FEDERAL TRADE COMMISSION

WORKSHOP:

BROADBAND CONNECTIVITY

COMPETITION POLICY

Tuesday, February 13, 2007

9:10 a.m.

Federal Trade Commission

601 New Jersey Avenue

Conference Room 1200

Washington, D.C.

FEDERAL TRADE COMMISSION

I N D E X

P R O C E E D I N G S

- - - - -

CHAIRMAN MAJORAS: Well, thank you very much, Maureen, and many thanks to all of you, for being here, live. It's good to see that some of us still value being live in the audience. But we do have many I also want to thank, who are watching us online today. So, thanks to everybody.

I particularly want to thank our distinguished panelists. We have what I consider to be a dream team line-up of panelists on this issue, and I think this is a great opportunity for all of us to hear from some of the most knowledgeable -- and, I could probably say, passionate -- people who are involved in this very significant debate over so-called network neutrality.

In a short time, the Internet has fundamentally changed our lives. It's made the world bigger, in the sense that it expands our reach in offering and acquiring knowledge, opinions, and goods and services, and it's also made the world smaller, in the sense that it makes communicating and transacting around the world a synch.

For our children, geographical and spacial limitations are quickly diminishing, as they can play games with friends who are sitting across town, communicate with a classroom halfway around the globe.

Their circles of friends and influences increasingly come less from geographic neighborhoods, and more from social networking neighborhoods.

Whereas we have grafted the Internet onto our lives, they are growing up in it, and have never known otherwise. And they will shape it, ultimately, into something that we cannot fathom. Our job, in the meantime, is to not screw it up.

Beyond providing a means to communicate and get news and entertainment, the Internet, of course, has fostered and, in some cases, actually created competition in countless markets. The FTC's job is to protect that competition online and offline, and we use a lot of different tools in this effort.

For over a decade, now, the FTC has investigated and brought enforcement actions, using both the consumer protection and the anti-trust laws, in matters involving Internet access. From combating spam and malicious spyware and deceptive online claims, to investigating mergers involving broadband and other Internet access services, the FTC has devoted -- and will continue to devote -- significant enforcement resources to this very crucial part of our economy.

And while the Internet environment presents new challenges, the fact is that what we often find in our

cases is that tried and true principles of competition, truthful and complete disclosures, and securing sensitive consumer information still apply, both in the offline and the online environment.

So, we often find that our existing legal authority is sufficiently flexible to allow us to address new competition and consumer protection challenges as they arise.

In addition to law enforcement, the Agency actively engages in competition advocacy to inform policy makers of the competitive and consumer implications of their proposed legislation, or policies. And this is actually an extremely important complement to our private enforcement work. Because, from the market's perspective, government-imposed restrictions on competition or barriers to entry may be more harmful than even private exclusion can be.

So, increasingly, we see our advocacy efforts targeting proposed restrictions on electronic commerce. Just within the past year, for example, we have responded to invitations to analyze proposed legislation involving online auctions, online wine sales, legal matching services -- I said "legal matching services," not "dating matching services" -- as well as a "do not e-mail" registry.

A recurring theme in many of these advocacies in the area of eCommerce, and of course, elsewhere, is that policy makers need to be wary of regulations that are clothed in terms of protecting consumers, because that's what groups always say that they want to do, that in practice would hamper competition, or raise barriers, while benefitting only particular vested interests. And this is particularly a concern of ours, when we are not seeing evidence of consumer harm.

Another potent tool that we have that we use at the FTC is innovative and timely consumer education. Now, people sometimes look at me when I say this, like, "Okay," like as though that is sort of the soft side of what we do. Much to the contrary. Education is what empowers consumers to protect themselves in the market place. And nowhere is that more critical than in the online environment.

Foremost among our education efforts is onguardonline.gov, which is a multi-media website, designed to educate consumers about computer security issues such as phishing, spyware, issues raised in online shopping, and wireless security.

Our latest effort in the area of consumer education is a home page that just went live on our website this morning, titled, "Competition in the

Technology Marketplace." And there, consumers can learn about the FTC's actions to promote and protect competition in technology markets.

Now, the final tool that we use is our -- is robust research and information gathering, which, in turn, then, informs our enforcement, our advocacy efforts, and our education. And this research can take the form of studies. You may be familiar with our municipal Wi-Fi report that was issued last October, which provides an analytical framework for policy makers for considering whether and how municipalities should provide wireless Internet service.

But we also increase our knowledge by holding public workshops, such as the one that you're attending today. Last August I announced the formation of our Internet access task force. My rationale was simple. I wanted us to gather more facts and less rhetoric. After being asked increasingly about our views on network neutrality, from both the competition and consumer protection perspectives, I began doing more reading on the issue, and talking to folks, to try to learn a little bit more.

And frankly, I was a little surprised by the lack of constructive public debate. What I found were too many sound bytes, too much talking past one another,

and not enough acknowledgment that this is a tough issue that poses risks on all sides.

So, when I announced the formation of the task force, I suggested a set of questions that I thought we ought to explore before going down the road of regulating the Internet.

Following my open invitation to interested parties to come in and talk to us about the issue, the task force has met with representatives from dozens of organizations, including content and applications providers, Internet backbone operators, broadband service providers, equipment manufacturers, computer scientists, advocacy groups on every conceivable side of the issue, consumer rights organizations, and academics.

And through these discussions, we have been exploring market conditions and incentives, and opinions about likely short and long-term effects of network neutrality regulation. Because the discussions were so valuable, we decided that airing them in a public forum would contribute to furthering a public understanding and analysis in the area.

So, we will have two panels this morning to help set the stage for the discussions over the next two days. Because we're not all electrical engineers, our first panel this morning is going to provide us with some

technical background on the workings of the Internet, to make sure that we are all speaking the same language over the next two days.

The second panel will attempt to define the parameters of the debate over network neutrality. One of the things that we have found is that the terms that we're using in this debate sometimes mean one thing to one person, and another to someone else, and people have different concerns.

So, we're going to review the regulatory changes at the FTC and in the courts that have sparked the debate, and air the court concerns of proponents and opponents of regulation. And we will attempt to try to identify the potential and actual harm to consumers that we are most concerned about.

In the afternoon sessions later today, we will have two panels devoted to the two main areas of the debate: data discrimination; and prioritization. And in the first of these, we will have five economists addressing the incentives of ISPs to discriminate against content or applications provided by unaffiliated parties, as well as the risks and benefits of vertical integration by ISPs into content and applications.

And then, the second of the panels will address the many issues associated with ISPs and other network

operators charging content and applications providers for prioritized delivery of data.

Tomorrow morning, our first panel -- hopefully, we will have a tomorrow morning; well, we will have a tomorrow morning.

(Laughter.)

CHAIRMAN MAJORAS: Hopefully, we will have a tomorrow morning here. We will address the current and future state of broadband competition in the United States.

Our task force, frankly, has heard many divergent views on that subject, with some characterizing the broadband market as a duopoly, at best, and others touting existing or imminent alternatives to DSL and cable modem, such as wireless, broadband over power line, and others.

The competition panel will offer views on the competitive significance of these alternatives, and debate whether robust competition in the market for broadband Internet access is the best way to address the potential harms envisioned by proponents of regulation.

Our second panel tomorrow morning will explore consumer protection issues in this area, including the disclosure of material terms in Internet access agreements. As ISPs are providing more differentiated

services, consumers will need to pay closer attention to what they are actually buying.

At the same time, ISPs may need to provide more information to consumers, to allow them to make truly informed decisions regarding their Internet access, particularly if the ISP is affecting consumer's access to certain content or applications.

And then, our final two panels tomorrow will address what framework best to promote competition and consumer welfare in the area of broadband Internet access, with industry views explored in one panel, and academic and policy views explored in the other. Wouldn't want to mix those. Just teasing.

Among the topics to be addressed there are: whether enforcement of existing anti-trust consumer protection and communication laws is sufficient to address concerns; and, if regulation is the answer, then what form should it take?

The purpose of the workshop is to further the discourse on these important issues arising in this area. In addition, I expect that the Internet Access Task Force will, at the conclusion, as quickly as we can, produce a report that conveys our learning, and hopefully, provides some guidance on a way forward.

Again, I want to thank each of our moderators

and panelists for being with us today, and for all your efforts you have put into this.

We, frankly, had more volunteers than we could accommodate, as far as speakers go, and we are sorry about that, although we were delighted by the response. But there is still time for filing written comments, up until the end of the month. So please keep that in mind. I hope that all of us will benefit from listening to the differing views offered -- emphasis on listening.

(Laughter.)

CHAIRMAN MAJORAS: So, it is now my pleasure to turn things over to Charles Goldfarb, of the Congressional Research Service, who has graciously agreed to moderate our first panel. Thank you very much.

(Applause.)

MR. GOLDFARB: Welcome to the opening panel of the FTC broadband workshop. I am very happy to be participating in the workshop for two reasons.

First, I began my public policy career in the FTC's bureau of economics, way back from 1974 to 1978, so this is a nice reunion for me. And second, in my current position, where I cover telecom and media competition issues at the Congressional Research Service, it's my responsibility to help frame public policy issues, and to provide balanced and non-partisan policy analysis to my

535 clients -- the 435 members of the House, and the 100 members of the Senate.

Chairman Majoras, Maureen Ohlhausen, and their FTC colleagues have correctly framed the fundamental issue as broadband connectivity competition. And this is perhaps the most complex issue that I have faced in my 32 years in Washington. And, therefore, I am particularly glad that the FTC wants to spend these two days developing a firm technical and factual base for the ongoing debate.

We're lucky to have two panelists with us today -- one by telephone, I hope. Bill -- are you there?

(No response.)

MR. GOLDFARB: Well, maybe we have one panelist with us.

MR. LEHR: Yes, I'm here.

MR. GOLDFARB: Okay. Glad -- we will try to figure out how to get a microphone to you. His flight was canceled this morning, so Bill -- but we have two panelists who have a lot of experience bringing their technical expertise to bear on public policy issues.

Jon Peha is the associate director of the Center for Wireless and Broadband Networking, and professor of electrical engineering and public policy at Carnegie Mellon University. His primary research areas

involve technology and policy issues of computer and telecommunications networks, electronic commerce, and technology policy.

William Lehr, who is up in Massachusetts right now, is a research associate at the computer science and artificial intelligence lab at MIT. His current research with the communications futures program, and previous research with the MIT research program on Internet and telecommunications convergence focus on emerging broadband and wireless technologies and their implications for industry structure, business, and public policy.

This opening panel has a relatively narrow mission to provide a factual, technical base that can be used in the various public policy discussions that will follow over the next two days. We face the challenge of providing information on the technologies available to operate and manage broadband access networks without bogging down the non-technologists, who are essential participants in the public policy debate.

Our plan is as follows. First, Jon will discuss the technologies available today -- or soon to be available -- that allow broadband network access providers to discriminate or differentiate among applications or users.

Then, Bill will discuss the technologies available to independent applications providers and end users for counter-strategies, if they face discrimination or differential treatment. I will then pose several questions to the panelists, and then we will take questions from the audience. So, Jon?

