

**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of)	
)	
Video Device Competition)	MB Docket No. 10-91
)	
Implementation of Section 304 of the Telecommunications Act of 1996)	
)	CS Docket No. 97-80
)	
Commercial Availability of Navigation Devices)	
)	PP Docket No. 00-67
)	
Compatibility Between Cable Systems and Consumer Electronics Equipment)	

COMMENTS OF SONY ELECTRONICS INC.

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EXECUTIVE SUMMARY

Sony Electronics Inc. (“SEL”) supports measures that will encourage the rapid and widespread deployment of “AllVid” adapter/gateway devices by all Multichannel Video Programming Distributors (“MVPDs”). An all-MVPD adapter/gateway device will at long last foster meaningful competition among service providers and device manufacturers. Such a solution will not only unlock innovation, but also will enable the competition in consumer set-top boxes that Congress and the Commission have long desired.

A universal AllVid/gateway device will mark a natural, evolutionary step in the progression of television over time. In the first 50 or so years of television (the era of TV 1.0), consumers received video through one technology—a national standard that applied to all over-the-air broadcasts. This model encouraged a great deal of innovation and competition, but it could not withstand the march of technology. In the 1970s and 1980s, as the country entered the era of TV 2.0, consumers entered the MVPD age, first through cable operators and then through direct broadcast satellite services (and more recently through services provided by telephone companies). TV 2.0 expanded consumer choice from a handful of channels to hundreds, as the technologies evolved from one to many. But the proliferation of so many different MVPD services came with a price, namely the lack of interoperability and the absence of true competition.

As the Commission recognized in its National Broadband Plan and in this NOI, the country is now at the dawn of TV 3.0. The confluence of the Internet and traditional MVPD services will provide consumers with virtually unlimited choices—but only if we get this navigation issue right. Facilitating the integration of Internet-delivered video with traditional MVPD services will leverage the massive power of the Internet, allowing consumers to tailor their television viewing in ways we can only imagine. It will bring consumers both better value and an infinite number of choices of news, information, and entertainment programming. It will permit viewers to interact with the programming they receive and with each other. Most importantly, it will give consumers the tools they need to manage their programming choices to get what they want, when they want it, and where they want to view it.

Yet, for millions of American consumers to step into the new age of TV 3.0 and fully enjoy its potential, they must have the capability of receiving the many different transmission signals in use by cable operators, satellite providers, phone companies, and other competitors. That is why SEL supports the Commission’s AllVid/gateway device proposal.

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COMMENTS OF SONY ELECTRONICS INC.

I. INTRODUCTION

Sony Electronics Inc. (“SEL” or “Sony Electronics”)¹ hereby submits the following comments to the Federal Communications Commission (“Commission”) on measures to spur competition in the retail market for set-top video devices, in particular measures that will encourage the rapid and widespread adoption of AllVid adapter/gateway devices, and that, in turn, will foster meaningful competition among service providers and device manufacturers.² As the Commission noted in its National Broadband Plan earlier this year, video is becoming “an increasingly important element

¹ SEL manufactures and sells Internet-connected products, including televisions, personal computers, and other devices, for the U.S. market.

² *In the Matter of Video Device Competition, Implementation of Section 304 of the Telecommunications Act of 1996, Commercial Availability of Navigation Devices, Compatibility Between Cable Systems and Consumer Electronics Equipment*, Notice of Inquiry, MB Dkt. No. 10-91, CS Dkt. No. 97-80, PP Dkt. No. 00-67, 25 FCC Rcd 4275 (2010) (“*Video Device Competition NOF*”).

of broadband applications, driving usage and adoption.”³ Enabling Americans to access the Internet through their televisions has the potential to extend the reach of broadband to the 99 percent of American homes that own at least one set.⁴ With widespread deployment of a universal all MVPD/gateway device, most Americans will finally be able to use their televisions to connect themselves and their families to a wider world of news, information, and entertainment. Such a solution will not only unlock innovation, but also will enable the competition in consumer set-top boxes that Congress and the Commission have long desired.

The AllVid proposal marks a natural, evolutionary step in the progression of television viewing over time. In the first 50 or so years of television, consumers received video through one technology—a national standard that applied to all over-the-air broadcasts. In the era of what we think of as TV 1.0, this model worked well. It encouraged a great deal of innovation and competition in the television receiver market. But it could not withstand the march of technology.

In the 1970s and 1980s, as the country entered the era of TV 2.0, consumers entered the Multichannel Video Programming Distributor (“MVPD”) age, first through cable operators and then through direct broadcast satellite services (and more recently through services provided by telephone companies). TV 2.0 expanded consumer choice

³ Federal Communications Commission, *Connecting America: The National Broadband Plan*, at 35 (2010), available at <http://download.broadband.gov/plan/national-broadband-plan.pdf> (“*National Broadband Plan*”) (last visited July 13, 2010).

⁴ David Lazarus, *FCC Pushes for Internet Access on Your T.V.*, L.A. Times, Dec. 6, 2009, available at <http://articles.latimes.com/2009/dec/06/business/la-fi-lazarus6-2009dec06> (last visited July 13, 2010).

from a handful of channels to hundreds, as the technologies evolved from one to many. But the proliferation of so many different MVPD services came with a price, namely the lack of interoperability between different service providers (and devices) and a lack of true competition between service providers and device manufacturers. In response to those problems, Congress enacted Section 629 of the Communications Act of 1934, as amended.⁵

As further described below, SEL has long supported, in both private negotiations and before the Commission, efforts to enable the interoperability of digital MVPD services and retail navigation devices. But for a variety of reasons, we have not yet achieved the goals established by Congress for the world of TV 2.0.

