From Broadcast (MULTICAST) to Video-Anywhere (UNICAST)
Dave Heal[1]

Executive Summary

On October 4th, 2010, the Silicon Flatirons Center, in conjunction with The Cable Center and Communications Technology Professionals (CTP), brought together leaders from the communications sector, the legal world, and the cable industry for a conference titled From Broadcast (MULTICAST) to Video Anywhere (UNICAST). The discussion was aimed at grappling with what Dale Hatfield called in his introduction "the most interesting and challenging set of business, technology, and public policy issues that I've seen in my career." The three panels dealt with 1.) the nature of the recent shifts in technology and the possibilities opened up by video-over-IP; 2.) the emerging business opportunities created by the move away from linear, broadcast TV; and 3.) the public policy implications of these shifts, specifically the role of government regulation in supporting or harming innovation.

One of the major themes across all three panels was the delicate balance between regulation and innovation. Some of the panelists shared professional experiences with government regulation that had helped create an industry or spur innovation. But there were just as many, if not more, countervailing anecdotes about heavy handed but well-meaning legislation that had handicapped business and increased costs to potential innovators and consumers alike. Unfortunately, much of the nascent over-the-top video industry is governed by many of these same outmoded regulations. What we're faced with is a morass of complicated legislation and political inertia. However, there is still plenty of opportunity for both new laws and legislative tweaks. Many of the technologies coming down the road might also be benefited by a hands-off approach, and the panelists at the conference talked at length about the importance of crafting the right balance between governmental action and inaction.

The day's discussion was wide-ranging and included excursions into compulsory copyright licenses, the future of the set-top box, and the Blind Giant Problem. Attendees also got to hear one panelist refer to Google as a "frenemy"[2] of the content industry and were regaled with anecdotes about the panelists' children that provided insights into the way youth culture is interacting with video.

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[1] Silicon Flatirons Research Fellow, Michigan Law School JD 2010
[2] Streaming video of the second panel (and the entire conference) is available here: http://www.cablecenter.org/livevideo/siliconflatirons/prerecorded/

Panel 1 – Disruptive Innovation and a Changing Technological Environment

Most people who have spent a considerable amount of time online in the past few years have noticed that alternative sources for video have been proliferating at an astonishing rate. Consumers are now able to purchase commercial-free television programming from most of the major networks via iTunes and watch free, ad-supported versions of many of these same shows on Hulu or on the networks' own websites.

The first panel dealt with this rapidly changing technological environment and addressed how these changes in technology are affecting the transition from broadcast to video-anywhere. Tom Lookabaugh, Chief Technology Officer of Entropic Communications and Senior Adjunct Fellow at Silicon Flatirons, moderated the panel and began by asking the panelists about the wide range of devices that consumers are using to access video and wondered aloud about the future of the set-top box in this new environment.

Stuart Elby, Vice President for Network Architecture at Verizon, opened his comments by telling an anecdote about checking into a hotel and being able to plug his computer directly into a box connected to the TV and watch streaming video from his Netflix account right on the hotel's TV. This story was meant not just to illustrate how far hotels have come from the days of offering only prohibitively expensive video-on-demand services. Instead, Elby expressed his surprise at what he deemed the limited selection of streaming video provided by Netflix. He believes this is a supply chain issue tied to the complexity and sheer number of devices available. When each show or movie only had to be produced for a few devices, there were only a handful of formats involved. Now, with the proliferation of handheld devices, tablets, and video game systems, Elby estimates there are at least 200-400 possible formats.

Ryan McIntyre, Managing Director of The Foundry Group, a Boulder venture capital firm, was much more optimistic that the market would sort out the format and device issues that Elby raised. He saw the biggest hurdle in the supply chain as the content owners' fear of letting their content out of their grasp. In an ideal world, McIntyre said, everything would be unbundled and consumers could buy programming a la carte. This frustration with bundling has led McIntyre to scale down his cable subscription, cancelling it entirely in one of his homes.

