

**BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554**

In the Matter of)

Closed Captioning of Internet Protocol-Delivered)
Video Programming: Implementation of the)
Twenty-First Century Communications and Video)
Accessibility Act of 2010)

MB Docket No. 11-154

COMMENTS OF ROVI CORPORATION

I. INTRODUCTION

Rovi Corporation (“Rovi”), founded in 1983 as Macrovision, is an industry leading provider of digital entertainment technologies for businesses in the consumer electronic, cable and satellite and entertainment markets across the world. The company is focused on developing entertainment technology that helps consumers sort through the numerous programming options available to find television shows and movies to watch. With its acquisitions of Gemstar-TV Guide and Sonic Solutions, Rovi is a preeminent provider of entertainment content distribution and navigation technologies, entertainment information and intellectual property.

Rovi Corporation is an industry-leading provider of both consumer-facing and professional products and services world-wide. Our businesses include services and technologies such as electronic program guide products, home and professional content authoring systems, Internet content delivery services, and Internet receiver solutions.

Rovi operates “white label”¹ services (known as Rovi Entertainment Solutions, or “RES”) for providing online video, including licensing content and operating the back-end services, billing, infrastructure and content delivery for a number of clients including retailers, device manufacturers and web presences, such as Best Buy, RIM/BlackBerry, Flixster/Warner Bros. and others.

Additionally, Rovi’s products include a widely-adopted video format (DivX), a metadata service for

¹ Rovi does not sell this service directly to consumers. *See* white-label product, http://en.wikipedia.org/wiki/White-label_product (last visited June 8, 2011).

television, and a number of program guides and video players for televisions, tablets, smartphones and other devices. With these varied businesses, Rovi products and services are affected by content interchange mechanisms (“ingest”) and captioning decoding/display technologies.

Because of its diverse business interests, Rovi participates in a variety of industry standards-setting organizations and consortia. Additionally, Rovi was proud to participate as a member of the VPAAC.

It is with this background, and as both a supplier to newly-regulated businesses and the operator of a newly-regulated business, we supply these Comments of Rovi Corporation with respect to the Digital Media Association’s (“DiMA”) petitions.² In particular, the Commission should grant both the *First Petition*,³ and the *Second Petition*.⁴

II. EXEMPTION OR WAIVER FROM SECTION 79.103(C) FOR A LIMITED PERIOD IS IN THE PUBLIC INTEREST

In the petitions, the DiMA details the “daunting difficulties” of complying with the advanced CEA-708 features of 79.103(c) in a “short time frame.”⁵ The *Second Petition* details the “significant technical difficulties” of implementing captioning *and* CEA-708-style rendering for VPDs that do not currently provide captions.⁶

A. SIX MONTHS IS INSUFFICIENT TIME FOR PLUG-IN DEVELOPMENT

The Commission correctly recognized that developing CEA-708-style decoding and rendering engines for apparatus is a complicated and time-consuming process, and set an implementation deadline for apparatus of January 1, 2014.⁷ The Commission set this deadline in

² *Comment Dates Established for Two Petitions for Temporary Partial Exemption or Limited Waiver of Certain Provisions of 47 C.F.R. Section 79.4(c)(2)(i)*, Public Notice, DA-12-775, MB Docket No. 11-154 (May 15, 2012).

³ *In the Matter of Closed Captioning of Internet Protocol-Delivered Video Programming: Implementation of the Twenty-First Century Communications and Video Accessibility Act of 2010*, Petition for Temporary Partial Exemption or Limited Waiver, Digital Media Association, MB Docket No. 11-154 (May 8, 2012) (“*First Petition*”).

⁴ *In the Matter of Closed Captioning of Internet Protocol-Delivered Video Programming: Implementation of the Twenty-First Century Communications and Video Accessibility Act of 2010*, Petition for Temporary Partial Exemption or Limited Waiver from the Provisions of Section 79.4(c)(2)(i) Relating to the Rendering of Captions, Including to the Applications, Plug-Ins, or Devices Provided by a VPD, MB Docket No. 11-154 (May 8, 2012) (“*Second Petition*”).

⁵ *First Petition* at 5.

⁶ *Second Petition* at 3.

⁷ *In the Matter of Closed Captioning of Internet Protocol-Delivered Video Programming: Implementation of the Twenty-First Century Communications and Video Accessibility Act of 2010*, Report and Order, 27 FCC Rcd 787 at ¶ 122 (Jan. 13, 2012) (“*Order*”).

recognition that it has “repeatedly determined manufacturers generally require approximately two years to design, develop, test, manufacture and make available to for sale new products.”⁸

1. THERE IS ESSENTIALLY NO DIFFERENCE BETWEEN PLUG-INS AND APPARATUS

Apparatus are products that have hardware and software components, and are designed, developed, tested, manufactured and made available for sale to consumers.⁹ Products which are software-only have little differences from hardware/software apparatus, and have only slight time-to-market advantages.

In all cases, whether a product is software or a hardware/software apparatus, the engineering necessary to enable closed caption decoding, rendering and pass-through is substantially identical. Both sorts of products must be designed, implemented and thoroughly tested, though only hardware devices are manufactured and physically transported.