As the Commission recognized in its National Broadband Plan and in this NOI, the country is now at the dawn of TV 3.0. Indeed, in this era, the confluence of the Internet and traditional MVPD services will provide consumers with virtually unlimited choices—but only if we get this navigation issue right. Facilitating the integration of Internet-delivered video with traditional MVPD services will leverage the massive power of the Internet, allowing consumers to tailor their television viewing in ways we can only imagine. It will bring consumers both better value and an infinite number of choices of news, information, and entertainment programming. It will permit viewers to interact with the programming they receive and with each other. Most importantly, it will give consumers the tools they need to manage their programming choices to get what they want, when they want it, and where they want to view it. SEL applauds the

⁵ 47 U.S.C. § 549(c).

Commission's bold, forward-looking effort to unleash video innovation and consumer choice.

Yet, for millions of American consumers to step into the new age of TV 3.0 and fully enjoy its potential, they must have the capability of receiving the many different transmission signals in use by cable operators, satellite providers, phone companies, and other competitors. That is why SEL supports the Commission's AllVid proposal.⁶ Simply put, this device will translate the many different transmission signals employed by MVPD service providers into a single nationwide standard that TVs and other retail consumer devices can understand.

For this vision to succeed, the Commission should follow six core principles in its efforts to develop and implement this proposal. First, the time has come for the development of a single, nationwide standard for communication and interoperability between retail navigation devices and MVPD video delivery networks. Second, the Commission must resolve how to unleash innovation in navigation devices without unreasonably limiting innovation in service delivery. A reasonable approach would be to allow MVPD service providers to add new features to their services so long as they do so using open and publicly available standards. Third, the Commission must require common reliance by all navigation devices, leased or retail, on a common technological solution. Fourth, in seeking to protect the public interest through this proceeding, the Commission should strive to simplify the MVPD user's experience. Fifth, to the extent possible, the Commission should avoid basing AllVid on new, untested technologies,

⁶ *National Broadband Plan* at 51-52.

which have proven costly and difficult to implement in the past. Instead, the Commission should ensure that the interface employs technologies that are well established, which will take advantage of economies of scale and drive costs lower. Sixth, and finally, the Commission should ensure that the AllVid interface implements technologies that will protect against unauthorized copying, interception, tampering, or retransmission of protected content, while ensuring that consumers retain the ability to view and store that content on their home networked devices.

In sum, SEL believes that the proposed AllVid gateway approach is a workable solution to achieve the goals of Section 629.⁷ We look forward to the opportunity to build the 3.0 version of TVs and other devices to provide consumers with unparalleled access to news, information, and entertainment and to spur robust competition in the marketplace.

II. SEL HAS LONG SUPPORTED THE COMMISSION'S EFFORTS TO IMPLEMENT SECTION 629

After more than a decade of effort, SEL remains committed to working with the Commission to finally achieve the fundamental goals established by Congress in Section 629. In both private negotiations and before the Commission, SEL has supported efforts to enable the interoperability of digital MVPD services and retail navigation devices. Consistent with the statutory directive of Section 629, SEL has sought to increase competition in the navigation device market by untying MVPD navigation from service delivery.

⁷ 47 U.S.C. § 549(c).

SEL representatives participated extensively in the private negotiations that led to the promulgation of rules for unidirectional digital-cable compatibility in 2003. From 2003 to 2007, SEL also participated in the private negotiations to achieve bi-directional digital cable compatibility. When these efforts appeared unlikely to produce an acceptable outcome, SEL engaged in additional negotiations that led to executing the 2008 Memorandum of Understanding.

Throughout the period of these negotiations, SEL invested heavily to bring products to market featuring the underlying interoperability technologies. Between 2004 and 2007, for example, SEL released more than 30 CableCARD-compatible products, including televisions, digital video recorders, and “media extenders” for personal computers. SEL also invested heavily in efforts to bring Tru2Way compatible products to market. Sony Electronics has not, however, released any Tru2Way compatible products to date, and has announced no plans to do so as of the date of this submission.

Sony Electronics’ efforts to bring CableCARD products to market, like the efforts of almost all other consumer electronics manufacturers, failed for at least four fundamental reasons. First, from the outset, CableCARD technologies functioned only with digital cable systems; they did not function in the substantial proportion of MVPD households that subscribed to non-cable MVPD services. When Section 629 was enacted, non-cable MVPD services comprised approximately 7.7% of the MVPD market.⁸ In 2003, when the Commission enacted its CableCARD rules, these non-cable

⁸ The Nielsen Company/NTI; People Meter Sample (July 1996 data), *available at* http://www.tvb.org/rcentral/mediatrendstrack/tvbasics/12_ADS-Natl.asp (last visited July 12, 2010).

MVPD services had risen to 21.7% of the pay-television market and today are even higher.⁹

Second, the licenses for CableCARD technologies limited device innovation. Output restrictions and the inability to access program-related metadata to competitive devices curtailed the development of digital video recorders and home networking functionality. It also limited the ability of independent device manufacturers to integrate 2-way and Internet functionality into their devices.

Third, technological incompatibilities between cable systems and retail devices added unnecessary complexity and diminished the consumer experience.

Fourth, and finally, a lack of standardization across cable systems required massive investments by device manufacturers to ensure compatibility across providers, across systems operated by the same provider, and even among head-ends within a system.

Although the development of Tru2Way promised to overcome many of the shortcomings of CableCARD, it is unlikely to resolve them all. Moreover, because Tru2Way remains a cable-only solution, it remains a partial solution and thus will limit the market potential for Tru2Way compatible devices.

III. THE COMMISSION SHOULD FOLLOW A SET OF CORE PRINCIPLES IN FUTURE EFFORTS TO IMPLEMENT SECTION 629

A. Nationwide, All-MVPD Standard

⁹ *Id.* (Nov. 2003 data).

The fundamental barrier to interoperability has been the lack of a single, nationwide standard for MVPD service delivery. For example, Time Warner delivers its video service differently from DirecTV, and both use different technologies than Verizon's FiOS. Some cable operators even use different technologies from market to market, and even within a given market. The time has come for the development of a single nationwide standard for communication and interoperability between retail navigation devices and MVPD video delivery networks.

