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Federal Communications Commission
445 12th Street, S.W.
Washington, DC 20554

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SUMMARY

As of date, Set Top Boxes (STB) remain the most popular means to distribute media content to television which can be called a “Lean Back” experience to enjoy content, because there is very little interaction from user other than changing channel. Personal Computers (PCs) meanwhile give a “Lean Forward” experience wherein consumers can enjoy any content and have absolute control and interaction with the content. A true marriage between lean back and lean forward experience is what consumers want and we are far away from achieving this milestone with the current setup in United States. I applaud FCC in pushing the boundary on video device innovation to encourage all parties to come up with a solution to achieve this marriage which will automatically accelerate adoption of high speed broadband network throughout the country. As a consumer and independent inventor of digital media technology, the magic bullet that FCC is looking for is already available and used by everyone in the world. I would request FCC and all interested parties to just step back and look at different pieces of hardware and software that are available today and examine the possibilities to marry lean back and lean forward experiences. As a consumer and inventor, I have proposed a set of standards called Digital Media Convergence Platform (DMCP) to address the marriage between lean back and lean forward experience and my patent is pending before United States Patent and Trademark Organization since February 2005. I have answered all the questions that FCC has posed in this public notice # 27.

Tectonic Shifts in Media consumption

Before addressing the problems that FCC has listed in this public notice, it will be good to step back and look at how digital media consumption has evolved for past five years since 2005. Let's look at the tectonic shifts that have taken place in music industry, especially the way music is delivered and how consumers listen to music. The shift started when Napster used Peer-to-Peer (P2P) technology to transfer and distribute ripped music from CDs and an entire generation of young consumers got hooked to it. The overwhelming success of Napster can be attributed to free music available from internet with very less effort. This was a paradigm shift in the way traditional music was distributed for many years. The traditional means of buying CDs started dwindling and consumers preferred digital format music which was easy to distribute and listen anytime, anywhere. Even after Napster was shutdown, the tectonic shift continued to happen at a rapid pace with introduction of sleek portable music players and associated software libraries like iTunes, Rhapsody, Real and eMusic. Within a short span of six years, the entire music industry and its distribution model was changed to a more nimble and efficient way that consumers listened to music. Even traditional music creation has been challenged and new artists have sprung up everywhere and there exists a different way that music album can be created and distributed. This is indeed a true disruptive technology. Five years from now (2009), the entire music industry will look and act different.

Now we will move from music to video, comprising of short films, TV shows, movies, user created shows and photos. The same paradigm shift is currently taking place in video industry in the way users consume video. Ticket sales and attendances at movie theatres are turning south and sales of DVDs are on wane. The new technology of Blu-Ray media is still under test and can turn either way because cost of discs and players are high as compared to DVDs. DVDs had a short life span of eight years as compared to VHS tapes and Blu-Ray may have a premature death altogether. Just like music, videos are starting to become online delivery through various means – Netflix, Hulu, YouTube, Yahoo, AOL, Apple, Xbox360, Roku, Vudu, Networked DVD players, TiVo and various cable set-top-boxes. The concept of Time wrapping or Digital Video Recording was a

disruptive technology to start with and users had capability to pause, record and rewind live TV shows. The same concept for movies are yet to take place but digital distribution of videos is gaining wide spread acceptance. Unlike digital music downloads, digital video has multiple formats and require high bandwidth to sustain good picture quality while streaming. Also content creators and distributors wield a much tighter control on video content thereby making downloads and streaming very difficult for normal consumers. This problem is further exasperated by incompatible end user devices.

Personal Computer as the epicenter of media consumption

Looking at both music and video consumption, it's apparently clear that Personal Computers (PCs) form an integral part of digital media ecosystem. Currently majority of downloadable video content is enjoyed by consumers using PC. Consumers require a PC to gather and manage their media content which is then transferred or displayed to an end device or on the Video Display Unit/ monitor. Hence users are always tied to a PC to maintain their vast library of digital media content. PCs have gotten smarter over the years in terms of powerful CPU, graphics card, faster network, larger storage disks and have the capability to handle to more complex tasks. The limitation lies in PC software and user interface. The user experience in PCs leaves much to be desired. Moreover PCs are mostly confined to a den, office or bedroom where users physically locate the device. What is being left out here? The TV that is placed in living room has been isolated from all these developments. The current TV technology though advanced in nature continues to operate the traditional route of receiving content from existing cable, satellite or Over-the-Air (OTA) antenna. Majority of early generation flat panel digital TVs lack a network port and cannot suitably display content from PCs. The very latest TVs introduced in 2008-09 period can hook up photos, music and videos stored in user's PC, provided the user knows how to set it up for streaming. This is a big problem for consumers and the bridge to bring PC and TV together is moving at a slow pace.

COMMENTS SOUGHT BY FCC:

A. What technological and market-based limitations keep retail video devices from accessing all forms of video content that consumers want to watch?

Consumers can choose from a plethora of devices that are able to access Internet video, but it appears that none of these devices are able to access all types of video content, and few of them are able to access MVPD content.

