

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

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| In the Matter of |) | |
| |) | |
| Video Device Innovation |) | GN Docket Nos. 09-47, 09-51, 09-137 |
| NBP Public Notice #27 |) | CS Docket No. 97-80 |
| |) | |
| Implementation of Section 304 of the |) | |
| Telecommunications Act of 1996 |) | CS Docket No. 97-80 |
| |) | |
| International Comparison and Consumer |) | |
| Survey Requirements in the Broadband Data |) | GN Docket No. 09-47 |
| Improvement Act |) | |
| |) | |
| A National Broadband Plan for Our Future |) | GN Docket No. 09-51 |
| |) | |
| Development of Advanced |) | |
| Telecommunications Capability to All |) | |
| Americans in a Reasonable and Timely |) | |
| Fashion and Possible Steps to Accelerate Such |) | GN Docket No. 09-137 |
| Deployment Pursuant to Section 706 of the |) | |
| Telecommunications Act |) | |

To: The Commission

COMMENTS OF NAGRAVISION

Nagravision, a Kudelski Group company,¹ is the leading supplier of open conditional access systems, digital rights management (“DRM”) and integrated on-demand solutions for content providers and digital TV operators over broadcast, broadband and mobile platforms. Its technologies are currently being used by more than 120 leading Pay-TV operators worldwide securing content delivered to over 114 million active smart cards and devices.

¹ Nagravision is a division of the Kudelski Group, a publicly traded company based in Switzerland.

We are pleased to provide the Commission our input on how the Commission can encourage innovation in the market for video devices, in hopes that our input will assist the Commission's development of a National Broadband Plan.

A. WHAT TECHNOLOGICAL AND MARKET-BASED LIMITATIONS KEEP RETAIL VIDEO DEVICES FROM ACCESSING ALL FORMS OF VIDEO CONTENT THAT CONSUMERS WANT TO WATCH?

1. What limitations prevent consumer electronics manufacturers from developing a true “plug-and-play” device that is network agnostic?

There are at least two technological and market-based limitations that keep retail video devices from accessing all forms of video content that consumers want to watch.

Unique and Diverse Network Architectures:

First, there are many different network architectures in use – each with different methods of operation and necessary equipment. Network architectures that the Commission should consider includes cable, fiber to the home (“FTTH”), DSL, terrestrial digital television (“DTV”) and both wireless cellular telephone systems and dedicated wireless video systems. Additionally, the Commission should consider that there will be new, innovative systems in the future, and any regulations adopted should take pains to be as future-proof as possible.

To be network agnostic, the network adaptation part of the home video system needs to work with all these systems. Currently the demarcation point between network architectural specific adaption and the in home distribution and rendering of the video varies widely.

Internet Protocol television (“IPTV”) systems (over managed networks – as opposed to over the unmanaged internet) typically have a DSL modem or gateway device that performs the network adaptation before the signal is forwarded to receivers in the home. In cable systems, the network adaptation is carried out within each STB.

A network agnostic retail video device in the home will require either all or none of the potential network adaption technologies.

Thus we are left with the potential of a network adaption device unique for each type of network, and the potential of a network agnostic video device (and associated in-home

networking technology). Mandating addition of complex and unique network adaptation for all types of service providers is unworkable from a cost and complexity perspective. Additionally, other services need to be considered as they likely share parts of the home gateway or network adaptation used for video services. Those include broadband data service, voice over IP (“VOIP”), and video services over broadband (over the top, “OTT”). Competitive VOIP services require a broadband connection using a dedicated modem or by sharing the existing broadband modem

OTT video services take advantage of the “best effort” unmanaged broadband service (e.g., Hulu, Netflix, Amazon On Demand). The video is typically displayed in a special-purpose set-top box, or via a PC, gaming console, Blu Ray player, or web enabled TV. These services are handled separately within the home and over a broadband network separate from the MVPD’s in-home video distribution network. In some cases OTT services may be originated by the MVPD.² In future in-home network architectures, these services may need to be merged with the MVPD services to avoid duplication of resources.

Some MVPDs are threatened by some OTT services, and some are attempting to co-opt the threat by offering their own internet or broadband-based services tied to existing subscriptions. There are also initiatives aimed at defining technical mechanisms for blending IP-delivered video content, an internet connection and traditional MVPD video delivery mechanisms into a hybrid television service.³

The Commission should bear in mind likely use cases for such MVPD-OTT services. See Annex A for a collection of such use cases.