Standardization of delivery technologies has worked well in other communications contexts, including video. For example, the NOI analogizes the AllVid proposal to the TCP/IP over Ethernet and WiFi standards used for broadband connectivity and home networking.¹⁰ Other examples include the NTSC and ATSC standards for over-the-air broadcast television, both of which have been mandated by the Commission and have led to widespread penetration of video devices (i.e., televisions) into U.S. households.¹¹ Another example is the Commission's requirement of a single standard in the *Carterfone* decision and implementation that ultimately unlocked Internet access through dial-up.¹²

In addition, the obligation to provide adaptor or gateway devices that support this single, nationwide standard should apply to all MVPD services. Exempting certain

¹⁰ *Video Device Competition NOI* at 4281-82, ¶17.

¹¹ Approximately 98.9% of U.S. households have at least one television. The Nielsen Company-NTI (Sep. 2009 data), *available at* http://www.tvb.org/rcentral/mediatrendstrack/tvbasics/02_TVHouseholds.asp (last visited July 12, 2010).

¹² *See In the Matter of Use of the Carterfone Device in Message Toll Telephone Service*, Decision, Dkt. No. 16942, 13 FCC 2d 420 (1968) ("*Carterfone*").

services will dramatically limit incentives to manufacture and sell retail navigation devices that will support the standard.

B. Innovation

One key question the Commission must resolve is how to enable the innovation in navigation devices without unreasonably limiting innovation in service delivery. Innovation should not be limited to one portion of the video-delivery ecosystem. Innovation in the development of new Internet-delivered services and applications is achievable, as reflected, for example, in the recent efforts to upgrade cable modem services to the DOCSIS 3.0 standard.

One approach would be to require MVPDs to standardize delivery of their services on the same technologies, in much the same way that the Commission effectively has required over-the-air broadcast video services to standardize on a particular technology. Given the potential costs of restructuring MVPD networks for operators in the near term, the Commission as an interim step should adopt the AllVid proposal as soon as practicable.

The Commission's AllVid proposal takes a more cautious near-term approach in that it identifies a clear demarcation point between the service-provider network and the home network. AllVid allows service providers to continue to innovate in their network as necessary to distinguish their services and build a competitive advantage. At the demarcation point in the AllVid gateway, however, these disparate delivery methods must coalesce, and convert into a defined set of open and publicly available standards. Assuming that this obligation to standardize applies nationwide and across all service

providers, AllVid represents the best possible approach in the near term for enabling innovation throughout the video service ecosystem and for helping achieve the goals of the National Broadband Plan. It is critical that the Commission ensure that the licensing and approval process does not limit device innovation. The licenses for the technologies that comprise the interface should include only those obligations necessary to implement the technology and nothing more. Additional burdensome licensing obligations necessarily increase implementation costs, with little corresponding consumer benefit.

C. Common Reliance

In order to implement a workable interoperability solution, the Commission must un-tie MVPD service access and navigation from MVPD service delivery. Any successful implementation of the AllVid approach must require all navigation devices, including all operator-provided devices and not just those devices offered at retail by third parties, to access MVPD services through the common set of AllVid interface standards. Even with this requirement, service providers will retain the ability to integrate Internet-delivered content or offer other distinguishing functionality, like a unique user interface or recording capabilities, into their AllVid-compatible devices. Absent such a requirement, however, service providers will likely introduce proprietary and incompatible technologies into their services and will stifle the retail market by refusing to license these technologies on reasonable terms. Accordingly, if the Commission elects not to continue its use of common reliance as a tool to enable the

development of a competitive market, it must take steps to open conditional access (“CA”) technologies to third-party access.¹³

D. Simplification

A primary goal of this proceeding should be the simplification of the user experience for MVPD services. Consumers today must use too many remotes and connect too many wires to access the lawful content of their choice. Consumers frequently have multiple content delivery devices connected to a single display – a game console, DVD player and MVPD set-top box, for example, often with an additional, separate input for access to Internet-delivered content. They must switch between display inputs to access content from each source, and must control each device through a different user interface. These devices duplicate parts, features and costs, including components and power. This complexity deters integration of Internet-delivered content, robbing consumers of a key incentive to adopt broadband Internet access. The AllVid model will facilitate the integration, and therefore simplification, of the consumer experience.

E. Low Cost

In addition, this single, nationwide interface should use technologies that are well established and widely accepted in the marketplace today. To the extent possible, the Commission should avoid the mistakes of CableCARD, which required the deployment of a previously untested technology and which never achieved widespread acceptance.

¹³ See *infra* Section V.E.

Using well-established technologies will limit IP claims, speed and facilitate implementation, and, most importantly, take advantage of economies of scale to keep costs low for both the AllVid adaptor/gateway and retail navigation devices.

F. Content and Service Protection

To ensure the continued availability of video content through MVPD services, the gateway/navigation device interface must include technologies that protect against unauthorized copying, interception, tampering, or retransmission of protected content, while ensuring that consumers retain the ability to view and store their lawfully obtained content on their home networked devices. In practice, this means that any content protection technology must be standardized for use and be made available via license to all parties. The standard must also prevent theft of MVPD services by including technologies that ensure that video content can only be delivered to authorized devices that are associated with a valid subscription.

IV. THE ALLVID CONCEPT AND STANDARDS

SEL supports the AllVid adapter/gateway concept as described in the NOI, and believes that implementation of this concept will lead to the development of a robust, competitive navigation-device market. SEL agrees that current technologies allow for the implementation of a “broadband” model of MVPD service delivery, whereby all network-specific functionality occurs in a small, inexpensive, operator-provided device, which then communicates with retail navigation devices from unaffiliated manufacturers over a defined set of robust, open protocols that have already seen wide acceptance in the marketplace.

SEL agrees that this concept, if implemented properly, would benefit consumers by allowing innovation and encouraging competition in the navigation-device market. Competition will lower costs and promote innovation in this market. This approach will also encourage integration of MVPD-delivered content with content from a wider and more diverse variety of sources, in particular the Internet.

