

Title: CFF File Creation: Collection of Assets and Transcoding $\nu\mathbf{1}$

W.I. #: N/A Yet Date: March 26, 2014

1. Purpose

The purpose of this work instruction is to inform **Authors** how to gather assets and complete transcoding of video and audio content in preparation for muxing.

The set of assets to collect are:

Video and Audio Assets

- i. Prores For client FOX, collected from IQC (Incoming QC dept.)
- ii. BDCMF For client Lionsgate, extract from Blu-ray disc, or get from Studio

Chapter Assets

iii. Chapter Assets – Get from client or extract from source video using timecode information from either video compression log or CEA QC.

Subtitles, AVI Scripts and Content Traveler XML Assets

- iv. Subtitle Collect from Subtitling dept. (they'll provide a subtitle file based on the HD or BD release aspect ratio that users send them)
- v. AVI Scripts and Content Traveler XML User generated with Video Source Editor tool

Metadata and Required/Optional Images

Metadata information (assets) and required and optional images are created using the **CFF Metadata Generator** tool, eventually placed in the applicable CFF Production Compliant Folders once the folders are created (see step 5.1 below). Because of the extent of the metadata gathering process, gathering metadata information is documented in its own work instruction document titled, "CFF File Creation: Getting Metadata Information," as the CFF file creation step *preceding* collection of assets and transcoding. Please see the document, "CFF File Creation: Getting Metadata Information," for more information.

Note that steps may vary between clients.



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2. Application

This work instruction applies to the second of five steps in the UltraViolet CFF (Common File Format) file creation process.

3. Process Owner(s)

If this document seems incorrect/outdated, please contact the below person for updates:

Role (BU & Dept.)	Contact Person
Technical Writer, Applications Development	Aaron Pillar (818-565-3893)
POD Leader, DDS Burbank 4 BD	Tom Lai
Director of Global Quality Assurance, Global QA	Justine Mannino



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4. Flow Chart: Gathering of Assets in Three Parts





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5. Setting Up Productions Folders and Collecting Video and Audio Assets

5.1.Project Folders Setup: Create CFF Compliant Folder Structure on Prod

For the title you're working on, on the production server create a folder with the film name, and then in that folder create a CFF compliant folder structure as seen in the example below. It is critical all folder structures and source files are not renamed for the automation processes to work.

00_Source 01_Video 02_Audio 03_Subtitle 04_RequiredMetadata 05_OptionalMetadata 06_RequiredImages 07_OptionalImages 08_ChapterThumbnails 09_WarningCard 10_Output 11_Verifier 12_MuxingScript 13_Others

NOTE: Usually you can find a pre-made Folder Template to use. Currently, templates are located (for example), at these locations:

- <u>\\10.1.17.37\cff\UltraViolet\FOX_Wave2_Folder_Template</u>
- <u>\\10.1.17.37\cff\UltraViolet\LIONSGATE_Folder Template</u>

5.2. Prores as Source Option: IQC Processing

The client will provide a prores file.

5.2.1.File Editing

IQC will trim the start and end of the file, as well as label the audio channels.

5.2.2.File QC

IQC will conduct a linear QC pass of the edited file. If it fails, a new source is needed. If it passes, the file will be placed on the Xsan server (IQC_FS01 or IQC_FS02), ready for retrieval by authors. See section <u>5.4</u> below.



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5.3.BD as Source Option

5.3.1.Harvest BD Asset to Demux

Make sure the application AnyDVD is installed on your computer (consult your supervisor for info on this), so you can access protected BD discs. Make sure the application Process Monitor is running on your computer and that its filters are set to capture data only from PowerDVD. Play the physical BD in Cyberlink PowerDVD Player and in Process Monitor take note of the feature playlist ID. This is the ID you'll select to extract in BD Asset Extractor below.

5.3.2.Extract Video and Audio Elements from BD

With a BD as source (either a disc or an image), from the CFF servers launch the BD Asset Extractor (currently located at \\10.1.17.37\cff\UltraViolet\TOOLS\BDAssetExtractor). On the tool's interface, follow the steps below.