The Commission should pursue a solution which does not require network-specific adaptation in the navigation devices. Such an approach will require development of new devices – home gateways.

² Paul Thomasch, *Time Warner, Comcast Test Approach to More TV on Web*, Reuters, June 24, 2009, available at <http://www.reuters.com/article/idUSN2418261120090624>.

³ <http://www.hbbtv.org/index.htm>, “Hybrid Broadcast Broadband TV”. HbbTV aims to develop specifications and usage models that blend broadcast video distribution with internet-enabled applications and interactive video services.

Content Protection:

One-Way versus Two-Way

Cable networks largely still achieve content protection in a one-way, broadcast architecture (one-to-many). In this architecture, devices cannot be reliably polled to check security status (authenticated), and where signals are widely available with little or no control from the operators. The security system required to protect such a broadcast one-way network is significantly different from that of an always-on two-way network such as used in IPTV systems.⁴ Even though cable is moving to two-way systems, until it is guaranteed that all video devices on the cable system are two-way, cable systems still needs to follow the one-way paradigm.

Separable Security

The CableCARD has been an unsuccessful attempt to separate the unique characteristics of content protection *and* navigation. Both of these functions and their underlying technologies are complex. One of the challenges that have undermined the CableCARD system is that it is an attempt to solve *two* major challenges simultaneously. From a purely technological perspective, even though there are some dependencies between navigation and content security, there is no reason that two technically challenging subjects need to be linked together under in a single technology, under a single mandate. As a result, the CableCARD is subjected to a significant increase in the number and severity of the technical challenges to that must be addressed in the CableCARD.

Nagravision suggests that future initiatives in this area should be focused on solving the navigation and the content security problems separately. This can be done concurrently and with full compatibility.

Simulcrypt

⁴ In a one-way network, receivers are not “on-line” and communication from the receiver to the authentication systems in the network is either nonexistent or via periodic telephone modem communication. In a two-way network, receivers *are* always “on-line” and communicate on-demand with the authentication systems.

Simulcrypt is a system that allows one or more conditional access systems to operate simultaneously on the same system.⁵ This approach successfully undermines “vendor lock” by allowing multiple suppliers of STBs to be able to partner with multiple suppliers (actual or potential) of network-compatible conditional access systems to address the needs of an arbitrary system operator. This has been shown to create competition in regions where deployed. Simulcrypt has been mandated in many parts of the world (e.g., throughout the European Union and in China), either directly or effectively by defining a common scrambling system (thereby enabling Simulcrypt).⁶ It should be noted that Simulcrypt does not actually have to be used to satisfactorily perform the function of encouraging competition – its mere presence is usually enough to discourage anti-competitive behavior, as there is no “vendor lock”.

However, Simulcrypt has never been mandated (nor significantly deployed) in cable systems in the United States.⁷ Instead, the CableCARD system attempted unsuccessfully to avoid common scrambling by locating the proprietary scrambling algorithm in the CableCARD.⁸ Even if the scrambling system used is common and standardized, the Motorola/Cisco duopoly still controls the secret keys that are necessary for the system to function.⁹ Thus insisted of addressing the root cause of “vendor lock”, the CableCARD system simply tried to side-step it

⁵ ETSI TS 101 197 v1.2.1, *DVB SimulCrypt; Part 1: Head-End Architecture and Synchronization* (Feb. 2002), available at http://www.etsi.org/deliver/etsi_ts/101100_101199/101197/01.02.01_60/ts_101197v010201p.pdf; ETSI TS 103 197 v1.5.1, *Head-End Implementation of SimulCrypt* (Oct. 2008), available at http://www.etsi.org/deliver/etsi_ts/103100_103199/103197/01.05.01_60/ts_103197v010501p.pdf; ETSI TS 102 035 v1.1.1, *Implementation Guidelines of the DVB Simulcrypt Standard* (Feb. 2004), available at http://www.etsi.org/deliver/etsi_tr/102000_102099/102035/01.01.01_60/tr_102035v010101p.pdf.