A. Generally

SEL agrees that the basic AllVid functionality described in the NOI can be implemented at relatively low cost in a small form factor. The majority of the expense in modern set-top boxes comes from the need to support video outputs and rendering functionality that the AllVid gateway will not need to offer. Video rendering also requires a set-top box to include additional processor power and video memory, unnecessarily duplicating components and functionality that are already widely available in televisions, personal computers, and other devices. Moreover, the AllVid gateway model avoids the licensing and implementation costs of including multiple video output technologies like HDMI, and analog component, composite, and S-video, which today's set-top boxes must support.

In addition, reducing the video processing that must occur in the AllVid device will reduce the power consumed, and, therefore, the heat produced by the device, as compared to current set-top boxes. Both of these factors represent significant design challenges for electronic devices generally, and eliminating them will significantly facilitate the design and implementation of the gateway.

Although the Public Knowledge proposal identifies five categories of standards necessary for the implementation of a gateway device model, these five categories do not, by themselves, describe all of the functionality that an AllVid gateway must support in order to succeed.¹⁴ In addition to the five categories specified – physical connection, communication protocol, authentication, service discovery, and content encoding – the AllVid device must support standards for: a) advertising the available channels on the MVPD service to connected devices; b) providing program-related metadata to connected devices; c) transmitting remote-code or user-generated inputs from connected devices to the AllVid gateway to enable channel changes, content ordering for on-demand services and, perhaps, “trick-play” (*i.e.*, pause, rewind, and fast-forward) functionality for streamed content; (d) remote user-interface functionality; and (e) transmitting parental-control and emergency-alert data. Each additional category of functionality can be supported using existing or soon-to-be-developed standards as set forth in the DLNA implementation guidelines.

In order to prevent consumer confusion and fragmentation of the AllVid user experience, the Commission should limit the inclusion of any additional features and functionality in the AllVid gateway device beyond what is described above. Allowing service providers to add complexity to the gateway will destroy any benefits derived from the creation of single, cross-platform, nationwide standard, and will almost certainly result in incompatibilities among implementations. The Commission’s goal should be to implement a minimum feature set. Service providers will always have the option of

¹⁴ *Petition for Rulemaking* of Public Knowledge et al., Appendix, CS Dkt. No. 97-80, GN Dkt. Nos. 09-47, 09-51, and 09-137, Appendix (filed Dec. 19, 2009).

offering additional functionality in devices connected to the AllVid gateway, and may elect to use Internet-delivered content, applications and services to enhance the consumer experience and differentiate their services.

B. The AllVid Equipment

Assuming that the Commission elects to follow the AllVid model described in the NOI, control over the deployment of the AllVid gateway should lie with the service provider, in much the same way that deployment of set-top boxes does currently. MVPDs will have a strong incentive to reduce the cost of the AllVid gateway.

SEL recommends, however, that the Commission avoid the potential for unnecessary complexity and confusion inherent in two or more AllVid device configurations. Instead, the Commission should only require a minimum of six video streams in the gateway configuration, and should not mandate a second, dual-stream “adapter” configuration. Given current trends in consumer electronics and home networking, the gateway configuration will support the widest possible consumer demand at little additional cost.

C. The AllVid Interface

Specifying certain mandatory technologies for inclusion in the AllVid interface, including physical layer technologies, will decrease costs, facilitate compatibility, speed implementation, and encourage rapid development of AllVid-compatible navigation devices. Rather than identifying an *ad hoc* collection of standards to describe the AllVid interface, SEL recommends that the Commission simply require the AllVid gateway to support the portions of the 2006 Digital Living Network Alliance (“DLNA”)

Interoperability Guidelines, version 1.0, for the digital media server (“DMS”) device class, and which relate to the delivery of audio/visual (“AV”) content.¹⁵ The Interoperability Guidelines reference standards for networking and connectivity, device discovery and control, media management, media formats, and media transport, and specify implementation of these standards, as necessary, to ensure interoperability. Specifically, SEL recommends that the AllVid Interface include support for the following standards:

Network physical layer	Wired Ethernet: IEEE 802.3i (10BASE-T) and IEEE 802.3u (100BASE-TX) ¹⁶
Connectivity	TCP/IP stack including IPv4, TCP, UDP, ARP and ICMP components ¹⁷
Device Discovery and Control	UPnP Device Architecture 1.0 ¹⁸

¹⁵ The International Electrotechnical Commission adopted the 2006 DLNA Interoperability Guidelines, version 1.0 (hereinafter “Interoperability Guidelines”) on Oct. 2, 2007, and published them as international standards IEC 62481-1 (Part 1: Architecture and Protocols) and 62481-2 (Part 2: DLNA Media Formats). *See* DLNA Interoperability Guidelines and Media Formats Adopted as IEC International Standards, *available at* http://www.dlna.org/www.org/KSurvey/pressrelease_db/cc05a97238b126adf941694c25be9848940a5cf9/pr_file (last visited July 12, 2010).

¹⁶ IEEE 802.3-2002, IEEE Standard for information technology – Telecommunications and information exchange between systems – Local and metropolitan area networks – Specific requirements – Part 3: Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specification (Mar. 2002). The Interface Guidelines allow implementation of either wired Ethernet or 802.11 wireless networking. As discussed below, SEL recommends that the Commission require only that the AllVid interface support wired Ethernet, while allowing service providers to include support for other networking technologies at their option.

¹⁷ IETF RFC 768, User Datagram Protocol (August 1980); IETF RFC 791, Internet Protocol (Sept. 1981); IETF RFC 792, Internet Control Message Protocol (Sept. 1981); IETF RFC 793 IETF Transmission Control Protocol (Sept. 1981); RFC 826, An Ethernet Address Resolution Protocol – or – Converting Network Protocol Addresses to 48.bit Ethernet Addresses for Transmission on Ethernet Hardware (Nov. 1982); IETF RFC 1122, Requirements for Internet Hosts – Communications Layers (Oct. 1989).

¹⁸ UPnP Device Architecture Version 1.0, UPnP Forum, June 13, 2000.

