June 29, 2015

Ms. Jacqueline Charlesworth
General Counsel
U.S. Copyright Office
101 Independence Ave., SE
Washington, DC 20559

<div align="center">

Re: **Docket No. 2014-7 Exemptions to Prohibition against Circumvention of Technological Measures Protecting Copyrighted Works**

Subject: **Class 5**

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Dear Ms. Charlesworth:

On behalf of DVD CCA and AACS LA, we are submitting the following response to the below post-hearing question to Proposed Class 5: Audiovisual works–derivative uses–multimedia ebooks.

Response to Question 1:

As described in detail below, there is a simple "work-around" for Mac users to be able to make use of screen capture software to record playback from DVDs. The concerns about the apparent modification to the Apple operating system for Macs in the most recent versions that prevents the video recording capability of currently available screen capture programs are thereby overcome. Consequently, clips created on the Mac users' computer using screen capture in the *Windows* environment are just as available for Mac users to manipulate for the purposes for which the exemptions have been requested.

<u>Screen Capture of DVD and BD Playback</u>

In the *Windows* environment, we are unaware of any limitations of the ability of screen capture software to record DVD playback. In the Mac environment, Apple's native operating system apparently prevents screen capture from recording DVD playback on a licensed player such as the Apple DVD Player or QuickTime player. Attempts to screen capture DVD playback on a licensed player will result in a recording that contains only the audio.[1] The video portion of the recording appears as a gray screen. Neither the CSS license nor the implementation of the Robustness Rules for the CSS license requires this result. (Note this limitation seems to apply to

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[1] This limitation on licensed players in the Mac environment however does not seem to apply to unlicensed (and unauthorized) DVD players such as the VLC player. As discussed at the hearing a Mac user can successfully screen capture DVD playback from the unlicensed VLC player. The VLC player however is decrypting the content on the DVD without the benefit of a license from DVD CCA and accordingly, it constitutes a circumvention device. In acknowledging this fact, we are not in any way endorsing the use of the VLC player or any other unlicensed player for the purpose of accomplishing screen capture of DVD playback.

any DVD playback, including those not protected by CSS, such as personal recordings made on DVDs).

With respect to Blu-ray, we are unaware of any screen capture software that is capable of recording the video portion of Blu-ray playback from a licensed BD player. Attempts to record BD playback will result in a recording of only the audio portion of the content; the video portion appears as a black screen. This result is consistent with the Robustness Rules for the implementation of the AACS license, which require the licensee to protect the content from interception from the point of decryption to the point of display. [2]

Alternative Approach to Screen Capture of DVD Playback in the Mac Environment

Mac users can use screen capture to record DVD playback if they take advantage of Mac's ability to run the *Windows* operating system. Mac users can run *Windows* on their machines through either *Boot Camp* or *Parallels Desktop*. While both methods would permit the Mac user to make use of any screen capture software made for the *Windows* operating system, below we only describe the *Boot Camp* method. We then suggest that *Parallels Desktop* may be used to compliment the *Boot Camp* method to facilitate the transfer of video files created with screen capture back into the Mac environment.

Boot Camp

Since 2006 Apple has included *Boot Camp* as a free utility in Macs to permit the user to run the *Windows* operating system.[3] While Apple preinstalls its native operating system to run the Mac, *Boot Camp* allows the user to install a separate partition on the hard drive from which to run the *Windows* operating system, which the user must license separately (*Windows* 8.1, currently the most up-to-date version available, retails for $119.99).

The Mac user is now able to run his or her machine with either the native Apple operating system or with the *Windows* operating system. Generally, without the benefit of additional software, the machine can run only one operating system at a time; the user is prompted to choose which operating system to load upon turning on the computer.

If the computer boots to *Windows*, the user can make use of any software applications intended to run in the *Windows* environment, including screen capture applications. Software and content associated with the *Windows* operating system will however remain isolated on the separate partition (that is, if the user boots to the Mac operating system, he or she will not be able

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[2] On Panel 7, while noting remixers generally could not screen capture BD playback, the proponents put forth a video from one remixer, who was described as "lucky" because she was able to screen capture BD playback of a scene from Captain America with Snagit. We subsequently tested Snagit with a BD copy of the Avengers, and Snagit was unable to record the video portion of the BD playback (i.e., Snagit performed like all other noncircumventing screen capture software and recorded only the audio). The "lucky" remixer most likely had to have circumvented the BD, knowingly or unknowingly, prior to playback such that the BD playback was not recognized as decrypted AACS content. If content is not recognized as decrypted AACS content then none of the additional protections required under the Robustness Rules would be in play to prevent the recording of the video portion of the content.