⁶ Council Directive 95/47/EC has the effect of requiring DVB Simulcrypt in the European Union, see Council Directive No. 95/47/EC, O.J. L. 281/51 (1995); “Italian regulation requires access to conditional access systems (CAS) on fair, reasonable and non-discriminatory terms for third parties and contains simulcrypt obligations”, Commission Decision No. 2004/311/EC, O.J. L. 110/90 at 104 (2004); see generally Press Release, Irdeto, *Irdeto Selected to Protection Content & Business Model Protection to Chinese Cable Networks in Hebei and Xinjiang, Over Two Million Smartcards to be Deployed* (June 24, 2008), available at <http://www.irdeto.com/press/55.html> (announcing selection of Irdeto simulcrypt systems for deployment in China).

⁷ But see Leslie Ellis, *To Seal In Revenues, Open the Video Lock*, Multichannel News (Mar. 17, 2002), available at http://www.multichannel.com/article/70775-To_Seal_In_Revenues_Open_the_Video_Lock.php (indicating that as of 2002, Simulcrypt had been implemented in several cable systems). Nevertheless, openness and standardization has been prevented, see *supra* note 8.

⁸ Scrambling algorithms in US cable are apparently standardized, but without some additional and closely held secret information, the standards are cryptographically locked to specific suppliers.

⁹ Comments of TiVo, Inc., in GN Docket Nos. 09-47, 09-51, 09-137, CS Docket No. 97-80 (filed Dec. 22, 2009) at p.2.

while simultaneously entangling it with the already complex initiative over the navigation functions.

The Commission should note that NagraVision is not alone in calling for implementation of Simulcrypt in the United States as a mechanism to increase competition in the market for both set-top boxes and head-end equipment.¹⁰

Section 629 instructs the Commission to "... in consultation with appropriate industry-setting organizations ... assure the commercial availability" of navigation devices.¹¹ The Commission should take bold new action to eliminate "vendor lock", in part by mandating interoperable conditional access systems via Simulcrypt. Such a mandate need not make existing systems obsolete, but would increase competition, decrease costs and increase innovation and features throughout the MVPD networks.

C. CAN THE HOME BROADBAND SERVICE MODEL BE ADAPTED TO ALLOW VIDEO NETWORKS TO CONNECT AND INTERACT WITH HOME VIDEO NETWORK DEVICES SUCH AS TELEVISIONS, DVRs, AND HOME THEATER PCS VIA A MULTIMEDIA HOME NETWORKING STANDARD?

Any solution that creates a competitive marketplace for navigation devices must deal with the *anti-competitive behavior* of the exiting vendors.

We discuss above how Simulcrypt may address "vendor lock" and monopolistic practices from a technology perspective.¹² However, there may be a more direct way of opening networks to competitive navigation devices. As discussed above, cable system architectures in the United

¹⁰ Comments of the American Cable Ass'n in GN Docket Nos. 09-47, 09-51, 09-137, CS Docket No. 97-80 (filed Dec. 21, 2009) at p.4 ("The Motorola and Cisco/Scientific Atlanta set top box duopoly presents a significant barrier to the development of a competitive marketplace for set top boxes"); Letter from Mark J. Palchick, Counsel to Massillon Cable Communications Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, Sept. 17, 2009, CS Docket No. 97-80, at p1 ("... the absence of SimulCrypt technology in Motorola and Cisco headends may be artificially limiting competition for price and features among set top boxes"); Letter from Robert Gessner, President, Massillon Cable TV, Inc., to Marlene H. Dortch, Secretary, Federal Communications Commission, Aug. 21, 2009, CS Docket No. 97-80, at p. 2 ("Cable providers need access to (and support for) a system known as SimulCrypt in order to preserve the benefits of low-cost set-top converters ...") (emphasis in the original, internal citations omitted).

¹¹ 47 U.S.C. § 549(a).

¹² See *supra* at A.1.

States result in a “vendor lock” situation.¹³ While alternative CE suppliers are licensed, these are under the terms negotiated by a competitor who has absolute control over the licensing (or lack thereof) on the mandatory content protection technology.¹⁴

For many years, the Commission has proceeded under a theory that promulgating regulation that allows mere *attachment* of navigation devices was sufficient to satisfy the goals of Section 629.¹⁵ However, as we note above and others have noted repeatedly, mere attachment does not guarantee full operation – at least partially because of the “vendor lock” situation described above.

We urge the Commission to consider whether imposing a ban such that no single company may supply both STBs and conditional access. We believe this would be a more appropriate and effective way to force competition. For example, similar initiatives have prevented companies from supplying web browsers tied to operating systems.¹⁶

Finally, should the Commission adopt network agnostic gateway regulations, it should take advantage of the “clean sheet” opportunity to prohibit operators from deploying both gateway devices and conditional access systems that are manufactured by a single supplier. This would have the desired effect of creating opportunities for various suppliers and manufacturers to compete and innovate without anti-competitive pressures.