MR. PEHA: Okay. So, I'm going to begin with a discussion of some of the underlying technology, and then its economic and policy implications.

We have heard -- and will certainly hear over the next two days -- advocates of network neutrality saying that networks have the ability and the incentive to limit customer choices through discrimination today. We will also hear opponents of network neutrality say that network neutrality legislation could interfere with useful activities related to discrimination.

And, unfortunately, both of these are right. So, I will talk about the emerging -- how emerging technology can discriminate. I will talk about why it is beneficial to users. I will talk about how it's harmful to users, at least if the network has sufficient market power, why we need to balance these things.

And I don't think I have much time for this; actually, I could spend two days on this -- about how the issue has been misframed on vague principles and away

from where I think the issue is.

So, what is net neutrality? I don't know. I have been following this debate for a while, and I don't have a clue. Definitions have not converged, as best I can tell. But if I go back to the principles endorsed by the Federal Communications Commission a few years ago, that consumers should have access to the legal content of their choice, be able to run applications of their choice, and be permitted to attach devices of their choice -- all three things related, I would argue, to discrimination.

The fourth, of receiving meaningful information on service plans, later choosing among competing providers is interesting, but I will focus on the first three, because they are related to discrimination.

So, first of all, we have to figure out what "access" means. And access, to me, can mean one or all of three things. Access could simply mean that something is available, it is possible for me to use the voiceover IP application, or it is possible for me to access that website I want. It could mean available at an acceptable quality of service. Or, it could mean available at a reasonable price. So we will talk about each of these three things.

First, to go back a little bit, the Internet is

based on the concept of packet-switching. That is, we will take -- all information sent, we have to divide it up into little discreet pieces, to each of those pieces we will slap on some control information at the front and the back, which we call a header and a trailer, kind of like you put control information on the outside of an envelope when you mail it. And each of these packets is sent separately.

So, based on traditional Internet technology -- might have been a better phrase -- delivery of these packets is entirely best effort. That is, packets can be lost, packets can be delayed. Packets can come, but not in the order you sent them. And it's entirely up to the sender and the receiver to sort that out, and to request retransmissions where needed.

Traditionally, most resources have been allocated on a first-come-first-served basis. Actually, the protocol for 35 years has allowed priority. But, for the most part, people haven't used it. Or even implemented it.

And in general, there has been little intelligence within the network. The idea is push the intelligence to the outside of the network, and try to keep up with packets as fast as you can, which, among other things, means that there was traditionally little

ability to defend against security threats inside the network, because it just wasn't built in.

This is changing. In many ways, there is more intelligence going in the middle of the Internet. And I won't talk about all of it, except related to discrimination. And discrimination, I would argue, has two components. First, you have to decide which packets or users or streams you want to favor or harm, and then you have to figure out what it is you want to do to benefit or harm them.

So, beginning with the first, how do you determine which streams to favor? The traditional way to do that was to look at each of these packets as they went by. Look at the fields and the header, that control information that was tacked on, one packet at a time. And things like IP address and port number, you can learn who the sender is, you can learn who the recipient is. Sometimes you can learn who the device manufacturer is, for that device at the edge, depending on where you're monitoring.

Once upon a time, you could learn who the application was, through something called a port number, but that hasn't been reliable or meaningful for a number of years.

But some new methods have emerged -- actually,

they're not that new; they have been in universities for a while. But they're actually products on the market that do new and interesting things to differentiate among packet streams.

One is called flow classification. Something new will actually keep track -- it is called stateful -- I will keep track of every stream that is going by my monitoring device. And for each of these, I will keep track of things like packet size, and the time between packets and stream duration, and I can learn a lot about the application that way. Even if you encrypt it, I can.

I can do something -- also do something -- called deep packet inspection, where not only will I maintain state for every stream of packets going by me, I will actually capture some of those packets, and I will reassemble them, as if I were an application. I will take a bunch of your packets together, and I will reassemble that e-mail message, if I want to.

And in fact, if I am doing that, I can actually even go a step further. As long as I have got state on every session, and I am pulling this information, I can also use this to cross-index with other information I might have, like your billing information, or your credit information, or whatever you want.

And when you put all this together, I can have

a really detailed information about who you are, and what you are doing. I know the subscriber, I know the application, I know the content, and the content or service provider. I often know the -- who made the attached device and billing information, and all the rest.

So, what might I do with all of this detailed information? There are a number of ways I might use this to discriminate. One is I may simply block streams and drop all those packets. Another I might do is I might divide the traffic into channels, and channels can mean a lot of different things, but I will group them together here. And some of them are better than others.

What is particularly interesting about this, from a policy perspective, is I'm not sure this meets the traditional definition of discrimination, but it certainly has an effect of giving some better service than others.

A third thing I can do is I can use a wide variety of traffic control algorithms to adjust data rates, to adjust end-to-end delays, to adjust packet loss rates or blocking rates -- that is, entire streams that are not allowed to start. For example, the scheduling algorithm, which says there are a bunch of packets waiting to go; who gets to go next? Or, a dropping

algorithm, which says the buffer is going to overflow; what do you throw away? Or, routing algorithms. Which path should this packet take?

And I can, if I want, introduce discrimination in to any or all of those.

A fourth thing I can do is sometimes called content billing or content charging. I can look into your packets, and I can decide to adjust your bill -- I guess up or down -- based on your application, based on content, based on subscriber. This is, actually, in fact, a little easier than managing your quality of service in real time, is to adjust your bill.

So, what do I do with all this stuff? Well, first, let me make the argument that discrimination is wonderful, that I can do really useful stuff with this. One thing I can do, for example, is I can watch for security threats and block them. I can watch for viruses, I can watch for denial of service attacks.

I should caution. Some of the proposals actually have a carve-out for security. Of course, the hard part is defining what it is to exempt security, what that means. And particularly, I mean, I have students right now back at Carnegie Mellon University, who are using deep packet inspection to find security threats, particularly spyware, and we're trying to develop some

new techniques.

And I can tell you also that there are false positives and there are false negatives. And if I block something that I am 95 percent sure is a security threat, am I going to get fined 5 percent of the time? It's tricky.

I can also block traffic from non-conforming devices. It's a way to make sure that all of the devices who are here actually obey the protocols, and don't cause problems for their neighbors.

I may also want to discriminate to improve fairness, particularly with always-on connections. Traffic from a very small number of users can dominate the network and starve everybody else out. Peer-to-peer, in particular, is a problem today, and other applications might come along. And some say after you have reached your monthly limit, perhaps I should block your traffic, or give it a low priority, or just charge you extra for consuming all these resources, and that will prevent starvation of others.

Another reason why you might want discrimination is to support diverse services. You will sometimes hear that a bit is a bit. Simply isn't true. Not all bits are created equal, from a network engineer's perspective. Some put more of a burden on the network

than others.

For example, if one application produces a steady stream of bits, and the other one produces big bursts, the burden per bit is different. Or, if they have a different quality of service requirements, the burden per bit is different. Or, depending on the way they adapt to congestion, the burden is different.

So, if my traffic control algorithms discriminate, it turns out that I can carry more traffic and still meet quality of service requirements, which might reduce infrastructure costs per user. And if I discriminate in pricing, well, one thing I can do is get you to accept a lesser quality of service, if you don't mind. No one is going to say, "I am willing to tolerate low delay; give the other guy priority," unless you give them a price incentive.

You can also give incentive to shift usage to less congested periods. And in general, you can align price-per-packet with cost per packet, which is sort of a complicated concept here, but cost, in general, here is opportunity cost of not carrying something else.

So, that's why discrimination is wonderful. Why is it terrible? A couple of reasons.

First of all, as you might expect, if -- assume, for the moment, I have a monopoly in some part of

the Internet, presumably the last mile connection. I now have extensive information on who you are and what you're doing, and I can use that information to try and set the price as close as possible to what -- to how much you value the service, to your willingness to pay.

And the economist will tell you that you are then extracting the consumer surplus, you are shifting benefit from the users to the carrier. And users, in this case, means both consumers and content, or service providers. And I can do that pretty effectively -- the more information I have, the more effectively I can do that. I will also probably intentionally degrade quality of service so that those who value a better service will pay for that better service. And in fact, we see that coming.

Now, nothing surprising here. This is in the broadband market, the transport of bits. If you have a monopoly in the broadband market, I expect to see you're going to try and get monopoly rents in the broadband market.

What is really interesting is that you may move into other markets. There are many upstream markets -- or some people say downstream markets -- but in any case, markets that depend on the Internet for their existence: electronic commerce; communications, like video

conferencing or voice-over IP; information distribution, whether it's video streaming or MP3's, or something else, or online advertising.

And I can try and affect those markets, as well. And just as with the broadband market, I can exploit the extensive information I have. I can deliberately degrade quality of service to further segment the market where that's useful, and I can try and set price as close as possible to what consumers are willing to pay in each market.

So, I may want to separate -- I won't treat all packets the same, so I will separate, for example, the voiceover IP market with a download of digital products. And within the latter, I will separate a four megabyte PDF from a four megabyte MP3 music file. I may even differentiate one song from another.

So, for example, without -- if I'm a carrier, without offering any eCommerce services, I can essentially tax eCommerce. I can say I'm going to tax -- put a one cent charge on book sales and a two cent charge on CDs. Why more for CDs? They're exactly the same, but I will charge what the market can bear.

I may put a tax on iTunes, and maybe even differential, based on the popularity of that particular song. And particularly interesting, I might put a tax on

voiceover IP, you know, $.10 per minute on voiceover IP. What's particularly interesting about that is that if you -- you can turn what is possibly a low price alternative to a high price alternative, which is useful if you are offering telephone service.

So, some observations. I can use these techniques to protect my legacy services -- that is, telephony for DSL provider, or video for a cable provider. I can try to extract monopoly rents from competitive markets. That is, the consumer may pay the equivalent of monopoly price, even in a competitive market, which -- I'm not sure that meets the definition of anti-competitive practices, which is where our anti-trust comes to play. So I'm not sure how this interacts with current law.

And I can do this without entering the market, or affiliating with a provider. So, people who talk about this as an issue of favoring affiliated versus non-affiliated content or service providers, there is more to it than that.

There could also be content filtering for other reasons. Perhaps for political reasons I will want to limit access to advocacy groups for issues I oppose, or candidates I oppose. For commercial reasons, I might want to limit access to commercial rivals or consumer

complaints or labor unions.

Oh, there is a line missing from this slide, but it says that there are accusations -- oh, okay, no, sorry, it's there -- there are accusations that some of this is happening already, and there are denials. I don't claim whether it's happening or not, but it's certainly technically possible.

So, where does that leave us? It leaves me in the hope that we can find a policy that -- what I call a balanced policy, that prevents networks from fully exploiting market power, you know, from using discrimination in a manner that limits discrimination to prevent them from fully exploiting market power to seriously harm users, but does not prevent them from using discrimination to greatly benefit users, which may not be simple.

