the target folder, enter the name here.
- Password (optional). If you need to log in to the remote storage to access the target folder, enter the password here.

# 4.2.12.4 Target File: Delivery—FTP Delivery

- Current Server. Server name to connect to.
- Server Status. Display whether Carbon Admin is currently connected to the FTP server.
- Current Folder. The folder on the FTP server that is currently being browsed. Select it to browse into this folder.
- Selected Folder. The folder on the FTP to write target files to.

# 4.2.13 Kernel Settings Configuration

The **Tools** > **Kernel Settings** menu in Carbon Admin is where less-frequently used configuration parameters for Carbon Server can be found. A number of these parameters can be used to fine-tune and debug Carbon Server machines or Carbon Server systems.

Some parameters can be changed and activated immediately (such as the **Transcoding Slots** parameter). For others, once the parameter has been changed, the Carbon Server Nexus Service needs to be restarted before the change is applied. These parameters have an asterisk (\*) appended to them. Help text at the bottom of the dialog box may mention "Requires machine restart."

() ()	Kernel Settings		×
⊡	Rendering		*
	Transcoding Slots	2	=
	Machine Priority	5	
⊡	Network		
	Use DNS to look up machine names	False	
	Bind to IP Address*		
	FTP Max Upload Sessions	5	
	FTP Max Download Sessions	5	
	Maximum FTP Send Bandwidth (Kbp	0	
	Maximum FTP Receive Bandwidth (K	0	
	Local Rendering only	0	
	Minimum Disk Space For Job Proces	0	Ŧ
Transcoding Slots Set the number of simultaneous transcodes this machine will perform. A good rule of thumb is to set this to half the number of processor cores on the mach			
		OK Cancel	

## 4.2.13.1 Configuration Parameter Categories

#### Table 4–3: Rendering Category

Parameter	Description
Transcoding Slots	Set the number of simultaneous transcodes this machine will perform. A good rule of thumb is to set this to half the number of processor cores on the machine. Setting this to 0 disables transcoding on this machine
Machine Priority	Jobs will be assigned first to those machines in a transcoding network that have the highest priority (10), lower priorities later.

#### Table 4–4: Network Category

Parameter	Description
Use DNS to lookup machine names	Enable this to have IP addresses resolved to machine names using DNS, for the UI and log files. Disable it when there is no DNS server on the network or to improve performance.
Bind to IP Address*	Force Carbon Server to communicate only using a specific IP address, specified as xxx.xxx.xxx . Leave this blank except on multi-homed systems. Requires machine restart.

### Table 4–4: Network Category

Parameter	Description
FTP Max Upload Sessions	Set the maximum number of simultaneous post-transcoding FTP uploads (deliveries) this machine will perform.
FTP Max Download Sessions	Set the maximum number of simultaneous pre-transcoding FTP downloads (retrievals) this machine will perform.
Maximum FTP Send Bandwidth (kbps)	Set this value to limit the total bandwidth in Kilo bits per second that all concurrent FTP sessions can use when sending output files that have been transcoded. Leave this value set to zero (0) to allow unlimited bandwidth use during sending. Note that unlimited bandwidth use may slow down the system to the point where no other network communications are possible, and may stall or crash system processes.
Maximum FTP Receive Bandwidth (kbps)	Set this value to limit the total bandwidth in Kilo bits per second that all concurrent FTP sessions can use when retrieving input files that will be transcoded. Leave this value set to zero (0) to allow unlimited bandwidth use during sending. Note that unlimited bandwidth use may slow down the system to the point where no other network communications are possible, and may stall or crash system processes.
Local Rendering only	Set this to '1' (default is 'local and remote' = '0') to do transcoding only on the local machine, instead of also accepting transcoding jobs from other Carbon Server machines.
Maximum Disk Space For Job Processing	The minimum disk space (in MegaBytes) required on the local machine for an FTP retrieval to commence.

# Table 4–5: Job Queue Category

Parameter	Description
Max completed jobs	Number of completed jobs kept in the queue if Manage-Job-Queue is enabled.
Max failed jobs	Number of failed jobs kept in the queue if Manage-Job-Queue is enabled.
Retry Delay for failed Jobs	Number of seconds to wait before a failed job is automatically resubmitted to the queue. Setting this to zero (default) never automatically resubmits a failed job.

### Table 4–6: Email Server Category

Parameter	Description
SMTP Server	Specify the SMTP Server to use for outgoing emails.
SMTP User	Specify the SMTP User account for outgoing emails.

### Table 4–6: Email Server Category

Parameter	Description
SMTP Password	Specify the password for the SMPTP User account specified above.
SMTP Sender	Specify the email address of the sender for outgoing emails.

### Table 4–7: Machine Render Properties Category

Parameter	Description
Machine Tags	Enter a list of strings separated by semi-colons (';'). Each string (tag) can be chosen by the end user and is used to designate this machine as possessing a specific property. When creating a Watch Folder (or submitting a transcoding job using the API), it is possible to add a tag to that Watch Folder. This signifies that jobs created by that Watch Folder will also have that tag, and be executed only on machines that have the same tag listed in this field. This is useful if there are many Carbon Server machines in a transcoding network, but only a few have a special codec or piece of hardware installed (often for licensing- or budgetary reasons). If, for example, there are 10 machines on a transcoding network, all with 2 processor cores and 2GB of memory, except for 2 of those machines that have 8 cores and 8GB of memory each, the tag HI_PERFORMANCE could be entered in this field on those two machines. If a Watch Folder has that same tag, source files dropped in that Watch Folder will then be sent only to those fast machines, and in theory will be processed much faster than other jobs. Note that jobs that do not have a tag can be executed on any machine, it is only jobs with tags that are sent to specific machines.
Pre-load Kernel in Memory	Set this to '0' (default is 'pre-load' = '1') to load the transcoding kernel only when transcoding jobs start. Enabling pre-load reduces the start-up delay of transcoding jobs, and reduces free memory by around $80MB$ .
Kernel Preset Enumeration	Set this to '0' (default is 'enumerate' = '1') when configuring the system for exclusive API use and new presets will not need to be created. WARNING: Disable this only for purely API-based use of Carbon Server. When disabled, no user interface interaction with presets is possible.

Table 4–8: Watch	Settings	Category
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Parameter	Description
Watch Folder Retry Time (ms)	When a source file is dropped into a Watch Folder, this setting determines how many milliseconds to wait before checking if the source file size is changing (for example, because the file is still being written by the OS or an FTP upload). If the file size has changed between checks, will check again, and continue doing so until the file size is the same for two consecutive checks. If this is set to zero, Carbon Server may immediately begin transcoding source files when dropped in a Watch Folder, regardless of whether they are finished being written. This can cause the transcode operation to fail.
Minimum Source File Size (bytes)	When a source file is dropped into a Watch Folder, it will be transcoded if it is this size in bytes or larger. Smaller files will be ignored, this can be useful for video source files that come with unneeded metadata files, for example.
Ignore FS Modifier	Set this to '1' (default is 'do not ignore' = '0') to ignore File System messages from the Windows OS. Some playout server file system drivers or network storage drivers may not completely or correctly implement those messages, so setting this field may resolve issues with jobs staying in the Preparing stage for a long time (tens of minutes). Setting this field disables Carbon Server's normal detailed file status analysis, so should therefore be used with caution.
Don't Resolve to UNC	Carbon Server normally automatically converts a directory name such as c:\Input on the machine STORAGE01 into the UNC path \\STORAGE1\C\$\Input, so that other machines can access the same file when needed (for example, when decoding a source file). Set this field to disable that mechanism, and leave directory names as they are. This can be necessary in the case of a SAN for example, where every machine on the transcoding network has a SAN driver with the drive letter X: installed for example. In this case, all file names such as X:\DropHere\Sourcefile.mpg will be passed verbatim to other machines. Use this with caution; if not all machines have this drive letter and the drive letter does not point to the exact same network storage for all machines, subtle and difficult to diagnose errors may occur.

# Table 4–9: Storage Locations Category

Parameter	Description
Media Submission Path*	DirectDrop exporters write media to this directory. This location must be accessible throughout your network, must allow fast writing and must have plenty of free space available. Requires machine restart.
Reference Files Data Storage*	The location for the data portion of submitted reference files. Requires machine restart.

## Table 4–10: Farm DIRECTDROP Category

Parameter	Description
Subscribed Farm Manager	Enter a server name or IP address. Carbon Server will assume this machine exists and use it for DirectDrops etc.

## Table 4–11: XML Job Submission Category

Parameter	Description
XML Watch Folder*	It is possible to execute API jobs by dropping XML files in the directory entered in this field. Requires machine restart. (See the <i>Harmonic Carbon API Manual</i> for XML file specifications; installation installs everything necessary to use the API.)

## Table 4–12: Logging Category

Parameter	Description
Log Jobs to Event Log	Setting this will log Jobs into the Windows Applications Event Log.
Write Engine Log File	Setting this causes Carbon Server to write a general log file, which contains general information for each transcoding job executed.
Log File Path*	The general log file is written to this directory. Requires machine restart.
Log File Retention (days)	A new log file is created at midnight every day. This field determined how many days back to keep the old log files, for example, setting this to 5 leaves today's file and the files from the preceding 4 days intact but removes log files any older than that. Setting this field to zero (default) leaves all log files in place an never removes any.

# Table 4–13: Logging – XML File Category

Parameter	Description
Write XML Log File to File Share*	Setting this causes Carbon Server to write a general log file in XML format. Requires machine restart.
File Path for XML Files*	The general XML-format log file is written to this directory. Requires machine restart.