Conclusion

The Commission should continue to implement Section 629 by separating conditional access *suppliers* from set-top box *suppliers*, adopt a requirement for support of network-agnostic

¹³ “Vendor lock” is where the two primary suppliers of content protection are able to control and license there technology in such a way that true competition is avoided. This is sometimes also referred to as a “CA Duopoly”.

¹⁴ See generally CableLabs, <tru2way> *HOST DEVICE LICENSE AGREEMENT*, available at http://www.opencable.com/downloads/tru2way_agreement.pdf (Aug. 26, 2009) (requiring all devices be tested and certified by CableLabs; requiring that host devices implement both a “CE Mode” and “Cable Mode”, prohibiting innovations which mix cable operator-supplied and other content).

¹⁵ See *In The Matter of Implementation of Section 304 of the Telecommunications Act of 1996, Commercial Availability of Navigation Devices*, Report and Order, FCC 98-116 at 28 (Rel. June 24, 1998).

¹⁶ See generally *United States v. Microsoft Corp.*, 253 F.3d 34, 259 (D.C.Cir. 2001) (describing unlawful tying of Internet Explorer to Windows 95 and Windows 98 in violation of the Sherman Act).

navigation devices, and adopt a Simulcrypt regime to create additional competition in all aspects of the MPVD marketplace.

Furthermore, as the technology and policy at issue have been long-studied and well-briefed in the fourteen years since the passage of the Telecommunications Act of 1996, the Commission should proceed expeditiously to a Notice of Proposed Rulemaking.

Respectfully submitted,

/s/

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TV Everywhere 1+1 = 3

Use Cases Where Cable TV and Internet TV Merge

This Annex describes some of use cases for when a subscriber has given access to both premium pay TV and Internet TV. For the purposes of this example, a cable MVPD was chosen, but this is not exclusive to cable MVPDs. In addition some of the content security considerations are discussed, including various cross authentication scenarios.

Use Cases

The concept of “TV Everywhere” leads to many different usage scenarios. Adding the Internet dimension is not new, but mixing it with live broadcast content brings new dimensions and new possibilities. The following is a description of some scenarios that are a minimum for a good “TV Everywhere” experience from a viewer perspective.

John is addicted to his favorite show. He never misses one live performance of this show. As a premium consumer to the Cable Company, he can access to all live events of this show, and also live broadcasting of the back-stage before and after the show on a dedicated channel. He particularly like the “after show” session. As every Sunday, he is in front of his TV, and did not miss a second of this show. The “after show” is about to begin, but for once, he is not able to watch it, as his mother just called him. The day after, John browses on his PC on the Cable Web Site on the Internet. John logs-in and is recognized as a premium Cable Company customer and because of this premium level, he can access the back-stage event he was not able to watch the day before.

Alice is also a Cable Company customer and also watches the same show, but is not a premium Cable Company customer. After a good dinner with friends at Alice’s home, John logs-in on Alice’s PC with his credentials on the Cable Web Site and is recognized as a premium Cable Company customer and because of this premium level, he can access the back-stage event. The evening party ends with watching one of the old best “after show” session.

John is commuting by train to work and this is always a long trip. Today, this is even worse, it never ends. John takes his mobile phone and browses on the mobile version of the Cable Company web site. John logs-in and is recognized as a premium Cable Company customer and because of this premium level, he can access the full collection of back-stage events specially formatted for mobile devices. He selects one of the recommendations and begins watching.

John, addicted to new technologies, just bought a TV with an Internet connection. He thinks this would make it easier and far more comfortable to watch old shows directly on this TV rather than using his PC and trying to connect everything. Once all set-ups are done, he uses the TV browser to log-in the Cable Web Site. As a premium Cable Company customer he accesses all old back-stage sessions of his favorite show. He can then enjoy again a previous session he particularly liked with an adapted version for his new TV.

Few months later, the show is over and John downgraded his premium Cable Company subscription to a normal Cable Company subscription. He remembers one of these “after show” sessions and would like to watch it again as this was fun. John browses on his PC on

Annex A

the Cable Web Site. John logs-in and is recognized as a normal Cable Company customer and therefore he cannot access the back-stage events anymore, as this is limited to premium Cable Company customers.