I would conjecture that the impact on upstream markets is probably most important for the serious harm. And one observation is that when you're doing that, you might see prices inconsistent with costs. For example, the price for carrying voiceover IP might differ greatly from the cost for carrying voiceover IP, and that might help us figure out when the problems are occurring. But it remains to be seen.

So, some conclusions on discrimination.

Discrimination can benefit users greatly. It can improve security, it can improve quality, decrease infrastructure costs, and allocate resources to those who value them the most. And so, imposing network neutrality, a policy that prevents these things, could do real harm.

On the other hand, discrimination can harm users, if the network operator has sufficient market power. It's because the network has access to a great deal of information, and it can use this information to discriminate, to extract consumer surplus in both broadband and upstream markets, even if the upstream market is competitive, and even if the network is not affiliated with any upstream provider. So, not imposing network neutrality could do real harm.

My final conclusions on network neutrality, I think that means we need to focus on the specifics of a balanced policy. I don't hear a lot of talk about specifics. You know, can we deter the most harmful and allow the most beneficial? I don't think it will be necessarily possible to eliminate all harmful, and preserve all beneficial. And therefore, really strict litmus tests like that are probably going to get us into trouble, too. It's a little more subtle than that.

I would also argue -- and I don't have time for this -- that the debate has been misframed. It's not

about the inherence of discrimination, because discrimination can be useful. It's not about unfair affiliate relationships -- it can be broader than that.

And the right of networks to differentiate, or the freedoms of end users are interesting concepts, but they don't provide us enough guidance as to what is really -- what really should be allowed or not allowed.

And for those who want more, there is a paper with much of the content I have just presented. Thank you.

(Applause.)

MR. GOLDFARB: We shall now experiment to see if we can hear from Bill. Hopefully, this will work. And if not, Jon will be helping out. But Bill, are you ready to go?

MR. LEHR: Yes, I am. I am here in Concord, and my great apologies for only being able to be down there virtually. Can you hear me?

MR. GOLDFARB: Can the audience hear? Yes. It seems to be working. I guess what you may have to do is inform whoever is moving the slides when you want to move to the next slide.

MR. LEHR: Okay. Well, why don't you just get to my very first slide there, and let me again apologize for not being there. They canceled my flight in

anticipation, I believe, of the weather that doesn't seem particularly evident -- certainly not up here, and from what I understand, not down there, either. At least that sounds good for you folks down there today.

I am actually watching this on the web, at the same time, to look at my presentation slides on the screen. So this is a strange occurrence, but demonstrates, I think, the critical importance of the Internet and its value in this situation.

Let me say that, first, by introduction, that I am an economist by training who lives in an engineering school, which means I am constantly confronting my ignorance on both sides of the issue, and that the paper that will inspire my talk today, you will notice, is a joint work with: Sharon Gillett, a former colleague of mine at MIT; Marvin Sirbu; and Jon Peha, also of Carnegie Mellon.

And so, luckily, Jon, the real engineer in this panel today, is there, and hopefully will be able to take over and answer questions that I can't. Next slide, please.

What I wanted to do today was, first, talk about my vision of the future. And by that, meaning an economist's look at where the technology trends are taking us, and what this means for the future environment

that we are going to be living in, to talk a little bit about why it's reasonable to believe there might be a problem about net neutrality, and addressing that problem. Then, talk about the joint paper that I wrote with Jon Peha and my other colleagues about what we call the net neutrality arms race and the sorts of responses that end users can have, and then wrap up with a brief just discussion of what I think that means about the policy agenda, and about further technical work that needs to get done.

Next slide -- and if you can click through to the end of the slide, because I have put animation in these slides that is particularly difficult in this situation.

Okay. So, a vision of the broadband future. I think that it's pretty obvious to anybody that is engaged in work on the Internet, following these technologies, following these industries, that the future of the whole information communications technology value chain is heavily dependant on the Internet. And the future of the Internet is a broadband, wireless Internet.

If you look at the really big things that have happened in this space that have been the sort of paradigm-shifting changes that have driven major growth, it was the growth of the Internet in the 1990s, mobile

communications, also in the 1990s, delivering, on the first hand, mass market data communications services, and then on the second hand, mass market personalized communications services.

And then, starting in the 2000s, the growth of mass market broadband, which really sort of unlocked the capability of the Internet. In the future, in computer sciencespeak, we're moving towards a world of pervasive computing. We already have computers in our cars, in our consumer appliances, in all kinds of things we're not even aware of, that are always on. And all of this computing power is much more valuable and useful if it's everywhere connected. And increasingly, a lot of that connectivity is going to be unaware. That's what we mean by the world of pervasive computing.

We could also see this coming in things like RFID and sensors, smart network edges, and the emergence of post-PC devices, all kinds of things that have computer chips in them that are communicating on our behalf, that businesses are using and increasingly consumers will be using, that we may not even be aware of, that are taking advantage of all this Internet.

That means we're going to have lots of networks, and that no one-size-all solution or treating or thinking about these networks is either desirable or

possible. You're going to have wired networks of many different types: coaxial cable, copper, and fiber. And you're going to have lots of different sorts of wireless networks, from the Wi-Fi networks that there has been a lot of talk about, to 3G and fourth generation mobile types of networks, WiMAX technology, ultra-wideband, free space optics, different kinds of satellite technologies, on and on and on.

This heterogeneous technology is a characteristic of the future environment that's being driven by convergence and the need for interoperability and connectivity, but it will also pose challenges for all of those things.

You're going to see a much more complex, competitive landscape, where the definition of who is a carrier, what constitutes a carrier, what service markets they operate in, making those definitions in a clean way is going to be increasingly difficult.

And that broadband is really local and more local than traditional Internet access has been, because you're going to have very different sorts of environments that are going to require and make possible different kinds of technologies. Certain kinds of wireless will work in places like the west, but won't work in the heavily treed and more rainy northeast.

Also, markets are going to differ significantly in their ability to attract and sustain infrastructure competition. Some markets are going to be lucky enough to have multiple fibers passing every home in the market. Other markets will be lucky if all they can get is some sort of wireless technology.

And you're going to have overlapping generations of technology, because the pace of change in this sector, if anything, has accelerated. So that the differences of the -- and the issues that are going to be relevant, in terms of what broadband looks like in one market may be really different, even across town, in the same market because of the, you know, terrain issues, what, you know, legacy infrastructure was available, et cetera.

And finally, we need a lot more investment in last mile access networks of all sorts all over. Okay? So I think that is the sort of technical future that, when you think about policy and the net neutrality debate, you really have to be thinking about when you address this.

Okay, let's go next slide, please. Is it plausible to believe there is a problem? First off, as we begin -- as we have sort of gone over the cusp, and increased the capacity of broadband connections,

broadband traffic is growing exponentially.

Before we had significant amounts of broadband access, you know, sort of pre-2000, the fact that most people who accessed the Internet were still doing it over dial-up connections throttled the ability of individual users demand to reveal itself as how bursting and peaky, indeed, it can be.

And the kinds of services that Jon has already talked about -- peer-to-peer, different kinds of rich media, gaming, interactive media -- means that the Internet is having to handle a much wider array of traffic types, and a much greater volume of all traffic types that have different tolerances for their quality of service needs.

So, for example, you know, voice telephony is very sensitive to delays. And so, if the packets don't get through in a particular period of time, the service is effectively unusable. Other services, like e-mail, are much more robust, obviously, to delays. Although, even e-mail is subject to congestion.

And there's questions about how traffic patterns are shifting. Is it a few heavy users that are basically consuming way more resources than they are effectively paying for, or is everyone sometimes a heavy user that needs to burst, because of the nature of the

applications? There is not a lot of great data in the public sphere to make informed policy decisions about that.

And even the carriers don't really know what this broadband traffic is going to look like, because this is a growing and emerging phenomenon. Users are learning how to use these broadband networks, and as they use them, they change their behavior. And as their behavior changes, the carriers are finding they are having to address ever-new challenges for managing this traffic.

Another important issue is that -- you're a slide too far ahead -- penetration saturates. And so, revenues growth slows. And the question is that if we want the industry to continue to meet the growth in traffic, we have to figure about what the incentives are. And there is a number of kinds of solutions that we may look at, and all of these have problems with them.

You can look at different kinds of traffic quotas -- and those are potentially an issue -- let me just jump ahead to the next slide, to catch up where you guys are. Okay.

So, at any rate, hopefully what I am trying to explain thus far -- and we have a paper that we have, that talks about this at greater length -- is that,

indeed, there is a real problem for the continued exponential growth of the traffic, and the market's current attraction to sort of flat-rate pricing that means that provisioning continual investment to address the real growth in traffic is not an obvious outcome that is going to, indeed, happen, and that if that were to be forestalled, I believe that would have deleterious effects for the whole Internet value chain. So let's go to the next slide.

So, scenarios for network neutrality arms race. And the reason we call it this is because we believe that there isn't an obvious outcome, that whatever efforts a carrier -- who, let's assume, has the power to discriminate -- might undertake, there are responses that the end users could do to that, that, in turn, would induce further responses from the carriers, and so on.

So, in this paper, what we looked at, we said, "Let's assume there is no net neutrality regulation," i.e., let's just ignore any kind of regulatory policy interventions that might discourage the sorts of behavior that Jon suggests might be possible by a carrier with sufficient power and capabilities. And that, indeed, those things are done to discriminate.

And I put discrimination in quotes to move away from the loaded term of -- you know, as an economist may

think about it, or as folks may think about it as a pejorative, bad thing that may be done. And just to say focus on suppose a carrier does something an end user doesn't like. Well, what can an end user do? Okay?

So, when we think about this, we say, "Why is net neutrality a concern?" Can we go to the next slide? The fear is that they're going to engage in this -- click through this slide, please, this has a lot of animation on it. Basically, a lot of the points here I think we have already addressed. The fear that motivates the concern for net neutrality is that these carriers will block access to content, will offer differential quality of service, or will price-discriminate. And Jon has explained how that can happen.

He has also explained that the ability to block access to content may be useful for detecting and protecting against distributed denial of service attacks, or viruses, or other sorts of malsoftware, that differential quality of service may be useful and required for traffic management, and that price discrimination may be useful for recovering of sunk and shared costs on the network -- what economists call "Ramsey pricing," something I am sure you will hear more about later in the day.

So, the question is, you know, is what they're

doing really discrimination? You know, and if there is really no problem -- you know, I don't think most people would have a problem with a carrier trying to recover the higher costs for more resources used. So, for example, if you're getting preferential caching for your service, your video service, and that's costing the carrier more, then the carrier ought to charge you for that. And if you don't care about that, because you're providing free content, then maybe you shouldn't have to pay for that preferential caching.

Similarly, there is the literature on two-sided markets, which I will leave to folks later today to talk about. So, the goal needs to be to protect against harmful discrimination, but there is lots of types of traffic management that are not likely to be harmful. And it's important to note that in the sorts of responses we talk about here today -- and this was sort of one of the insights we gained from writing this paper -- that end users' ability to respond doesn't really matter if what the carrier is doing is actually something socially we like or not.