Whither the Set-Top Box?

The first to comment on the future of the set-top box was Balan Nair, Senior Vice President and Chief Technology Officer at Liberty Global. Nair said that in

September 2010 there were over 33 billion streams of "over the top[3]" (OTT) video, 25% of which were on YouTube. Hulu alone had 1 billion streams, which Nair estimated was more than the video-on-demand services of all the major cable providers combined. The bottom line, he said, is that consumers want to watch video online. He then brought up Tivo as an illustrative example of what the response of incumbents might be in this space.

Tivo came out with their DVR in 2001. But within a few years, satellite and the cable providers had built their own. And though they were inferior to Tivo's product, they were free or had the monthly rental fee bundled into the customer's bill. This made their adoption nearly a foregone conclusion and significantly cannibalized Tivo's business. Nair sees the pay TV industry doing the same thing to third party "over the top" boxes this time around as well. Ryan McIntyre chimed in to say that Tivo's product had, and probably still has, the best user interface, and that he was not pleased at the thought of the content industry coming into this space and once again squeezing out products that provided a better UI.

Emergence of the Home Gateway

Background

In April 2010 the FCC issued a Notice of Inquiry[4] seeking comment on "specific steps we can take to unleash competition in the retail market for smart, set-top video devices that are compatible with all multichannel video programming distributor (MVPD) services." Essentially, this was the FCC's way of officially moving away from the failed CableCARD experiment[5], which was the FCCs first attempt to create competition in the market for set-top boxes by making it easier for third party boxes to access the streams of cable programming. For reasons that are still up for debate, there was very little third party adoption.[6]

The FCC's proposed "AllVid" box would act as an intermediary between the variety of home theatre devices and Pay TV content. Any coaxial cable, fiber optics or satellite content would be routed through the AllVid box which would then act as a standardized relay station for connections to the rest of the consumer's devices,

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[3] "Over the top" video refers to video that is delivered over the Internet to a PC or another device that is connected to the Internet such as a Roku or an X-Box.

[4] *Available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-10-60A1.pdf

[5] In December 2009, the FCC released a document titled "Comment sought on video device innovation" that signaled its desire to try and open up the market for both set-top and portable devices that receive video over the Internet.

[6] For more discussion on CableCARD's failures, *see* Nate Anderson*, FCC admits CableCARD a failure, vows to try something else*, Ars Technica (Dec. 4, 2009), http://arstechnica.com/tech-policy/news/2009/12/fcc-admits-cablecard-a-failure-vows-to-try-something-else.ars.

essentially any TV, computer or other device capable of displaying MVPD or Internet content.

AllVid as a "home gateway":
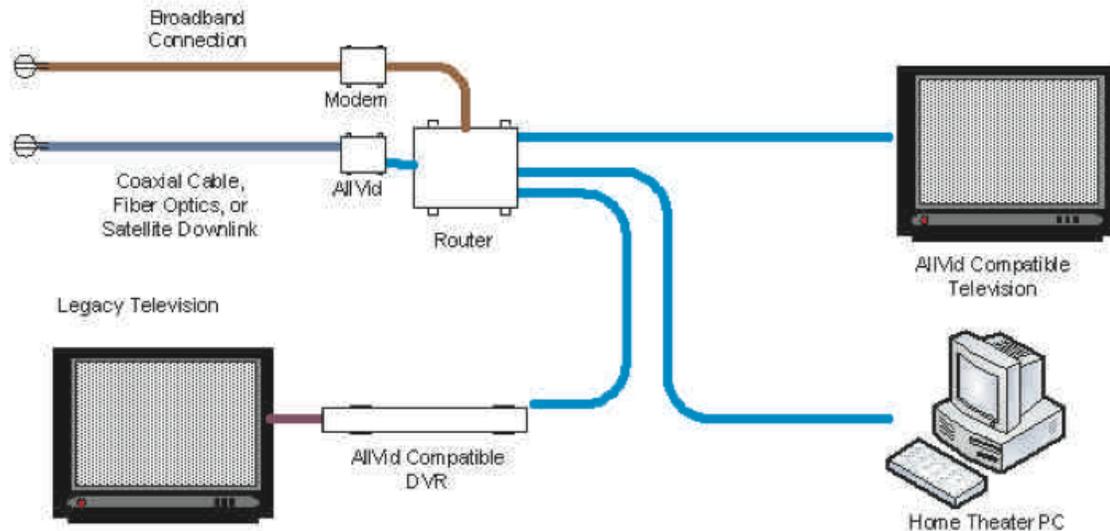
It is against this background that Tom Lookabaugh asked the panelists to talk about the idea of the so-called home gateway proposed by the FCC. Is the gateway idea a real trend?