[3] *See* https://support.apple.com/en-us/HT204048 (detailing system requirements for all Boot Camp *Windows* compatible Macs with Intel processors since 2006.)

to access files associated with the *Windows* partition). If the Mac user desires to move content created in the *Windows* environment to the Mac environment the user must either use the *Parallels* system described below or make use of an intermediary process to transfer the content back to the Mac partition (e.g., copying the software to a removable storage device such as an external hard drive, or a cloud storage service such as Google Drive or Dropbox).

Parallels Desktop

Parallels Desktop, which retails for $79.99, is another software application that enables Mac users to run the *Windows* operating system, but unlike the *Boot Camp* approach, Parallels allows the two operating systems to run simultaneously (the *Windows* environment essentially appears as any other program would within the Mac environment). *Parallels Desktop* thus results in a more integrated experience where *Windows*-based applications and content are not segregated by the partitioned Mac and content can be moved more seamlessly between the *Windows* and Apple environments. Like the *Boot Camp* approach, the Mac user must have a version of *Windows* to operate the *Windows*-based applications.

After installing *Parallels Desktop* and a copy of *Windows*, a Mac user can run *Windows*-based screen capture software just like any other *Windows*-based software. Because screen capture software requires significant processing power and RAM memory, older or less-well-resourced machines may experience difficulty running screen capture software by way of *Parallels Desktop*. (The machine is essentially running (i) the Apple operating system and (ii) *Windows*; (iii) playing back a DVD and (iv) recording it - all at the same time.) The *Boot Camp* approach described above is less taxing as it involves only the latter three tasks. Nevertheless, *Parallels Desktop* is a useful tool to transfer the video after its capture from the *Boot Camp* process.

Results

Through the above *Boot Camp* method, we were able to screen capture DVD playback using WM Capture software. The resulting quality through the *Boot Camp* method was identical to the screen capture videos submitted as exhibits and presented during the panels. Using *Parallels Desktop*, we were then able to access and seamlessly transfer the videos created with WM Capture from the *Windows* partition back into the Mac environment without issue.

Conclusion

In light of the foregoing, screen capture software is completely available to Mac users as an alternative to the circumvention of DVDs, and as an alternative to circumvention, the value of screen capture software cannot be overstated, particularly for those multimedia ebook creators who are not engaged in film analysis. The evidence, at best, warrants only an exemption to circumvent DVDs and only for multimedia ebook creators engaged in film analysis. (DVD CCA does not object to the renewal of the prior exemption on the same or similar terms.) Nevertheless, those multimedia ebook creators, whose work would not qualify under a renewed exemption, may still include short clips of movies in their ebooks by means of screen capture technology. We have demonstrated that screen capture technology has significantly improved to the point that the details proponents want in the clips are readily visible. Consequently, even if proponents had proffered evidence of uses beyond film analysis, there would be no reason to

expand the exemption as screen capture software enables multimedia ebook creators to accomplish the same uses that proponents claim they want to make. Therefore, any exemption for this class should be limited to the renewal of the past exemption on the same or similar terms.

Response to Question 2

<u>HD Video Policies</u>

We were unable to identify any ebook provider policy that requires authors include HD video. We were also unable to identify any multimedia ebooks that claimed to offer any HD video. We are not surprised by the absence of such a policy as any such mandate would be completely unsustainable in light of the current platform requirements, industry practices, and technological limitations.

<u>File Size Limitations</u>

The single largest obstacle to the integration of high definition (HD) video content in multimedia ebooks is the overall size limitation imposed on ebooks by distribution platforms, such as Apple's iBooks Store (2 gigabytes)[4] and the Amazon Kindle Marketplace (650 megabytes). [5] These restrictions reflect how much storage device consumers are reasonably expected to have available on their devices, particularly mobile devices such as iPads; how much storage the consumer will reasonably be able to dedicate to storing ebook content; and how much time downloads would take if they exceeded these limitations, especially on mobile devices connected to networks using cellular (as opposed to WiFi) networks.[6]

HD video requires larger file sizes (which, in turn, require longer download times). While a chart on download times from iTunes suggests that a 45-minute TV show is 200 MB and 600 MB in HD, *see* Attachment A, real examples demonstrate a TV show to be approximately 549 MB in SD and 1.86 GB in HD, *see* Attachments B and C, when delivered as an MPEG-4 file. (In April 2015, Kindle Textbook Creator began to support video, and it accepts only MPEG-4 files.[7] While the iBooks Author program claims to support any video file format compatible with Apple's QuickTime Player,[8] MPEG-4 has emerged as the standard.[9]) Based on

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[4] *See* https://support.apple.com/en-us/HT201478 (section header "Buy and Download: File Sizes").