End users who can have ability to respond may respond against anything they don't like. So, resist paying higher prices, or tolerating reduced quality of service when they can do that, by sort of hiding, you

know, their capabilities, and that sort of stuff. So there may be another kind of concern here, that hasn't really been talked much about, which is the concern of what do you do about end users who are sort of doing the end run around good management practices on the Internet.

So, what are the kinds of responses that an end user can have, if a carrier does something that an end user doesn't like? Next slide, please. There are three sorts of strategies here -- and click through all three of the points, here, that I am going to talk about, quickly.

The first is -- strategy one is -- they can do something to try and bypass the actual differentiation. In other words, the carrier's attempt to charge higher prices, or offer lower quality of service. The second sort of strategy we talk about are end user countermeasures, which are sort of actually trying to deal with the inband discrimination techniques, using end user-based strategies.

And then, the third one we call learning to live with differentiation, which is basically -- it is just sort of using other aspects of the full Internet connectivity pie to, effectively, mute the impact of any discrimination by the carrier, and thus render it non-harmful.

So, let's go to the first strategy, strategy one, bypassing differentiation. Next slide. The most obvious way that you can get around the problem is take advantage of multiple bit paths. Now, if there is facilities-based competition, that may be sufficient to render the whole concern over non-neutral treatment by a carrier mute, so that, you know, the -- you know, as an economist, I would believe that if there is adequate competition, the competition would result in carriers offering consumers what they want, and so a carrier that tried to abuse consumers and do something they didn't want would find those consumers switching to other carriers.

But even in a situation of where there appears to be ample competition in the originating market, as Jon explained -- and I'm sure other folks will talk about today -- there may still be a terminating problem, where the -- an individual end user doesn't necessarily know what content providers or application providers upstream had to go through to get to that end user consumer. And because the end user consumer doesn't directly pay the cost of that, he may not really care, and may not be willing to vote with his feet to move to another carrier, if that carrier is engaging in such activities.

One way to do this is if the carrier -- if the

end user is able to multi-home. So, for example, if it's a business, the business may actually -- and this is typical of a lot of businesses -- have service provided by multiple carriers. And so, the content provider can go to that user across any of those, because the user has those.

That's less likely to be an option for the typical mass market customer, although in the future, that may become a little bit more of an option through things like cooperative access sharing, and things like scalable mesh networking.

And there are ways in which -- and, you know, we know of situations of folks doing this already today, although it is, at this point, a technical -- that is able to do this -- but where people are doing things like, you know, I have a Comcast connection and you have a DSL connection, and the two of us are able to share that, because we are on the same local area network that we have set up. And so we now have routing diversity to get out to the Internet, and we have a way to actually share that, and you can do even more interesting things like that. So, upstream aggregation and consumer networks are a way to do this.

A second way is broadband resale. So, different types of technologies and uses that allow

broadband connections to be shared more generally can help here. And there are different sorts of models that a number of folks have put forward for how this can happen, and we are sort of seeing experiments with this in the market place.

And then, finally, by end users sort of -- you know, in a much more concentrated way, organizing alternative access connections, and municipal networking where communities get together, maybe with the help of their local government -- usually with the help of their local governments or local utility, but not necessarily -- get together and provision a network. And if that network is an open access network, then that provides another way to deal with this.

And we stress the importance of it being -- considering it as an open access network, because otherwise, it's just another network. And so, in principle, that will help, because more choices is better. But it’s possible that the municipal network, if it's not an open access network, could also be guilty of non-neutral treatment. There is no reason to presume that your municipal carrier, if it has market power, may be any better behaved than an investor-owned carrier. Next slide.

So, the second class of strategies are end user

counter-measures. And we sort of organized those into non-technical and technical. The non-technical strategies are if a bunch of end users don't like something that a particular carrier is doing, in the Internet space they have demonstrated a remarkable ability to organize and bring serious consumer pressure on this. We call this shining a light on the rats.

So, if there is a particular behavior that a carrier is doing, some sort of quality of service differentiation that really has no justification in cost, and looks really high-handed, it's very common for this to get, you know, blogged in real time, and for this to embarrass the carrier so that -- I mean, the carriers and the operators -- and force them to change their behavior.

Now, you know, is this something we want to rely on absolutely? No, but I don't think -- perhaps not, but I don't think that we should neglect it when we think about the power of this, or underestimate it.

Another sort of response is the ability to sort of lie on applications. A lot of the discriminatory techniques -- and I'm not -- again, I'm using "discrimination" in a non-judgmental way here -- are attempts by the carriers to get users to self-classify. So they say, "If you're a business user, then tell us, and you'll pay more." And the reason you pay more is

because, as a business user, we expect you to use more expensive resources.

But if you don't really want to pay more, you just sign up for a residential DSL line, and then run your home business on it. And I think most small home businesses, that's exactly what they do. They don't opt for commercial services. And maybe -- whether or not they should or shouldn't, you know, is another question. But the ability to sort of misrepresent your user behavior in very non-technical, simple, you know, sort of old-world ways, is another sort of end user counter-measure.

And, of course, you know, if there is -- some of these sorts of behaviors are more likely to be able to work if the end users -- if the discrimination is widespread, as opposed to, you know, idiosyncratic or distributed.

There is also a lot of different sort of technical options, and the paper goes into these. And the technical options really depend on the level at which the blocking is taking place. So, in other words, is it happening at the application port? In other words, in some of the blocking -- for example, peer-to-peer applications -- is based on identifying the ports used by those applications.

It's relatively easy, and the people doing applications in this space have done this, where they can use the -- they change the ports to use ports used by common applications that nobody really wants to block, or by doing things like port hopping, which the application is changing randomly the ports it is using, which are attempts to offset things like application port blocking. And these sorts of quick fixes to programs can be downloaded and virally spread across these peer-to-peer programs very rapidly.

So, it's not much of a burden, you know, to end users, in a day of automatic software updates, to keep abreast of these kinds of responses, and sort of continue playing in the game.

You can also do things like source and destination address filtering, you know, and traffic analysis-based filtering, to change the nature of the traffic you're offering to the Internet if you're doing this upstream, or by going through some sort of thing that obscures this information. So there is all kinds of things like that you can do.

One of the things that needs to be focused on is whether or not the discrimination that is being offered by the carriers quality of service enhancing or degrading. So, for example, if what they're giving you

is a higher quality of service for a higher price, it's very hard to get that by hiding your -- the nature of what you're doing, unless you pay more.

Well, on the other hand, if what they're doing is they're degrading your traffic if they can figure out what it is, then these responses are more effective. So, the quality of service enhancing types of discrimination are much, much harder to respond to by these sorts of technical end user counter-measures, all of which, you know, that we talk about, essentially rely on hiding the basis of the discrimination.

Next slide, please. The last category of technical responses they'll talk about are learning to live with the differentiation. And by this we mean, effectively, suppose they discriminate and no one really cares? Turns out that there is a lot of applications that are just not very vulnerable. So delay-tolerant applications, or applications with lots of substitutes, don't seem to be particularly good candidates for concern about discrimination.

So, you know, in a number of cases, the postal system offers a good alternative to broadband delivery, and we see the example of that in the case of Netflix versus online movie delivery. Netflix has managed to craft a pretty good business by shipping around CDs. And

a number of computer scientists are, you know, fondly quoted as reminding people that one should never underestimate the bandwidth of a bunch of tractor trailers loaded with DVD ROMs.

So, there is a lot of kinds of options that you can do to -- and a lot of applications and business models for delivering services that need to be considered, when one thinks about, you know, how much these would actually harm individual consumers.

One of the kinds of strategies that you know broadly -- one of the kinds of strategies someone could do here is buffering. In other words, they stream the technology at a slower rate than was really, let's say, required by the broadband, and they store it on the digital video recorder, and then their ability to view it at whatever quality of service, or capacity, or rate that they want isn't affected by the service they're getting delivered from the networks. They're using whatever the plain vanilla low service is, and then they're getting the high quality experience.

This will work for any applications that aren't real real-time. And for example, that works for a lot of television, and a lot of -- I mean, a lot of video entertainment viewing experiences, but not for all. It won't work for real sports for most people, you know.

Will work even for some people, but, you know, probably not for that. Certain other kinds of programming, like old reruns or something, you know, those are things that may be really not dependent upon having very real-time access.

But, of course, the ability to do strategies like this isn't going to work if the carrier controls your set top box, or your digital video recorder, in which case that's just an extension of the network.

And another thing that could happen here is if you're pre-loading contingent content -- in other words, this is content that you might want to watch, but you're not really sure -- then this sort of end user response puts additional stresses on the network, because you're loading traffic that, in effect, you do not really need to load, and you're doing this because you don't want to deal with the fact that the quality of service you will experience may not be what you want it to be.

You could also do a lot more with distributed caching. In other words, capture traffic and keep it local. If someone in your neighborhood was viewing a movie cached out locally, and then other people have it available locally to view, you know, the question is for what types of content will this work?

It won't work for really live content, but it

obviously makes sense where it works. And so, I think you will see a lot more of this.

And then, finally, there's different kinds of end user processing substitutes for conduits. So, broadly, computing, communications and storage are all substitutes for each other along some dimension. And so, if you have more limited transmission capacity, you can use more processing to compress those streams and get an equivalent experience.

Again, this costs money by having fancier boxes at either end of the connections, and you know, you may have some degradation in quality, depending on what it is, exactly, you're doing. But those are the sorts of things you can do.

Next slide -- and click through this. So, what do we learn? What we learn from this exercise is that end users do have lots of strategies to respond to carrier differentiation, and that when one thinks of the problem that net neutrality is trying to address, technically one has to consider what the "but for" world would be, in a world where there aren't any rules. And in that "but for" world, one has to consider what these kinds of responses would be, and do a little bit more thinking about, you know, what the implications of that might be.

Another learning that we took away from this is that the end user responses can occur even when the kind of traffic management differentiation we're seeing is good. And so, there may be another problem that really hasn't been adequately addressed yet in the debate, and maybe something we're going to have to sort of observe.

It's certainly something that the carriers perceive themselves having to deal with when, for example, they look at certain types of users that they feel are using dramatically more resources, and they're trying to figure out, you know, what is a fair way to recover the higher costs associated in providing those customers with service, while at the same time, you know, not denying traffic that, in fact, you know, the network can carry, and ought to be able to carry, but only if able to cover its costs.

And then, the responses that end users have, though, our analysis suggests are imperfect, and that most of them depend on the carrier using a particular model of discrimination, and that the carriers, if they use a more sophisticated model, can perhaps render ineffective.

And so, the only really sure way for end users to provision around this is to be able to bypass the bits path over which they're seen experiencing discrimination.

And so, technologies for doing that, and options for doing that -- more facilities-based competition -- are all critically important in addressing that challenge.