More particularly, for devices with the hardware capability to perform caption decoding and rendering, there is essentially no difference between the engineering and testing tasks that must be performed for plug-ins and for apparatus.

For a plug-in or apparatus, engineers must design and create software that receives, decodes and renders the captions. The engineers must also create a user interface which allows selection of font, colors, sizes, *etc.* (the 79.103(c) features), and configures the decoding/rendering engine to respect those preferences—which is a nontrivial problem.¹⁰

There must also be a significant testing effort undertaken to verify that the decoding and rendering software properly works in a great number of cases. Even a rough estimate on the complexity of cases that must be tested yields a testing grid of nearly three million test cases.¹¹ While it may be the case that not each and every case needs to be tested, a significant number of

⁸ *Id* at ¶ 122, n.495.

⁹ *See generally, id.*

¹⁰ Changing font sizes is particularly problematic, as it is important to respect both the viewer’s preferences, the content authoring, and create a readable on-screen result.

¹¹ By way of a rough-order estimation, consider three presentation modes (pop-on, roll-up, paint-on), 64 or eight character colors, two character opacities (opaque, semi-transparent), three character sizes (50%, 100%, 200%), seven or eight fonts, 64 or eight background colors in each of three states (opaque, semi-transparent, transparent), five edge attributes (none, raised edges, depressed edges, uniform edges, drop shadowed edges), 64 or eight window colors in each of three states (opaque, semi-transparent, transparent)

them certainly do—and even deciding which ones do need to be tested is a difficult and necessary undertaking.

Each of these tasks are essentially identical, whether for a software-only product or for an apparatus.

2. DEVELOPMENT OF PLAYBACK SOFTWARE IS COMPLEX

Development of CEA-708-style caption decoding and rendering engines is a difficult and complex task, not suited to rushed development and a short deadline. Developing or integrating any character rendering is a complex task, but just a first step. The software also must receive, decode, and parse the caption syntax. It must render the characters according to the features encoded with the content, or according to the user's preferences. However, there are significant rendering complications that must be addressed when users' preferences would yield poor (or not displayable) results. Additional capabilities, particularly additional windowing and user controls add significant complexity.

Furthermore, the user interface to preferences, the decoding, and the rendering engines must be integrated and tested with each other. Care must be taken to assure that operation of the caption features do not adversely affect the primary operation of the software—showing audiovisual content.

3. VARIETY OF PLATFORMS IS LARGE

There are a large variety of platforms in wide usage, which vary by hardware, operating system, browser, plug-in versions, and by other ways. Rovi provides software “plug-in” players for many of those diverse platforms, both by virtue of being a “white label” provider of VPD services and as a third-party software supplier. As a result, any substantial change to “plug-in” software has manifest effects on many different custom and semi-custom software products, with a large set of customers (each with their own development, integration, and testing needs).

Development and deployment of software for such a wide variety of platforms is the result of many years of producing, maintaining and updating software to an ever increasing set of customers and platforms. Moreover, some of these products may no longer be in active

development and the engineers involved have moved on to other products; assigning new engineers and allowing them to become familiar with the products is time-consuming as well.

Any attempt to make significant changes or feature enhancements is necessarily a long process, and one that cannot be accomplished in a mere six months.

4. TESTING PLAYBACK SOFTWARE IS COMPLEX

As discussed above, the variety and quantity of caption display options yield a very large set of caption display possibilities. The effort that must be undertaken to verify that the decoding and rendering software properly works in a great number of these cases will take months to develop, and months to complete—above and beyond the time it takes to create the software initially.

While it may be the case that not each and every case needs to be tested, a significant number of them certainly do—and even deciding which ones do need to be tested is a difficult and necessary undertaking. Developing an automated testing mechanism may itself take many months.

This substantial testing effort must be undertaken with an understanding that any significant disruption in either content display or caption display is a grave problem.

B. RELEASE MANAGEMENT IS A DIFFICULT PROBLEM

In addition to the time requirements for design, development and testing of “plug-in” software, there are significant time requirements for release management tasks. As Rovi is both a user of its software (in the “white label” Rovi Entertainment Store) and a supplier of software to VPD customers, we have to consider the process and time requirements of preparing the software product for release to our customers as well.

1. MULTIPLE PRODUCTS FOR MULTIPLE CUSTOMERS

Rovi produces software “plug-in” products, which are used by a variety of customers. These customers include VPDs—including both VPDs who were already subject to Commission regulations and those who are newly-regulated. Additionally, we provide software which is incorporated into “apparatus” hardware products—including some, like BluRay players, that are newly-regulated and others, like televisions, that have been subject to Commission regulation for some time.

For our VPD customers, there is a variety of software products and options available to them. Some of those products require significant integration with other software to be integrated

into our customers' products, which takes a significant amount of time. Other of these products require specialization to certain run-time platforms (browser differences, operating system differences, *etc.*).

