American Enterprise Institute for Public Policy Research

April 22, 2016

Ms. Marlene H. Dortch, Secretary
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20054

Via Electronic Filing

Re: **MB Docket No. 16-42, Expanding Consumers' Video Navigation Choices**
CS Docket No. 97-80, Commercial Availability of Navigation Devices

Dear Ms. Dortch,

I[1] offer these comments to aid the Commission in reaching the proper conclusion in the matter of the replacement of its CableCARD rules with a more practical and up-to-date video content security system consistent with Section 629 of the Communications Act and the directions to the Commission in Section 6(d) of the STELA Reauthorization Act of 2014 (STELAR).

I also comment on the portions of the February 18, 2016 NPRM that deal with matters wholly extraneous to the Communications Act, STELAR, and to the Commission's authority such as the three streams proposal and video on demand access.

I conclude that the approach proposed by the NPRM is unlikely to increase competition in digital video markets, likely to impair the production of video content, and inconsistent with the recommendations made by the bona fide technical experts who participated in the DSTAC process.

Rather than rushing into a rulemaking on the basis of incomplete market data and unfinished technical standards, it would be more prudent for the Commission to replace this proceeding with a Notice of Inquiry on remaining work for DSTAC or a similar body. The NPRM proposes to mandate, on a strict timeline, technical standards that do not exist but which the NPRM believes may exist in a year.

It is unwise to impose binding regulations on a vibrant economic and technical sector on

[1] I am an independent network engineering consultant and policy analyst, presently working at the American Enterprise Institute as a Visiting Scholar and at High Tech Forum as editor and founder. These remarks are offered in my personal capacity and do not necessarily represent the opinions of AEI or any client or sponsor. I have previously offered comments in the "Preserving the Open Internet" and "Broadband Industry Practices" dockets, GN 09-191 and WC 07-52 respectively, and offered testimony at the FCC En Banc Public Hearing on Broadband Network Management Practices in Cambridge on February 25, 2008 as an invited technical expert. My CV is available at http://www.bennett.com/resume.pdf.

a hope and a prayer. It is also wholly unnecessary.

CableCARD Replacement

As the NPRM admits, CableCARD has failed to produce competition in the market for video decoding devices: "approximately 99 percent of customers rent[] their set-top box directly from their pay-TV provider."[2] This is not because CableCARD devices don't exist: TiVo, SiliconDust, and Hauppauge have offered them for several years.[3] Consumers simply don't like them.

Despite the failure of CableCARD, the NPRM refuses to rescind the CableCARD mandate.[4] This refusal can only be seen as an admission that the CableCARD alternative proposed by the NPRM, the Google/TiVo/Public Knowledge "Media Server", is not a realistic proposal.

Why CableCARD Failed

Consumers have voluntarily rejected CableCARD devices because they lack a compelling value proposition. The principal benefit of TiVo over MVPD-supplied DVRs is its ability to skip commercials, either through its traditional 30 second skip button or through a recently-added feature that skips the entire set of commercials shown during a program break at the press of a button.

TiVo's other features, such as live recording with pause and back-up, programmed recording, and access to streaming services such as Netflix and Major League Baseball, are essentially indistinguishable from MVPD DVR features and in many cases inferior to similar capabilities found in Roku, Apple TV, Amazon Fire, and other video streaming devices.

TiVo charges a hefty fee for the ability to skip commercials: from $15 per month to $600 for a plan that covers the lifetime of the device. The lifetime plan is now twice its initial cost and no longer covers multiple devices. While a small cadre of video fanatics are willing to pay these steep prices to skip commercials, the price is too high for the mass market.

SiliconDust is in a quandary because it relies on Windows Media Center to provide its DVR capability, and Microsoft has discontinued support of this feature as of Windows 10. But SiliconDust does offer live streaming through a variety of apps on platforms such as Amazon Fire, Sony Play Station, and Roku.

While the NPRM touts the potential for better user interfaces enabled by either CableCARD or its speculative Media Server alternative, we have not seen improved UIs in all the years of CableCARD. So this aspiration amounts to hoping against experience.

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[2] NPRM, ¶13.

[3] I personally use the Tivo Roamio and the SiliconDust HD Homerun Prime, both of which use multi-stream CableCARD devices. I have not leased an MVPD set top box or DVR for 15 years and have never missed a program because I use CableCARD devices instead of leased MVPD devices.

