

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)	
)	
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)	
)	

**REPLY COMMENTS OF INTEL CORPORATION TO THE
FOURTH FURTHER NOTICE OF PROPOSED RULEMAKING**

Intel Corporation submits this Reply to address the nearly-uniform comments supporting revision of Rule 76.640(b)(4)(ii) so as to enable the use of additional interface protocols and physical interfaces. In the period between the submission of Comments and Replies, this Commission already has altered the home networking landscape for the better by issuing its Memorandum and Order granting the Petition for Waiver filed by Intel,¹ the petitions filed by subsequent petitioners, and, significantly, for any entity that wishes to offer cable-supplied set top boxes (“STB”s) using an interface that supports Internet Protocol (“IP”).²

Intel commends the Commission for taking this first, bold, step now, before regulations emerge from this FNPRM process. Intel has suggested to the Commission in

¹ Intel Petition for Waiver, CSR-8229-Z (Oct. 7, 2009).

² *In the Matter of Intel Corporation, Motorola, Inc., TiVo, Inc. Requests for Waiver of Section 76.640(b)(4)(ii) of the Commission’s Rules*, CSR-8229-Z, CSR-8251-Z, CSR-8252-Z, Memorandum Opinion and Order (rel. June 18, 2010) (hereinafter, the “MO&O”).

public and ex parte meetings over the last several years that allowing the use of Internet Protocol, free from the 1394 mandate, could unleash innovation in home networking. As the Commission correctly observed in its MO&O, the waiver achieves the same goals and promotes the same policies that supported Rule 76.640(b)(4)(ii) from the outset: “the IP-based interfaces that the petitioners will include on their devices can also provide the baseline of connectivity that the IEEE 1394 output requirement was intended to achieve when those IP-based interfaces output video in a format that can be received by third-party devices.” MO&O at 4 ¶ 8. The ability to link a cable STB to a consumer’s other devices, and to integrate all that consumer’s audiovisual content into a single seamless network, provides a powerful platform for new features, competition, and innovation.

But these benefits will not be reaped in just a few months. The flexibility and functionality of integrating cable, internet, stored, and user generated video content flowing over a fully connected IP-based network will only develop over time. Additional cable products using IP must be designed, manufactured, and marketed. For example, the multimedia capabilities of the Intel systems-on-a-chip processors, when built into cable products, will bring consumers advanced and exciting applications – and will serve as a springboard for further innovation – but such products will require time for development and production. It also will take time to educate consumers as to the hows and whys of home networking. And, as demand for home networking ramps up, and equipment prices decline through robust competition and economies of scale, Intel anticipates that someday home networking will be as common and necessary a feature in consumer homes as a second computer or TV.

Thus, while the grant of Intel’s petition is a most welcome development for Intel, the market, and consumers, temporary relief will not achieve the Commission’s established goals of innovation, interoperability, and marketplace competition. For these changes to occur, the Commission must embody the outcome of the MO&O waiver in Rule 76.640(b). Only a long-term regulatory change will stimulate the necessary investment and commitment to product development, marketing, and consumer education that will fuel this next phase of the DTV transition.³

As Intel stated in its Comments, and as the Commission implicitly acknowledged in the MO&O, interoperability in home networking relies more on the use of common protocols than physical plugs. Adopting in regulation the use of Internet Protocol as implemented through the DLNA guidelines and Universal Plug and Play (“UPnP”) voluntary standards will assure that devices can seamlessly communicate and exchange audiovisual data. As the Commission notes, Ethernet and Wi-Fi provide the most popular physical interface connections for IP. Many products already in consumer homes already support home networking using Ethernet or Wi-Fi, and most computers sold today connect using either option. In Intel’s view, if the Commission mandates the use of the communications protocols, the market will take care of any physical connector issues. Therefore, the Commission’s priority in the FNPRM should be to specify the use of IP, using the DLNA guidelines and UPnP.

That requirement also should specifically prohibit the addition of proprietary or “add-on” elements to those standards that could create incompatibilities with those

³ Intel also questions the need for further waivers of a network-capable output requirement once these regulations are in place. IP-based networking is far less expensive than the IEEE 1394 connections in the current Rules. If the FNPRM lifts the 1394 requirement and instead mandates use of IP, it will be economical (indeed, a nearly trivial expense) to include a networkable IP-based output on any cable-supplied equipment from the lowest-end DTA to the highest-end STB.

devices that implement the standard to the letter. Such “pollution” of standards would essentially turn a voluntary standard into a private walled-off network, and frustrate the Commission’s goal of achieving true interoperability among cable-supplied and competitively-available products.

Intel has no inherent objection to a regulation that requires the use of Internet Protocol with DLNA, and identifies physical interface options. Ethernet and Wi-Fi connections already are associated in the minds of consumers with Internet Protocol.⁴ And, as noted by other commenters, IEEE 1394, USB 3.0 and MoCA are all capable of supporting Internet Protocol, and Intel has participated in consortial efforts to develop and promote each of these technologies. Intel notes, however, that certain physical interfaces are in some ways less suited to support an IP-based home network tying together operator-supplied and retail-acquired products. For example, USB 3.0 has sufficient speed and throughput to support exchanges of audiovisual data, but was designed to use master-slave connectivity rather than full peer-to-peer networking. The MoCA interface is not commonly used on consumer electronics or information technology products, in contrast to Ethernet or Wi-Fi, which already are nearly ubiquitously available on products ranging from DVRs, Blu-ray BD Live players, and game consoles to personal computers. Consequently, any regulation should focus on a requirement to use IP with DLNA and UPnP standards. Regulation of physical interfaces should be regarded as optional, and probably unnecessary.

⁴ See, e.g., MO&O at 4 n.22 (“As we refer to consumer adoption of IP-based connectors throughout this order, we generally are referring to consumer acceptance of the physical interfaces of Ethernet and Wi-Fi for IP-based communication.”)

Conclusion

By granting the petitions of Intel and others to waive the 1394 mandate in favor of IP-based networking, the Commission has already acted forcefully to promote home networking, recording capabilities, and interoperability. Intel urges the Commission to make that waiver permanent, and to adopt in its regulations the use of Internet Protocol in a networkable output of cable-supplied set-top boxes. This seemingly small step should produce giant leaps in the adoption of powerful new technologies, and the integration of all consumer video content into a seamless home network.

Respectfully submitted,

/s/

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