## Table 4–14: Status - XML File (FTP) Category

Parameter	Description
Write XML Log File to FTP Server*	Setting this causes Carbon Server to write a general log file in XML format to an FTP server. Requires machine restart.
FTP Site*	Enter IP address or server name. Requires machine restart.
FTP Port*	Enter Port# to use. Requires machine restart.
FTP User*	Enter User Name. Requires machine restart.
FTP Password*	Enter Password. Requires machine restart.
Remote Path*	Enter Remote Path. Requires machine restart.

### Table 4–15: Status Timeouts Category

Parameter	Description
Timeout Preparing Status (s)	Number of seconds a transcoding job allowed to be in the Preparing status before it times out and is considered as having failed.
Timeout Preparing Status - Agent (s)	Number of seconds a transcoding job allowed to be in the Preparing status before it times out and is considered as having failed. This field applies to Carbon Agent machines only, very long timeouts must be tolerated for these machines because very large source files could still be in the process of being written.
Timeout Starting Status (s)	Number of seconds a transcoding job allowed to be in the Starting, Paused, or Reading status before it times out and is considered as having failed.
Timeout Stopping Status (s)	Number of seconds a transcoding job allowed to be in the Stopping status before it times out and is considered as having failed. Note that Stopping can take a relatively long time some exporters index files, re-multiplex, etc. during the Stopping phase. A very high value is recommended, at least twice the time it would take to read/write the typical output files to/from disk.
Timeout Started Status (s)	Number of seconds a transcoding job allowed to be in the Started status before it times out and is considered as having failed. This is the longest total time a job is considered valid without having received status updates.

## Table 4–15: Status Timeouts Category continued

Parameter	Description
Transcoding Inactivity (s)	Number of seconds a job is allowed to have no transcoding progress before it times out and is considered as having failed. Note that the default is 30 minutes, this should be changed without careful consideration. Many output formats have processes that do not involve any transcoding progress at all, such as de-multiplexing source files or writing temporary output files, and those jobs would fail if this timeout limit is set too low.
Pipeline Inactivity (s)	Number of seconds the transcoding pipeline will wait (for example, to receive newly decoded video samples) before it times out and the job is considered as having failed.

# Table 4–16: User Interface Category

Parameter	Description
Alternate H.264 Encoder	If alternate, third part H.264 encoders (not installed with this transcoder) are installed on this system, enable this to expose a text field in the H.264 target that allows you to set parameters specific to the selected H.264 encoder. Those parameters are encoder-specific and the encoder may not be passed all the parameters set in this transcoder's user interface or presets.
Use COM Messaging*	If the service user is a dedicated user and the desktop user is different from the service user, updating the GUI with status changes may fail. Use a special communication through a COM interface by enabling this option. Requires machine restart.

### Table 4–17: Debug – Network – Autodetect Category

Parameter	Description
Broadcast Server IP	Disable this to prevent Carbon Agent and ProMedia Carbon machines from finding this Carbon Server machine. The Server will still see the Agents.
Broadcast Agent IP	Disable this to prevent Carbon Server machines from finding this Carbon Agent machine. The Agent will still see the Server.
Broadcast Client IP	Disable this to prevent Carbon Server machines from finding this ProMedia Carbon machine. The Coder will still see the Server.

# Table 4–18: Debug - Network - Ports Category

Port	Description
Nexus Service Port*	Main listening port of the Nexus background transcoding service for all external connections. Requires machine restart.
Nexus Admin Port*	Internal Nexus to Nexus and component communication port. Requires machine restart.

# Table 4–19: Debug – Logging Category

Parameter	Description
Log Watches	Setting this causes Carbon Server to write a Watch Folder log file, which contains processing information about source files dropped in Watch Folders and jobs created by Watch Folders. NOTE: Use only for debugging and support.
Log Remote Retrieval Watches	Enable this to write a remote retrieval watch log file containing processing information about FTP and LAN retrievals attached to the Watch Folders. NOTE: Use only for debugging and support.
# Chapter 5 Configuring Carbon Server

By using Carbon Server, an organization can easily scale the number of machines being used for transcoding without changes to the basic workflow. Carbon Server allows a network of transcoding machines to "look" like a single transcoding machine. The Carbon Server application manages the following items:

- Job distribution
- Job prioritization
- Load balancing
- Failover protection
- FTP transfer management
- Status monitoring
- Job notification

# 5.1 Carbon Server Setup

A simple Carbon Server setup would look something like this:



In this case a single Carbon Server is controlling a number of Carbon Agents. A Carbon Agent is the "slave" transcoding process that runs under the "master" of Carbon Server. The Carbon Agent is a version of the ProMedia<sup>™</sup> Carbon application that runs without a user interface. The Carbon Server application can also perform local transcoding. Therefore a configuration of one Carbon Server and 4 Carbon Agents would provide five times the transcoding throughput of a single ProMedia Carbon machine.

Carbon Server is designed to scale from a single user to an entire enterprise. The server software automatically recognizes new Carbon Agent "nodes" and adds them to the transcoding network. If a Carbon Agent fails to transcode a job, that job is automatically routed to another Carbon Agent.

The distributed transcoding network managed by Carbon Server can access shared storage on the network or remote storage via FTP. As an example, Carbon Server can be set to watch an FTP location on a catch server, then automatically transcode arriving material into an editing format. The transcoded video can then be automatically transferred to an editing station.

## 5.1.1 Carbon Server Tools

You can manage your Carbon Server transcoding network, using Carbon Admin, the desktop tools, the optional Web user interface, and the API, as described in the following sections.

#### 5.1.1.1 Carbon Admin

The Carbon Admin application allows you to see all the jobs that are currently queued for transcoding. You can see the parameters for each job, including priorities and targets. It also allows you to manage transcoding nodes within the system. For example, you can individually set the number of simultaneous transcodes that you want each node in the network to work on. You can also activate or reset specific nodes in the system. In addition, Carbon Server Admin allows you to set up specific Watch Folders on your network. A Watch Folder has a number of parameters including source file location, location to write the target file, preset, etc. A Watch Folder can also be used to get data from a specific FTP server or to send a transcoded target file out to an FTP server. Watch folders can also have instructions regarding what to do with source files once transcoded. For example, whether they should be deleted or left in place. See *4.2.6 Watch Folder Management* on page 92 for more details.

#### 5.1.1.2 ProMedia Carbon

The Carbon Server installation process also installs the ProMedia Carbon application on the machine. ProMedia Carbon allows you to create presets for specific transcoding operations. Carbon Server ships with several hundred presets, or you can create your own. A preset includes both the transcoding parameters and any desired video and audio filters. The presets created in ProMedia Carbon are available for setting up Watch Folders.

#### 5.1.1.3 Tagging Agent Machines for Specific Jobs

Carbon Server has the ability to 'tag' certain agents on its render farm to do specific types of jobs. A tag is simply a word you define for a specific task or group of tasks. You may then create a job or Watch Folder that uses only the agents which have a certain tag. See instructions below to set up an agent and Watch Folder to use a 'tag.'

#### Instructions

- 1. Go to the desktop of the agent machine you want to assign a tag to and start the Carbon Admin interface.
- 2. Select Tools > Advanced Kernel Options....

3. In the Machine Tags field enter something like Flash8.

Ξ	Rendering		^
	Transcoding Slots	2	Ε
	Machine Priority	5	
Ξ	Network		
	Use DNS to look up machine names	False	
	Bind to IP Address*		
	FTP Max Upload Sessions	5	
	FTP Max Download Sessions	5	
	Maximum FTP Send Bandwidth (Kbp	0	
	Maximum FTP Receive Bandwidth (K	0	
	Local Rendering only	0	
	Minimum Disk Space For Job Proces	0	Ŧ
Ti Se ru	ranscoding Slots et the number of simultaneous transc lle of thumb is to set this to half the r	codes this machine will perform. A good number of processor cores on the mach OK Cancel	f 1



**NOTE:** You can enter multiple tags for one agent by separating each tag with a ;.

- 4. Select OK.
- 5. Restart the Nexus service.
- 6. Using Carbon Admin, create a new Watch Folder.
- 7. When you add a target to the Watch Folder using Carbon Admin, select the double arrows in the Job **Tags** field, you should see the **Flash8** tag.
- 8. Select **Flash8** and finish adding the target.
- Any transcoding jobs from this Watch Folder that will be converted to this target will now be run only on the machines that have the Flash8 tag assigned to them in the Advanced Kernel Options dialog box.

## 5.1.2 Controlling Carbon Server with the API

In addition to the desktop tools and Web UI, a transcoding network can be controlled directly via an XML-based API provided with the software. Every aspect of the transcoding process can be controlled by the API, including source- and target destinations, transcoding parameters, filtering, compositing, ad insertion, titling, notifications, etc. The same API controls both ProMedia Carbon and Carbon Server, so your work will scale from a single machine to an entire transcoding network.

# 5.2 Considerations for Operating Carbon Server

#### 5.2.1 File and Folder Access

Every Carbon Agent "sees" a job exactly as you submitted it. If you set your Watch Folder to the Carbon Server machine's "c:\incoming" folder and you drop a file "test.avi" into the folder, the job will be passed to the Carbon Agent with instructions something like "take the file in the folder c:\incoming\test.avi and convert it." The "c:" drive on the Carbon Agent machine is different and may not even contain a "c:\incoming" folder, therefore the job will fail. Carbon Server does do translation of local drives to UNC paths, such as converting "c:\incoming\test.avi" to "\\<Managermachine>\c\$\incoming\test.avi," but this may still be a problem in some circumstances, for example, with user access rights.