Media Management	UPnP AVTransport:1, UPnP Connection Manager:1, UPnP ContentDirectory:1, UPnP MediaServer:1 ¹⁹
AV Media Formats	Video: MPEG-2 (North America profile for Standard-Definition and High-Definition AV class media, with a 0 or valid Time-stamped Transport Stream (“TTS”)) ²⁰ Audio: LPCM, AC-3, MPEG Audio Layer 2 ²¹
Media Transport	HTTP 1.0/1.1 ²²

The Interoperability Guidelines also include a detailed informative guidance that describes the representation of a multi-tuner digital media server like the AllVid Gateway, and specify a method for identifying each tuner, the channel order for the tuner, and the number, name and title of each channel.²³ Although the Interoperability Guidelines offer this tuner representation as “informative,” and, therefore, not mandatory,

¹⁹ UPnP AVTransport:1, Service Template Version 1.01, UPnP Forum, June 25, 2002; UPnP ConnectionManager:1, Service Template Version 1.01, UPnP Forum, June 25, 2002; UPnP ContentDirectory:1, Service Template Version 1.01, UPnP Forum, June 25, 2002; UPnP MediaServer:1, Device Template Version 1.01, UPnP Forum, June 25, 2002.

²⁰ ISO/IEC 13818-1:2000, Information technology – Generic coding of moving pictures and associated audio information: Systems, International Standards Organization; ISO/IEC 13818-2:2000, Information technology -- Generic coding of moving pictures and associated audio information: Video, International Standards Organization; ISO/IEC 13818-3:1998, Information technology -- Generic coding of moving pictures and associated audio information: Audio, International Standards Organization; ISO/IEC 11172-3:1993, Information technology -- Coding of moving pictures and associated audio for digital storage media at up to about 1.5 Mbit/s -- Part 3: Audio (MPEG-1Audio), International Standards Organization; ATSC Standard A/52A1, Digital Audio Compression (AC-3) Rev A, Advanced Television Systems Committee, Aug. 20, 2001; ISO/IEC 13818-11:2004, Information technology -- Generic coding of moving pictures and associated audio information – Part 11:IPMP on MPEG-2 Systems:, International Standards Organization; DVD Specifications for DVD-RAM/DVD-RW/DVD-R for General Discs Part 3 Video Recording, DVD Forum, Version 1.1, May 2001.

²¹ *Id.*

²² IETF RFC 1945, Hypertext Transfer Protocol – HTTP/1.0 (May 1996); IETF RFC 2616, Hypertext Transfer Protocol – HTTP/1.1 (June 1999).

²³ Interoperability Guidelines, Appendix B.

SEL recommends that the Commission adopt it as a mandatory component of the AllVid interface.

In addition to the Interoperability Guidelines identified above, the Commission should also require the AllVid interface to support two additional standards that will expand the capabilities of the gateway, facilitate its implementation, and enable wider compatibility: Gigabit Ethernet²⁴ and the MPEG-4 Part 10 (AVC) media codecs.²⁵ Gigabit Ethernet is widely available on devices today, is not substantially more expensive to implement than its 100 Mbps predecessor, and will extend the useful lifetime of the AllVid gateway by allowing it to support higher bandwidth video streams, if and when such applications become available. It also “downshifts” when connected to 100 Mbps equipment to ensure backwards compatibility. Similarly, MPEG-4 Part 10 allows delivery of high-quality video streams at a substantially lower bandwidth cost. It has been widely implemented in currently available consumer products.

Finally, provided that the Commission requires the AllVid interface, at minimum, to support the delivery of MVPD content using the standards identified above, the Commission should not preclude the inclusion of additional networking, device discovery and control, media management, media transport, and media format standards at the discretion of the MVPD. Service providers should have the flexibility to respond to market forces and integrate, for example, WiFi or MoCA networking, or additional advanced video codes, into the AllVid interface as they see fit.

²⁴ IEEE 802.3ab (1000BASE-T).

²⁵ ITU-T Rec H.264 | ISO/IEC 14496-10 Information Technology - coding of audio-visual objects - Part 10: Visual.

D. Encryption and Authentication

The success of the AllVid gateway, or any home networking interface that supports the delivery of protected commercial content, depends in part on the ability of the interface to protect content from unauthorized copying, interception, tampering, or retransmission of protected content, while ensuring that consumers retain the ability to view and store their lawfully obtained content on their home networked devices. Absent such protections, content providers will find more secure delivery methods for their content, and will withhold such content from traditional MVPD services, to the detriment of consumers who want easy and legal access to these movies and programs.

Beyond ensuring that commercial content and MVPD services are securely protected, the AllVid adapter/concept will only be successful if the Commission ensures that any content protection technology employed: 1) be ubiquitously adopted and/or fully interoperable with other widely-used content protection technologies; 2) provide content owners and MVPDs with the flexibility to offer consumers a rich variety of business offerings; and 3) enable a seamless, consumer-friendly experience by the end user.

Digital Transmission Content Protection (“DTCP”)²⁶ is a robust standard that, as the NOI notes in Paragraph 28, has been approved for high-value commercial content in a variety of contexts, including for the highest-value MVPD content.²⁷ Indeed, DTCP has

²⁶ SEL’s parent company, Sony Corporation, co-developed DTCP with Intel Corporation, Hitachi, Ltd., Panasonic Corporation, and Toshiba Corporation, and collectively licenses the technology with these same companies through the Digital Transmission Licensing Administrator LLC.

²⁷ DTCP can be mapped to protect audiovisual content transmitted over any high-speed bi-directional transport. Currently, DTCP has been mapped for use over Internet Protocol, Wireless HD, MOST and IDB-1394 transports for mobile environments, USB, Bluetooth, and

been adopted and/or approved for use by 140 companies, including cable companies, major motion picture studios, set-top box manufacturers, and television and personal computer manufacturers. Thus, DTCP represents perhaps the best encryption and authentication technology currently available for use by the AllVid interface.

