

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

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)	
Downloadable Security Technical)	MB Docket No. 15-64
Advisory Committee Report)	

COMMENTS OF PUBLIC KNOWLEDGE

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Introduction

After years of inaction, the Commission now has the chance to finally fulfil its statutory duty of promoting a competitive market for video navigation devices. The Commission should take that opportunity, and, building on the DSTAC report's "virtual head-end" proposal, move quickly to a rulemaking proceeding that formalizes a new standard allowing differentiated devices to access and display MVPD content.

When it recently passed STELAR,¹ Congress recognized that the Commission's implementation of Section 629 of the Communications Act needed to be revisited. It repealed part of the Commission's CableCARD rules while directing the Commission to begin a process aimed at creating new standards for "downloadable" (that is, software-based) security, which would replace the current CableCARD system's security system, which is based on a physical PCMCIA card.

While Public Knowledge disagreed at the time with Congress's sequencing—PK would have preferred to sunset existing CableCARD rules as part of the implementation of a new standard, rather than in anticipation of a new standard—PK agrees with and appreciates Congress's instruction to the FCC to begin the process for replacing CableCARD with a software-based solution. Too often in the past, attempts to reform the Commission's implementation of Section 629 either through revising the CableCARD rules or replacing it with a more modern technology have run into roadblocks. By directing the Commission to convene an advisory committee of experts to survey the state of current technology and issue recommendations to the Commission as to how to proceed, Congress demonstrated

¹ STELA Reauthorization Act of 2014, Pub. L. No. 113-200, 128 Stat. 2059, § 106.

that the political will exists to reform the video device marketplace and bring about greater consumer choice. While the Downloadable Security Technical Advisory Committee (DSTAC) issued two incompatible recommendations—one, backed by the pay TV industry, which effectively encourages the Commission to do nothing (the “app proposal”), and another, backed by consumer groups and companies that would like to deliver new choices to consumers, that would enable the Commission to deliver on its mandate to promote competition and innovation (the “virtual head-end proposal”)—the DSTAC process was valuable both for providing the Commission with a valuable recommendation for how to proceed and for demonstrating that the only obstacles to the Commission proceeding are political and policy-oriented, not technological.

I. The Need for Action is Even Greater Now Than When Congress First Directed the Commission to Promote Video Device Competition

Senators Markey and Blumenthal recently released a study that highlights the cost of the Commission’s so-far inadequate implementation of Section 629 of the Communications Act. They found that about 99% of customers rent devices from their operator rather than purchasing them on the commercial market, and that the average household pays more than \$231 per year on device rental fees.²

Meanwhile, consumers can outright buy similar devices (that cannot access MVPD content, but are broadly similar technologically) for significantly cheaper. Roku devices, for instance, start at \$50, Amazon sells a Fire TV stick for \$40 and an advanced device that

² Press Release, Markey, Blumenthal Decry Lack of Choice, Competition in Pay-TV Video Box Marketplace, July 30, 2016, <http://www.markey.senate.gov/news/press-releases/markey-blumenthal-decry-lack-of-choice-competition-in-pay-tv-video-box-marketplace>.

supports 4K video for \$100, and even a high-end device like the TiVo Roamio or Bolt, which has significant onboard storage space for recorded programs and which can record at least four programs simultaneously, starts at \$200 (plus service), with a version that is not burdened by having to support CableCARD starting at \$50 (plus service).³

There is clearly an imbalance here. Two decades after Congress directed the FCC to create a competitive market for MVPD video devices, barely any such market exists. Meanwhile, openness and competition have driven the market for online video devices, tablet computers, smartphones, and other devices forward faster than most would have predicted possible. Broadly speaking, the MVPD market has proven itself more able to fend off “disruption” from new technologies and new competitors than has the print media or music industries, due, among other things, to how MVPDs control not only the programming their hopeful competitors need to access, but the very infrastructure (broadband) they must access to reach customers.