2. INTEGRATION AS THIRD PARTY VENDOR IS COMPLEX

In our situation, we are faced with the requirement to design, develop and test complex caption decoding and rendering software. This task is onerous in the timeframe currently required. Because of the variety of customers, products and platforms, in addition to developing the software, we must customize and test a large number of customized software products. After this is completed, we also need to productize the customization, deliver them to our customers and support their task of integrating the software into their product(s). Much of this process must be performed one step at a time, and no matter how much additional funding or resources available (to the extent there is any), little or no schedule acceleration is possible.

3. TESTING REQUIRES SIGNIFICANT EFFORT

Before each of the large number of software products can be released and supported to our internal and external customers, they must be tested to ensure that they both perform as required by parsing, decoding and rendering captions (including consumer preferences and selections, if any) properly, *and* do not adversely affect the product in unrelated ways.

For example, it is vitally important that the software does not consume resources (like random access memory) in such a way as to cause a shortage over a long period of time.¹² Furthermore, there can be millions of different test cases that need to be examined for each custom software release. The combination of the number of unique software products and the complexity of the new requirements yield a very complicated and time-consuming testing process.

¹² When software allocates memory resources but does not de-allocate the memory as it is no longer needed, the total available memory decreases over time. If the total available memory decreases beyond a certain point, the situation generally causes instability, crashes and other consumer-affecting problems. This is often called a "memory leak." Testing for memory leaks that can occur over the period of long-form content or indefinite length streaming content can be very time-consuming.

C. REGARDLESS OF SIZE, COMPANIES FACE POTENTIALLY INSURMOUNTABLE BURDENS TO COMPLY

Rovi has committed to devoting significant resources to supporting the Commission's regulations. However, there are aspects of the new rules that cannot be accelerated by assigning additional engineers, testers or other resources.

Companies that are smaller than Rovi face even tougher challenges. Smaller companies (including those that are our competitors) find themselves in what may be an insurmountable position: required to devote significant (but unavailable) resources to comply with rules that have a very short deadline.

D. FAILURE TO GRANT RELIEF WILL RESULT IN DECREASED CONTENT AVAILABILITY

There is little or no IP-delivered programming currently available with 79.103(c) caption controls available; however there is a significant amount of programming available with simpler CEA-608-style captions. Of course, there is also a significant amount of IP-delivered programming available without any provision for captions.

The very aggressive timeframe for implementation may have the consequence of making content that falls under the six-month implementation deadline offline. Without relief, if a VPD is unable to implement captions with the full set of 79.103(c) controls by September 30, 2012, it would likely be forced to stop streaming content that is "prerecorded programming that is not edited for Internet distribution and is subject to the new requirements."¹³ A similar situation would occur in March 31, 2013 for "all live and near-live programming" not edited for Internet distribution.¹⁴

E. EXEMPTION OR WAIVER WILL STILL RESULT IN CAPTION DISPLAY

If the Commission elects to grant the requests of the *First Petition*, Consumers will still be able to view captions on IP-delivered programming, albeit without the additional preference controls required by Section 79.103(c). Without at least the relief requested in the *First Petition*, VPDs will be "between a rock and a hard place," forced to choose between failing to comply with the potentially unachievable regulatory phase-in deadline, and taking some or all of its content off-line until it can

¹³ *Order* at ¶ 2; *also see* 47 C.F.R. 79.4(b)(1).

¹⁴ *Id.*; *also see* 47 C.F.R. 79.4(b)(2).

comply. Clearly, the public interest is better served by *some sort of captions* on available content than by no captions as a result of content being taken off-line.

F. THE PUBLIC INTEREST IS SERVED BY NOT FORCING CONTENT OFF-LINE

By the same token, if the Commission elects to grant the requests of the *Second Petition*, Consumers of VPD services which do not currently receive captions will continue to not receive captions—but the content will continue to be available. Failure to grant the relief in the *Second Petition* would place VPDs in a similar “rock and a hard place” situation whereby it must decide between failing to meet a potentially unachievable deadline and taking content off-line, where it benefits nobody. Clearly the public interest is better served by encouraging IP-delivered content availability, even if caption display is delayed somewhat for certain content and services.

III. CONCLUSION

The CVAA requires compliance to the extent requirements are “achievable (as defined in section 716),”¹⁵ and Section 716 of the CVAA describes “achievable” as “with reasonable effort and expense.”¹⁶ The petitions at issue today clearly show that short deadlines for “plug-in” software do not appear to be achievable—and certainly not achievable with “reasonable” effort and expense. The Commission has found that “apparatus” can be made to be compliant by January 1, 2014. It is our firm belief that “plug-in” software is of similar complexity and that the Commission should grant both petitions. Such an action would be in the public interest for several reasons discussed above.

¹⁵ *Order* at ¶ 104, quoting 47 U.S.C. § 303(u)(2)(A).

¹⁶ *Order* at ¶ 104, quoting 47 U.S.C. § 617(g).

The Commission should grant the relief requested in the DiMA petitions.

Respectfully submitted,

Michael Papish
Director, Innovation
Rovi Corporation
2830 De La Cruz Blvd
Santa Clara, CA 95050
Michael.Papish@rovicorp.com

June 15, 2012