To avoid this, we suggest avoiding drive letters entirely. If you want to create a drop location in your local machine, create it as "\\<your machine>\<drive>\$\<folder>\." In this case the agents will be able to access the Watch Folder regardless of location. The same issue applies to the target folder of your Watch Folder.

## 5.2.2 Codec and Third-party Component Availability

If you are using codecs or exporters that were not shipped along with your Carbon Server, please make sure they are installed on every Carbon Agent in your farm. Carbon Server distributes user created presets automatically but it cannot re-distribute third-party components such as codecs, etc.

## 5.2.3 Multiple Carbon Servers

Carbon Server can be operated with multiple Carbon Server farm manager machines. In this scenario, each Carbon Agent serves each Carbon Server. When a Carbon Agent has free slots, the first Carbon Server that polls the Carbon Agent will receive access to the Carbon Agent resources. When running multiple Carbon Servers, please consider user right issues: the Carbon Agent is controlled by a Windows Service with a user login and has to serve multiple Managers. The access to all Manager machine administrative shares must be ensured for this user (for preset distribution). This issue is covered in the installation and configuration steps, but pay specific intention in the multiple Carbon Server issues to issues such as account naming and credentials.

## 5.2.4 Failover

Carbon Server has built-in "failover." If a job fails to transcode on a Carbon Agent machine for any reason, the job will be re-assigned to a different Carbon Agent. This will be repeated until all Carbon Agents report failure.

If you use the Carbon Server Admin application to look at the queues of the individual Carbon Agent machines, you will see those errors reported. Since Carbon Server spends a significant amount of time in retrying and reassigning jobs please consider troubleshooting that particular Carbon Agent if the number of errors is high.

## 5.2.5 Logging

To view job status (Job started, failed, completed etc.) as well as certain error conditions, enable logging as follows:

- 1. Launch the Carbon Server Admin application.
- 2. Select **Tools > Kernel Settings** and check the following options:
  - □ Logging: Write Engine Log File
  - Logging: Log File Path (if you want to change the location of the log files)
  - Optionally you can also enable the debug logs (enable the first two only when asked to by Harmonic Support, they will significantly impact transcoding performance):
    - Debug—Logging: Log Watches
    - Debug–Logging: Log Remote Retrieval Watches
- 3. Close the Carbon Server Admin application.
- 4. Restart the Nexus Service to read the logging options.
- 5. Select Start > Control Panel > Administrative Tools > Services.
- 6. Select the Nexus Server (Carbon Server) service, and select **Restart the service** in the top left of the window.

After setting the logging options, Carbon Server will generate log information and write it to the specified file.

#### 5.2.5.1 Error Handling

Error logs are available both through logging in Carbon Server as well as through the NT Event Log. Following are explanations of how to enable logging in Carbon Server, how to enable sending logs to the NT Event Log, and a list of common errors for reference. To see the error list with descriptions, go to *A.2 Error Numbers and Descriptions* on page 119.

#### 5.2.5.2 Enabling Logging

To enable logging, open Carbon Server Admin, select the Tools menu, and then Kernel Settings. Once there, scroll down to Kernel Settings.

#### 5.2.5.3 Log Jobs to Event Log

Setting this to True will log jobs into the Windows Applications Event Log.

#### 5.2.5.4 Write Engine Log File

Setting this to True causes Carbon Server to write a general log file that contains general information for each transcoding job executed.

#### 5.2.5.5 Log File Path

The general log file is written to this directory. Please note that the default directory has been changed from previous versions of Carbon Server and is now c:\Program Files\Common Files\Rhozet\Carbon Coder\Kernel\. Also note that changing this setting requires restarting the system to take effect.

#### 5.2.5.6 Log File Retention (days)

A new log file is created at midnight every day. This field determines how many days back to keep the old log files, for example, setting this to 5 leaves today?s log file and the log files from the preceding 4 days intact but removes log files any older than that. Setting this field to 0 (default) leaves all log files in place and never removes any.

You may additionally enable logging to an XML file.

- Write XML Log File to File Share. Setting this to True causes Carbon Server to write a general log file in XML format. This requires a machine restart to take effect.
- File Path for XML Files. The general XML-format log file is written to this directory. Changing this requires a machine restart to take effect.

By enabling the XML File (FTP) logging you can write an XML log to a remote FTP location. To do this set Write XML Log File to FTP Server to True and enter the appropriate information for the FTP server and path where you would like the XML file stored. For debugging purposes there are 4 additional types of information you can log (described below). It is important to note that enabling these logging options can significantly affect the performance of Carbon Server.

#### 5.2.5.7 Log Watches

Setting this causes Carbon Server to write a Watch Folder log file that contains processing information about source files dropped in Watch Folder and jobs created by Watch Folders.



**NOTE:** This should be used only for debugging and support.

#### 5.2.5.8 Log Remote Retrieval Watches

Setting this causes Carbon Server to write an attached watch log file; this contains processing information about FTP and LAN retrievals attached to Watch Folders.



**NOTE:** This should be used only for debugging and support.

## 5.2.6 Importing the DivX File Extension

The following instructions explain how to give Carbon Server the ability to import the \*.divx file extension.

1. Run regedit.

📨 Run	
	Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
Open:	regedit -
	OK Cancel Browse

- 2. Browse to HKEY\_LOCAL\_MACHINE\Software\Rhozet\Carbon Coder\{477062CF-ABAE-4EE2-9049-6010A7E6B9B9}.
- 3. Add a new string value to this key titled ImportExtensions.
- 4. Right-click the ImportExtensions string and select Modify.
- 5. Change the value of the **ImportExtensions** string to **divx**.
- 6. Close regedit.
- 7. Restart ProMedia Carbon.



**NOTE:** When using a render farm, these instructions will need to be followed individually on each agent machine. The DivX player needs to be installed on all machines that need to process DivX files.

## 5.2.7 Force Import Using MPEG Importer Based on File Extension

The following instructions explain how to give Carbon Server the ability to import nonstandard file extension with the MPEG importer.

1. Run regedit.

📨 Run	
	Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
Open:	regedit -
	OK Cancel Browse

2. Browse to HKEY\_LOCAL\_MACHINE\Software\Rhozet\Carbon Coder\{C8C765E3-B3EB-4AE3-B463-1B5C82E63CBB}.

- 3. Add a new string value to this key titled **ImportExtensions**.
- 4. Right-click the **ImportExtensions** string and select **Modify**.
- 5. Change the value of the **ImportExtensions** string to the file extension that you would like to import. For example, if you want to import a file with extension "\*.encoded", then enter the value **encoded**.
- 6. Close regedit.
- 7. Restart ProMedia Carbon.



**NOTE:** When using a render farm, these instructions will need to be followed individually on each agent machine.

This chapter provides suggested actions that users can take should commonly reported issues occur, and ways to contact Harmonic support:

- A.1 Solving Unexpected Problems
  - □ Includes steps you can take if Carbon Server or Carbon Agent found issues arise.
- A.2 Error Numbers and Descriptions
  - Includes error descriptions to solve issues quickly.
- A.3 Common Video Encoding Problems
  - □ Includes common video encoding problems and how you can avoid or fix them.
- A.4 Contacting Harmonic Support
  - Contact information, including Harmonic's web address, mailing address, and support phone numbers.

# A.1 Solving Unexpected Problems

## A.1.1 Carbon Products are not Working as Expected

If one of the **Carbon Server** or **Carbon Agent** machines does not work as expected, please check the following points:

- DirectX and QuickTime. Verify that DirectX and QuickTime are installed on Carbon Server and Carbon Agent machines.
- USB Security Keys. Verify that each USB security key (dongle) is inserted correctly and in the appropriate machine. The Carbon Server farm manager machine requires the "Carbon Server" USB security key; each Agent requires one "Carbon Agent" USB security key. If you are in doubt, the Carbon Admin interface will report an incorrect or missing USB security key when launched.
- Firewalls. Please ensure that the firewalls are disabled on the involved machines. If a firewall is required to run, please open the ports 21, 80, 1101, 1102, 1103 and 1104. You may find that under some circumstances even opening ports will not make Windows Firewall work correctly, in this case try disabling it entirely.
- Event Viewer. When the Harmonic background transcoding services start, potential problems will be logged as events, which can be viewed using the Windows Event Viewer (Start > Control Panel > Administrative Tools > Event Viewer).

## A.1.2 Multi-hosting issues with Carbon Server

Multi-hosting is supported with Carbon Server or Carbon Agent by binding the Nexus background service to a specific IP address. We define multi-hosting as a machine with multiple NICs connected to the same or different network but maintaining different IP addresses. Please see *4.2.13 Kernel Settings Configuration* on page 100 for more information.

## A.1.3 Windows Firewall Consideration

By default, Windows Firewall will block the ports that Carbon Server requires to communicate. In order for Carbon Server to be able to properly communicate across the network, either Windows Firewall needs to be disabled or configured to allow traffic on those ports. If your Carbon Server installation is using the default ports for communication, then you need to make sure that the Nexus Service has access to both ports 1101 and 1111. If you've customized the ports over which Carbon Server communicates, then those new port numbers would be assigned to Nexus in the firewall configuration instead of ports 1101 and 1111.

## A.1.4 Data Execution Prevention

When running Harmonic products on Windows Server 2003, errors may appear when trying to launch applications. One symptom is the Harmonic application stalling on the message "Loading 'Sharpen' filter".

To solve this requires changing the Windows Data Execution Prevention (DEP) default setting. See the steps below how to set the DEP option.

 Go to Start > Run and enter sysdm.cpl. Select OK to open your System Properties dialog box.