The other thing that comes out of this is as you begin to unpeel this onion, you realize that, as with most interesting problems, the complexity gets worse, not easier, as you go forward. So the net neutrality problem is complex, and it's going to remain a concern that we think the welfare and efficiency and equity gains of this -- of not having it and allowing the market just to play it out, the implications are ambiguous.

It's not clear whether or not the net -- you know, what happens with this arms race, and what those costs of playing out the arms race, in the absence of regulation would be. But if we had the regulation, we understand that there could be real problems with discouraging effective market behaviors.

Last slide -- and with this slide I will conclude -- so, the broadband future we see is complex and heterogeneous. And so I think, you know, my own view is that there needs to be a nuanced response, and along the lines of something like what Jon was suggesting, and that, you know, there is a real need to try and get some free -- clear framework, a regulatory framework, so that the industry and everybody knows what the game is going

to be, and what the critical concerns are going to be.

The key -- since the key element is going to be to -- you know, the key element in ensuring that end users do have responses and ability to avoid addressing this whole net neutrality problem is more facilities-based alternatives, then there are some obvious issues, in terms of infrastructure investment.

Let me just, you know, focus here on the technical issues. With respect to municipal entry, a lot of folks, you know, make the false conclusion that when local governments, or local communities build infrastructure, or get involved in the infrastructure provisioning question, that that's a -- you know, that's a sort of binary good/bad thing, and they do it one way or they don't do it.

The answer is, it's a very complex mix of strategies they face. The particular technologies and strategies they undertake, how they do that, is a very complicated thing, and has big implications for what sorts of net neutrality problems may happen.

For example, if they do do, like, a fiber deployment that's an open access platform, then that really does go a long way towards eliminating concerns, most of the net neutrality concerns. But such an infrastructure plan is unlikely to make sense in most

communities. And other alternative sorts of strategies, if they make sense at all, need to be evaluated in this.

The other thing is that a lot of the sorts of alternatives that we talk about really depend a lot on wireless, and new sorts of wireless technologies. So, making sure that we have a really vigorous commercial market for new wireless technologies, I think, is critical to addressing this problem. And there are so many different wireless technologies -- we may get a little bit into that in some of the question/answers -- but spectrum reform is, obviously, a key element in that.

So, with that, let me thank you very much, and let's go to questions.

(Applause.)

MR. GOLDFARB: Before I ask questions, can people please fill out the questions they have, and if there is someone who -- from FTC -- who could pick up some of the questions, I will have one or two to ask, but then questions from the audience are really appreciated. Jon and Bill specifically said they would like to get as many -- as much audience participation as possible.

But while they are coming up, let me start with a question. To date, most employee broadband access networks are wireline, and thus, the tools that have been developed to manage them are tied to wireline

technologies. But let's now talk a little bit about the wireless technologies -- Bill gave that list of them.

Do any of the potential wireless technologies have technical characteristics or cost characteristics that would make it more or less difficult for the wireless broadband access network provider to discriminate, than it is for the wireline provider to discriminate? And along with that, do any of these wireless technologies have technical or cost characteristics that would make it more or less difficult for the independent applications providers and end users to undertake counter-strategies, if they faced discrimination by their wireless broadband access network provider?

So, Jon, you want to start? And then, Bill, feel free to step in.

MR. PEHA: Sure. I mean, if we're talking about a broadband packet switch network -- which is a place to start, as opposed to, you know, voice telephony -- many of the things we have said, I think, are the same. But there are a few interesting differences. One is if you have a network that has multiple paths into the Internet -- for example, a mesh network, in particular, then it becomes a whole -- a lot harder to discriminate, and there are a lot more counter-measures that become

possible.

If you have mobility, somebody moving from Wi-Fi hotspot to Wi-Fi hotspot, some of the techniques become harder. If you have sharing -- which you do in a lot of these systems -- let's say you have a big WiMAX broadband system, and you are, in effect, sharing capacity. That actually may make the technology of discrimination a little harder, but it may make the need for it a little greater, because now you're sharing. You have reason to -- greater reason -- to worry that a small number of users will dominate the resource.

So, there are some subtle differences. The market differences may be more important than the technical ones here, though.

MR. GOLDFARB: Bill?

MR. LEHR: Yeah. Well, first off, everybody should be very clear in their mind. Point one is spectrum is perceived to be a very scarce resource, RF spectrum. So that, generically, your bandwidth is more of something -- a resource you're going to be more concerned with in the wireless world.

So, you know, equivalent levels of performance are, in some sense -- so the need to, for example, carefully manage traffic on a wireless network is greater.

A second important issue is that, you know, the architectures of mobile networks versus these other alternative sorts of, you know, broadband wireless fixed networks that are just emerging, based on things like Wi-Fi and meshes, and newer technologies like WiMAX, that are just now beginning to roll out, are pretty different.

And, for example, with the, you know, sort of mobile carriers, because of the way they actually provision customers, they're probably in a better position to discriminate on a customer-by-customer basis, if they wanted to. And end users' abilities to sort of do much about that, because of the closed nature of the current mobile networks, is sort of -- is tougher. It's sort of more attenuated.

With these other sorts of, you know, sort of mesh, WiMAX types of networks, I think Jon, you know, addressed most of the key points there that I would have mentioned.

MR. GOLDFARB: Okay. I encourage more questions to come up. I have a few. They may be verging a little more on policy than on technical, so I encourage people to ask technical questions for this group.

But one question that came up was the fundamental question of incentive assumes that the service provider owns the transport. Why not correct

that dysfunctional assumption, and assume a not-for-profit, or a for-profit road system, so that there is a distinction between, I guess, the access provider and an applications provider?

MR. LEHR: Who is that to?

MR. GOLDFARB: Well, that was just --

MR. PEHA: You want it, Bill, or should I take it? Either way.

(No response.)

MR. PEHA: Okay. I mean, a for-profit road system sounds similar to what we have, except -- oh, I'm sorry, not-for-profit?

AUDIENCE PARTICIPANT: I am arguing we should not, obviously, have a for-profit road system --

MR. PEHA: Oh, so you would like a not-for-profit road system? So, probably a monopoly, or a single provider, if you like? A single provider, not-for-profit?

If you were building a new system from scratch, it would make a whole lot of sense to say is there a strong economy of scale in some part of this -- perhaps the last mile -- and then you could ask that question. But we're not building a system from scratch.

MR. GOLDFARB: Let me perhaps have some other questions. There has been a lot of hand wringing about

U.S. broadband networks providing less bandwidth than some foreign networks.

In my conversations with Bill and Jon, the two of you have suggested what might be viewed as two technical truths. One, that no network architecture has a bandwidth constraint that the network provider can't buy its way out of. And -- but -- and secondly, that to attain a higher data rate with any given network, you must serve fewer homes or less distance.

So, it seemed like there was -- one was looking at it dynamically, you can always sort of buy your way out of it, but there are certainly constraints when you have a given capacity.

You know, so this seems to suggest that -- the first one suggests that the constraint is cost, or the time to develop necessary hardware and software, rather than a technical constraint. The second one, where you're saying, "Well, there is only a limited amount of homes that you can serve or distance," suggests a technical constraint. And I am sort of curious about this trade-off of cost and technical constraint.

Assuming it's an important goal, to substantially increase the bandwidth capacity of our broadband access networks, since there is the argument that we don't have very high capacity, at least to the

end user, which of the various wireline and wireless technologies potentially available for broadband access are likely to face the fewest technical or cost obstacles to achieving this goal?

And for the wireless option, is lack of available spectrum likely to be the greatest constraint to providing large bandwidth?

MR. PEHA: I think that the distance that we were talking about there is distance to some point where you aggregate data. Could be a central office in a telephone system, it could be a cable head end -- something like that.

So, if you're limiting distance, it means you need more of those aggregation points, and that is expensive. The engineering economics change with the density of users. So what is most -- you know, anything is possible, if you throw money at it, but what is most cost effective in a rural area might be different from what is most cost effective in an urban area. And everything gets more expensive in the rural area, except labor, you know, digging up roads.

But, generally, the wireless services seem to show greater promise there. And, particularly, if you want to cover large areas, wireless -- not at a very high frequency -- is rather important. So there are

interesting opportunities in the digital television transition that some 700 megahertz spectrum becomes available.

There may also be some opportunities to share spectrum more than we have in the past, at frequencies that allow you to cover large areas and rural areas.

MR. GOLDFARB: Bill?

MR. LEHR: Yeah. Let me just say a couple of things. First off, you know, broadly, when one talks about the available bandwidth, the technical limits, different media, physical media, have different transmission. When Jon and I were talking earlier with Charles, we were saying that, essentially, those technical limits are unlikely, really, to be the binding concern, although they are relevant.

So, you know, broadly, you know, it's harder to get bandwidth across air, so wireless is the technology that generally is going to have, you know, less capacity than copper wire. And copper wire has more capacity, if you go over copper wire for shorter lengths.

So, you know, DSL at a megabyte per second works, you know, pretty far from the central office. But if you want to go at much higher rates, then you need to be going -- driving that copper wire much closer to the home.

Coaxial cable used by the cable television carriers has a lot -- you know, it's bigger, thicker wire, and it has a lot more bandwidth on it. But the way they use that is a shared cable that passes many different homes. And so, the bandwidth that is available in an individual home, you know, sure, you can't compare that as the whole cable on an average rate, although potentially on a burst rate you can.

And then, of course, the biggest capacity that you get into a home is if you have fiber all the way to the home. The cost of scaling any technology depends on the up front investment in how far you want to go. So, if you know you want to be able to arbitrarily scale the amount of bandwidth to accommodate lots of competitors, or you know, dramatically do expansions in use, then put in fiber. But putting in fiber is expensive, and so that affects the cost model.

The architecture of the different technology -- and that may -- that depends very much on who the carrier and the provider of the facilities are, and what it is you're trying to do -- is going to influence how easy it is to scale. And so, key elements of the architecture include the choice of media. Is this copper wire, coaxial cable, or are we talking about fiber plant?

You are -- how you are doing the backhaul

aggregation. How many homes are you serving off of a nade -- you're pulling over a common wire until you're eventually connecting to the upper Internet. All of those sorts of decisions have big implications for your ability to expand the capacity at a low cost to additional homes. Whether the traffic is symmetric, how much upstream versus downstream traffic do you expect, and are you provisioning for.

And finally, which is, I think, the thing that has been over-dominated -- or really dominated most of the net neutrality discussion, is what are you doing, in terms of managing the traffic, especially over the shared elements of that network?

If you cut that shared infrastructure into silos, for example -- say, you know, this infrastructure is, you know -- you know, this is dedicated to this application, and this is dedicated to that other application, you're going to have less effective capacity than if you're able to share the whole infrastructure, using the advanced kind of techniques that Jon talked a little bit about.

But, of course, as soon as you're sharing all of that as one common infrastructure across applications and potentially providers, then you're going to have quality of service spillover effect, which means you're

going to have some of these sorts of net neutrality concerns that you're going to need to try and mediate.

MR. GOLDFARB: Well, some technical questions have come in. This one is for you, Bill. It's how realistic are the consumer strategies? Many consumers have no choice of carrier, or tote no technical expertise to deal with harmful discrimination.