E. Content Ordering and Billing

To ensure that the AllVid gateway remains as simple, low cost and efficient as possible, the Commission should avoid allowing the gateway device to perform video rendering of subscriber purchases of on-demand and pay-per-view content. This functionality could be achieved through a set of standardized, open application programming interfaces that would identify the available content and its pricing, and then return confirmation from the end user of a purchase. End-user devices could therefore render the content choices while maintaining a more consistent, user-friendly interface for the device.

F. Intellectual Property

The AllVid gateway interface technologies SEL is advocating are derived directly from DLNA Guidelines, which, in turn, cite exclusively to existing standards. As such, the vast majority of the standards necessary for the implementation of the AllVid interface exist currently, and are implemented in retail products today. Certain additional standards may be necessary, however, for billing and transactional communications between the AllVid gateway and end-user devices, as well as standards for the transmission of data relating to public interest obligations, such as emergency alerts,

Op-iLink. DTCP-IP can be used for numerous physical or wireless interfaces (including Ethernet and 802.11).

parental controls and disabilities access. In each instance, however, SEL believes that any necessary standards development can occur quickly, particularly for the public interest obligations, where existing standards can be adapted to new functions.

There is no clear legal precedent specifying the nature and scope of the Commission's authority to mandate *ex ante* the licensing terms for technologies generally. As such, the Commission should avoid potential legal entanglements and the resulting implementation delays by not mandating licensing of the technologies that comprise the AllVid interface on reasonable and non-discriminatory ("RAND"), or other, terms. Given that this interface will incorporate dozens of technologies developed by hundreds of licensors, a RAND or other licensing requirement would impose an enormous administrative burden on the Commission.

SEL acknowledges, however, that terms of individual licenses can limit, and indeed have limited, the deployment of technologies in ways that frustrate the Commission's ability to exercise its clear jurisdictional prerogatives.²⁸ Given this reality, a more reasonable approach for addressing licensing-related concerns would be for the Commission to evaluate, on an ad-hoc basis, specific complaints about specific licensing terms if and when such complaints arise.

G. Other Issues

²⁸ See, e.g., Comments of the Consumer Electronics Association to the *Third Further Notice of Proposed Rulemaking* in Implementation of Section 304 of the Telecommunications Act of 1996: Commercial Availability of Navigation Devices, CS Dkt. No. 97-80, PP Dkt. No 00-67, at 11-13 (filed Aug. 24, 2007) (arguing that the CableLabs CHILA and O-ILA licenses for bi-directional cable products "exert controls and limitations on licensees that extend well beyond those permissible under existing Commission regulations"); *Petition for Clarification and/or Reconsideration* of Consumer Electronics Association, MB Dkt. No. 03-15, at 6-9 (filed Nov. 3, 2004) (addressing IP claims relating to the Commission's V-Chip rules).

Assuming that the Commission would require AllVid gateways to output a minimum of six video streams, the Commission should allow individual MVPDs to decide how best to handle any resource conflicts that might occur when a given household attempts to access more than these six streams at a given time.

The Commission should not mandate the inclusion of an ATSC tuner in AllVid-compatible navigation devices. This obligation arose for unidirectional digital cable receivers in the context of the former Section 309(j)(14) of the Communications Act.²⁹ This provision set the deadline for the transition from analog to digital over-the-air broadcasting based, *inter alia*, on the percentage of ATSC compatible receivers available in the market.³⁰ The ATSC requirement for digital-cable-ready devices was designed to accelerate the deployment of ATSC-compatible receivers, and thus accelerate the transition to digital broadcasting. With the Commission's subsequent tuner mandate, and the enactment of the Digital Television Transmission and Public Safety Act of 2005, which set a fixed date for the digital over-the-air broadcast transition,³¹ the need for a tuner-mandate in AllVid-compatible devices has disappeared.

Moreover, the ATSC tuner obligation makes little sense from a consumer perspective. Most cable operators and satellite services already carry, and in many cases must carry, over-the-air broadcast channels. Requiring an ATSC tuner in devices that would already have the capability to access broadcast television channels simply adds

²⁹ 47 U.S.C. § 309(j)(14)(B) (2000 & Supp. IV).

³⁰ *Id.* § 309(j)(14)(B)(iii)(II).

³¹ Pub.L. No. 109-171, 120 Stat. 4 Title III § 3003 (2006).

cost and complexity, with no corresponding consumer benefit. Moreover, any requirement to include an ATSC tuner would likely deter the development of portable and mobile devices that have limited physical space and power capacity.³² Rather than have to comply with a mandatory ATSC requirement, some portion of these devices simply would not be developed.

SEL acknowledges that MVPDs have chosen system designs and delivery technologies that might require including additional components to an AllVid gateway in order for the service provider to deliver its service in its entirety. The Commission should allow such additional components, provided that: 1) they are used only to deliver the MVPD service, rather than to offer additional functionality in the AllVid device; and 2) all content made available through these additional components is delivered over the AllVid interface and is accessible to retail navigation devices.

DBS service providers should not, for example, be entitled to use an AllVid hard disk drive or other storage technologies to deny AllVid receivers access to on-demand content or services.

Finally, to the extent that a service provider integrates other non-video services in its infrastructure, the Commission should not limit the inclusion of components necessary to continue providing these separate services. Thus, a cable operator that provides “triple-play” voice, video and data services should have the option of including a

³² See, e.g., *Request for Waiver of Section 15.117 of the Commission’s Rules* of Dell Inc. and LG Electronics USA, Inc., MB Dkt. No. 10-111 (filed May 12, 2010) (requesting a waiver of the Commission’s NTSC tuner mandate for mobile, battery-powered devices.).

DOCSIS modem in the AllVid gateway, with separate outputs on the gateway for VoIP and Internet access services.