Stuart Elby remarked that many devices have the processing power to be this gateway. So the idea of AllVid, insofar as the box would be provided by the broadband/telco companies, doesn't seem to be an ideal solution. Why not provide consumers with the software to turn their Wii or Playstation 3 into a gateway device, he wondered. Elby, as a consumer, expressed his frustration with the monthly rental fees the cable companies charge for rental of a set-top box and suggested that consumers would much rather turn one of the devices they already own, or would gladly purchase, into a home gateway.

Once again, McIntyre expressed his desire for completely unbundled services and said that his fantasy is a set-top box with a DVR, BlueRay, and a UI designed by Apple that can have the rest of his peripherals plugged into it. There are no technical barriers to such a box, he said, but the reluctance to unbundle services is getting in the way.

Tom Moore, Chief Executive Officer of WildBlue Communications, a satellite high-speed internet provider, said that the essence of solving the home gateway problem is going to be collaboration between content providers and pipe owners to make sure that content can efficiently be routed into the home while also providing fair value for that content. Currently there is a stalemate between the content providers, who want neutral and free access to the pipes, and the pipe owners, who support

unbundling and getting rid of middlemen. Both Elby and Moore agreed that digital video distribution is simply too expensive right now and that we will need to find efficiencies somewhere along the line between content creation and content consumption at the retail level. David Reed, Executive Vice President and Chief Strategy Officer of Cablelabs, appeared in the second panel and actually disagreed with the first panel's gloomy account of the efficiencies present in the current system. He identified satellite as a fantastically efficient way to distribute video in lightly populated areas and said that the MPEG platform used by cable operators was also worth mentioning.

Balan Nair, citing the CableCARD experiment, felt that the FCC should not be involved at all. Their history with regulating in this space, he said, has been simply to increase costs, both for the consumer and the industry implicated by the regulation, without any appreciable benefits. Tom Lookabaugh reminded the audience that the CableCARD was designed to modularize security and give the content industry assurance that only people who are paying for the content will be able to consume it. Raised in the final part of the panel was the question of whether DRM technology would do anything to quell these security concerns. The panelists seemed to agree that security in the UNICAST world is more important but also easier to implement. In the broadcast world it was relatively easy to learn how to physically hijack the cable line or intercept a broadcast signal. Physical intrusion is less of an issue in the IP UNICAST world, and Elby suggested that we need to divorce ourselves from the security techniques of the past. Different delivery mechanisms call for different security considerations.

Balan Nair felt that stealing content outright was less of a concern, and that rightsholders were more worried about the ease with which people can manipulate content (e.g., using cheap consumer software and hardware to turn *Dr. Strangelove's* Slim Pickens' trusty H-bomb steed into a giant carrot with a few deft keystrokes). These concerns led Nair to the conclusion that DRM is more important than ever and that third party devices will all come with robust DRM. McIntyre responded that the protection just needed to be strong enough so that that the average person would not bother trying to get around it. He added that this measure of protection was likely already available. The implication seemed to be that people with the combination of skills and malicious intent will always find a way to crack the security and that we shouldn't inconvenience the average consumer in order to provide the highest level of security possible.