📨 Run	
	Type the name of a program, folder, document, or Internet resource, and Windows will open it for you.
Open:	sysdm.cpl 👻
	OK Cancel Browse

2. Select the **Advanced** tab.

System Properties			
Computer Name Hardware Advanced System Protection Remote			
You must be logged on as an Administrator to make most of these changes.			
Performance			
Visual effects, processor scheduling, memory usage, and virtual memory			
Settings			
User Profiles			
Desktop settings related to your logon			
Settings			
Startup and Recovery			
System startup, system failure, and debugging information			
Settings			
Environment Variables			
OK Cancel Apply			

3. In the Performance section select Settings.

4. Select the Data Execution Prevention tab.

Performance Options		
Visual Effects Advanced Data Execution Prevention		
Data Execution Prevention (DEP) helps protect against damage from viruses and other security threats. How does it work?		
<ul> <li>Turn on DEP for essential Windows programs and services only</li> </ul>		
Turn on DEP for all programs and services except those I select:		
Add Remove		
Your computer's processor supports hardware-based DEP.		
OK Cancel Apply		

- 5. Select Turn on DEP for essential Windows programs and services only.
- 6. Select OK.

## A.1.5 Carbon Server and Carbon Agent on Different Subnets

By default, Carbon Server and Agent will not find each other if they are located on different IP subnets within your network. The reason for this is that the ports over which Carbon Server communicates are more often than not closed by default on routers. There are two possible solutions to get Carbon Server to communicate through different subnets. First, you can reconfigure your routers to allow the default ports Carbon Server uses by default to be open. Second, you can change the ports Carbon Server uses to communicate on each system to a port that is already open and available on your routers. Note that this change needs to be made on every Carbon Server and Carbon Agent machine you wish to communicate. Please see *Table 4–18* on page 108 for more information.

**Option 1: Router Configuration**. The two default ports that need to be open for Carbon Server to communicate are 1101 and 1111. Individual router configuration is different between different brands and models, so please consult the documentation accompanying your router to open these two ports.

**Option 2: Port Configuration**. To change the ports on which Carbon Server communicates, open the Carbon Admin application on both Server and Agents. Select the **Tools > Kernel Settings**. There you will find two settings: Nexus Service Port and Nexus Admin Port. Change these two fields to the ports that you would like to use and set the routers accordingly. Please note that these cannot be the same port. Please see *Table 4–18* on page 108 for more information.

# A.2 Error Numbers and Descriptions

#### Table A-1: Error Numbers and Description

Error Number	Description	
x0000001	"This operation is not supported in this version. [CR:0x00000001]"	
x0000002	"An unknown error occurred. ICR:0x00000002]"	
x0000003	"A version conflict occurred. ICR:0x00000003]"	
x00010F06	"The Transcoder cannot import this file format. ICR:0x00010F06]"	
x00010F0A	"Destination Parameter problem occurred. ICR:0x00010F0AJ"	
x00010F0C	"Destination Interleaving violation [CR:0x00010F0C]"	
x00010F0E	"Generic Target Error occurred. [CR:0x00010F0E]"	
x00010F0F	"Copy Protection Device not found ICR:0x00010F0FJ"	
x00010F10	"Generic Error in Plugin. [CR:0x00010F10]"	
x00010F11	"Your destination location has no free hard drive space available. The conversion was stopped. ICR:0x00010F11]"	
x00010F12	"Could not write to your destination location ICR:0x00010F12]"	
x00010F15	"File size limit reached. Your OS does not allow to write files larger than 4GB. The conversion was stopped. ICR:0x00010F15]"	
x00010F16	"File system limit reached. Your File system does not allow to write files larger than 4GB. The conversion was stopped. [CR:0x00010F16]"	
x00010F17	"File size limit reached. The conversion was stopped. [CR:0x00010F17]"	
x00010F18	"Not enough memory available for the current operation [CR:0x00010F18]"	
x00010F19	"The Conversion was aborted. ICR:0x00010F19]"x00010F1A="Your Transcoder Installation is damaged. Please run Setup again. ICR:0x00010F1A]"x00010F1D="Internal Application Error: (NOTIMPLEMENTED). ICR:0x00010F1D]"	
x00010F1E	"The file name you specified is invalid. [CR:0x00010F1E]"	
x00010F1F	"The Target File was not written correctly. It might contain errors. [CR:0x00010F1F]"	
x00010F20	"Your source video has an odd size. The Transcoder can only import sources with an even size. ICR:0x00010F20]"	
x00010F22	"DirectX 9 or higher needs to be installed on your computer. The Transcoder cannot start. [CR:0x00010F22]" x00010F23="QuickTime 6 or higher needs to be installed on your computer. The Transcoder cannot start. [CR:0x00010F23]"	

#### Table A-1: Error Numbers and Description continued

Error Number	Description	
x00010F24	"This product requires EDIUS to be activated or in the trial period. Please activate EDIUS and try again. ICR:0x00010F24]"	
x00010F25	"This product requires trial or activated version of EDIUS HDV. Please install and activate EDIUS HDV and try again. [CR:0x00010F25]"	
x00010F26	"Cannot add another module of this type (limit of simultaneous usage exceeded). ICR:0x00010F26]"	
x00010F27	"Invalid parameters [CR:0x00010F27]"	
x00010F28	"There is an error happened when create/open or process memory map file [CR:0x00010F28]"	
x00010F29	"There is an error happened when create/open /set/reset event ICR:0x00010F29]"	
x00010F2A	"Specified target filename is invalid. This can happen if you try to write to a read-only media or the target file already exists and is in use. ICR:0x00010F2Al"	
x00010F2D	"The Transcoder detected stalling in the conversion. Possibly your source is no longer accessible. Select <b>Stop</b> to cancel your conversion ICR:0x00010F2DI"	
x00010F2E	"Non-recoverable Frame Drop occurred during Capturing ICR:0x00010F2EI"	
x00010F2F	"The job cannot be rendered - please try again later (global resource currently not available). [CR:0x00010F2F]"	
x00020001	"Plugin not found. ICR:0x00020001]"x00020002="Your source file name is invalid ICR:0x00020002]"	
x00020003	"Audio/Video formats incompatible. [CR:0x00020003]"	
x00020004	"Your system is low on memory. ICR:0x00020004]"	
x00020005	"Conversion cancelled. ICR:0x00020005]"	
x00020006	"This preset is referring to an exporter which is not installed on your system. ICR:0x00020006]"	
x00020007	"This preset is invalid. ICR:0x00020007]"	
x00020008	"The settings of this preset are invalid. [CR:0x00020008]"	
x00020009	"Please select a target first. [CR:0x00020009]"	
x0002000A	"The Transcoder cannot import this file. Either the file format is not supported or the file is damaged. ICR:0x0002000AI"	
x0002000B	"The Transcoder cannot load the required plugin for this action. ICR:0x0002000B]"	
x0002000C	"Copy-Protection Device not found. [CR:0x0002000C]"	

#### Table A-1: Error Numbers and Description continued

Error Number	Description	
x0002000D	"A Preset with the given name already exists. Please choose another name. ICR:0x0002000D]"	
x0002000E	"The preset name you entered is not a valid file name. Either it is too long or contains invalid characters. Please choose another name. [CR:0x0002000E]"	
x0002000F	"Couldn't change the category for the presets - possibly the presets are write protected or system presets. ICR:0x0002000FI"	
x00020010	"Couldn't change the category for the some presets - possibly the presets are write protected or system presets. New Category was created but old category was kept. [CR:0x00020010]"	
x00020011	"The project file is invalid. [CR:0x00020011]"	
x00020012	"One or multiple sources/targets could not be restored [CR:0x00020012]"	
x00020013	"One or multiple sources from the project file could not be loaded. [CR:0x00020013]"	
x00020014	"One or multiple targets could not be restored from the project file. [CR:0x00020014]"	
x00020015	"One or multiple filters could not be restored from the project file. [CR:0x00020015]"	
x00020016	"Your system is low on virtual memory. The Transcoder needs sufficient virtual memory (150 MB) to perform the conversion. The Transcoder cannot load this source file. ICR:0x00020016]"	
x00021001	"Internal Application Error: (NOT_SUPPORTED). [CR:0x00021001]"	
x00021002	"Internal Application Error: (PARAMETER). [CR:0x00021002]"	
x00021003	"Internal Application Error: (INTERFACE). [CR:0x00021003]"	
x00021004	"Internal Application Error: (DLLINTERFACE). [CR:0x00021004]"	
x00021005	"Internal Application Error: (ENUMINDEX). [CR:0x00021005]"	
x00021006	"Internal Application Error: (GRAPHSTATUS). ICR:0x00021006]"	
x00021007	"Internal Application Error: (CLASSSTATUS). [CR:0x00021007]"	
x00022001	"No audio filter found to perform required conversion. [CR:0x00022001]"	
x00022002	"No video filter found to perform required conversion. [CR:0x00022002]"	
x00022003	"Internal Error: unable to start conversion. ICR:0x00022003]"	
x00022004	"Internal Error: unable to locate required filter. ICR:0x00022004]"	
x00022007	"Audio/Video mismatch between source and target. [CR:0x00022007]"	

#### Table A-1: Error Numbers and Description continued

Error Number	Description
x00022008	"Unable to spawn new thread. ICR:0x00022008]"
x00022009	"Unable to read source file. ICR:0x00022009]"
x0002200A	"Unable to write target file. [CR:0x0002200A]"
x0002200B	"Unable to start encoding preview. [CR:0x0002200B]"
x0002200C	"Internal Error: Unable to start video processing. ICR:0x0002200Cl"
x0002200D	"Internal Error: Unable to start audio processing. [CR:0x0002200D]"
x0002200E	"Unable to start multipass encoding session. [CR:0x0002200E]"
x00022028	"Two or more Audio Normalize filters in sequence not allowed. ICR:0x00022028]"
x0002202A	"Cannot login to network share. ICR:0x0002202AI"

#### A.2.0.1 Errors Description

Each error description returned by Carbon Server will now end with the string "ICR:0x??????!" containing 8 hexadecimal characters. This will be visible to manual operators in the Carbon Admin as well as in errors returned when using the API.