V. ALLVID SUPPORT REQUIREMENTS

A. Generally

Assuming that the Commission moves quickly to enact AllVid regulations based on the standards referenced in the DLNA Guidelines as described herein, MVPDs should have no difficulty whatsoever in complying with a December 31, 2012, deployment deadline for AllVid gateway devices. To date, DLNA has certified hundreds of products as compatible with the digital media server (“DMS”) device profile, a subset of which would be implemented in an AllVid gateway. Most modern cable and satellite set-top boxes already include multi-tuner capabilities to enable picture-and-picture or watch-and-record functionality. Assuming a minimum lead time of 24 months gives MVPDs more than sufficient time to combine this functionality into a single unit.

B. Navigation Device Economics

Consumer ownership and retail availability of navigation devices has represented the predominant and preferred model for access to video programming since the development of commercial television services approximately 80 years ago. From the era of over-the-air broadcast television to the development and market success of analog cable television, consumers purchased hundreds of millions of navigation devices at retail.

The leased market for MVPD navigation devices did not develop as a result of consumer choice. Rather, it developed as service providers began deploying digital services. These digital services enabled the use of conditional access technologies to protect against theft of services. Service providers chose different technologies, thus foreclosing the development of a single nationwide conditional access standard, and elected not to make these technologies open to third-party implementation in any event.

Efforts to overcome these obstacles and enable the development of a market for retail navigation devices have no doubt failed to date. However, it is disingenuous for anyone to contend that these failures occurred due to consumer choice. In reality, consumers never had a choice. The technological solutions offered by the cable industry have proven costly, difficult for manufacturers to implement, and poorly supported by cable operators. Even without these high barriers, these technologies provided no solution for the significant proportion of the market comprised of non-cable subscribers.

Today, consumers predominantly purchase, rather than lease, personal computers and cell phones, even though the rate of innovation for these products (and therefore the risk of obsolescence) dwarfs that of MVPD set-top boxes. The same is true for nearly every product in the consumer electronics marketplace: AM/FM stereo receivers, audio and video fixed media players, portable music players, video-game consoles, mobile Internet devices, eBook readers.

The Commission should not, however, prohibit MVPDs from offering navigation devices that offer greater functionality than is otherwise available across the AllVid interface. An MVPD, like a consumer electronics or IT device manufacturer, may wish

for example to offer an AllVid-compatible set-top box that integrates Blu-ray disc or video-game console functionality, or which integrates access to third-party, “over-the-top video” services like Netflix or Hulu. It is critical, however, that these devices are required to attach to an AllVid gateway in order to access the MVPD service, and that the entirety of the MVPD service be made available through the AllVid gateway. Allowing MVPDs to add proprietary service features through proprietary set-top devices, while denying competitive devices access to these service features through the AllVid interface, will create an exception that will swallow the rule and eventually will destroy the AllVid model entirely.

C. Device Classes Supported

If implemented, the AllVid interface will enable access to MVPD services through a wide variety of device classes, including televisions, set-top boxes, and personal computers, as well as other consumer electronics products like fixed-media players and game consoles, smart phones and mobile Internet devices. The universe of potential device classes is limited only by the availability in the device of a display and sufficient processing power to support the AllVid interface. Given the implementation flexibility that the AllVid interface allows, it seems likely that AllVid functionality will ultimately become available on presently unknown and unimagined device classes.

For this reason, the Commission must avoid dictating minimum functionality requirements for device classes. Assuming the nationwide availability of a clearly defined AllVid standard, device manufacturers will have strong incentives to ensure that products function as advertised, given the expected widespread availability of

competitive alternatives. The Commission should trust market forces to continue to work in the consumer electronics industry.

Given its use of proprietary conditional access and other network-specific technologies, SEL expects that the AllVid gateway will typically, but not necessarily, require MVPD installation. DLNA-compatible devices today, however, do not require home installation by the manufacturer, and, as such, AllVid-compatible devices based on DLNA-recommended standards should not require home installation either.

D. Costs

The cost to manufacturers and consumers of any consumer electronics or IT product depends heavily on production volume for the product. Low volume unit shipments of AllVid gateways and AllVid-compatible receivers would likely be costly. These costs, however, decrease dramatically both for higher-volume shipments of a particular product from a single manufacturer, and for higher-volume shipments of similar products when measured across multiple manufacturers.

Accordingly, it is difficult to predict the ultimate consumer cost of either an AllVid gateway or an AllVid-compatible receiver with any useful certainty. By way of example, however, DLNA has certified dozens of network addressable storage devices with DLNA DMS capability. These products typically include hard disk drive storage capacity, and many cost around \$200.³³ Given that an AllVid gateway would need to

³³ See, e.g., http://www.amazon.com/Western-Digital-Network-Attached-WDH1NC20000N/dp/B001UHOR7O/ref=sr_1_4?s=electronics&ie=UTF8&qid=1278992340&sr=1-4 (Western Digital My Book World 2 TB NAS, Model No. WDH1NC20000N, retail price 199.99).

include a subset of this functionality, and would not need to include a hard disk drive, the cost should be lower, and much lower at higher volumes. Notably, DLNA DMS capability is included in the Windows 7 operating system at no extra consumer cost, and downloadable DMS functionality is available for other PC operating systems for a nominal fee. The price of integrating DLNA compatibility in receiving devices is similarly well within the reach of average consumers. The Sony PlayStation 3, manufactured and sold by SEL sister company Sony Computer Entertainment, added DLNA compatibility via a free software download over two years ago. The PS3, which includes Blu-Ray Disc and video-game functionality, is available at retail for \$299.99.

E. Alternatives to AllVid

The Commission's AllVid proposal, implemented as described herein, would lead to the development of a robust, competitive navigation device market, and the Commission should not be distracted by often hypothetical and unproven solutions. Downloadable conditional access ("DCAS"), for example, has not achieved the hopeful goals set for it many years ago. Although MVPDs have investigated DCAS for a number of years, no nationwide, cross-platform solution exists today and there is little hope for the development of a single, open and nationwide DCAS standard in the foreseeable future. Similarly, cloud-based MVPD services offer some of the benefits of AllVid, but SEL is unaware of any plans for nationwide adoption and cross-platform implementation in the near future. Ultimately, many promising but theoretical approaches are under investigation today, but none yet offers the combination of nationwide standardization, technical maturity, low-cost and cross-platform compatibility that the AllVid solution proposed by the Commission would provide.