0	BD Ass	et Extractor	r																_		23
	File H	lelp																			
	Disc R	oot Z	:\UltraVi	olet\LION	ISGATE\	THE_FRO	ZEN_GR	O/DNUC	_Sourc	e\00_BE	CMF\00_li	mage						Browse	🗸 🔽 Disc R	oot	
	Dutput	Path Z	:\UltraVi	olet\LION	ISGATE\	THE_FRO	ZEN_GR	O/DND	_Sourc	e\00_BC	CMF\01_E	xtracted						Browse			
	Hot Fo	lder															`	(📕 📃 Enable	Watch	
	Configu	figuration Brows							Browse												
	Index	Playlist ID	Play Items	Primay Video Streams	Primay Audio Streams	Seconda Video Streams	Seconda Audio Streams	PG Streams	Multi Angles	Video Format	Audio Lan	guage	PG Language	Code	эс				Duration	Extract	A III
	0	469	1	1	1	0	0	0	1	1080p	ENG			MPEC	G-4 AVC VID	EO DOLE	BY DIGITAL (A	.C-3) AUDI	00:02:29.167		2
	1	83	1	1	0	0	0	0	1	1080p				MPEO	G-4 AVC VID	EO			00:00:06.000		-
	2	474	1	1	2	0	0	0	1	1080p	ENG			MPEC	G-4 AVC VID	EO DOLE	BY DIGITAL (A	.C-3) AUDI	00:00:27.125	V	
	3	457	1	1	1	0	0	0	1	1080i	ENG			MPEO	G-4 AVC VID	EO DOLE	BY DIGITAL (A	.C-3) AUDI	00:14:07.167	V	
	4	487	1	1	1	0	0	0	1	1080p	ENG			MPEC	G-4 AVC VID	EO DOLE	BY DIGITAL (A	.C-3) AUDI	00:01:49.333		
	5	4/3	1	1	1	0	0	0	1	1080p	ENG			MPEC			BY DIGITAL (A	.C-3) AUDI	00:00:51.750	V	
	0 7	472	1	1	1	0	0	0	1	1080p	ENG			MPEC					00:01:49 333		
	8	465	1	1	1	0	0	0	1	1080p	ENG			MPEC	G-4 AVC VID	FOLDOLE		C-3) AUDI	00:03:42 375		-
		Index	C	ClipID	PID		Codec					Format	Lang	uage	Primary	Multi Angles	Duration	Preview			
	⊟	PlayItem	0 0	0817												1	00:02:29.16	7			
		Stream 0			1011		MPEG-4 A	VC video				1080p			True			Play			
		Stream 1			1100		Dolby Dig	ital (AC-3)	audio str	eam for F	Primary a	Stereo 4800	00 ENG		True			Play			
										0	%						4 -	rocess	Abort		

5.3.3.Browse and select either the disc or disc image you want to extract the data from.

5.3.4. Browse and select the Output Path for the extracted data to land:

UltraViolet\Client\Title\00_Source\00_BDCMF\01_Extracted

5.3.5.Select the streams you want to extract (you can right-click then Select All to select all streams at once).



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5.3.6.Click the Process button to begin the extraction process.

5.4. Prores as Source Option: Place Prores in CFF Production Compliant Folder

IQC will place the edited and QC'ed prores on the Xsan server (IQC_FS01 or IQC_FS02). Collect the feature prores you'll be using for muxing and place it in 00_Source folder you just created on the production server.

Example: 00_Source\01_mez\00_Video



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6. Collecting Chapter Assets

Either clients will provide you with chapter images as source files or you'll have to create them yourself. Select 6.1 or 6.2 below depending on which workflow applies to your situation.

6.1.Create New Chapter Assets

If you have to create chapter thumbnails and you don't already have the required time code information, either access the video compression log file or contact CEA QC and retrieve both the chapter point time codes and the chapter thumbnail time codes for the film you're working on. Then, save the chapter point time codes into one Notepad document, and the chapter thumbnail time codes into another Notepad document, at these location:

UltraViolet\Client\Film_Title\08_ChapterThumbnails\chapStops.txt

UltraViolet\Client\Film_Title\08_ChapterThumbnails\chapThumbs.txt

Generation of chapter assets will continue later in the CFF creation process. For this workflow, skip the rest of chapter 6, and continue with chapter 7, step 7.4 of this document.

6.2.Use Client Supplied Chapter Assets

If the client has already provided chapter thumbnails, they now need to be converted to the .jpg file format (even if they're already jpegs) to ensure no header information was lost when the Coordinator downloaded the images. They will also be given a CFF production compliant name.

6.2.1.Go to and open the prod folder UltraViolet\TOOLS (current location is \\10.1.17.37\cff\UltraViolet\TOOLS\CFF_RENAMER). Make sure the source chapter files are in the 00_HD and 01_SD folders in the ChapterThumbnail folder inside the CFF Production Compliant folder you created for the title you're working on (UltraViolet\Client\Film_Title\08_ChapterThumbnails).