The first 3 hex digits identify the Carbon Server module (0x000????? - 0xFFF?????), these could be importers, exporters, filters, etc. The last 5 hex digits identify the error (therefore both 0x00F00001 and 0x00C00001 could be generated for example)

#### A.2.0.2 Identical Error Numbers

Identical error numbers with different error descriptions may occur, for example, the string could be "Can't write to d:\" or "can't write to e:\" with the same error number representing "can't write to [letter]:\".

Identical error descriptions with different error numbers may occur, for example, both the MXF and GXF source import modules may generate a "can't access Metadata" error description but since they have different module numbers the error numbers will be different.

There is a common number space [0x000????], designed for generic errors, which can appear when it is not possible to identify the module in which the error occurred.

# A.3 Common Video Encoding Problems

This section illustrates some common video encoding problems and how you can fix or avoid them.

## A.3.1 Video is Blocky or Appears to Break Up

The video image appears to break up into different moving blocks. Parts of previous video may appear in different locations. Notice in the example that elements of the correct video seem to be mixed with the older video. After some time, the image may recompose itself, producing a correct image.



#### **Possible Causes**

- DVD media reading problem. If you are seeing this type of problem after authoring a DVD and playing it back on a set-top DVD player, it could simply be a difficulty reading the DVD-recordable media. Try the same disc in a computer-based DVD player. If it plays in the computer without problems, try a different set-top player or a different brand or type of DVD-recordable disc. Many set-top players cannot reliably play all DVD-recordable discs.
- Use of seek or trick-play in the player. If you were playing the file and playback was okay until you used the player's fast-forward, rewind or scrubber to reposition the playback location, then it's probably not a problem at all. Depending on the format and player, the video may take until the next keyframe to start displaying properly. Try letting the file play through from start to end without interrupting it to verify. If the video displays correctly in a straight-through playback, then the output file is fine.
- Video bit rate too low or not enough keyframes. If the break-up only appears after scene changes, then the video bit rate is too low to handle the large change in the video. Increase the video bit rate to allow faster recomposition. Alternatively, if the target format supports keyframing, decrease the keyframe interval, thus increasing the number of keyframes. Keyframes provide a full video frame so large changes can be tracked and better compensated for.
- Video bit rate too high. When using a hardware decoder, such as for MPEG playback, in some cases a video bit rate that is too high can cause the to image break up. If the video bit rate is at or near the maximum setting, try reducing it a bit. If it plays on a software-based player but not on a hardware-based player, this may also be because the bit rate is too high.

## A.3.2 Video Appears Fuzzy or Blurry

The video appears fuzzy or blurry. When played zoomed, it appears blocky, almost like viewing something through a frosted glass window.



#### Possible Causes

 DV playback not set to full quality. If the problem occurs only with Microsoft DV AVI files, the problem may be due to the Digital Video decode setting being set to Low. When set to Low, DV files are decoded in low resolution, regardless of what the resolution of the actual file is.

#### To fix this problem in Windows Media Player:

 Open Windows Media Player, and look for the **Options** selection in the menu (usually under **Tools**).

- Look for a setting called Digital Video that has a slider with Small at one end and Large at the other. In Windows Media Player 9, this is found by selecting Advanced in the Performance.
- Set the slider to Large.
- Close all open programs including **Windows Media Player**, then open the file for playback again. The file should now play in full resolution.
- Video resolution too low. When stretched to the original size, a low-resolution image will appear blocky. If you want or need to view the image at the same size as the original, you should increase the video frame size. In order to preserve quality and avoid similar effects due to too low a bit rate, the bit rate should be increased when increasing the video resolution.
- Video bit rate too low. Depending on the encoding format, a video bit rate that is too low can also produce blocky video as shown above. Increase the video bit rate to see if this is the case. If increasing the bit rate does not help, the video frame size needs to be increased.

## A.3.3 Video Has Halos or Blocks Near Objects

The video appears to have halos around the edges of objects and/or block-like noise around near objects. There does not seem to be a loss of resolution, just loss of sharpness and some changes to colors.



#### **Possible Causes**

Video bit rate too low. This type of effect is usually caused by setting the video bit rate too low. Increase the video bit rate to get a better result. If increasing the video bit rate produces too large a file, keep the video bit rate the same, but decrease the video frame size. When the choice is available, choosing Optimize for Quality instead of Optimize for Speed should also help.

## A.3.4 Video Appears to Jitter

Movement in the video seems to jitter up and down. Moving objects may seem to take two steps forward then one step back.

#### **Possible Causes**

- Single-field detail in interlaced output. If the video appears to have vertical jitter or flashing horizontal edges, the source image may have single-field detail. This usually occurs with still images used for video. ProMedia Carbon normally makes the appropriate adjustments to avoid this situation, but if you still have trouble, try applying an anti-flicker or deinterlace filter to your source before bringing it to ProMedia Carbon.
- Improper source interlacing field order. For interlaced sources, the interlacing mode may not be set correctly. Verify that the proper interlacing field order is set in the Advanced Source Configuration.

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Improper target interlacing field order. For interlaced output, the target field order may be incorrect for the playback device. Check the requirements of the intended playback device to determine the proper interlacing setting.

## A.3.5 Video Movement Appears Jumpy

Movement in the video does not appear smooth—it seems to jump instead of move in a fluid fashion. Objects in motion seem to jump or "flash" to the next position like a strobe effect.



#### Possible Causes

- Video frame rate too low. If the video frame rate is too low, motion in the video will not appear smooth. Increasing the frame rate will help to improve the fluidity of motion but will also make the file size larger. Generally speaking, a frame rate below 15fps will result in unsatisfactory playback.
- Streaming connection speed too slow. Users viewing a streaming file that was made for a
  faster connection speed may see this type of "snapshots in time" effect. The user need a
  faster connection to the streaming server, a progressive download file should be used
  instead.
- Playback machine too slow. Some formats play with different frame rates depending on the speed of the viewer's machine. Try playback on a faster computer to see if it plays better.

## A.3.6 Audio and Video Are Out of Sync

Audio and video do not play in synchronization with each other. For example, a person talking may show their lips moving, but their speech may not be audible until a second or two later.

#### **Possible Causes**

- Use of seek or trick-play in the player. If you were playing the file and playback was insync until you used the player's fast-forward, rewind or scrubber to reposition the playback location, then it's probably not a problem at all. Depending on the format and player, audio/ video synchronization cannot be guaranteed after repositioning the playback point. Try letting the file play through from start to end without interrupting it to verify. If synchronization is maintained in a "straight-through" playback, then the problem is trickplay and not the output file.
- Video and audio playing from different devices. If you are playing the video on one device and using a different device for audio, synchronization is not guaranteed. For example, DV files playing audio from the PC but using a connected DV camera or converter for video output will be unsynchronized. This is because there is a slight delay between the DV camera or converter between getting the DV data from the PC and outputting the decoded analog video. Thus, in this situation audio will appear to come slightly before the video.

- Set-top DVD audio decoder problems. If you're seeing the problem using a set-top DVD player for playback, it could be a problem with the player itself. Some set-top DVD players have problems with audio synchronization, especially when the audio is AC3 format. Try a commercially-produced DVD in the player and see if it has the same problem. Also try playing your DVD with a software-based DVD player.
- **DVD authoring error**. If your problem exists with an authored DVD, it could be a problem with the DVD authoring. Substandard DVD authoring can also cause audio/video sync problems. Try reauthoring the DVD with a different DVD authoring application.

## A.3.7 Video Shows Strange Patterns or Blocks

The video shows strange patterns or blocks of different data.



#### **Possible Cause**

• **Corrupt video file**. The data of the video file is probably corrupt. Check to see that the source file does not show the same problem, as any problems in the source will be faithfully reproduced in the output. If the problem only occurs in the output, try writing the file to a different drive or directory, or try a different compression format.

## A.3.8 Video Appears Stretched or Squashed

The video appears to be stretched in one direction. Circles now appear as ovals and people are taller or wider than they should be.



#### **Possible Causes**

- Widescreen MPEG-2 output. If your output is widescreen MPEG-2, then this is not a problem. Some MPEG-2 playback software does not properly size the video playback according to the aspect ratio set in the MPEG-2 file. Thus, widescreen MPEG-2 files play back squashed. Authoring a widescreen DVD using this file and playing that DVD on a DVD player will produce a correct widescreen result.
- Player does not compensate for pixel and frame aspect ratio. Some media players do not compensate for video with non-square pixels and thus do not display video in the proper aspect ratio. This is not a problem with the encoding or ProMedia Carbon; it is a problem with the player. Try to find a player that properly compensates for non-square pixel playback.

Incorrect source aspect ratio setting. Check the aspect ratio setting in your source file. If it is set incorrectly, ProMedia Carbon will interpret the shape of the video image incorrectly and therefore process it incorrectly. ProMedia Carbon never does anything to stretch or squash the image; widescreen sources converted to standard screen size will be scaled to fit into the standard width, a process known as letterboxing, as shown in the image below.