[4] "We tentatively conclude that [CableCARD] rules continue to serve a useful purpose and propose to retain them in our rules.", NPRM, ¶87.

CableCARDs are not especially difficult to obtain, install, and activate. Consumers obtain them from the MVPD office or by mail, install them, and call a number displayed on the TV screen to have the device activated. The MVPD sends an activation signal from a remote location, and within seconds the device is functional. In some cases, a second call and a second activation signal is needed to provide access to premium content such as HBO.

The process has greatly improved over the years; at one time CableCARDs had to be inserted by MVPD personnel, if memory serves; and there are occasional glitches in which a CableCARD fails or needs to be reactivated. But in most instances, once the CableCARD device is activated it operates for years without incident.

While CableCARD is technically effective at decoding encrypted video streams and authenticating user accounts and authorized devices, its technology is obsolete, expensive to manufacture, and inefficient with respect to energy usage.

Consequently, it would have been wise for the NPRM to propose an equally functional replacement for it. In fact, the motive for Section 106(d) of STELAR is to *replace* CableCARD with "a not unduly burdensome, uniform, and technology- and platform-neutral software-based downloadable a security system designed to promote the competitive availability of navigation devices in furtherance of section 629 of the Communications Act of 1934 (47 U.S.C. 549)," the law that caused the FCC to formulate CableCARD rules.[5]

Rather than sticking to this mandate, the NPRM engages in an expedition to identify a bundle of features that MVPDs might provide to third parties in hopes of bringing this long-awaited improved user interface to market. Despite the NPRMs discovery of a laundry list of new features, including machine-readable program guides, entitlement information, and delivery of content to untrustworthy devices, by its own admission it fails at its primary task.

Why DSTAC Failed

So I'm compelled to consider why the DSTAC process failed to produce a viable result, or if it did, why the NPRM refuses to recognize that result and therefore insists on leaving the obsolete CableCARD mandate in place.

A successful outcome to the DSTAC process would be a consensus document identifying (real, current, existing) technical standards that would permit innovators to produce video navigation devices that can select, record, and play linear television programming, including premium channels, on television sets and computer screens.

We know that such standards exist, because a number of MVPDs have and video device manufacturers have already used them to enable MVPD customers to watch television without leasing set top boxes. Indeed, DSTAC did identify the standards that have

[5] H.R.5728 - STELA Reauthorization Act of 2014, 113th Congress (2013-2014), Section 106 ¶ d.

allowed software-based security systems to be developed by Comcast, Time Warner Cable, Charter Cable, and others for the Roku platform: this proposal is named "WG3 HTML5 Security APIs Proposal" in the DSTAC Report.[6]

How the NPRM Can Succeed

If the NPRM had simply recommended rules to operationalize this DSTAC recommendation, it would have been wildly popular and would have achieved at least some of the goals of Section 629 that have languished under the CableCARD regime.

But DSTAC muddied the waters by also including a second proposal, the Media Server approach. Unlike the HTML5 Security APIs approach, the Media Server recommendation lacks technical substance, possibly because its lead developers included lobbyists as well as technical experts. The inclusion of such non-experts was an error on the part of the FCC and an affront to Congressional direction.

The Media Server approach relies on standards that don't exist, as the NPRM admits; it requires a new version of DTCP and the creation of a Trust Authority that doesn't exist.[7]

In fact, the Media Server is a speculative proposal that envisions the implementation of the UPnP, DLNA, and DTCP standards across wide area networks, a use case that has never been seriously considered by the developers of these standards.[8]

While the risk involved in developing regulations based on standards and authorities that do not yet exist may have motivated the NPRM to retain the CableCARD mandate, the speculative nature of the Media Server proposal is not its greatest defect.

The Trouble with Media Server

Media Server fails to provide serious copyright protection to the creative works it seeks to handle. To understand why this is so, it's only necessary to understand the requirements of copyright protection systems implemented on devices with persistent storage such as hard drives.

It's fairly straightforward to implement authentication, authorization, and decryption for content downloaded from a media service to a device such as a computer with the capability for playing the content: The service identifies the requestor, verifies the requestor's right to access the content, and then delivers it in a form that can be decrypted as the program plays. For standard content, the license permits copying across the end user's local network to some number of other devices controlled by the end user.