6.2.2.Drag and drop the title folder (for example:

\\10.1.17.37\cff\UltraViolet\LIONSGATE\PULP_FICTION) onto the CFF_Renamer.exe executable (icon). The application will begin to launch with a publication security window asking if you trust this publisher. Click "yes." The application will open with a yes or no question (see below). Type "y" and the files will be converted and renamed.





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6.2.3.Ensure Thumbnails Match Blu-Ray Release

Locate the supplied Blu-ray check-disc for the title you're working on. Compare the checkdisc chapter images with the chapter images you generated and make sure they are identical. If they are not identical, inform your supervisor, fix any incorrect time code data that may have been used, then repeat the thumbnail generation process until the generated images and the check disc images all match.

6.3.Crop JPEGs at Verified Matte Line Values

Launch the executable Jar File HD Matte Detector application (currently located at $\10.1.17.37\Cff\UltraViolet\TOOLS\HDMatteDetector$).

B HD Matte Detector 1.0	
Image File Input Video File Input	
Browse to Framegrab Image(s)	Process Image(s)
Input Image(s): Browse	Determine Matte and Crop

In the 08_ChapterThumbnails folder for the title you're working on, select the 00_HD folder and drag and drop it into the Input Image(s) field. Then click the Determine Matte and Crop button in the Process Image(s) section at the right.

Once processing has finished, a folder called _CroppedImages will appear in the 00_HD folder.

6.3.1.Remove all original chapter pics in 00_HD and 01_SD and copy the new pics into *both* folders.



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7. Collecting Subtitle, AVI Script, and Content Traveler XML Assets

Launch the Video Source Editor (currently located at

\\10.1.17.37\cff\UltraViolet\TOOLS\VideoSourceEditor\1.4.10) and in the Tools menu select the CFF Content Traveler Creator option.

MideoSourceE	ditor									x
File View Too	ols Help		_							
	Description File Editor	Ctrl+D	1							
	Image Sequence Editor	Ctrl+I			1.1					×
	CFF Content Traveler Creator			File Name						
-			-	File Type	RAW					
				Frame Width	1920					
				Frame Height	1080					
				Frame Rate	24					
				Rate Scale	1					
				Bit Depth	0					
				FOURCC	IYUV					
				Buffer size	0					
				Total Frames	0					
				Frame Number	0					
				Video Pixel Value Properties of the so frame image.	es EST WM ource video, g	Info generate	d edge	image	and resu	Ilting
				[0	0] 0,	0(0	, 0)		0, 0	(

7.1.Set Input and Output Folders

Project Path U:\UltraViolet\UNIVER		Browse
Source Type	Source Aspect Ratio is 16 x 9	
C BDCMF Source C Ma	E22. Force Stereo Downmix	
	Process Audio Only	
ideo Path U:\UltraViolet\UNIVER	SAL\SAVAGES_THEATRICAL\00_Source\00_BDCMF\01_Extracted\pl_00800\1011	Browse
udio Path U:\UltraViolet\UNIVEP	ISAL\SAVAGES_THEATRICAL\00_Source\00_BDCMF\01_Extracted\pl_00800\120	Browse
M Hot Folder U:\UltraViolet\UNIV	ERSAL\SAVAGES_THEATRICAL	Browse
-Video Cropping and Output Besolu	3 Preview	
-Video Cropping and Output Resolu Top Matte Position 40	tion Output SD Width 854 Output HD Width 1920	
Video Cropping and Output Resolu Top Matte Position 40 Bottom Matte Position 104¢	tion Output SD Width 854 Output HD Width 1920 Output SD Height 444 Output HD Height 1000	



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- 7.1.1.Browse, locate, and select the **Project Path**.
- 7.1.2.Browse, locate, and select the Video, Audio, and TM (Transcode Manager) Hot Folder paths.

Note: For the Content Traveler File (CTF) output destination, use either the designated Transcode Manager (TM) Hot Folder to automatically trigger transcoding, or use the Title Folder for QC of CTF before transcoding. Then, drop QC'ed CTF file in the Transcode Manager (TM) Hot Folder to trigger transcoding.

7.1.3.Click the **Preview** button to open the **Video Source Editor Preview** window.

7.2. Retrieve and Enter Top and Bottom Matte Values for Active Picture



- 7.2.1.Go to the View menu, to the Macroblock item, and then check YUV.
- 7.2.2.Make sure the **Pixel Values** tab at the bottom right is selected.
- 7.2.3.Use keyboard arrow keys to navigate the onscreen gray block to identify the matte value.