## A.3.9 Cannot Load Encoded MPEG Files into DVD Authoring Software

Your DVD authoring software does not accept the MPEG files you made with ProMedia Carbon.

#### **Possible Causes**

- File naming problem. Some DVD authoring applications do not recognize the standard .m2p file extension for MPEG-2 program streams. Instead, they want files named .mp2 or .mpg instead. Try renaming the output file from .m2p to .mp2 or .mpg and try again.
- Incorrect MPEG-2 file type. Not all DVD authoring applications support MPEG-2 elementary streams (.m2v files and associated audio files) and MPEG-2 program streams (.m2p files), some will only accept one or the other. Check your DVD authoring software's documentation to see which type it supports and verify that you are creating the correct type with ProMedia Carbon.
- Software does not accept MPEG files. Some DVD authoring applications do not accept MPEG files as sources. If this is the case, you will need to use ProMedia Carbon to output a different file type (usually VOB) that the authoring application will accept or use a different authoring application. Consult your authoring software's documentation to find out what file types it accepts.

## A.3.10 Nexus Credentials Can't Read From Source

Watch folders, API scripts, and certain target folders say "Can't read from source," but the ProMedia Carbon GUI works properly.

#### Description

If you are getting errors such as "Can't read from source" when using the API or Watch Folders, or target files are not being written properly, the Harmonic background transcoding service called "Nexus" may not have the proper permissions/credentials. Normally the Nexus Service has the credentials of the "Local System" account, you may need to change that to an authorized account. The Nexus Service is responsible for handling requests from Watch Folders, the queue manager, and the API. The GUI tool can transcode independently without accessing the Nexus Service in most instances, which is why you may not see those same problems when transcoding with the ProMedia<sup>™</sup> Carbon user interface.

#### Instructions

1. Open the services console by going to Start > Run. Enter services.msc and select OK.



- 2. Double-click the Nexus Server service.
- 3. Select the Log On tab.
- 4. Set the credentials ("This account" and "Password") for the service to a user that has rights to access the share. It is recommended to use Browse to find the appropriate account, especially if this machine is part of a domain.

Nexus Server (Carbon Coder) Properties (Local Computer)			
General Log On Red	covery Dependencies		
Log on as:			
<ul> <li>Allow service to</li> <li>This account:</li> </ul>	interact with desktop .\Administration Browse		
Password:	•••••		
Confirm password:	•••••		
Help me configure user account log on options.			

- 5. Close the Nexus Server Properties dialog box.
- 6. Now that the proper login credentials have been set, the Nexus Server service needs to be restarted for the changes to take effect. To do this right-click Nexus Server and then select Stop.



- 7. Wait a few seconds after the service has stopped, then right-click **Nexus Server** and select **Start**.
- 8. Nexus now has the credentials of the specified account, and jobs submitted with the apt or Watch Folders should be able to access source files and write target files.

#### A.3.10.1 About Nexus Service

Transcoding manually uses a different process than transcoding with Watch Folders or using the API. The ProMedia Carbon program is a separate transcoder from the Windows Service that is also installed on a system when ProMedia Carbon or Carbon Server/Agent is installed. This service is called "**Nexus Server**" and, by default, just like every other Windows Service, it has permission to only access resources on the same machine that it was installed on. On the other hand, the ProMedia Carbon program with the GUI has the same permissions as the account that the user enters to log on to the machine. That is why it is necessary to give Nexus permission to access network resources.

**NOTE:** With regards to mapped drives versus UNC paths; mapped drives only exist for the user that is logged in, Windows Services do not see mapped drives. That's why the UNC path works with Watch Folders and the API, and mapped drives do not.

## A.3.11 Remote Retrieval

#### Description

A Watch Folder is set up on a NAS or play-out server and is not processing new jobs. Carbon Server Watch Folders are "passive" processes, that is, they wait for a signal from the filesystem to indicate that a new file has been created in the Watch Folder path.

When working with some devices with drivers, such as NAS drivers or file-system drivers for video play-out systems, passive processes may not work properly. The reason is that some file system drivers do not \*completely\* simulate a real Windows file system, that is they do not notify passive processes when a new file has been created in a folder that the passive process is watching.

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#### Instructions

For this reason it may sometimes be necessary to add "Remote Retrieval" to a standard Carbon Server Watch Folder. Remote Retrieval can either be FTP retrieval, or File System retrieval. Both types of Remote Retrieval periodically check the remote FTP server or remote file system for new files. If a new file is discovered, Remote Retrieval checks again a second time, to see if the file size is constant. If the file size is not constant but growing instead, it means that the file is still being written to the remote device, and Remote Retrieval continues checking until the file size is constant.

When the new file has been verified to have a constant size, Remote Retrieval then copies it to the local file system, to the Watch Folder path that was specified when the Watch Folder was created. In the case of a File System type of Remote Retrieval, a shortcut can also be copied instead of the entire file. The Watch Folder then sees the new file and precedes to transcode it normally.

You can access the Remote Retrieval setup through the Carbon Admin. Select a Watch Folder and then select edit watch in the lower right. The Remote Retrieval option is located in the tree on the left. A file share/folder or FTP location can be targeted for the Remote Retrieval process. You will also need to specify the correct login info (username/password) if permissions are needed to access this location.

Once you select OK, the Remote Retrieval process will be enabled for the location specified.

**NOTE:** If you choose the File Share/Folder option, make sure that you use only UNC paths of the form \DeviceOrServerName\FILESYSTEM\Folder. Do not use mapped drives such as M:\Folder, since mapped drives are only valid for the user who is currently logged on, and cannot be accessed by background processes like Carbon Server Watch Folders.

# A.4 Contacting Harmonic Support

The Harmonic Customer and Technical Support groups are available to help you with any questions or problems you may have regarding Harmonic products.

For assistance, refer to the following table for contact information in your region:

Region	Telephone Technical Support	E-mail
Americas	888-673-4896 (1-888- MPEGTWO) or 408-490-6477	techhelp@harmonicinc.com
Europe, Middle East	+44 7699 391552	support.emea@harmonicinc.com
Asia (excluding India and Russia)	+852-2116-1119	hongkongtechsupport@harmonicinc.com
India	+91 22 6793 9291	support.sm@harmonicinc.com
Russia	+7 495 926 4608	support.sm@harmonicinc.com
Africa	+972-54-900-7740	support.sm@harmonicinc.com
China	+852-2116-1119	dlchinatechsupport@harmonicinc.com

Table A-2: Contacting Harmonic Support

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#### The corporate address for Harmonic is:

Harmonic 4300 North First St. San Jose, CA 95134, U.S.A. Attn: Customer Support

The corporate telephone numbers for Harmonic are:

Tel. 1.800.788.1330 (from the U.S. and Canada) Tel. +1.408.542.2500 (outside the U.S. and Canada) Fax.+1.408.490.6770

The web address for Harmonic is www.harmonicinc.com.

This appendix summarizes and describes ProMedia™ Carbon features since release 3.0.

# B.1 New Features in ProMedia Carbon Release 3.19.2

There are no new features, only bug fixes for this release. The fixed bugs are:

 CCDR-225: in certain cases the H.264 Exporter causes Carbon to abort unexpectedly due to a memory leak.

Fix: the memory leak has been fixed.

 CCDR-221: The frame time code contained in the Generic Container System Item of MXF OP1a clips created with Omneon Exporter v2 is always all zeroes (00:00:00:00).

**Fix**: this frame time code was removed. This makes the behavior of the Omneon Exporter  $v_2$  the same as in releases prior to 3.19.1.

CCDR-255: The value of the firstFrame field for clips created with the Omneon Exporter v2 is always equal to zero.

**Fix**: the firstFrame field value is now derived from the start time code, for all Omneon formats and wrappers.

# B.2 New Features in ProMedia Carbon Release 3.19.1

ProMedia Carbon 3.19.1 is a full Carbon release that extends Carbon 3.19 with new features and bug fixes. The new features are:

- Improved Video Quality for H.264 encoded video. This affects the following Exporters and WFS Presets:
  - □ H.264 Exporter
  - HTTP Live Exporter
  - Smooth Streaming Exporter H.264
  - WFS Preset "Audio Passthrough with TS Transcode"
- Creation of H.264 proxies from Omneon Spectrum clips. This feature is primarily intended for quick turnaround workflows that involve viewing and/or manipulation of large quantities of Spectrum clips with the Omneon Media Application Server<sup>1</sup> (MAS). In order to keep network bandwidth usage low, MAS displays derivatives of the Spectrum clips called proxies instead of the Spectrum clips themselves.

ProMedia Carbon can also create the proxies without MAS, and when the proxies are wrapped in QuickTime they can be viewed with a QuickTime player.



**NOTE:** This feature is only available for transcode farms controlled by WorkFlow System (WFS). It is not available for Carbon Server/Agent farms or standalone Carbon installations.

This feature includes growing file support, meaning proxies can be created from Spectrum source files that are still being recorded. Watch Folder support for growing files is only available when WFS is controlled by MAS.

<sup>1.</sup> The Media Application Server monitors and manages content across multiple Omneon systems, including Spectrum and MediaGrid. In addition it provides several media processing services, such as clip transfers.

# B.3 New Features in ProMedia Carbon Release 3.19

- Rebranding of the Carbon Coder standalone application to "ProMedia Carbon". The rebranding is limited to Carbon Coder and does not impact Carbon Server or Carbon Agent. ProMedia Carbon is fully backwards compatible with Carbon Coder.
- Improved video quality and rate control for the H.264 Exporter and the HTTP Live Streaming Exporter. For these two Exporters, the H.264 video codec has been improved in the following ways:
  - □ Improved adaptive QP assignment at the macro-block level.
  - Improved adaptive deblocking.
  - □ Improved CBR rate control.