Tom Moore noted that content providers become more uncomfortable the farther content travels from their servers. But it is clear that consumers do not want linear content anymore; they want to time shift everything and watch when they want to watch. Additionally, the increase in network traffic from mobile devices means that it is going to be imperative to find efficiencies in the way that content gets to

consumers. Multi-casting & single-instancing[7] make content providers uncomfortable because, Moore said, we do not have a paradigm for DRM that can accommodate caches of data deep in a network. It would be easier in many cases to let interested viewers join a streaming session already in progress, but this makes the industry uneasy.

As we increasingly move into a world where people use wireless technology to send and receive large amounts of data, we will begin to be confronted by the reality that bandwidth is not free or limitless. One of the recurring themes of this first panel was the stress that the widespread use of smartphones and other mobile devices with streaming video capabilities will place on the network. Both Balan Nair and Tom Moore agreed that network operators would have to start selling the last mile as a metered service if they want to have a sustainable business model. Moore cited a Cisco announcement that they expect 50% annual growth in wireless consumption. He also cited a Frost & Sullivan report that indicated the average person with an iPhone consumes an order of magnitude (300-400mb vs. 50mb) more data than a Blackberry owner. Although the providers will see an efficiency gain of 30% or so with the move from 3G to 4G, that is less than the growth in wireless usage in a single year.

Stuart Elby said that these efficiency concerns would be even more urgent once there is more live TV being streamed over the Internet. At the moment most of the traffic is video-on-demand streaming. But consumers are getting a taste of live TV-over-IP with, among others, MLB TV, and the desire for more live options will likely increase. In order to accommodate this change, Elby believes that business models need to evolve. Content providers are now very hesitant to allow any video optimization anywhere other than on their own servers, but Elby predicts they will have to rethink this in order to be able serve their customers adequately.

Panel 2 – Changing Business Models and Emerging Opportunities

The second panel was moderated by Raymond Gifford, a partner at Wilkinson Barker Knauer and Senior Adjunct Fellow at Silicon Flatirons, and focused on the business side of the transition from broadcast to TV-Anywhere.

Gifford first asked the panel about the pace at which "over the top video" was challenging broadcast and how the industry was going to find new revenue sources.

Albert Cheng, Executive Vice President for Digital Media at Disney-ABC Television Group, said that ABC had tried to learn from the music industry's mistakes in

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[7] Multi-casting refers to a situation where, if multiple people wanted to watch a stream of content, instead of sending a single stream to every interested customer, a single stream would be made available to multiple people. Consumers would also be able to join a session already in progress, for example. Single-instancing is a storage technique that allows a single file to serve multiple users, thus creating greater efficiency in delivering data to customers.

dealing with piracy and that serving up their own content online was viewed internally as a powerful marketing tool for their shows. Which is not to say that ABC does not hope to make money from their online offerings. They do try to look at the money they make per eyeball per episode in broadcast and then try to match that number by calibrating their advertising accordingly.

Michael Zeisser, Senior Vice President for Liberty Media, did not think that the newspaper and music industries' lessons were particularly instructive for the television and video. But even though the conditions were different, video has benefited from getting to confront these issues after the music industry. The issue for content rightsholders, he said, was trying to decide what and how much content to make available for free or at lower price points while also being able to preserve their core business.

Robert Zitter, Executive Vice President for Technology Operations and Chief Technology Officer of HBO, said HBO's philosophy is not to fight against technology but to predict what consumers want and find a way to provide that while preserving their bottom line. As a result, HBO developed HBO Go, which will allow customers to access all 700 HBO and Cinemax titles on any device anywhere.

Having listened to the first panel, one might think HBO would be worried about piracy. Zitter said HBO is not particularly worried, but he did admonish law enforcement that the laws need to be enforced, and he hinted that other countries with more lax copyright enforcement were an issue. HBO also seemed very concerned about getting the FCC to close the so-called "analog hole[8]," which Zitter claimed is the source of all of the piracy of HBO's programming.