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

My answer: Consumer electronics (CE) vendors will have great difficulty to market a true “plug-and-play” device (STB) that is network agnostic because video distribution in US is mostly done by two groups - Cable and Satellite TV companies. These two major groups of content distributors solely depend on STB vendors to control and distribute video feeds. The cable/ satellite operators and their STB vendors want to maintain a walled garden to keep out other means of video distribution like online streaming and digital downloads.

2. What technical or market limitations keep certain video devices from accessing video services to which a consumer has subscribed?

My answer: Numerous media formats make it difficult to control and consume the content in a easy to use manner. Lack of uniform media standards is a bottleneck to distribute the content to multiple end devices and also makes the life of consumer difficult. One has to be technologically savvy to understand the nuances of various media formats like MPEG-4, QuickTime, AVI, WMV, Real, etc. The end device should have the correct codecs to handle different formats, besides displaying the content in a correct format and good resolution.

3. With respect to Internet access, consumers can purchase or lease interface devices (for example, cable modems) that perform all of the network-specific functions and connect via Ethernet ports to a multitude of competitively provided consumer devices including computers, printers, game consoles, digital media devices, wireless routers, refrigerators, network storage devices, and more. What technical or market limitations prevent video content distributors from providing similar devices that allow for innovation in the navigation device market?

My answer: The concept of having a STB to control and distribute video content throughout the home is akin to having separate engine to individually drive four wheels of an automobile. The cable/ satellite TV vendors want consumers to buy more powerful STBs to enjoy TV shows while other manufacturers (Operating System, CE, Networking) want to add additional STBs. This has resulted in Set Top Box fatigue and creep. Consumers are reluctant to add yet another box to their living room stack of hardware. Having a Ethernet port on many devices is a good beginning but will not solve problems that FCC has identified. It's like creating a conduit to transfer and receive content and information but without a proper content repository and management, these Ethernet ports don't serve much purpose. The ideal networked home is still a far fetched reality wherein penetration of broadband will be slower than expected.

B. Would a retail market for network agnostic video devices spur broadband use and adoption and achieve Section 629's goal of a competitive navigation device market for all MVPDs?

1. How could the Commission develop a standard that would achieve a retail market for devices that can attach to all MVPD networks and access Internet-based video sources?

My answer: As a consumer I am faced with the following dilemma. In today's world with increasing usage of digital media products and digital lifestyle, an

average consumer has these lingering questions: How can one use and share their ever-growing digital pictures from camera, scanned images, music collection, and personal video in a convenient way? How can one manage their digital data that is scattered on their computers? How can one watch a movie when they want? How can I watch my favorite TV show whenever and wherever I want? Should users need a myriad of boxes like DVR, PC, Streaming players, cable set-top boxes, Game console, etc. to enjoy their digital content? How can one satisfy all the above needs in a most cost-effective way? How can they accomplish all the above actions with minimum user interaction? Finally how does one achieve their dream of the perfect “digital living room” where one can access TV, Internet, radio, music, video and games – all things digital, all the time? All these devices have different interfaces, user screens, media formats and none of them are interoperable or compatible with each other. The end result is a cacophony of myriad consumer devices, formats and media files that an average user is unable to enjoy his/ her media whenever and wherever he/ she wants. Device creep is a major problem for consumers and living room has become a storage space for Set Top boxes. In my own living room I have to juggle space for my TiVo, Sling Media, BluRay Player, Cable receiver, IPTV receiver, USB Media Player and Apple TV. You can imagine the plight of an average consumer to be able to operate all these devices without any hitch. To address this mess, I came up with a set of standards called Digital Media Convergence Platform (DMCP). DMCP uses existing CE specifications like UPnP, DLNA and IEEE 802.x. DMCP has been filed as a utility patent with USPTO in February 2005.

2. What are the pros and cons of each of these types of solutions, and which one would do the most to promote broadband adoption and utilization? Would any inhibit broadband adoption and utilization?

My answer: A central home media server which is network agnostic can act as a repository for all media content that users own. The media server can then distribute the content to other users within a house using existing networking

technology and standards that are well developed, thereby making content consumption a seamless affair. A strong broadband infrastructure to home then becomes an absolute necessity and increased usage of media server will spawn tremendous growth in adoption of broadband internet use to all households. The current strategy of various manufacturers to divide and rule the consumer market with incompatible devices will lead to a fractured broadband market and FCC's goal of development of a National Broadband Plan will be a distant dream.

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?

My answer: It's moving consumer's home PC to the living room and having a form factor that can gel with other A/V equipment in the living room. It can be a laptop computer without LCD panel, keyboard and touchpad tracking device. The laptop will be connected to home network and output will be through a HDMI interface to a flat panel TV. Other home users will connect to the machine using thin clients. Users can do everything they did with a PC while watching TV. Users can go back to a room and tap a thin client to check email, click and select everything from a touch screen remote and all TVs are connected and contents can be bounced off between display units.