MR. LEHR: I think it's a really important question, and I think that there are sort of two -- there are a couple of things here. First off, the question is, the net neutrality issue is largely a perspective one, because there isn't a lot of evidence that currently, today, really bad things are happening, which is good, from the point of view of the end user responses, because a lot of the end user responses we talk about are things that are not easily or really widely able to be done today.

The other bit of response is you of course don't need every user to be able to do this, to have the benefits of these sorts of strategies out there showing up in the market.

For example, a lot of the kinds of application programs, especially if they have automatic updates, the users aren't even aware of how these new application programs are responding or changing to market conditions.

And so -- you know, a few folks out there can actually do the work of a much larger consumer base.

On the other hand, as we conclude in the thing -- we think that the end user responses are somewhat limited, and are likely to be most effective against the least sophisticated versions of discrimination. And so, that's the reason why we conclude that this really is a valid concern, and that is it not sufficient, based on our analysis of the fact that end users have options to conclude that there is no problem here.

MR. GOLDFARB: I'm not sure which one this question goes to, which of you, but could we switch to a different network structure, where video and heavy content doesn't run on TCPIP networks?

MR. PEHA: We have long had an infrastructure where video doesn't run on TCPIP -- the question is whether we should switch the other way.

And, I mean, from a technical perspective, either are certainly possible. I would say packet switching has an advantage when you are not always downloading -- you know, if you are always downloading all content all the time, there isn't a big reason to move to packet switching. If you move to a more on-demand model for video, if TiVo is the model -- is closer to the model of the future video, as opposed to what

we're used to, then there is perhaps a reason to switch to packet switching, so when that capacity is not used for video it can be used for something else.

MR. GOLDFARB: I would like to follow up on one of the responses you gave earlier, Jon, when I had asked a little about spectrum as a constraint, and you talked about the 700 megahertz.

I think this thing gets into the issue of how spectrum is made available and auctioned off. One of the competitive users, or demanders for spectrum, on one hand, there have been arguments from satellite companies that past spectrum auctions have had license areas, geographically, that were too small to have a nationwide coverage. On the other hand, smaller regional carriers have been arguing to have very small license areas, an argument that they would be focusing on -- they would be focusing specifically on rural service, and therefore, enter.

So, I guess a question I would have is how likely is it that the technology is available and would be used, if there were a nationwide license given to have a nationwide wireless network made available through an auction?

MR. PEHA: Predicting the market is notoriously hard. I can certainly say that having the license cover

too much area is a problem. That is, somebody who only wants to serve urban areas may get the license and ignore the rural areas.

Having a license that covers too little area is a problem. We have seen cellular carriers have to piece together lots of licenses over the years, because by no fault of -- the FCC can't know the future. It seems, with 20/20 hindsight, that perhaps some of those were too small.

I guess I'd like to see more efficient secondary markets, so that we can correct the fact that we cannot absolutely predict the future, and deal with some of these problems. But I don't know whether the best way to go at the moment is a nationwide network or a bunch of regionals.

MR. LEHR: Well, I mean, from the technical point of view, certainly operating down in lower frequencies -- the guard -- the beachfront property in spectrum is below one gigahertz, because spectrum -- because signals at that level, at that low rate, don't meet line of sight. And so that's really, really valuable. It means lower cost for deploying infrastructure.

And so, making spectrum available down there, more spectrum available down there for commercial

communication services, would open up new options to help alleviate last mile facilities competition concerns. And so I think it's very important that we try to figure out how to free up some of that spectrum.

With respect to the end user responses, a lot of the models that I talk about I think would be given a big shot in the arm if there were more opportunities for edge user/end user-deployed kinds of networks: municipal Wi-Fi; community-based networks. And it's not just using Wi-Fi, but using other sorts of emerging wireless technologies.

And so, I've argued in favor of the white space access. I think that would be very important in energizing the wireless market. And then also, I have argued in favor of additional unlicensed spectrum in that band, and how you get it into the market, you know, what auction model. That's a complicated decision, I think, debate and discussion that I think is beyond the scope here.

But definitely, the question about what we do with that 700 megahertz spectrum, I think, is an important aspect of this whole net neutrality debate.

MR. GOLDFARB: Well, since, in fact, most of the questions that have come in are really policy, I think just for the last few minutes I will just turn to

both Jon and Bill and ask if you have any closing remark or statement, or anything that has come up in this hour that prompts you to want to expand on what you presented.

(No response.)

MR. GOLDFARB: And if not, we will be in the very unusual situation of being 5 minutes ahead, rather than 20 minutes behind on our schedule. Bill, thank you so much. And, Jon, thank you. Look forward to using some of the information they've provided in the next two days. Thank you both.

(A brief recess was taken.)

MS. OHLHAUSEN: Well, thank you, everyone, for getting back so promptly. We are going to move now into our next panel, which is, "What is the debate over network neutrality about?"

I am Maureen Ohlhausen. As I mentioned earlier, I am the Director of the Office of Policy Planning at the Federal Trade Commission. As our panelists, who are with us today, we have Chris Libertelli. He is the Senior Director of Government Regulatory Affairs for Skype Limited, a global Internet communications company. Before joining Skype in July 2005, Chris was the senior legal advisor to FCC chairman Michael Powell.

I am doing this in the order in which they're

speaking, not in which they're sitting, so Bob Pepper, or Robert Pepper, is Senior Managing Director of Global Advance Technology Policy for Cisco Systems, Inc. Dr. Pepper joined Cisco in July 2005 from the FCC, where he served as Chief of the Office of Plans and Policy and Chief of Policy Development, beginning in 1989.

Next, we will have Gigi B. Sohn, who is the President and co-founder of Public Knowledge, a non-profit organization that addresses the public stake in the convergence of communications policy and intellectual property law.

Gigi will be followed by J. Gregory Sidak, who is a Visiting Professor of Law at Georgetown Law Center, and founder of a Criterion Economics, LLC. In addition to his time in private practice with Covington & Burling, he also served as Deputy General Counsel for the FCC, and Senior Counsel and Economist to the Council of Economic Advisors.

I also wanted to mention that all of the panelists' biographies are in your materials. They have many more credentials. And I encourage you to read the bios.

Just a couple of small details. Again, I encourage people to write out their questions, and to hold them up, and we will have staff come through and

collect those, and they will bring them up for me to pose for the panel.

With that, I will just say I think it's pretty obvious from the description in the agenda, this is meant to be a framing panel, much like this morning's panel, to define some of the parameters of the debate over what is network neutrality, why are we talking about this at this point in time, who is in favor of it, who is opposed to it, what are the possible harms of either having it or not having it.

I really appreciate all our panelists joining me today to address these important issues. So with that, I will start with Chris.

MR. LIBERTELLI: Great. Thanks. Good morning, and thank you, Maureen, for inviting us to be part of this important FTC panel.

I encounter various levels of awareness of about what Skype is, so what I thought I would do is just say a brief word about the salient aspects of our software, before getting into the policy issues that Maureen has asked us to address this morning.

First, Skype is a software company, not a telecommunications carrier. We employ software engineers, voice compression experts, usability designers, all of whom are dedicated to making the hard

easy, and removing barriers to more natural forms of communications.

The Skype community currently stands at 171 million users, in just about every country on the planet. If Google's goal is to organize the world's information, it is Skype's goal to enable the world's conversations.

And like most good innovations, they come from the bottom up, from our user community. Skype offers various products, including the ability to make free Skype-to-Skype calls on the broadband Internet, to make video calls, to transfer documents via Skype, or to send an instant or a text message. Skype is not simply about voice competition, but a range of features that cannot be found on the phone network.

And though our products are many, our software shares a few basic characteristics that are relevant to the debate over net neutrality.

First, it's Skype software that enables users to connect to each other. We do not operate any centralized -- any significant centralized -- resources.

Second, Skype users purchase broadband Internet connectivity separately. And in the U.S., that means largely from cable and DSL providers. In this way, Skype stimulates the demand for broadband.

Third, we develop the software for various

operating systems, including Windows, Windows Mobile, Mac, Linux, et cetera. We have a growing ecosystem of partners and an open API program that allow our partners to extend the Skype experience on the Internet. We develop software that operates on a multiplicity of devices, including mobile phones and PDAs.

And so, this brings us to the question of this panel. What is the debate over network neutrality about? And for Skype, network neutrality is about protecting our users' ability to connect to each other, whenever and wherever they want. We support net neutrality, because it embodies a policy of decentralized innovation. For us, net neutrality is not a theory, but a concrete example of what is possible on the Internet when entry barriers are low.

The founders of my company began in a basement bar in London, and were able to invent a way for a global community of users to talk to each other for free on day one. Such a fee is hard to imagine, if they were required to cut a deal with every incumbent in every country where people are using Skype. Without a neutral network, they would have had to spend a great deal of time on planes to achieve what they have achieved.

So, in a sense, net neutrality is about whether you want innovators spending time on planes, establishing

commercial arrangements, or do you want them spending time innovating and thinking up innovating ways of delivering things like free phone calls. In other words, open Internet networks keep entry barriers low.

Now, none of the competition policy issues in the net neutrality debate are new. The use of market power to leverage from one market to an adjacent market is certainly not an unfamiliar problem for this agency. What has changed is that we are working against a backdrop of changed law. In particular, the Supreme Court's Brand X case, which removed Internet access from Title II of the Communications Act.

Whatever the merits of treating cable and DSL Internet access as a non-common carrier, this decision has pushed us into a brave new world, an uncertain world where this agency may have new-found jurisdiction, but where government policy, in our view, has become dangerously unbalanced.

Now, this imbalance appears to us to emphasize the interest of network owners over all other competing concerns. For Skype, network neutrality rules are designed to reset that balance so that network owners and software companies serve the interests of consumers. And we try to be humble about this issue, recognizing that Skype and network owners are part of an inter-connected

Internet ecosystem.

We support and share the goal of increasing broadband penetration in America. Applications like Skype provide consumers with another reason to subscribe to broadband, or purchase a new computer, or buy a PDA. If government policy becomes too focused on the interests of network owners, we put at risk all of the innovation and software development that has allowed the Internet to thrive.

In short, we risk building an Internet bridge to nowhere, or at least only to the places the network owners allow you to go. It seems to us that competition policy is advanced when there is competition at the software layer for services like voice or video, and at the physical layer between wireline and wireless networks.

So, in this regard, we take Chairman Majoras's admonition to do no harm seriously. We understand that there is an impulse for regulators to rely on markets to self-correct and solve problems in advance of government solutions. For example, she has emphasized the need to focus on actual anti-competitive conduct by network owners.

So, let's take, for example, the market for wireless broadband, or 3G services. We offer two

examples designed to allow you to test assumptions surrounding whether markets will naturally self-correct for anti-consumer behavior.

First, all of the wireless carriers that offer 3G services specifically prohibit the use of those Internet access services for things such as VoIP, peer-to-peer, or "heavy" machine-to-machine connections, even as they are advertised as unlimited.