As many panelists throughout the day noted, both from their professional and personal perspectives, customers want and are beginning to expect access to all the content on all their devices. And yet the marketplace clearly doesn't provide anything approximating this celestial jukebox for video. Gifford asked the panelists to talk about whether the barrier was mainly transactional or technological.

Albert Cheng felt that the barriers were entirely transactional. He said that Disney's offerings are not where they want them to be simply because they could not agree on terms with their partners. The various stakeholders--most specifically the cable companies that Disney partners with--haven't been able to agree on the economic

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[8] Hollywood has attempted on a number of occasions to craft legislative solutions to the analog hole issue. For an overview on the Broadcast Flag legislation, take a look at Public Knowledge's primer, *The Broadcast Flag and Analog Hole Legislation: A Threat to Online Video Producers*, *available at* http://www.publicknowledge.org/node/536 (last visited Nov. 5, 2010). For a more positive spin on the results of allowing technological controls, *see generally* Jane C. Ginsburg, *Copyright and Control over New Technologies of Dissemination*, 101 Columbia L. Rev. 1613 (2001).

models involved. For instance, Disney is adamant that consumers not fast-forward through their commercials, a issue that they have fought over with their partners.

Michael Zeisser thought it was some combination of the two. Building an offering like HBO Go, he said, was a labor-intensive and thorny technological problem. Another issue Zeisser identified, which may fall under the "transactional" side, is the difficulty of assembling all of the rights in order to offer a "full bouquet of shows." Zitter commented that while the rights side was certainly complicated, they had successfully negotiated the rights in order to go ahead with HBO Go. It is likely, however, that a company with less capital and less clout would have had a much harder time getting the rights issue settled.

During the Q&A session, the panelists were asked about the challenges of getting customers to pay for content that they might be used to getting for free. Robert Zitter and Albert Cheng agreed that the expectations about what content is worth paying for break down along generational lines. Zitter said that he believes there is a generation of people that have grown up without an appreciation for intellectual property rights, and Ray Gifford chimed in to note that his kid thinks music should be free. Cheng said that we will simply have to wait and see whether millenials will be willing to pay for content as they get older.

Michael Zeisser disagreed and said that it was a situational issue, not a generational one. He said that so long as it is easier to steal content with a minimum burden and a small chance of getting caught, why would we expect people to do anything else? He asserted that getting people to pay for content is merely an issue of putting in the right incentives, and that people do not actually *expect* content to be free. He cited as evidence that teens he knows will not think twice about "stealing music or video" but will gladly pay $3.50 for a fake tractor from Zynga.

Panel 3 – Public Policy Implications

The third panel dealt with the public policy implications of the move from multicast to unicast and focused on the proper role of government. It was moderated by Preston Padden, a Senior Fellow at Silicon Flatirons. The overarching inquiry was whether we want the government to help nudge the industry into making certain decisions or whether we think regulation at this stage is likely to stifle, not promote, innovation.

Both Andrew Crain, Vice President and Deputy General Counsel for Qwest, and Paul Glist, a partner at the law firm Davis Wright Tremaine, agreed that while there are examples of the government getting regulation of technology right, they were worried about government intervention in a space that has yet to mature. The industry would be better off, they said, if the government restricted its present role to advice and collaboration and passed on imposing regulations that might decide winners and losers before the market has a chance to operate. Stanton Dodge, Executive Vice President and General Counsel of DISH Network, felt that his company had benefited from some "light touch regulation" in the form of program

access rules. He thought it was important that the government regulate in favor of net neutrality in order to allow smaller players to avoid being discriminated against.