[-Video Cropping and Output	Resolutio	n			
Л	Top Matte Position	40	Output SD Width	854	Output HD Width	1920
	Bottom Matte Position	104C	Output SD Height	444	Output HD Height	1000



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- 7.2.4.Enter matte values into Video Cropping and Output Resolution section of the Content Traveler Creation page.
- 7.2.5. Provide Video Aspect Ratio Information to the Subtitling Department to get subtitles.
- 7.2.6.Place subtitle files received from the subtitling department in the CFF production compliant folder (03_Subtitle).

7.3.Retrieve and Enter Start and End Time Codes

Video Trimming Head Trim Start 225 frm Tail Trim Start 66911 frm Replace Tail Trim with Blank Stream Start TC 01:00:00:00	Audio Trimming Source Asset Info Head Trim Start 225 sec Tail Trim Start 66911 sec FPS 23.976 Audio Channels 6	
Chapter Pts U:\UltraViolet\UNIVERSA	L\SAVAGES_THEATRICAL\06_ChapterThumbnails\Savages Chapter Times	Browse
Chapter Thumbs U:\UltraViolet\UNIVERSA	L\SAVAGES_THEATRICAL\06_ChapterThumbnails\savages_th_chapter_pu	Browse
Universal Fox Warne	er Lions Gate	

7.3.1. Start time: Find out the starting timecode of the pro res file (it is usually on the file name), and find out the actual starting timecode of the encoded video (from the video log file from compression), and find the difference in seconds between them, Then, times the result by 24. This will be your Head Trim Start. You can open the pro res file in quick time and on the bottom left where the time code is click on it and choose "Timecode in Non-Drop-Frame". This will give you timecode which the video starts.

End Time: Find the first frame of black after the credit and add a couple more frames to accommodate fading audio. This will be your Tail Trim Start.

7.3.2.Click the copy button to duplicate the Head Trim Start and Tail Trim Start times to the Audio Trimming fields.

7.4.Enter Stream Start Timecode and (if needed) Select Chapter Point and Chapter Thumb Time Code Documents

- 7.4.1.Enter the Stream Start TC (timecode). It's always 01:00:00:00.
- 7.4.2. Browse and select Chapter Pts. and Chapter Thumbs .txt documents.



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1	Stream Start TC	01:00:00:00	
	Chapter Pts	U:\UltraViolet\UNIVERSAL\SAVAGES_THEATRICAL\06_ChapterThumbnails\Savages Chapter Times	Browse
2	Chapter Thumbs	$\label{eq:constraint} U: \label{eq:constraint} U: eq:constrain$	Browse

7.5.Select Client-Specific Settings

Select Client (click client-named tabs at bottom) and apply client-specific settings.

7.5.1.Select Watermark Option

Universal Fox Warne	r Lions Gate		
Video Encode Mode placebo	Bitrate 8 Mbps	Multi Channel Audio	5.1 💌
Watermark			
Embed Watermark			
Image U:\UltraViolet\FOX\Life_of_Pi	100_Source101_Mezzanine101_Sc	ripts\Fox_logo_waterma	Browse
X 774 Y 27	0 Start Frame -1	End Frame -1	

For clients using a watermark file can be applied by dragging and dropping file from UltraViolet\Client\Title\00_Source\01_Mezzanine\01_Scripts folder into Image field.

7.5.2. Choose a Multi-Channel Options

Chapter Thumbs	U:\UltraViolet	LIONSGATE \EM	IPEROR\00_Source\0	0_BDCMF\chapters.txt	Browse
Universal	Fox	Warner	Lions Gate		
Multi Channel	Audio 5.1	•			

7.6.Generate AVISynth Scripts and Auto-Begin Transcoding, or Generate Scripts but QC Files First

Create AV	S Scripts and Content Tra	veler
Create AV	S Scripts and Content Tra	veler



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Click the **Create AVS Scripts and Content Traveler** button to create the file. Depending on the output folder you selected in step 7.1.2, files will either be generated into the Transcode Manager (TM) hot folder to automatically begin the transcoding process, or they will be generated into the CFF production compliant title folder for pre-transcode QC.

7.6.1.QC AVS Scripts and Content Traveler Files generated into the CFF production compliant title folder

AVS Script QC

Launch the application GraphEdit (currently located at

\<u>\10.1.17.37\cff\UltraViolet\TOOLS\GraphEdit</u>) and drop the generated AVS file onto the application and click the play button.



Do a 5-spot visual (and aural) check on the file (Beginning, Beginning/Middle, Middle, Middle, Middle/End, End).

Content Traveler File QC

Follow checklist for QC.