[5] *See* https://kindlegen.s3.amazonaws.com/AmazonKindlePublishingGuidelines.pdf (page 55, section 6.13 "File Size").

[6] *See* http://www.kdl.org/kdl/pdf/eReaderComparison.pdf (comparing the various e-readers storage capacities) and http://www.phonearena.com/news/Which-carrier-offers-the-fastest-mobile-data-and-coverage-4G--3G-speed-comparison_id53828 (comparing download speeds across various 4G mobile networks).

[7] *See* https://kdp.amazon.com/community/ann.jspa?annID=753 (announcing video support in KTC) and https://www.amazon.com/gp/feature.html?docId=1002998671 (Question 13 "What video formats does Kindle Textbook Creator support?").

[8] *See* https://support.apple.com/en-us/HT202374 and https://support.apple.com/en-us/HT201290 (listing all of the Quicktime compatible formats).

[9] *See* http://techcrunch.com/2012/04/17/survey-mp4-is-top-format-for-web-and-mobile-videos/

the foregoing, a HD video file is at least three times larger than a SD video file, and the use of either SD or HD video would be restricted by the platform provider's overall size limitations.

Download Speed Restrictions

Internet download speeds are also a critical element to the viability of offering HD video. Content providers must consider whether a consumer is motivated to wait for the content to download. The earlier mentioned iTunes chart suggests that even over a typical broadband connection (5Mbit/s) a 45-minute TV show in SD would download in 3 to 5 minutes, while in HD it would download in 10 to 15 minutes. *See* Attachment A.

At least one multimedia eBook author shares this concern in her pursuit of publishing "Easy Chinese Recipes in 30 Minutes".[10] In her review of the iBooks Author application, she described difficulties in using 720p HD video for use in the cookbook. A 4-minute instructional video for a single recipe took up 316 MB. She recognized that readers may be discouraged from downloading the book if they had space-limited devices or limited broadband access. She thus reduced the resolution of the videos from 1280x720 to 480x272, reducing the file size of each video by roughly 90%. The final published product containing four 4-minute clips has a total file size of 69 MB.

Conclusion

In light of the foregoing, the proponents' demand to make use of HD content is illusory. The realities of the marketplace do not support HD content being included in multimedia ebooks. Multimedia ebook creators are constrained by file size limitations, device storage space, download speeds and most importantly consumer expectations. Faced with these challenges at least one multimedia ebook creator chose to forego her desire for HD video and instead chose to deliver a viable product to the marketplace. While the example is anecdotal, the creator's story is compelling. In contrast to the proponents' examples of individuals who want to create multimedia ebooks, this creator actually published her multimedia ebook. Consequently, no basis exists to conclude that maintaining the prohibition against the circumvention of AACS on Blu-ray discs results in any harm, particularly when for the immediate foreseeable future including HD video in multimedia ebooks simply is not feasible.

Sincerely,

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[10] *See* http://in30minutes.com/ibooks-author-review-ebooks-ipad/.

iTunes Store: Download times will vary

When you buy an item from the iTunes Store, the amount of time it takes to download your purchase will vary according to the file's size and your Internet connection speed.

When you buy an item from the iTunes Store, the amount of time it takes to download your purchase will vary according to the file's size and your Internet connection speed. A broadband connection is highly recommended for making music purchases and required for making video purchases or rentals.

For reference, here are some examples of download times for various media types. Your download times may vary. If you want to know your speed specifics, your Internet Service Provider (ISP) can help you determine your download speed, or you can use CNET's Bandwidth Meter.

Length and type of media	Approximate size	Download speed		
		Broadband[1]		Dial-up
		5 Mbit/s	1 Mbit/s	56K modem
4-minute song	4 MB	4-5 seconds	20-30 seconds	About 10 minutes
5-minute video	30 MB	30-40 seconds	About 3 minutes	About 1 hour, 10 minutes
9-hour audiobook	110 MB	2 minutes	About 10 minutes	About 4 hours, 15 minutes
45-minute TV show	200 MB	3-5 minutes	15-20 minutes	About 7 hours, 45 minutes
45-minute HDTV show	600 MB	10-15 minutes	About 45 minutes-1h	n/a[2]
2-hour movie	1.0-1.5 GB	18-24 minutes	About 1.5-2 hours	n/a[2]
2-hour HD movie	3.0-4.5 GB	54-72 minutes[3]	About 4.5-6 hours[3]	n/a[2]
iPod Game	10-60 MB	About 30-70 seconds	About 3-6 minutes	About 1-2 Hours

Notes

1. Broadband speeds can range from 256 kbit/s and up. These estimates are based on both a 5 Mbit/s and a 1 Mbit/s broadband connection. Download speeds will vary depending on your Internet connection.
2. Broadband required for movie and HD downloads.
3. Refer to the Apple TV Technical Specifications page for your Apple TV model for more information on the time before you can start viewing a movie rental: Apple TV (3rd generation) - Technical Specifications, Apple TV (2nd generation) - Technical Specifications, Apple TV (1st generation) - Technical Specifications.