The Home Gateway & Over-The-Top Regulation

Glist thought that the FCCs mandated AllVid gateway solution was a perfect example of the government's good intentions leading it astray. It is fine for the government to suggest that there should be a solution than can accommodate all MVPDs, he said, but legislating a hardware solution, especially at this stage, is a bad idea. Why not allow the market to decide whether another solution, a cloud-based approach for instance, might be better. In the context of the FCCs AllVid hearings, Glist brought up an economic paper[9] that was presented to the FCC that reminded the agency of the "Blind Giant problem." The essence of the metaphor is that in a highly innovative industry, the greatest opportunity to influence the direction of that industry is early on. But that is also when one is least likely to know what the right regulatory solutions are. Dodge agreed that there was already plenty of innovation taking place in this space and that this was evidence that the market did not need a whole lot of prodding from the FCC.

Padden asked the panelists whether they thought the government should step in to give a boost to over-the-top providers and what the response should be to new entrants that want to offer services by riding on an incumbent's network. Fernando Laguarda, Vice President at Time Warner, said simply that the question of what to do about new entrants should be decided by looking at what is best for consumers. Stanton Dodge's understanding was that existing MVPDs would have to make content available to new entrants on a non-discriminatory basis. If Google wants to come into the space with Google TV, he said, they should have the same unrestricted rights to content as DISH does. Andrew Crain cautioned that Dodge's model might not be workable. The marketplace of the future, he said, is not going to have easily distinguishable entities. And coming up with ways of distinguishing over-the-top providers from other types of providers would be difficult. Right now it is obvious that cable and satellite are more or less the same service, but with the proliferation of different kinds of MVPDs, distinguishing between them will become practically impossible from a regulatory standpoint.

Another relationship that the government might decide to regulate is that between networks and premium site operators. As most Internet-savvy sports fans know, ESPN rebranded its streaming online video service as ESPN3 recently, and they charge ISPs for the privilege of giving their customers access to their site. If your ISP doesn't have a relationship with ESPN, you don't get access to the content. It's that simple. Preston Padden asked the panelists whether this was an area the government should step in and regulate.

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[9] Michael G. Baumann and John M. Gale, *Economic Analysis of the Regulation of MVPD Navigation Devices*, July 19, 2010, p. 15. *available at* http://www.ei.com/downloadables/mgb_report.pdf

All of the panelists agreed that the government should probably take a wait-and-see approach. Andrew Crain said the government doesn't need to step in, but that the lack of restrictions should be symmetrical. That is, if we're not going to have rules against content providers charging ISPs, then we shouldn't have rules that require a company like Qwest to charge all customers a uniform rate. Many of the customers that don't use the premium services are going to subsidize those who do, and that's not a sustainable model, Crain argues. He also noted that this big, underlying debate in the net neutrality discussion about the potential balkanization of the Internet is similar to the debate that took place when cable TV was first being regulated. Most of the worries are about ISPs discriminating against certain types of content. But Crain thinks that if the Internet is going to become fragmented it will be because of money flowing from ISPs to content providers, not because ISPs will be charging content providers for access to their customers.

Dodge said that Qwest should be able to charge their customers whatever they want. If someone is watching only three channels, it was self-evident to him that they should be able to pay less than someone watching a lot of video. Paul Glist said he did not appreciate being held up by ESPN3, but that his preference was for the market, not the FCC, to determine which business models would survive. A blanket regulation prohibiting this kind of behavior would likely prevent the development of other creative business models, including many that regulators cannot even imagine at this early date. Laguarda echoed these concerns and said that the decision about whether ESPN3 was good for the consumer is an open question, but one that is rightly determined in an open market.

Compulsory Copyright Licenses

The discussion then shifted to compulsory copyright licenses. Padden gave a brief background on the history of these licenses, mentioning that the Copyright Office has proposed phasing them out, and asked the panelists to talk about how they would solve a relatively new problem in this area: the terms of the compulsory license mean that local stations do not have the ability to sub-license to another retransmitter. However, if you are a new entrant and are not classified as a cable system or satellite provider, you cannot get a compulsory license for yourself. So new entrants seem to be in a no-man's land where they cannot get a license directly and also cannot negotiate for a license in a secondary marketplace.