7.6.2. Drop QC'd Files into the Designated Transcode Manager Hot Folder.

Once the **Content Traveler** is placed in the TM hot folder, the **Transcode Manager/BD Live Transcoder** automatically picks it up and, based on the available nodes, encodes the video source into HD and SD formats, and encodes the audio sources into 2.0, 5.1 or 7.1 channel configurations. Various progress parameters are available on three different **Transcode Manager** tabs, shown in the three screen shots below.



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Transcoder Mar	nager		
CPN Control CPN 9	Status Job Status		
CPN Manifest D:\S	Storage/Configurations/CPNs.xml		Browse
Stream Output			Browse
Hot Folder D:\S	Storage\HotFolders\TranscodeManager		Browse
🔽 Enable Wate	tch		
Encoding Configural	ations D:\Storage\Configurations\EncodingConfig_CFF.xml		Browse
Configuration Path	Avg Peak Bitrate Bitrate (Mbps) (Mbps)	Output Format	Resolution
ranscoderTest_AV	VC_Fox_x264_3pass_SD_Main_2000k_EC3_384k_AAC_96k.xml 1 1.5	BD	720x480
Date/Time 11/11/2013 6:28 11/11/2013 6:29 11/11/2013 7:11 11/11/2013 7:12 11/11/2013 8:04	Event UVUIIva/violeVF0V/SkyFalV00_SourceV01_MezzanineV01_ScriptsV00_AVSV01_SD/SkyFalLSD_Mezz_854x354.avs sent to DT0-DR- UVUIIva/violeVF0V/SkyFalV00_SourceV01_MezzanineV01_ScriptsV00_AVSV01_SD/SkyFalLSD_Mezz_854x354.avs sent to DT0-DR- U/UIIva/violeVF0V/Heat_The_TheatricalV00_SourceV01_MezzanineV01_ScriptsV00_AVSV00_HD/Heat_The_Theatrical_ND_Mezz_8 U/UIIva/violeVF0V/Heat_The_TheatricalV00_SourceV01_MezzanineV01_ScriptsV00_AVSV00_SD/Heat_The_Theatrical_SD_Mezz_8 U/UIIva/violeVF0V/Heat_The_TheatricalX00_SourceV01_MezzanineV01_ScriptsV00_AVSV00_SD/Heat_The_Theatrical_SD_Mezz_8 U/UIIva/violeVF0V/Heat_The_TheatricalX00_SourceV01_MezzanineV01_ScriptsV00_AVSV00_SD/Heat_The_Theatrical_SD_Mezz_8	15_a 15_a 120x800.avs sei 4x356.avs sent 50_BDCMF_85	nt to TRANSNODE-P04_a to TRANSNODE-P04_b - 4x356.avs sent to TRANSN
11/12/2013 1:07	. U:\UltraViolet\F0X\WAY_WAY_BACK\00_Source\01_Mezzanine\01_Scripts\00_AVS\00_HD\WAY_WAY_BACK_HD_Mezz_1320x1	080. avs sent to	o TRANSNODE-P03_a





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🧱 Transcoder Manager		
File Encode Job Queue Length 0		
CPN Control CPN Status Job Status		
Asset Name	Assigned CPN	Status
±- 31183470-0d0f-4d8c-9158-afffa4410f67	TRANSNODE-P04_a	Processing
D:\Storage\HotFolders\TranscodeManager\ContentTraveller_cff_WAY_WAY_BACK_HD_Mezz_1920x1080_2Pass5438e5e1-28c1-4d45-a57c-91808		
	TRANSNODE-P03_a	Processing
D:\Storage\HotFolders\TranscodeManager\ContentTraveller_cff_WAY_WAY_BACK_SD_Mezz_854x1518_DG2eb5089a5490b-4c6f-8092-7a50d0ee		
±− 013fdbc4-771f-4a42-84b6-405760023fa0	TRANSNODE-P03_b	Processing
D:\Storage\HotFolders\TranscodeManager\ContentTraveller_cff_RedDawn_HD_Mezz_1920x800_2Passe8d9f0d9-c0ce-4f6f-9c21-53aa635723c1.xml		
	TRANSNODE-P04_b	Processing
D:\Storage\HotFolders\TranscodeManager\ContentTraveller_cff_RedDawn_SD_Mezz_854x2050_DG214937ae8-c341-4ded-9595-184a7c9877e1.xml		
iii — c661a48a-60ac-4154-a17c-49lbd963108f	TRANSNODE119_b	Processing

7.7.QC Transcoded Content

QC the transcoded content using GraphEdit and any other programs your department uses to watch video and listen to audio, which is all indicated in the department provided QC checklist.

This completes the work instructions for CFF File Creation: Collection of Assets and Transcoding.