II. Statutory and Policy Background

In the early 1990s, as cable systems began necessary upgrades to provide clearer signals, new features, and to limit theft of service, Congress recognized that new “cable scrambling, encoding, or encryption technologies and devices” could “disable[] or inhibit[]” the third-party video equipment that consumers purchased from the competitive market to watch, record, and interact with subscription programming.⁴ It found that “if these problems are allowed to persist, consumers will be less likely to purchase, and electronics

³ TiVo Roamio product page, <https://www.tivo.com/shop/roamio#/roamio>.

⁴ Cable Television Consumer Protection and Competition Act of 1992, PL 102–385, 106 Stat 1460, Sec. 17 (“Consumer Electronics Equipment Compatibility”), codified at 47 USC 544a(a)(1).

equipment manufacturers will be less likely to develop, manufacture, or offer for sale, television receivers and video cassette recorders with new and innovative features and functions.”⁵ It therefore directed the Commission to adopt regulations that enact “narrow technical standards that mandate a minimum degree of common design and operation, leaving all features, functions, protocols, and other product and service options for selection through open competition in the market,”⁶ while considering “the need to maximize open competition in the market for all features, functions, protocols, and other product and service options of converter boxes and other cable converters unrelated to the descrambling or decryption of cable television signals.”⁷

This statutory directive resulted in the Commission codifying standards for “cable ready” equipment that could access video programming without the need for an external tuner.⁸ However, these efforts did not change one of the fundamental problems with the direction of the cable industry: the need for an external, cable-provided set-top box to perform security functions. Congress therefore revisited the issue in the Telecommunications Act of 1996, when it directed the Commission to adopt regulations to “adopt regulations to assure the commercial availability, to consumers of multichannel video programming and other services offered over multichannel video programming systems, of converter boxes, interactive communications equipment, and other equipment used by consumers to access multichannel video programming and other services offered

⁵ 47 USC 544a(a)(2).

⁶ 47 USC § 544a(a)(4)

⁷ 47 USC § 544a(c)(1)(A).

⁸ *See* 47 C.F.R. § 15.118.

over multichannel video programming systems, from manufacturers, retailers, and other vendors not affiliated with any multichannel video programming distributor.”⁹

Thus, in both the Cable Television Consumer Protection and Competition Act of 1992 and the Telecommunications Act of 1996, Congress gave the Commission clear directives to ensure that the market for video devices that access subscription programming was open and competitive. Congress reacted to the Commission's less-than-fully-successful efforts in this area in late 2014, when it directed the FCC to “establish a working group of technical experts representing a wide range of stakeholders, to identify, report, and recommend performance objectives, technical capabilities, and technical standards of a not unduly burdensome, uniform, and technology- and platform-neutral software-based downloadable 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).”¹⁰

However, there are even deeper roots to the communications policies the 1992, 1996, and 2014 Acts addressed. With its *Carterfone* decision in 1968,¹¹ the Commission remedied problems in a market analogous in many ways to the video devices market today. Prior to *Carterfone*, most telephones were rented from AT&T for prices substantially higher than consumers would have paid in a competitive market.¹² The telephones they rented

⁹ Pub.L. 104-104, 110 Stat. 125, Title III, § 304 (amending the Communications Act of 1934, Pub. L. No. 73-416, 48 Stat. 1064, to create Section 629), codified at 47 U.S.C. § 549.

¹⁰ STELA Reauthorization Act of 2014, Pub. L. No. 113-200, 128 Stat. 2059, § 106.

¹¹ *Use of the Carterfone Device in Message Toll Telephone Service*, 13 FCC 2d 420 (1968).