Crain said the obvious answer was to phase out the compulsory license while giving stations time to set up their own licensing regime. But he was not exactly sanguine about the prospect of local stations, which he said have always had a disproportionate amount of political power, allowing this to happen without a fight.

Paul Glist and Fernando Laguarda both highlighted that the compulsory license was the result of a political deal struck when the 1976 Copyright Act was being written. They could both imagine a world where local stations would be responsible for clearing all of the rights, but the interconnected nature of these regulations means that if you get rid of the compulsory license, you have to change a lot of other

legislation. Essentially, this would be a giant bureaucratic undertaking and one which new entrants do not have the political capital to push for.

Laguarda also rhetorically asked if the same people advocating the revocation of compulsory licenses in this arena would support doing the same for the public performance of music. Television programming as we know it depends on these compulsory licenses for music, he said. Both Laguarda and Glist thought that marketplace negotiations of licenses were great in theory, but negotiating such a license is another obstacle that a new entrant will have to deal with and nobody is quite sure what an environment without them would look like. And it is this uncertainty that is likely to prevent attempts to do away with them.

Restructuring Retransmission Consent

Padden noted that thousands of retransmission consent deals get done between broadcasters and cable operators without any problems. And when there are disputes, there is rarely a disruption in service for the consumer. So, Padden asked, nodding in Laguarda's direction, why do some people want to restructure retransmission consent[10]?

Laguarda noted that when the retransmission consent rules were written by Congress in the 1992 Cable Act[11], the market for cable services looked quite a bit different. Back in the early 90s there was usually one broadcaster negotiating with one cable operator in every marketplace.   As Stanton Dodge noted, the prospect of mutually assured destruction prevented some bad acting. Now we have broadcasters playing multiple MVPDs against each other and the consumer is often caught in the middle.

Laguarda believes that the marketplace has evolved dramatically in the intervening 18 years and said that the malfunctioning regulatory environment should give us pause about regulating new video entrants too soon. This theme was echoed throughout the conference. When you look at a marketplace and regulate as if it is always going to look a certain way, you set the market up to fail in ways that are not always obvious.

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[10] Although struggles between broadcasters and cable/satellite providers are not a new phenomenon, the recession exposed advertising revenue as extremely volatile. In these negotiations, broadcasters try to squeeze more money out of the providers so they don't have to rely on advertising as much. Needless to say, the cable providers usually resist these fee raises, which usually get passed on to angry customers.

[11] The 1992 Cable Television Consumer Protection and Competition Act is *available at* http://www.fcc.gov/Bureaus/OSEC/library/legislative_histories/1439.pdf

The panel ended with a brief discussion on privacy and the industry's response to recent legislation[12] attempting to ensure that people with disabilities are able to realize the benefits of broadband Internet. Andrew Crain said that "we're focusing too much on technology rather than information" and thinks we'd be better served by regulating types of information and not trying to categorize companies as particular kinds of service providers. That is, instead of trying to determine whether a company is an ISP and regulating accordingly, we should have rules that say how information is treated across the board. That way, he says, the consumer is better able to figure out how his or her data is being treated. Laguarda noted that in thinking about privacy regulation it is important to find a balance between protecting consumers and supporting innovation. Regarding the accessibility legislation, Crain felt that legislative solutions are never going to be able to do all of the work. The greatness of the Internet depends on the innovation of anonymous people in their basement, and rules are always going to have a tough time reaching these kinds of actors. The answer, he seemed to suggest, was developing technology that disabled people could use on their own computers to provide the desired functionality. Technology is always going to be more nimble, and often more effective, than legislation.

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[12] The 21st Century Communications and Video Accessibility Act, *available at* http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=111_cong_bills&docid=f:h3101pcs.txt.pdf