PC sales remain flat because consumers have shifted their usage to Notebook and Netbook computers due to their ease of use and mobility. The modern PC is much more powerful than many servers and home users do not know the amount of processing power that remains idle at their disposition. My patent pending standard, Digital Media Convergence Platform (DMCP), can bring out the processing power and usefulness of these powerful machines that are languishing in millions of house hold bedrooms, dens and home offices. The idea is to have a smart software interface that will turn this idle power into something that can be used to enjoy digital media.

DMCP will be the ultimate home media server which will gather, manage and distribute media content to users to a variety of end devices anytime, anywhere. It will be software running on existing PC hardware to make things easier for consumers. All users have a PC which can be converted to DMCP using a software installation and configuration.

1. Are DLNA and HANA the only home networking standards that the Commission should consider in reviewing this model? If not, which other standards should the Commission consider?

My answer: DLNA is widely used by PCs, TVs and Media Players. DLNA has the highest adoption rate amongst CE vendors. HANA could be considered the HDTV equivalent of DLNA. FCC can support both standards for home networking.

2. What are the strengths and weaknesses of each home networking standard?

My answer: DLNA is primarily used for sharing content within a home network -- photos, music and video -- across myriad devices with appropriate digital rights management (DRM) solutions in place. HANA's key goal is to solve distribution of High Definition (HD) content throughout a home network. HANA is supposed to remove many barriers like copy-protection schemes, device connectors, distribution protocols and lack of interoperability standards, so consumers can easily find, watch, store and distribute high-definition content in the home. If consumers can do this, they will buy more HD services and more HD-enabled TVs and components. HANA has always said that DLNA is synergistic with what HANA are trying to accomplish. HANA and DLNA employ Internet protocols (IP), just not for transporting content. HANA uses IEEE 1394 for transport; DLNA solely uses IP.

3. Would any of these standards allow consumers to use existing technology? For example, many devices already in consumers' homes can accept firmware upgrades

and are already DLNA or HANA certified. Could the Commission adopt a network interface standard that allows those devices to connect to an MVPD network?

My answer: Both DLNA and HANA interface standards allow STBs to connect to an MVPD network.

D. What obstacles stand in the way of video convergence?

The Commission's CableCARD rules have resulted in limited success in developing a retail market for navigation devices. Certification for plug-and-play devices is costly and complex. The tru2way license requires device manufacturers to separate cable navigation from all other functions that the device performs. On the other hand, devices like TiVo, Moxi, Microsoft's Xbox 360, AppleTV, Roku, Sony's Playstation 3, and Vudu each use a consistent menu as they navigate through video content regardless of its source. Certain elements of MVPD technology move at a faster pace than technology on the consumer device side (*e.g.*, the adoption of switched digital video), and vice versa (*e.g.*, the adoption of advanced video codecs in consumer devices). We seek comment on how to encourage innovation.

1. Given the flood of video content that is now available from a multitude of sources, what obstacles stand in the way of allowing consumers to navigate those sources? What can the Commission do to eliminate those obstacles?

My answer: This choice of accessing video and MVPD content, besides music and photos from a plethora of device(s) anytime is called Digital Media convergence. The fundamental problem in addressing the above issue lie in the fact that technology heavyweight companies see digital media convergence through their own myopic lenses as follows:

- ❖ Operating system vendors see convergence as a software problem to be solved with new versions of operating systems. Sales of Personal computers drive growth and revenue for OS vendors.

- ❖ Computer processor vendors see convergence as a microprocessor problem to be solved with a new processor which will make few devices work together more easily.
- ❖ Networking hardware vendors see convergence as a home networking problem to be solved by networked DVD/ Blu-Ray players
- ❖ Online media/ search engine vendors see convergence as an online services problem to be solved with new features for managing one's life (email, music, calendar and video) and entertainment through a web browser
- ❖ Consumer electronics hardware vendors see convergence as a consumer hardware problem, to be solved with new wireless television sets
- ❖ Telecommunication vendors see convergence as a telecommunications problem, to be solved with ultra-fast fiber-optic networks that deliver voice, video and web pages through a single telecom line
- ❖ Cable and Satellite television providers see convergence as allowing only a slice of programming content to be accessed at a later time

This is the main reason why content convergence hasn't become a mainstay in regular households. As the commission rightly pointed out, consumers can access the Internet using a variety of delivery methods (e.g., wireless, DSL, fiber optics, broadband over powerlines, satellite, and cable) on myriad devices made by hundreds of manufacturers; yet there are no device available at retail that can access all of an MVPD's services across that MVPD's entire footprint.

2. Is there a solution that would allow MVPDs to continue innovating without making navigation devices obsolete when MVPDs adopt incompatible delivery methods?

My answer: A paradigm shift in the way media convergence is addressed has to happen wherein MVPDs can continue innovation. A home media server with patent pending DMCP standard will make media convergence a mainstay.

3. Would a network interface solution address the concerns raised regarding cost and complexity of device certification and approval? Why or why not?

My answer: No Comments

Respectfully Submitted,

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