¹² For a particularly egregious example of how uneconomic it can be to rent rather than own telecommunications equipment, see USA TODAY, *Woman Paid Thousands to Rent Rotary Phone*, Sept. 14, 2006, http://www.usatoday.com/news/offbeat/2006-09-14-phone_x.htm.

changed little from year to year, decade to decade. The innovation let loose by *Carterfone* set the stage for the Internet by allowing computers to access the telephone network via modems. But more immediately, it allowed a competitive market in telephone equipment to develop, with telephones of all shapes and sizes available at every price point, and allowed previously rare devices like answering machines to become commonplace. On other occasions, the Commission has found that promoting interconnection standards benefits consumers. The Commission's Part 68 regulations, which define the physical interface for attaching equipment to a telephone network, were essential in realizing the policy goals behind *Carterfone*. By ensuring that ISPs had access to essential telecommunications facilities in the *Computer Proceedings*, the Commission laid the groundwork for the ISP boom of the 1990s. Additionally, in the 1970s, the Commission laid the regulatory groundwork for the emergence competitive markets in telecommunications services such as long distance. In each of these cases, the Commission promoted competition by adopting lightweight standards.

The Commission has recognized the similarity between *Carterfone* and Section 629.

In the 1998 order, the Commission wrote that

Just as the *Carterfone* decision resulted in the availability to the consumer of an expanding series of features and functions related to the use of the telephone, we believe that Section 629 is intended to result in the widest possible variety of navigation devices being commercially available to the consumer.¹³

It later elaborated that

The competitive market for consumer equipment in the telephone context provides the model of a market we have sought to emulate in this proceeding. Previously, consumers leased telephones from their service provider and no marketplace existed for those wishing to purchase their own phone.... As a result of *Carterfone* ...

¹³ Navigation Devices Order at ¶ 26.

the choice of features and functions incorporated into a telephone has increased substantially, while the cost of equipment has decreased.¹⁴

Of course, the Commission was not the first to see the analogy between the creation of a competitive market in set-top boxes and *Carterfone*. The same analogy was noted by Representative Markey,¹⁵ Section 629's chief advocate in the House, and by Representative Bliley¹⁶ when he introduced the earlier Competitive Consumer Electronics Availability Act.

The *Carterfone* precedent is clear: when the Commission opens the door to a competitive market in devices that attach to a communications network, consumers benefit. However, while *Carterfone* and its follow-ups were resoundingly successful, the Commission's efforts in the area of video devices have run into various obstacles.

The Commission should learn from its past efforts and move forward with the virtual head-end proposal that both emulates the successful *Carterfone*/Part 68 approach of a simple standard that allows for maximum flexibility and differentiation among devices and that does not give the network operator influence or veto power over the design of third-party devices. Unlike the app proposal, the virtual head-end proposal is also

¹⁴ *Id.* at ¶ 11.

¹⁵ Representative Markey noted that the provision would [H]elp to replicate for the interactive communications equipment market the success that manufacturers of customer premises equipment (CPE) have had in creating and selling all sorts of new phones, faxes, and other equipment subsequent to the implementation of rules unbundling CPE from common carrier networks. Comments of Representative Markey, 142 CONG. REC. H1170 (1996)

¹⁶ Representative Bliley observed that under his bill, Commission regulations will assure that converter boxes, interactive communications devices, and other customer premises equipment [would] be available on a competitive basis from manufacturers, retailers, and other vendors who are not affiliated with the operators of telecommunications systems, as is the case in our telephone system today. Comments of Representative Bliley, 141 CONG. REC. E635 (1995).

congruent with the Congressional directive for the Commission to adopt “narrow technical standards that mandate a minimum degree of common design and operation, leaving all features, functions, protocols, and other product and service options for selection through open competition in the market.”¹⁷