There are three new parameters in the H.264 Exporter to support these improvements, and some obsolete parameters have been removed at the same time. The removal of the obsolete parameters has no impact on previously saved presets.

- Omneon Exporter v2 improvements.
  - Support for Spectrum-compliant file naming for QuickTime Reference and MXF OP1b target clips.
  - □ SDK version 6.4: the Omneon Media SDK has been upgraded to version 6.4.
  - New formats: Support for the Omneon Internal / Low Latency OP1a wrapper, and support for eVTR D10 (IMX).
  - Support for writing video-only clips, that is, clips without audio.
  - Support for writing 436m tracks for all target formats wrapped in regular and Low Latency OP1a, and for XDCAM HD wrapped in RDD9. The number of ANC bytes can be set manually or detected automatically.
- XDCAM Exporter improvements.
  - □ Support for writing 436m tracks for DVCAM25 and MPEG HD target formats
- Auto-sensing for the Line 21 Extraction filter.
- Carbon 3.19 has improved performance for JPEG 2000 decoding, and for AVC-Intra encoding with the Omneon Exporter v2. The performance gains were achieved by implementing multi-threading for both processes; in 3.17 both were single threaded. Initial tests show that real time speed can be achieved with an 8-core machine, though this was not a hard requirement. (Decoding and encoding tested separately, not simultaneously.)

# B.4 New Features in ProMedia Carbon Release 3.18.2

Carbon 3.18.2 is a full Carbon release that extends Carbon 3.18.1 with two new features and a few bug fixes. The new features are:

- Support in the QuickTime 7 Exporter for ProRes 422 that complies with requirements from the Apple iTunes Store. Carbon can now be used to generate ProRes 422 material suitable for uploading to the iTunes Store.
- Expansion of the number of audio tracks to 16 for ProRes 422 in the QuickTime 7 Exporter.

These features only apply to the ProRes 422 export format and are only available for systems that meet the requirements for ProRes 422 as an export format. Support for this was introduced in release 3.18.1. Please read the Upgrade Considerations in the 3.18.2 release notes before deciding to install or upgrade to 3.18.2.

## B.5 New Features in ProMedia Carbon Release 3.18/3.1.8.1

ProMedia Carbon 3.18 includes the following new features that provide high-performance, scalable and cost-effective transcoding for a broad range of business environments, from specialized studios to enterprise-scale installations.

## B.5.1 QuickTime 7 Exporter for Apple ProRes 422 (3.1.8.1)

Support for QuickTime 7 Exporter for Apple ProRes 422 (a standard-definition and highdefinition lossy video compression format for use in post production) as a target format for 8bit source material. A wide range of ProRes 422 frame rates and resolutions is supported and the transcoded material can be imported into Final Cut Pro for viewing and further processing. Support for Apple ProRes 422 as a target format for 10-bit JPEG 2000 and 10-bit Avid AAF / DNxHD sources. The transcoded material can be imported into Final Cut Pro for viewing and further processing.

See 2.3.2 *Installing ProMedia Carbon 3.20* on page 21 for special, required usage conditions before deciding to install or upgrade to ProMedia Carbon 3.18.1.

## B.5.2 Microsoft Smooth Streaming with H.264

Carbon Coder 3.18 adds an exporter for creation of multi-bit rate streaming files for Microsoft Smooth Streaming with H.264. Use of H.264 for streaming to Microsoft Silverlight players has become increasingly popular and ProMedia Carbon 3.18 adds the H.264 Smooth Streaming Exporter to the Smooth Streaming Exporter for VC-1, which was already available. The audio codec used with the H.264 Smooth Streaming Exporter is AAC.

The name of the new Exporter in the Carbon User Interface is "Smooth Streaming Exporter— H.264". To avoid confusion, the VC-1 based Exporter has been renamed "Smooth Streaming Exporter—VC-1".

The maximum number of video layers is 16, and so is the maximum number of audio streams. Video frame size and bit rate for each layer can be generated automatically, or set manually by the user.

## B.5.3 Multi-bit rate Audio for HTTP Live Streaming

Carbon Coder 3.18 allows the user to set the audio bit rate in HTTP Live Streaming per individual stream. In previous versions of Carbon this was not possible because the bit rate was the same for all streams. With the support of multi bit rate audio you can now assign different bit rates to different streams, allowing for configurations that use low bit rates for audio only streams.

## B.5.4 Framework for Improving Video H.264 Quality

A framework has been put in place inside the H.264 encoder to allow for future optimizations to the video quality. There is no impact on the performance of the H.264 encoder.

## B.5.5 Omneon Exporter v2

The Omneon Exporter v2 has expanded format support and now includes XDCAM HD and XDCAM EX. Both can be wrapped in QuickTime 6 and 7, and MXF OP1a and OP1b, and for XDCAM HD there is also the RDD9 compliant OP1a wrapper. Wrapping of AVC-Intra Class 50 and 100 in QuickTime has been added too.

The Exporter has been updated and now uses Spectrum SDK version 6.2, the most recent at the time of this release

## B.5.6 Support for SMPTE 2038

Carbon 3.18 implements SMPTE 2038 for carriage of SMPTE 291M Ancillary Data (ANC data) within Transport Streams that use MPEG-2 video. The ANC packets are carried inside Transport Stream PES packets and ProMedia Carbon allows the user to set the PID of the PES stream. Inclusion of SMPTE 2038 PES streams is controlled by a check box.

Frame rate conversion is not supported with this feature, and if the box is checked then a PES stream will always be included, even if there is no SMPTE 291M ANC data in the source file

## **B.5.7** Dolby Digital and Dolby Digital Plus Decoding

Until now, use of the Dolby Digital (AC-3) and Dolby Digital Plus (E-AC-3) decoders in Carbon was restricted to verification of audio content encoded in these formats. This restriction has been removed and these decoders can now be used for production purposes

## B.6 New Features in ProMedia Carbon Release 3.17

- A new RPI-based MPEG-2 Exporter has been added. It allows the creation of multiple audio programs. Each stream can be tagged with an audio language descriptor and PID.
- The XDCAM exporter supports the Active Format Descriptor (AFD) in the MPEGHD format.
- A new Video Scaling Algorithm has been added in the Kernel Settings.
- A new RPI-based Omneon Exporter has been added. It has added support for DVCPRO HD/DV100 format as well as the ability to allow multiple audio channel configurations.
- Carbon will now insert its version number when writing Projects, Presets and Profiles.
- Added several parameters to the H.264 Exporter to provide more fine-grained control, this
  offers the option to substantially increase transcoding speed at the cost of some visual
  quality. New HD & SD presets in the H.264 preset category illustrate both high quality and
  high speed settings for these new parameters.
- Closed Captions are now supported on MPEG2-v2 exporter with frame rate conversion of 23.98, 29.97 and 59.94 fps.

# B.7 New Features in ProMedia Carbon Release 3.16

- Allow creation of multiple audio output streams in the Smooth Streaming exporter. Each output stream can be tagged with an audio language descriptor.
- A new Video Filter that allows for insertion of V-Chip XDS information into the Carbon pipeline in the caption/708 payload. Other filters such as the Line 21 Modulator video filter can use the data from the caption/708 payload and insert it into line 21 of the VBI of output files.
- A new Audio Filter that allows Dolby-E encoding for any ProMedia Carbon Exporter supporting an Uncompressed or PCM audio format.
- Added support for the creation of MPEG-2 Transport Stream Video with MPEG-2 AAC-LC LATM/LOAS or MPEG-4 AAC-LC LATM/LOAS audio for the MPEG-2 exporter.
- Added support for the import of MPEG-2 Transport Streams with MPEG-2 AAC-LC LATM/ LOAS or MPEG-4 AAC-LC LATM/LOAS audio streams from MPEG-2 video.
- Added support for extracting striped timecode tracks from GXF files.
- Extended the API functionality to return StartTimecode of ProRes sources in the reply from a JobEvaluate API call.
- Added support for the creation of MPEG-2 Transport Stream Video with MPEG-2 AAC-LC LATM/LOAS or MPEG-4 AAC-LC LATM/LOAS audio for the H.264 exporter.

- Added support for the import of MPEG-2 Transport Streams with MPEG-2 AAC-LC LATM/ LOAS or MPEG-4 AAC-LC LATM/LOAS audio streams from H.264 video.
- Extended the GUI of the Channel Mixer audio filter to support up to 32 input audio channels and allow the mapping on up to 32 output audio channels.
- Support writing of CEA-708D captions for the Omneon exporter.
- Added Support For AVC-Intra encoding in the Omneon Exporter
- Added support for inserting Active Format Descriptor into H.264 elementary video streams per ATSC A/72 Part 1, section 6.4.
- Added a Video Filter to map any input VBI that contains less than the standard 32 lines, from 1 up to the normal 32 lines, to a full 32 lines of VBI.
- Enhanced the existing MXF OP1B importer to support J2K content.
- Expanded the H.264 Importer to read captions from MPEG Transport Streams per CEA-708 standard.
- Added the Http Live Streaming exporter, which lets you send audio and video over HTTP from an ordinary web server for playback on iPhone, iPad, iPod touch and desktop computers.
- Added a Timecode Processing filter. This filter can correct, clean up, or synchronize the timecode payload with time sources other than the source file.
- Enhanced the H.264 exporter to allow the creation of multiple audio programs for Transport Streams and System Streams.
- Updated the Avid MXF Exporter to AMT SDK V1.5.2, which added new Avid formats, frame rates, bit rates, etc.
- Extended the API multiplexer with the control option for text justification background options on STL subtitle files.
- Enhanced the H.264 importer to allow multiple audio programs on Transport Streams and System Streams.
- Added the ability to Read ATSC A/53 compliant caption data from QuickTime-wrapped Omneon input files with MPEG essence.
- Added support for reading CEA-708 caption data from MXF input files with MPEG video essence.
- Updated the AS02 exporter with the ability to read ATSC A/53 captions and SMPTE 328M timecode.
- Added support to the H.264 exporter with the ability to include CEA-708 closed captioning data.
- Extended the API multiplexer with control options for advanced video options.
- Updated the SMPTE302 importer to support 32-Channel source files.