Protecting Premium Content

Things get interesting when the content is licensed with restricted copying, the common norm for HBO and other premium services. In these scenarios, the content can play

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[6] DSTAC Summary Report, Final: August 28, 2015, at 3.
[7] NPRM, ¶55 and ¶60.
[8] I contributed to UPnP and DLNA standards in 2002-3 while working with Sharp Laboratories as an engineering consultant.

streamed by the authenticated user and device; I can watch premium programs stored on my TiVo on other devices, such as an iPad, in my home, but I can't make copies of them to my iPad for viewing when it's not connected to the Internet.

In order to obtain a trust certificate, it's necessary for TiVo to prove that its system doesn't permit copying of premium content. Because TiVo is a Linux-based system with a standard hard drive, it might be possible to boot the device into a standard Linux configuration, find the premium content, and then copy it off the TiVo to a piracy-oriented device.

This isn't possible, however, because TiVo has taken steps to ensure that programs are stored in encrypted formats, the TiVo boot loader is tamper-proof, and the operating environment is signed to prevent modification.

So the logic that gets premium content into the TiVo must be enclosed in a secure, tamper-proof container to prevent the content from being leaked to the kinds of devices preferred by movie pirates. There is nothing in the DTCP standard regarding containers of this sort and there are no Trust Authorities in the wild who can test for secure containers.

The Media Server approach, which provides nothing more than pro forma protection, fails miserably at respecting copyright because it does nothing to prevent copying by users willing to replace software.

Regulation by Outrage

Media Server's advocate, Public Knowledge, admits this in a recent blog post promoting its insecure approach on the basis of a threat of extortion:

> *That's not to say there aren't some bad actors out there. There are. But their bad activity on the web isn't contingent upon whether or not the FCC moves forward with a policy that saves cable customers up to $15 billion in overcharges and makes it easier for subscribers to control their own experience when accessing the programming that they -- again -- have paid for and to which they have lawful access. And it certainly isn't a reason to delay a process toward a legitimately competitive device market that has taken upwards of two decades to come to fruition.*
>
> *But let's get real. This isn't really about pirating cable over the box. It's just a rerun of the same Hollywood complaint that applies to any computer, or your Roku or Apple TV, smartphone - flatly, anything that exists today that can connect to the internet and has search functionality. Opposing a competitive set-top proposal because you're worried the internet more generally facilitates pirating makes about as much sense as opposing a competitive automobile marketplace because bank robbers sometimes use roads to flee the scene of the crime. It's non sequiter at its highest.*[sic]

> *We've seen this from Hollywood before, in 2011 and 2012 during their support of SOPA and PIPA laws which targeted internet technology out of the same fear of piracy. The end result was online protests from millions of Americans. Thankfully, Congress pulled itself back from harmful action before it was too late. I think it's time to address what the industry is really afraid of going bump in the night. If the complaint you all really want to make is that you just generally, broadly oppose the concept of open devices and open internet access, and that you don't want these innovative viewing technologies to become popular, you're free to do so. But should you get what you want, a reversion to an incumbent-controlled video model on anachronistic, closed devices, I get the feeling you're likely to see a whole lot more unlawful viewership, not less. And when, as the kids say, pirates are the new zombies, you'll have no one left to point fingers at but yourselves.*[9]

Public Knowledge is confused about this proceeding on several levels, but the most important one relates to the relationship of MVPD "incumbents" with creative artist "incumbents."

Copyright Terms Are Set by Content Creators, not Device Manufacturers

This NPRM is driven in large part by the (mistaken) belief that MVPDs are extracting monopoly rents from consumers for rented set top boxes and DVRs. This attitude is reflected in the NPRM's citation of a survey conducted by Sens. Markey and Blumenthal on current pricing, and some rather mysterious extrapolation by Public Knowledge on overall consumer costs that is not present in or supported by the Markey/Blumenthal figures:

> It's one thing to claim that rental prices for STBs are too high based on specious calculations. It's quite another to then claim what prices would be if a company such as Google were to step in between cable providers and content creators, potentially selling advertising around unbundled content, and selling viewing information to advertisers. The CFA/PK study suggests that had the FCC pried open the STB market in 1994, STB rental prices would have evolved at the rate of inflation for cellular and personal computer equipment, falling from $2.60 in 1994 to $0.31 by 2015.[10]

So the factual basis of the NPRM is somewhere between non-existent and flawed. But it contributes to the conspiratorial claim in Forscey's post about "an incumbent-controlled video model on anachronistic, closed devices." The devices are as open as they can be and as closed as they must be to respect the copyright terms of content creators. These requirements are not driven by the MVPDs.