III. Specific Policy Considerations Which Underscore the Superiority of the Virtual Head-End Proposal

A. Device Differentiation is Necessary to Create a Market; Only the Virtual Head-End Proposal Allows This

Any proposal the Commission adopts needs to allow third-party devices to meaningfully differentiate themselves from each other in terms of how they display and allow users to interact with MVPD programming. Differentiation in user interface design and features has been one of the key drivers of competition in various consumer technology markets. Software products such as word processors and web browsers compete with each other, not merely on the basis of compatibility and a feature set but in terms of how well they present their functions to consumers. In the smartphone space, Apple’s iOS, Google’s Android, and Microsoft’s Windows Phone all offer differentiated designs and user interfaces—and devices within the Android ecosystem further differentiate from each other, often offering different user interfaces that are unique to each manufacturer. The virtual head-end proposal allows just this level of differentiation—it’s up to each device maker (and ultimately, its customers) to decide what features each device offers, and how to organize them. This “bottom-up” approach, rather than the MVPD-supported, centrally-controlled approach, is more likely to lead to innovation in the

¹⁷ 47 USC § 544a(a)(4).

design and capabilities of video devices, as well as giving device makers the ability to make low cost devices. Furthermore, under the “app approach” the MVPDs are able to foreclose large opportunities for integration and consumer-friendly features like intelligent agents, prospective recording and integrated search, discovery and recommendation engines. The virtual head-end approach, by contrast, does not give MVPDs the ability to veto features that consumers demand.

The MVPD’s app-based proposal falls short in this regard. It takes the proprietary set-top box and transforms it into a proprietary app—hardly an improvement. Under the MVPD-supported approach, a third-party device would do nothing more than display a user interface and expose features entirely designed and controlled by the MVPD. No differentiation between devices would be possible.

B. Network Operators Should Not Be in Charge of Determining Who May Compete with Them, But the App-Based Proposal Would Give MVPDs This Ability

Another shortcoming of the MVPD-supported, app-based approach is that an app will only work on a platform it is designed for. If an MVPD must first create an app that works on a third-party device, then it has the ability to decide exactly what devices to make apps for. There is no such thing as a universal software platform— not even a HTML5 browser— and the app-based approach would necessarily limit the ability of a device maker to offer devices with incompatible new hardware or software technologies. Either a device maker would have to create a device that uses some platform that MVPDs have decided to support (assuming they all agree), or it would have to submit its device to MVPDs, hoping they agree to create an app for it. A simpler, protocol-based approach such as the virtual head-end proposal avoids this pitfall—a device maker would have much

lighter technical requirements, for example, only having to make a device that knows how to speak the right “language” to access paid-for video programming. This approach limits the ability of MVPDs to control which devices they will allow to display subscription content, and takes away their incentive to manipulate any processes to limit who might sell devices that compete with their own.

C. Facilities-Based MVPD Services Are Different from Online Services and Should Be Treated Differently, But the App Proposal Does Not Recognize This

MVPDs and their representatives have used the success of apps on smart devices and for online video to buttress their arguments for an app-based implementation of Section 629.¹⁸ But these comparisons are inappropriate.

To begin with, facilities-based MVPDs like cable, telco video providers, and DBS compete in a different market than online video distributors. Specifically, their market is highly regulated—which doesn’t just mean that they have obligations that online video providers do not share, but that they have particular benefits, as well. MVPDs often have franchise agreements with localities which limit the ability of new competitors to simply enter the markets they operate in without government approval. In some areas (and especially considering how customers buy MVPD video along with broadband) they are essentially natural monopolies. They run their wires over public rights of way, install their equipment on public property (or are legally allowed to make use of private property they do not own), or are given exclusive spectrum licenses or satellite slots. Broadcasters are

¹⁸ John Solit, *Is Time Cook Right? Are Apps the Future of TV?*, PLATFORM (Sep. 10, 2015) <https://www.ncta.com/platform/technology-devices/is-tim-cook-right-are-apps-the-future-of-tv>.

required to negotiate with them “in good faith” for carriage. They receive copyright compulsory licenses which prevents them from having to negotiate licenses with either broadcasters or individual programmers. In these and other ways, their operations and interactions with other entities are highly regulated. By contrast, online video providers operate in a cutthroat competitive environment with no regulatory or physical barriers to entry, no regulated access to content, and where, but for the Commission’s Open Internet rules, they could be blocked from even reaching customers by their incumbent competitors. Additionally, online video services do compete with each other, with differentiated content catalogs as well as on the basis of features, price, and app design. Additionally, online video services can already be accessed on a variety of different hardware devices—inside and outside of the home. By contrast, with limited exceptions, MVPDs do not compete with each other. In other words, treating online video services (which usually control their own apps, user interface, and so on) differently from MVPDs makes perfect sense, logically, legally, and in terms of promoting the competitive goals of Section 629 of the Communications Act.