# B.8 New Features in ProMedia Carbon Release 3.15

- Allow the GXF Exporter to write SMPTE 291M ancillary data to the VANC section, for example, when inserting CEA-708 captions into GXF output files. The GXF Importer has also been enhanced to extract CEA-708 captions stored in VANC from GXF input files.
- Convert CEA-608 analog (line 21) captions to CEA-708 Digital TV captions.
- The Omneon Importer now reads MXF OP1A input files with AVC-Intra video tracks.
- Importing and Exporting various types of MPEG-2 Transport Streams now supports reading and writing CEA-708 captions.
- Updated the Microsoft Smooth Streaming Exporter with enhancements and fixes, and manifests are now Version 2 compliant.

- The Windows Media Exporter can now create output files with multiple audio files, such as when creating files that need to contain audio tracks in more than one language.
- Added the ability to select which audio PID to extract the audio channels from when importing Transport Streams with H.264 video essence. Also, all audio PIDs in an input Transport Stream can now be combined into one linear list of input audio channels.
- Audio in GXF files can now be 24 bits, in addition to sample sizes supported in previous versions.
- Added an option to the MPEG-2 Transport Stream multiplexer to distribute video packets uniformly over time, in addition to the previous method which is to distribute all packets in such as way as to optimize the bandwidth of the stream. The optimized method is the default, but the option can be enabled with a check box in the Carbon UI.
- Support for reading VBI from MXF files that are compliant with the SMPTE 436M specification. This enables the import of CEA-608 line 21 captions or Teletext, for example, from those MXF files that contain such information in the Vertical Blanking Interval.
- Teletext to STL caption file conversion, and vice versa. A new STL caption file Exporter has been added, which can create STL text files from Teletext information from source files. Conversely, STL caption files can be imported and used to create Teletext information in the VBI, which can be inserted into output files.
- API support for de-multiplexing MPEG-2 Transport Streams into their constituent elementary video and audio streams. Some metadata formats can also be extracted.
- The Carbon transcoding engine now supports carrying caption information for progressive formats with 23.98p and 59.94p frame rates.
- Carbon now works differently when creating MPEG-2 output files from input files that have video and audio tracks of different durations. Instead of generating a few extra blank video frames to compensate for longer audio tracks, output files now have their audio tracks truncated to match the duration of the video tracks. This ensures that the video duration of such output files will be the same as the duration of the video tracks of the input files.
- Extended support for DVB VBI import and export, compliant with ETSI EN 301 775.
- A language descriptor can now be set for H.264 output files when creating Transport Streams.
- The API Transport Stream multiplexer now supports Dolby Digital Plus (E-AC-3) as an input audio elementary stream type.
- Support for SMPTE 291M ancillary data in the Carbon transcoding engine, initially in support of the GXF Importer and Exporter for the reading and writing of CEA-708 captions.

# B.9 New Features in ProMedia Carbon Release 3.14

- Improved H.264 Exporter. The H.264 exporter has been updated to improve quality and increase transcoding speed. Many new settings are now exposed allowing the ability to truly tune the exporter to meet higher video quality while hitting lower bit rates. The exporter also adds compatibility for more devices, such as the iPhone OS v3.0.
- Microsoft Smooth Streaming Exporter. This new exporter introduces Microsoft's Smooth Streaming SDK allowing you to create multi-bit rate streaming files with the VC-1 video codec and deliver them to Microsoft Silverlight players.
- Avid MXF Exporter. A new exporter has been added allowing the creation of MXF wrapped Avid codecs for compatibility with many Avid products.
- Motion-Compensated Temporal Filter (MCTF). The MCTF filter is an advanced video algorithm from the Harmonic codec research and development team. The MCTF filter allows you to hit lower bit rates without losing video quality.

- De-Blocking Filter. Also from the Harmonic codec research and development team, this advanced de-blocking filter helps to remove blockiness in a compressed source file before the final encode.
- STL Caption Video Filter. This new video filter burns captions from an STL file into the output video.
- VITC Video Filters. Two new video filters to extract and insert information to and from the Vertical Interval Timecode (VITC).
- ITU 1770 Audio Filter. This audio filter allows standards-based adjustment of audio levels to meet broadcast requirements.
- Harmonic Programming Interface (RPI). The RPI allows 3rd parties to develop importers, exporters, and filters for use in the Harmonic transcoding pipeline.
- Carbon Farm Manager (CFM). The CFM is a service which runs outside of your Carbon Server Farm environment. It monitors for stalled jobs as well as other problems and performs routine maintenance like scheduled, graceful reboots of the entire farm.
- Carbon Farm Analyzer (CFA). The CFA reports information about the utilization and status
  of the machines in your transcoding farm in addition to what's available in the Carbon
  Admin interface. This tool is extremely helpful in tracking down problematic situations.

# B.10 New Features in ProMedia Carbon Release 3.13

- API support for SMPTE Transitions (RMF-13/65).
- Enhanced Television Binary Interchange Format (ETV-BIF) pass-through for MPEG-2 Transport stream outputs (RMF-15).
- Import EVS XT-1 compatible MXF-wrapped Motion-JPEG files (RMF-16).
- Apply rules to Watch folder allowing features such as automatic aspect ratio overrides (RMF-23).
- Extract Teletext caption information (RMF-24).
- Insert or burn-in Teletext captions into targets when using sources with Teletext (RMF-76).
- Enhanced API support for inputs with multiple audio sources and independent in- and outpoints (RMF-51).
- Multiplexing-only API call to create DVB outputs with multiple audio sources and DVB/STL subtitle streams (RMF-55/57/58)
- XDCAM MXF & MOV MPEG-2 HD 4:2:2 import and export support (RMF-62/103/112).
- Added Dolby Digital Plus (E-AC-3) encoding ability to the AC-3, H.264, and MPEG exporters (RMF-75).
- Support for writing and reading MXF AS02 compatible files (RMF-79/80).
- Add Active Format Descriptors (AFD) to output files (RMF-81).
- Support for reading DVS Clipster compatible MXF-wrapped JPEG2000 input files (RMF-84).
- Omneon exporter can create one output file per each audio channel (RMF-101).
- New filter "Map Alpha to target Y channel" filter creates separate luma-only output files (5827).

## B.11 New Features in ProMedia Carbon Release 3.12

- Allow export of MPEG-1 Level II elementary audio files using the MP3 Target.
- Web-based help system with improved searching and indexing.

# B.12 New Features in ProMedia Carbon Release 3.11

- XDCAM EX files, which are MPEG-4 files with MPEG-2 video essence, can be imported.
   XDCAM EX metadata is not imported.
- Implemented the reading and writing of Panasonic AVC Intra files, which are files with AVC-Intra essence in an MXF OPAtom wrapper.
- Allow the insertion of AC-3 audio in MP4 files created by the H.264 exporter.
- Support the reading of Avid MXF-wrapped DNxHD files.
- Allow the deletion of original source files, even if they are referenced by a Windows shortcut.
- The Panasonic P2 exporter can now be used to create MXF files that can be directly imported into Avid systems without the Avid system taking extra time to "render" the files first.
- The H.264 exporter now exposes an API for users to use an alternative H.264 encoder instead of the default H.264 encoder installed during installation of the applications.
- Allow the specification of the duration of video fades in increments of one-tenth of a second.
- H.264 Exporter has a new caption mode to support Echostar-specific STB captioning requirements.
- Video Timecode Inject filter allows the setting of the Start time code for target files.
- Read time code when importing DPX frames.
- Ability to associate a Look-Up Table (LUT) with a DPX sequence.

# **B.13 Harmonic Flash Support**

With the 3.0 release support for Flash was added to ProMedia Carbon and Carbon Server. The following sections summarize the various ways in which Carbon supports Flash versions 7, 8, and 9.

## B.13.1 Flash 7

- Carbon supports reading and writing.
- H.263 inside an FLV or SWF wrapper. This is very similar to "Flash-7 Sorenson", and works the same in all the players, like YouTube and 2-pass support.
- While the ability to export a SWF-wrapped file is supported it should be mostly seen as a vector format and not used for normal web video applications.

## B.13.2 Flash 8

- Carbon only supports writing, this is a licensing issue.
- VP6 (licensed from Adobe) inside an FLV wrapper.
- Single Pass only, but high quality.
- High Speed.
- Takes advantage of Macro-Grid processing allowing multiple systems to work on a single encode.
- For multi-pass we support the On2 Pro Encoder, however it must be purchased separately.
  - Multi-pass
  - A few additional parameters compared to Adobe.
  - There is a version of a QuickTime plug-in from On2 called the FlixExporter that is licensed for non-commercial use as stated on their website.

## B.13.3 Flash 9

- Carbon 3.0 supports reading and writing.
- H.264 in an F4V wrapper. Video H.264 in other wrappers is also supported by Carbon but is not Flash 9.
- 1 and 2-pass support.

# harmonic

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