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[9] Forscey, Kate, "Zombies, Pirates, and Why the Latest Copyright Fray Over Set-Top Box Undermines Itself," Public Knowledge blog, April 13, 2016, https://www.publicknowledge.org/news-blog/blogs/zombies-pirates-and-why-the-latest-copyright-fray-over-set-top-box-undermines-itself.

[10] Singer, Hal, "The Sketchy Stat Behind The FCC's 'Unlock The Box' Campaign," *Forbes*, February 5, 2016, http://www.forbes.com/sites/halsinger/2016/02/05/the-sketchy-stat-behind-the-fccs-unlock-the-box-campaign/.

So the manufactured outrage over set top box rental fees is no excuse for making premium content freely available for distribution over the Internet by movie pirates, regardless of what Public Knowledge would have us believe.

The Extraneous Three Streams Proposal

CableCARD devices have access to live video streams and very limited meta-data about the association if channel numbers with channel identifiers. It does not get a program guide and it does not get entitlement data. Despite these limitations, CableCARD users can view the same linear TV programming that MVPD-supplied set top box users can view. TiVo has a complete program guide because it buys program guide data from Tribune Media Services (TMS) and curates it for its purposes.[11]

The program guides on MVPD-supplied set top boxes get their program guides through the same process. The timing and selection of programs on HBO or FOX is determined by the network, not by the MVPD. So it's unwise to impose obligations on MVPDs that they are not uniquely able to provide, or even able to provide at all.

The NPRM proposes to require MVPDs to share the program guides they purchase from TMS and similar firms for no cost to upstart device and app vendors. There is absolutely no doubt that the NPRM imposes this requirement at the request of TiVo in order to externalize its costs.

The NPRM argues that free program guides will lead to better user interfaces, which appears to be a leap of faith. In any event, it's an extraneous condition that could just as easily be imposed on TiVo as on MVPDs. The program guide data comes from the networks, not from the MVPDs.

This requirement makes no more sense than requiring Google to share search results with Bing in order to create more competition in a market dominated by one firm. It's doubtful that the FCC would do this even if it could.

The Extraneous VoD Access Proposal

The NPRM also requires MVPDs to share their Video on Demand content, indexes, and archives with device manufacturers. While this requirement is clearly driven by the desire to protect devices makers from uncertainty and business negotiations as consumers shift from linear TV to on-demand TV, it makes no more sense to impose this requirement on Comcast than on Netflix.

Both firms, after all, provide VoD. Both index their VoD, and both maintain archives. The inventories of both are constantly changing, and they only exist because both firms have licensed content from creators for streaming to their customers.

[11] Richard Bennett, "Teaching the FCC to Think Outside the Box - High Tech Forum," *High Tech Forum*, April 21, 2016, http://hightechforum.org/teaching-the-fcc-to-think-outside-the-box/.

Before imposing this requirement on MVPDs, the agency needs to explain why it should not also impose it on video streaming services such as Netflix, Amazon, and YouTube. Or even better, before waiving this requirement for streaming services, the FCC needs to explain why it should not waive it for MVPDs as well.

Conclusions

The Chairman advocates for this NPRM on the basis of "innovation without permission." This is the wrong slogan for this market because the distribution of licensed digital goods is all about permission. Content creators have the right to control where, when, and how their works are used, regardless of bumper-sticker slogans with populist appeal.

As my comments have illustrated, there are a number of factual and logical errors in the collection of topics contained in the NPRM.

The NPRM appears rushed, and indeed the DSTAC process was rushed. Congress demanded a report after nine months, but the report says repeatedly that DSTAC needs more time to converge on a consensus. This is the fault of Congress, but it can be corrected by the FCC.

The NPRM appears to have punitive intent; among other things, it imposes special requirements on MVPDs who write apps for video devices that it doesn't impose on other apps. The NPRM also accepts a confused, technically weak, and incomplete proposal from a subset of DSTAC in place of the more mature, fully developed, and technically sound proposal.

The correct course of action for the FCC is to cancel this NPRM, initiate an NOI, and reconvene DSTAC with the mandate of producing a single proposal with multiple options for the security aspects of the original DSTAC report. The non-security aspects are irrelevant and beyond the Commission's authority in any case.

Proceeding down the present course is a recipe for disaster.