The branding the MVPD industry has adopted for its proposed implementation (or non-implementation) of Section 629 is very well-chosen, because apps are certainly a big part of the future of video and of device competition. The question, however, is not “Will there be apps?” but “Who will control the apps?” The virtual head-end proposal allows each device maker (and, indeed, independent software vendors) to create its own app that allows customers to access the content they pay for, and forces each device maker to compete with every other device maker. The MVPD approach, by contract, takes the non-competitive MVPD industry model and imposes it on the consumer electronics industry—

an approach that, when considered in light of the Commission’s statutory goals, is doomed to failure.

D. The App Proposal Would Be a Step Back from the Existing CableCARD System

Many of the policy-based arguments that were voiced at DSTAC and elsewhere against the virtual head-end approach are nothing more than criticisms of Congress’s decision to enact Section 629 to begin with. Cable operators, for instance, characterize the combination of linear video programming with ancillary offerings such as on-screen programming guides and video-on-demand as a unified service, and describe efforts to promote competition in navigation devices as “disaggregation.” But when Congress directed the FCC to promote competition in navigation devices, it foreclosed that line of reasoning by envisioning that navigation could be separated from and offered by a different entity than the MVPD’s linear video offering. What the MVPDs characterize as “disaggregation” is in fact the approach most consistent with Congressional intent and the statutory scheme, which is why it is the approach already taken by the CableCARD system, which cable operators claim to support. CableCARD products are already able to present linear video in any format that consumers demand, and do not display an MVPD-provided user interface. Nor do CableCARD customers demand that they do. CableCARD operators have no privity with programmers and are not required to follow any private agreements about content display that may exist between MVPDs and programmers—instead, they respond to customers. This customer-centric approach has proven itself to produce better and more innovative products than one where design decisions are determined by negotiations between programmers and distributors. The app approach, by contrast, walks back the flexibility of the CableCARD system and gives MVPDs more control than they even

have now over third-party devices. The virtual head-end approach, by contrast, builds on the general CableCARD model in that it permits third party devices to differentiate their user experiences and offer new features, and because compatible devices are answerable to the marketplace, not network operators or programmers.

E. Consumers Should Be Able to Exercise Their Fair Use Rights, But the App Proposal Would Give MVPDs and Programmers the Ability to Restrict Them

Any approach the Commission adopts should allow consumers to exercise their judicially-recognized fair use rights with programming: They should be able to record it, copy it to different devices, and play it back at any time and in any manner, without paying extra or obtaining specific permission for each lawful use. Neither programmers, MVPDs, nor even consumer electronics companies should have the ability to prevent consumers from exercising their rights under the law—not only should consumers not be forbidden from (or required to pay for) things they are already allowed to do, a system that puts roadblocks in the way of consumers creates the risk that gatekeepers will abuse their power and that new services and devices may be artificially limited in their functionality. Congress recognized this issue when it specifically directed the FCC to ensure that cable systems are compatible with products such as “video cassette recorders, and similar technology” that can offer “new and innovative features and functions,” including subscribers’ ability “to use advanced television picture generation and display features” and to record programming appearing on different channels while watching other programming.¹⁹

¹⁹ 47 U.S.C. § 544a.