One possible criticism of the AllVid proposal is that it treats the symptoms afflicting the navigation device market, but does little to cure the underlying illness. The use of closed conditional-access technologies to protect content and limit unauthorized access to services continues to impede the development of a functioning retail navigation device market. Although these closed CA systems may have been technologically or economically necessary in the early days of digital video services, service providers can now open these systems to third-party access without compromising the security necessary to deliver high-value commercial content. Thus, the Commission could consider mandating standardization of conditional access technologies across providers, and require open, low-cost licensing of these technologies to third parties.

Alternatively, the Commission could require implementation of conditional access interoperability technologies like DVB SimulCrypt and SEL's own Passage.³⁴ The Commission might even consider imposing structural limitations that prohibit conditional access suppliers from also manufacturing and selling navigation devices and head-end equipment. These alternative approaches would attack more directly the underlying impediments to a competitive navigation device market, and could result in direct connection of navigation devices to MVPD networks without the need for an intermediary device like the AllVid gateway. Not incidentally, they could also lead to the innovative development and marketplace acceptance of new conditional access

³⁴ See Reply Comments of Sony Electronics Inc., CS Dkt. No. 97-80 (filed Mar. 10, 2004). See also Comments of NagraVision, Public Notice #27, at 5-6 (filed Dec. 21, 2009) (discussing SimulCrypt); Letter from Robert Gessner, President, Massilion Cable TV, Inc. to Marlene Dortch, Secretary, Federal Communications Commission, CS Dkt. No. 97-80 (filed Aug. 21, 2009) (asking that the Commission "require manufacturers of conditional access systems (CAS) to include and support SimulCrypt [which] would enable MVPDs to make a wider range of [device] options available to consumers.").

technologies that could expand business opportunities for content providers and allow consumers a more personalized content usage experience.

To enable these alternative models, and assuming the continuing unavailability of a nationwide downloadable conditional access standard, the Commission would need to replace its cable-specific pod-host interface standard with a more modern, service-agnostic standard like CI+. Based on the DVB-CI standard, CI+ includes support for an encrypted pod-host pathway, thus making it suitable for the delivery of encrypted content.

In addition, should the Commission elects to adopt CA-related rules, it should avoid mandating standards that include specific hardware requirements, and instead should favor solutions that can be implemented in software alone, assuming software-based solutions can satisfy all legitimate security concerns. Hardware-based CA solutions ultimately prove impractical for many devices due to size, cost or power limitations. Hardware requirements would also preclude many currently deployed devices (*e.g.*, game consoles and certain smart-phones) from updating and improving their security through a simple software upgrade.

VI. OTHER ISSUES

Theoretical customer service concerns relating to the implementation of an AllVid model are overblown and should not preclude the Commission from pursuing this technological solution. An open and competitive navigation device market creates the strongest possible incentive for ensuring customer satisfaction. Customer service issues occur throughout the video-service ecosystem today, and are often addressed by service

providers and device manufacturers in tandem, not individually.³⁵ This requirement will not change under an AllVid model – device manufacturers and service providers will need to continue coordinated responses to ensure the satisfaction of their mutual customers.

The Commission should avoid enacting unprecedented rules that dictate content presentation. Any such requirements would necessarily limit the user-interface integration of MVPD content with non-MVPD, Internet-delivered content, and, as such, would dramatically limit competitive incentives for manufacturers to integrate AllVid compatibility into products. The Commission, should not, however, prohibit the *optional* inclusion of remote user interface technologies in the AllVid gateway and in AllVid receiving devices. Individual consumers may elect to use an MVPD-provided user interface, and nothing should preclude the development of devices to meet this demand.

SEL agrees with the Consumer Electronics Association (“CEA”) that program-related metadata constitutes an integral part of the MVPD service, which is highly beneficial for presentation of the MVPD service, and which is included in the price for the service paid by the consumer. As such, this data should be made available for use by competitive retail devices.

VII. THE FCC HAS AUTHORITY TO ACCOMPLISH ITS OBJECTIVES

As it has done in this NOI, the Commission asked in its “Plug & Play” rulemaking in 2003 whether it had the authority to enforce Section 629 through

³⁵ Approximately 22% of the TV customer-service contacts received and addressed by SEL today involve non-Sony set-top box products, rather than customers’ Sony televisions.

regulations that refer to technical standards, licensing, copy protection, and related limitations.³⁶ The Consumer Electronics Association and Consumer Electronic Retailers Coalition comments began their extensive review of this subject with this recitation:

Actions taken to implement this “Plug & Play” solution will be a direct and necessary consequence of congressional mandates in 1992 and 1996, as the Commission has interpreted and implemented them for more than a decade. Each element of the agreement derives directly from these congressional mandates. Commission jurisdiction (as issuance of this FNPRM in two dockets reflects) is supported by separate but overlapping congressional mandates directed toward assuring consumer electronics and cable *compatibility* for television programming (Section 624A), and toward assuring *commercial availability* of navigation devices for *any* service from *any* Multichannel Video Programming Distributor, or “MVPD” (Section 629).³⁷

SEL requests that these comments be included in the record in Docket No. 10-91.

The Commission concluded that it does have the necessary authority to accomplish its objectives. SEL urges that it reaffirm that conclusion now.

³⁶ *In the Matter of Implementation of Section 304 of the Telecommunications Act of 1996, Commercial Availability of Navigation Devices Compatibility Between Cable Systems and Consumer Electronics Equipment*, Further Notice of Proposed Rulemaking, CS Dkt. No. 97-80, PP Dkt. No. 00-67 18 FCC Rcd 518, 520 (2003).

³⁷ Joint Comments of the Consumer Electronics Association and the Consumer Electronics Retailers Coalition to *Further Notice of Proposed Rulemaking* in CS Dkt. No. 97-80, PP Dkt. No. 00-67 at 4-12 (filed Mar. 28, 2003).

Respectfully submitted,

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