So, when we hear that wireless broadband is a competitive threat to the cable/DSL duopoly, that possibility rings hollow for us, because the major carriers have contracted with their users in a way that does not permit Skype on their networks. This kind of conduct is set against a backdrop of a wireless market with HHI values of, on average, 2,700 -- well above 1,800, which the FTC and DoJ consider highly concentrated.

Second, because voice has become untethered from the underlying access network, the decisions this agency makes will have profound effects on competition and downstream markets -- like, for example, the markets for 3G devices. Take, for example, the Nokia E61. This is a device that first arrived in Europe. However, in the U.S., it was presented to consumers as the E62, a crippled version of the E61, that made it impossible for

users to access the Wi-Fi connectivity in the phone.

In the words of one MSN columnist, Gary Krakow, "What some carriers fear most is the E61's ability to handle voice calls when you're near a friendly wireless network. That's why we won't see Wi-Fi on the E62."

Relatedly, the Apple iPhone was recently announced. But as Blair Levin, an analyst for Stifel Nicolaus, observed, "The true service break-through for U.S. consumers will come when the market for such unlocked phones develops, and manufacturers offer pure IP devices that allow for the provision of voice as a mobile web application."

And this is not to say that wireless carriers do not face unique challenges in managing their networks. They do. Differentiating services and charging more for users who use more bandwidth can be pro-competitive. But we encourage policy makers to scrutinize network management practices, so that they are not used as an excuse for otherwise anti-competitive behavior.

And so, observers and industry reps have raised a number of objections to network neutrality rules. When you hear arguments that net neutrality will destroy the deployment incentives and network operators or reduce competition, we ask that the FTC consider whether those claims are exaggerated.

Allowing network owners to discriminate against software-defined competition is the worst way to build out broadband, and represents a return to a system of implicit support that Congress ordered removed from the old phone network in 1996.

And when we hear opponents argue that net neutrality should be applied to the Internet companies themselves, please consider whether this is really an effort to change the subject away from the market power of these operators. Consumers can switch search engines in a snap, and can choose from a nearly unlimited number of VoIP applications, like Skype. But they lack this kind of frictionless choice in the market for Internet access, and it is this limited range of competitive choices that underpins our urging regulators to adopt reasonable network neutrality safeguards.

And finally, when you listen to rosy presentations of competition in the market for Internet access, we ask that you keep in mind that, according to the FCC's latest numbers, 95 percent of all Americans buy their Internet access from cable or DSL providers. And when operators tell us that they haven't enforced the restrictions that are found in the terms of service in the wireless market that I spoke of, we wonder whether a policy of "trust me" is really any protection at all,

given the incentives that are present in this market.

So, in closing, our request to this Agency and policy makers is to adopt a policy that is balanced. Tools such as increased disclosure, or language along the lines of the AT&T merger condition are good starts. Competition would be enhanced, and consumers would have more choices, if government adopts a net neutrality approach that respects the interests of network owners and, equally, the interests of innovative application providers like Skype.

Thank you, and I would be happy to answer any questions.

MS. OHLHAUSEN: Thank you so much, Chris. I just have a quick question to follow up on. You were mentioning entry barriers being low, with the end-to-end principle, that once you're on you can reach anyone.

One of the issues that some network neutrality opponents raise is, will that rule really benefit the incumbents, who have already gotten on in this world, and built up a base and an infrastructure, and that for providers of new applications providers who haven't built up something that can give them a certain level of quality of service, will they be prevented from purchasing that if it is seen as discriminatory.

I was wondering if you had any comments on

that.

MR. LIBERTELLI: Yes, this is an argument that I think is a bit upside down. Because if it were true, I think you would expect us to be against net neutrality.

Our business is built on the idea that once you distribute a software onto the Internet, users can connect to each other. And in the absence of entry barriers, or discrimination, or intentional degradation of our traffic, those users will continue to be able to speak to each other, and use all the functionality of the software.

Net neutrality is not about locking out the next innovation. I think, indeed, it is the contrary. It is about creating the conditions so that people who are developing software can reach their users. And you know, we operate in a highly competitive environment. We are one innovation away from being replaced by another entity that can develop software in a borderless environment with low entry barriers.

So, you know, we try to apply the same principles to ourselves, and say, you know, "We're fine to slug it out in the market, and compete based on the features of our software, as long as there is a level playing field for competition at that layer."

MS. OHLHAUSEN: Thanks, Chris. And now I will

move on to Bob Pepper.

MR. PEPPER: Yes. Thank you, Maureen, and thanks for the opportunity to be on today's panel. I will be making three key points.

First, next generation services require intelligent networks. It's a false choice to say that we need innovation either at the edge of the network and applications, or that we need innovation in the core. We need it in both places.

Second, there is no clear definition of network neutrality. We have already heard a little bit about that today.

Third, the best way to address potential competitive and consumer problems is to, first, determine the extent to which a real problem exists, and then to weigh the benefits and costs of alternative approaches to preventing and then remedying the problem.

I conclude at this point, weighing the facts and the potential benefits and costs, new detailed ex-ante regulation would be counter-productive. And instead, the FTC should play a leadership role in protecting consumers and competition, by exercising its authority, experience, resources, and expertise on a case-by-case basis.

Before addressing what is network neutrality,

and what policy makers should do about it, it is important to understand the network that some want to make neutral.

The Internet is at a transition point, as we enter the second phase, commonly known as Web 2.0. Services like web browsing e-mail, instant messaging, Voice over IP, and low-quality streaming video do not require high broadband speeds, and with a few exceptions, can actually tolerate interruptions and short delays in transmission.

Dumb networks that merely send packets along and randomly drop packets during periods of congestion have been mostly sufficient to handle these types of applications. But they're not going to be sufficient if we are to realize the potential, full potential, of Web 2.0, which will focus on new applications like high-quality video, user-generated content, multi-media applications. And these new applications are going to require a ubiquitous broadband Internet, where any consumer can easily use any standard space device to access and use content applications, of their choice in multiple locations, whenever and wherever they want.

Enabling these services requires an intelligent network that can recognize and configure intelligent devices without your needing to be an IT specialist. In

addition, different services require different transmission characteristics, such as speed, latency, jitter, symmetry, bursting, and capacity that Jon talked about earlier.

For instance, Voice over IP does not require high speed, but it does require low latency and very little jitter. Video downloads, on the other hand, need high speed, but can handle some level of latency and jitter. And new technologies, such as tele-presence, that provide a real-life experience for virtual, in-person meetings, requires high speed, low latency, and symmetry.

Complex devices and networks will work together to make it seem simple to consumers. Simplicity in the foreground, but it's going to be complexity in the background. Intelligence in the network is necessary, not merely to allocate scarce bandwidth at times of congestion -- though this is important -- it is also necessary to identify, configure, authenticate, and secure devices, applications, and systems.

The notion that we must choose between intelligence at the edge or intelligence in the core is a false choice.

So, what is network neutrality? As we have already heard, the term has never been clearly defined.

It means different things to different people, and has, therefore, become very subjective and is probably meaningless, although it's a great bumper sticker.

As the debate over the issue of network neutrality has evolved, I think, actually, it is analytically useful to focus on four sets of questions that have emerged, and that people have labeled as net neutrality.

First, the first is whether the Internet is an open and inter-connected network. This is sometimes called the end-to-end principle. Or, put more simply, can I go where I want and get what I want over the Internet, without being blocked, steered, or degraded?

The answer, I think first, came from the high-tech broadband coalition's connectivity principles in 2003, which articulated the Internet's version of consumer interconnection rights. Specifically -- and Jon already raised this -- consumers should have the access -- the right to access -- any legal content, run any legal application, connect any non-harmful device to the network.

And in addition -- and, in my mind, perhaps most importantly -- have sufficient information to make informed decisions about what to buy. Markets, after all, work best if consumers have that kind of information

to make informed decisions.

These connectivity principles were embraced by FCC Chairman Powell in 2004, and formalized by Chairman Martin and the entire FCC in a policy statement in 2005. Since then, there has, I think, been wide agreement that the connectivity principle should be followed. The debate is whether or not Congress should codify them, or is it necessary -- congressional action is necessary -- to enforce them.

The second group of questions are those surrounding whether service providers may charge different prices for different levels of service, or whether flat rate access was part of the nature of the Internet.

Well, a few traditionalists still advocate a flat rate for very high speeds. The fact is, I think that there is general agreement that, for the most part, it is recognized that different levels of service at different price points is pro-consumer and pro-competitive.

The third question is whether all packets on the Internet must be treated exactly the same. This is the non-discrimination issue that we talked about this morning, or heard about. The problem with non-discrimination is that it does not recognize that

treating different packets differently is necessary for the effective delivery of many services.

As more real-time interactive services dominate Internet traffic, it's going to be more important to differentiate among packets. It's important to note -- and I underline this -- that differential treatment does not have to equal anti-competitive treatment. Right? And this is a really important point.

Along these lines, a pure non-discrimination requirement, as some people have argued in Congress, goes way beyond even the traditional FCC common carrier regulation in section 202, which states that, "It shall be unlawful for any common carrier to make any unjust or unreasonable discrimination in charges, practices," et cetera. A pure non-discrimination requirement would not allow for reasonable differences in treatment of packets, based upon different natures of services and the packets themselves.

And even if a non-discrimination requirement applied only to types of traffic, there would still be constant questions of whether a provider was receiving the same service at the same price, which would inevitably lead to tarriffing of Internet services. The common carrier world learned long ago that tarriffs like this can lead to government-managed cartels, keeping

prices high, and that was the world we lived in in the long distance business, until we finally got rid of tarriffing.

The last set of questions on net neutrality concern who can be charged for what service on broadband connections. Should the Internet access be funded solely by consumers, or can the cost be shared with content providers and application providers?

Well, it's clear that broadband access providers cannot unilaterally impose charges on a third party. It would be very difficult. Several legislative proposals would make it illegal for third parties to pay for improved quality of service, even if they wanted to do so voluntarily. Web 2.0 services have classic characteristics of two-sided markets.

And to prohibit these kinds of business relationships from developing could seriously harm consumers. Sender-pay services, or advertiser-supported services have long provided consumers with more choices at lower prices. To prohibit third-party payments in other areas of communications would have prohibited toll free 800 service or advertiser-supported television. Worse, it would socialize Internet access pricing, effectively forcing light users to subsidize heavy users.

So, what are the problems we should really be

focusing on? For the most part, I think there are really two key problems that are sort of wrapped up in this debate. First is anti-competitive conduct by broadband access providers, right? If broadband providers have sufficient market power, they could leverage the market power to restrict competitors' access to consumers, or raise competitors' costs. That would lead to higher prices for consumers.

Alternatively, they could use the control of the physical access network to deny applications and the application competitors, access to certain services or functionalities, thereby foreclosing portions of the market. These are classic problems associated with undue market power in any market, and they are not unique to the Internet, or broadband.

The second concern is really whether net neutrality regulation designed to prevent anti-competitive conduct could limit, or prohibit consumer welfare-enhancing network functionality and management, as well as discourage innovation. In other words, regulation is not costless.