ATTACHMENT A

Some content types are not available in some iTunes Store countries.

Information about products not manufactured by Apple, or independent websites not controlled or tested by Apple, is provided without recommendation or endorsement. Apple assumes no responsibility with regard to the selection, performance, or use of third-party websites or products. Apple makes no representations regarding third-party website accuracy or reliability. Risks are inherent in the use of the Internet. Contact the vendor for additional information. Other company and product names may be trademarks of their respective owners.

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🇺🇸 United States (English) ›

ATTACHMENT A

TV Shows > Sci-Fi & Fantasy > Doctor Who

Doctor Who, Season 1

TV-14 CC

Details   Ratings and Reviews   Related

$24.99 Buy

★★★★⯪ (913)

Description

Christopher Eccleston's Doctor is wise, funny, cheeky and brave. An alien and a loner, his detached logic gives him a vital edge when the world is in danger. However, when it comes to interpersonal relationships, he can be found wanting. That's why he needs new assistant Rose. Rose is a shop-girl from the present day. From the moment they meet, the Doctor and Rose are soul mates. They understand and complement each other. As they travel together through time, encountering new adversaries, the Doctor shows her things beyond imagination. She starts out as an innocent, unfettered by worldly concerns. But she ends up an adventurer who, by the end of the series, can never go home again...

Episodes

1. Rose

$1.99

TV-14 CC   Mar 26, 2005   44 min   549 MB (SD)

The first appearance of Christopher Eccleston as the Doctor. Rose Tyler meets a mysterious stranger called the Doctor, and her life will never be the same again. Soon, she realizes that her mum, her boyfriend, and the whole of Planet Earth are in danger. The only hope for salvation lies inside a strange blue police box...

ATTACHMENT B

Edward ✓

Search Library

Unwatched ✓

2. Dark Wings, Dark Words — Game of Thrones
Sansa says too much. Shae asks Tyrion for a favor. Jaime fir

TV-MA HD
April 7, 2013
58 minutes

Dark Wings, Dark Words
Game of Thrones
Season 3, Episode 2 TV-MA HD

| Details | Artwork | Description | Options | Sorting | File |

size **1.86 GB**

profile **Low Complexity**

kind **Protected MPEG-4 video file**

video quality **720p**

total bit rate **4535 kbps**

dimensions **1280×720**

purchased by **Edward Lang (eclang@gmail.com)**

purchase date **4/18/14, 1:30 AM**

date modified **4/18/14, 2:12 AM**

date added **4/18/14, 1:30 AM**

FairPlay version **3**

< >   Cancel   OK

3. Walk of Punishment — Game of Thrones
Tyrion shoulders new responsibilities. Jon is taken to the Fis   captors.

TV-MA HD
April 14, 2013
53 minutes

4. And Now His Watch Is Ended — Game of Thrones
The Night's Watch takes stock. Varys meets his better. Arya   ip.

TV-MA HD
April 21, 2013
54 minutes

5. Kissed By Fire — Game of Thrones
The Hound is judged by the gods; Jaime is judged by men. J

TV-MA HD
April 28, 2013
58 minutes

6. The Climb — Game of Thrones
Tywin plans strategic unions for the Lannisters. Melisandre p   th House Frey. Roose Bolton
decides what to do with Jaime Lannister. Jon, Ygritte and th

TV-MA HD
May 5, 2013
54 minutes

7. The Bear and the Maiden Fair — Game of Thrones
Dany exchanges gifts with a slave lord outside of Yunkai. As Sansa frets about her prospects, Shae chafes at Tyrion's new situation. Tywin counsels the king, and Melisandre
reveals a secret to Gendry. Brienne faces a formidable foe in Harrenhal.

TV-MA HD
May 12, 2013
58 minutes

8. Second Sons — Game of Thrones
King's Landing hosts a wedding, and Tyrion and Sansa spend the night together. Dany meets the Titan's Bastard. Davos demands proof from Melisandre. Sam and Gilly meet
an older gentleman.

TV-MA HD
May 19, 2013
57 minutes

9. The Rains of Castamere — Game of Thrones
Robb presents himself to Walder Frey, and Edmure meets his bride. Jon faces his harshest test yet. Bran discovers a new gift. Daario and Jorah debate how to take Yunkai

TV-MA HD
2013

ATTACHMENT C