In addition to being required by statute, giving consumers these abilities does not conflict with copyright law. Courts have repeatedly upheld consumer rights with respect to recording and playing back video programming. In *Sony Corp. of Am. v. Universal City Studios.*, 464 U.S. 417 (1984), the Supreme Court found that consumers have a fair use right to record programming for playback at a later time (time-shifting)—and that device makers have a right to sell devices that enable this. In *RIAA v. Diamond Multimedia Systems*, 180 F. 3d 1072 (9th Cir. 1999), the court found that “merely mak[ing] copies in order to render portable, or space-shift” media is a “paradigmatic noncommercial personal use” and expressly analogized this use to the Supreme Court’s holding in *Sony* with respect to time-shifting. And in *Fox Broadcasting Co., Inc. v. DISH Network LLC*, 723 F. 3d 1067 (2013), the court made it clear that consumer rights in this area apply not only to time- and space-shifting but expressly noted that place-shifting includes the right to copy recorded media to other devices such as mobile phones (device- and possibly format-shifting), and to play back media in the manner of the users' choice (e.g., skipping past commercials).

These views are hardly judicial novelties. As early as 1961, the Register of Copyrights stated,

New technical devices will probably make it practical in the future to reproduce televised motion pictures in the home. We do not believe the private use of such a reproduction can or should be precluded by copyright.²⁰

Along the same lines, in 1971, the House Report on the Sound Recording Act (which was passed in the explicit hope of curbing record piracy) includes the recognition of lawful

²⁰ Copyright Law Revision, Report of the Register of Copyrights 30 (July, 1961),

home recording. In today's parlance, that would constitute not only time-shifting, but also space-shifting and format-shifting as well:

[I]t is not the intention of the Committee to restrain the home recording, from broadcasts or from tapes or records, of recorded performances, where the home recording is for private use and with no purpose of reproducing or otherwise capitalizing commercially on it.²¹

In short, that consumers are permitted to record, copy, convert, and play back lawfully-acquired copyrighted content for personal fair uses is by now a settled point of law.

Commission action around standards for video devices should recognize this, and not give any stakeholder the ability to restrict consumers' lawful activities.

IV. The Virtual Head-End System is More Versatile from an Engineering and Design Perspective for Both MVPDs and Third-Party Device Manufacturers

The virtual head-end system is more versatile and flexible than the app proposal, and supports a much more robust marketplace, where different devices can use different approaches to present MVPD programming to subscribers.

For example, the virtual head-end system supports both "in-the-cloud" and locally-provided MVPD services (indeed, that is the source of the name). The virtual head-end can provide services to retail, competitive devices via a lightweight server (for example, built into the cable modem), a heavier-weight server (built into a set-top box), or with no local server at all (completely provided via a network connection). At the same time, the choice of how to provide virtual head-end connectivity is entirely the MVPDs'. This light-touch

²¹ H. Rep. No.287, 92d Cong., 1st Sess. 7.

approach merely creates a standard that MVPDs must support, but does not determine how they must support it.

This light-touch approach also facilitates MVPD competition and efficiencies, since it allows different MVPDs to support the virtual head-end in different ways. At the same time, the virtual head-end system does not require any changes to the operation of the MVPD's network, systems, or services. If it chooses to, an MVPD may simply deploy a device which acts on the MVPD network just like any of its existing devices, and bridge the services onto the link-protected home network.

Furthermore, the system does not require any compromises or changes to the MVPD's security mechanisms, systems, or standards—and does not constrain the conditional access system(s) chosen by the MVPD now or in the future. More generally, the system does not require any compromise in security generally, as the content flows to retail competitive devices via link protection like DTCP-IP, which is approved for use by the content industry generally (and DTLA is willing to extend it where necessary, for, e.g., 4K video).²² Notably, DTCP-IP link protection has proven more robust to attack than other MPAA-approved security systems, like Blu-Ray (AACS), DVD (CSS) copy protection systems and HDMI (HDCP) interfaces.

The virtual head-end system can be specified quickly and simply, using mostly off-the-shelf technologies and does not require a lengthy or complicated process of defining many new technologies. Standard internet technology, like Web Services, and standard television technologies, like the existing v-chip standards, and SMPTE-TT and CEA-

²² See Letter from Digital Transmission Licensing Administrator to DSTAC Chair Cheryl Tritt, MB Docket 15-64 (Aug. 7, 2015).

608/708 closed captions, and link protection systems like DTCP-IP are easily identified, chosen, and documented. For example, one avenue would be to adopt DLNA “VidiPath” with certain easily-specified modification – like removal of mandatory Remote User Interface, addition of a Content Directory Service, and other minor additions.

V. The App Proposal Would Not Facilitate Retail Competition Because It Is Too Rigid Technologically and Gives MVPDs the Ability to Design Their Competitors’ Products

From an engineering perspective, the app proposal is less versatile and flexible than the virtual head-end proposal, requires substantially more engineering and resources, and significantly limits the market for navigation devices.

To begin with, the app proposal provides what amounts to a “best efforts” system by MVPDs, where MVPDs provide iOS and Android applications for tablets and smart phones, and provide a HTML5-based interface which is both limited to HTML5 functionality and requires extensive support for the security systems in use. Finally, it requires all competitive navigation devices to have HTML5 browsers (even when otherwise unnecessary), and where incompatibilities exist between various HTML5 implementations, MVPDs have little or no incentive to support *all* HTML5 implementations.

Under the MVPD’s app proposal, a third-party device maker cannot simply build a device that can interoperate with a particular clear, simple standard. Instead, it must build a device that is capable of running arbitrary apps provided by MVPDs, without having any way of knowing, in advance, whether a particular MVPD’s app will in fact be compatible with its device. In the event of a technical problem, the device maker may be reliant on the MVPD to fix a problem in its app. But MVPDs do not have an incentive to invest resources in ensuring a robust market for third-party devices, and an approach that requires that

MVPDs expend significant resources to create apps for a variety of ever-changing consumer electronics devices is unlikely to succeed—and an approach that requires device makers to implement a specific technology platform or technology stack to ensure MVPD compatibility (e.g., Android TV) amounts to a technology mandate on consumer electronics that undermines those company’s ability to compete with each other and to offer differentiated products.

In addition, the security of the app proposal is based on the Encrypted Media Extensions standard (“EME”). EME provides an interface between an application (like an HTML5 application) and conditional access/DRM software on the device (the Content Decryption Module, “CDM”). In order for content to be decrypted, the platform (like the specific Windows PC) must have a CDM for at least one of the specific conditional access or DRM systems that control access to some specific content.

This is designed for an environment where there are only three platforms, and only one hardware architecture that needs to be supported – an Intel-based Mac, Windows or Linux personal computer. Even in this simple case, there are problems and complications – certain PC browsers only support certain DRMs, but in a PC environment, a new browser can be downloaded.

However, this model fails when applied to an environment where the user cannot download a new browser, or where the hardware architecture or operating system may be new or novel. In each case, there must be a CDM available for the operating system platform, for the specific hardware architecture, for the specific browser, for the conditional access/DRM system the specific content is protected by.

In order to have a portable nationwide marketplace, *every* operator would need to support *every* conditional access/DRM system implemented on *any* competitive navigation device, or *every* competitive navigation device would need to have a CDM for *every* conditional access/DRM system in use by any MVPD now or in the future. While some MVPDs may possibly be able to accommodate this restriction (implement every system in use on any device), most will not. In any case, it's certainly true that a requirement on devices to implement CDMs for every conditional access/DRM system in use must be a nonstarter.

In fact, the EME problem described above should seem familiar to the Commission—it is the same fundamental problem of conditional access interoperability, in that it requires that either every MVPD must support any software implemented on receivers, or every receiver must support every conditional access system implemented by any MVPD.

Conclusion

The Commission should quickly begin a rulemaking proceeding implementing the virtual head-end proposal.

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