Network facilities are extremely expensive to construct. You will hear more about this. Even in situations where physical networks are adequate, the cost to upgrade electronics and other functionalities is non-

trivial. Regulations that constrain what services and network operators may offer, and prices, terms, and conditions of those services, could constitute a strong disincentive to invest in functionality.

There is a natural tension, therefore, between the goals of preventing anti-competitive behavior, and providing incentives for consumer welfare enhancing innovation. Strict network neutrality regulations may eliminate potential for anti-competitive conduct. On the other hand, the same regulations could also eliminate deployment of pro-consumer, pro-competitive, and pro-innovative services applications and functions. Any attempt to resolve the tension needs to weigh benefits and costs of various approaches.

The case for intrusive neutrality regulation is predicated an on assumption that network operators have undue market power, and yet there is plenty of evidence that these markets are functioning much more competitively, in terms of prices and service and functionality competition. Consumers are getting more services at lower prices. But there is more competition that needs to come.

In addition, to date there has only been one case of anti-competitive conduct that could harm -- that harmed competition and consumers that has been brought to

the FCC. And this, of course, was the Madison River case, which was quickly remedied by the Commission in 2004. Since then, there have been no formal complaints of broadband access providers blocking, degrading, inhibiting any Internet application, nor have there been allegations of anti-competitive conduct.

I am finishing up. So, rather than debating whether theoretical problems require theoretical regulation, it would be much more productive to examine whether current laws and regulations are sufficient to handle anti-competitive conduct problems if they arise, while maintaining an environment that encourages innovation and network facilities and function.

Without significant new detailed ex-ante regulation on network neutrality, case-by-case enforcement of access principles, and anti-competitive conduct is available to the FCC, and the anti-trust enforcement agencies, including the FTC.

Post facto enforcement is superior to ex-ante regulation on several accounts. First, it ensures the costs of regulation are limited to the benefits.

Second, in a rapidly changing technological environment, it is difficult to narrowly target ex-ante regulation to future harms, and you can have over-broad regulation.

Third, should widespread anti-competitive conduct arise later, you can always -- there is no technical or business barrier to subsequently impose regulation.

And fourth, new ex-ante regulation is likely to inhibit investments. Therefore, in the absence of a significant demonstrable problem, and weighing the benefits and costs, new detailed regulation is not warranted. But this is not to say there is not an important role for monitoring and oversight, including by the FTC, which plays a crucial role in the superior case-by-case model.

Identifying and assessing anti-competitive conduct, performing analyses of competition and market power, and formulating appropriate remedies is part of your core mission here. Likewise, the FTC has an historical consumer protection mission, which is appropriate for enforcing -- for ensuring that broadband consumers have accurate information to make informed choices.

Therefore, the final false choice I would like to debunk is the following. To say there is no need for new detailed regulation does not mean that there is no role for government to protect consumers in competition. Rather, the right answer is to identify an appropriate

and balanced approach that will protect consumers in competition, as well as innovation, and meet the benefit cost test that is all too often missing in regulatory debates.

The FTC has the authority, resources, expertise, and institutional experience to play an important role, addressing potential problems in the broadband access market, without new detailed ex-ante regulation. FTC leadership in this area can ensure the vision that we all have for ubiquitous broadband access becoming a reality that we heard about this morning. Thank you.

MS. OHLHAUSEN: Bob, actually, let me just follow up on your point. One of the issues that gets raised by people concerned about network neutrality is that consumers won't be able to know what they're getting. They won't be able to detect discrimination, or it will be easy to say, "Well, it's happening somewhere else in the network." It's not your broadband provider, it's somewhere else, and so that there will be this sort of tacit discrimination, but it won't be detected. So, perhaps harm is already occurring, and it's just difficult to detect.

I was wondering if you could perhaps comment on that.

MR. PEPPER: Well, yes. That is a -- technical detection is an issue. But it's an issue, whether or not there is ex ante prohibitions, or whether it's a case-by-case approach, but there are techniques that consumers actually have readily available to them to test their own bandwidth and performance and latency between, you know, the home, or the office, and the first POP, right?

And so, those techniques are actually relatively available. The problem is that, depending upon the service you're trying to download, the application that you're using, it may -- you may be going through two or three hops, or as many as a dozen hops across the Internet. When you go across multiple hops across multiple networks, it's more difficult for a consumer to know.

But the standard, you know, sort of relationships, in terms of what is called, you know, hot potato routing and cold potato routing, which we can talk about, among the networks and the applications providers minimizes -- or attempts to minimize -- the numbers of hops. That's number one. Number two, a lot of these large providers made enormous investments in big server farms to bring content closer to consumers with their caching servers. Bringing content closer to consumers reduces the need to go across multiple hops.

Finally, if consumers are not getting the performance they need -- again, whether it's ex ante or ex post enforcement, the large service provider application providers -- you know, Chris's company -- have the ability to identify where these problems are. And in fact, the FCC received the complaint about Madison River, because a consumer couldn't get service for Vonage, complained to Vonage. Vonage figured out where the problem was.

So, it's not as opaque as, you know, some people would want to argue. But it's not completely transparent. And that's why I think it's important that consumers have information available to them to help make those decisions.

MS. OHLHAUSEN: Thanks, Bob. Now we turn to Gigi.

MS. SOHN: I would like to stand up, because sometimes it is hard to see me.

(Laughter.)

MS. SOHN: Well, good morning, everybody. I love Bob Pepper -- he is my colleague at USC -- but I disagree with every single thing he said.

(Laughter.)

MS. SOHN: That's not actually true. I want to thank the Commission and Maureen Ohlhausen. You guys

have done a fabulous job. We are looking forward to your report. You are not going to have much of a life for the next couple of months, and I feel your pain. But we really appreciate being asked to speak at this conference.

I am here to give a consumer perspective on the net neutrality debate, and what it's about. I think one of the things that proponents and opponents of net neutrality will agree upon over the next two days is that the Internet is the most open and robust engine of innovation, commerce, creativity, and democratic discourse this country has ever known. But what we won't agree upon is how it became that way.

We believe that the Internet is where it is today because of an FCC requirement that the on-ramps communications system be made available to all content applications and services on a non-discriminatory basis. Simply put, the net neutrality debate is about that non-discrimination requirement. And, you know, Bob set up a lot of straw men, and talked about a lot of different definitions. But this is what it's about: non-discrimination.

As Chris told you, that requirement was repealed by the Brand X decision and its FCC progeny. Rather than new regulation, net neutrality supporters,

like Public Knowledge, seek to have that ban on discrimination reinstated, so that the proprietors of the on-ramps to the Internet will not be able to use their market power to favorite services and content in which they have a financial interest, like video, gaming, and Voice over IP.

This closed cable-like model harms consumer choice and their ability to use the Internet without the interference of gate keepers. Raise your hand if you like the cable company. I thought so.

AUDIENCE PARTICIPANT: Wait a second, wait a second.

MS. SOHN: The market power is clear. Jay, I am not asking for a response.

(Laughter.)

MS. SOHN: The market power is clear. Cable and telcos are still dominant providers, controlling nearly 97 percent of the residential broadband market. Other technologies barely make a dent. And, in any event, are not substitutes for DSL and cable modem service.

Even when a consumer has a choice of DSL and cable, the switching costs may be prohibitive or unattractive, particularly if the service is bundled with other communications services.

While broadband wireless is held up as the great savior of competition, Professor Tim Wu's recently released paper -- and he will talk about it tomorrow -- demonstrates that, instead, it is a closed system where music, movie, and game downloads and streaming, and use of Voice over IP can be reasons for termination, and devices that attach to the network are hobbled, or prohibited by certain carrier restrictions. I think Chris really covered that, the land, very well there. So I won't talk any more about it.

But let me address for a minute the FCC's recent Internet access status report, which purports to show increased significantly -- excuse me -- significantly increased access to broadband, as well as increased competition. Its methodology is completely and totally flawed, and I really don't think it should even be taken seriously. And there are two major flaws, two of many.

The first is that it defines broadband at a ridiculously slow speed, 200 kilobits per second. I mean, that definition should just be thrown out of the box right away. And second, it inflates the amount of competition by looking at zip codes. So, if one person in a zip code has access to two providers, or three providers, they assume that all consumers in that zip

code have that access. So I have access to three providers, RCN, and I know that not everybody in 2008 has access to that. So it's completely flawed.

I think a better assessment of the broadband market and the potential for discrimination was made in a June 2006 report written by Chuck Goldfarb for the Congressional Research Service. And I quote, "To the extent that the broadband network providers seek to maximize their revenues for what they perceive as the killer broadband applications, they will have the incentive to build, operate, and manage their broadband network in a fashion that favors their own applications. With only limited alternatives to the cable and telephone broadband duopoly for the foreseeable future, and with the cable and telephone companies pursuing largely the same business plan, the broadband providers might have both the incentive and ability to exploit their control over access to end users to restrict competition and harm consumers."

So, now I talked about what the debate is about. So let me talk about what the debate is not about. It is not about whether consumers should be charged more for greater bandwidth and faster speeds. Of course they should, just like today.

It is not about whether content and service

providers should pay for the ability to get to their customers faster. They already pay at the originating and terminating ends. This is about whether the last mile provider will deny them the opportunity for better service, so as to advantage their proprietary services.

The debate is not about making broadband access a dump pipe. We do not oppose broadband providers owning applications, continent services that flow over the pipes, or engaging in legitimate network management to ensure the proper operation of the network. Every legislative proposal had an exception for legitimate network management. We just don't want the providers to favor those services or other services in which they have a financial interest.

It is not about -- the debate is not about a new undefinable regulatory concept. Non-discrimination appears over 60 times in the Communications Act, and indeed, at least one broadband provider, Verizon, has taken advantage of the FCC's program access rules, which require cable operators to make cable programming available to competitors on reasonably non-discriminatory bases.

This regulation has been going on for 14 years. It hasn't led to tarriffing, hasn't led to price regulation. I mean, that is -- you know, that's a big

scare that the program access rules have been self-effectuating, have worked really, really well, and seem to work well for the broadband providers.

In addition, last year, cable operators sought to ensure that the telephone companies did not discriminate against their Voice over IP services in the draft telecom bill. As I said, Dr. Pepper set up a couple of straw men. Intrusive net neutrality regulation, detailed regulation, those don't have to be the choices here. And there are models.

I think a good place to start for the definition of non-discrimination is in the AT&T/BellSouth merger conditions, in which AT&T agreed not to "provide or sell to Internet content application or service providers, including those affiliated with AT&T/BellSouth, any service that privileges, degrades, or prioritizes any packet transmitted, based on its source, ownership, or destination."

So, there goes the argument that you can't define that neutrality. That's a pretty darn good definition.

So, what should the FCTC (sic) do? At a minimum, we believe the FTC should investigate and act on allegations of anti-competitive conduct by broadband Internet access providers filed by consumers, content

service, and applications providers.

As Chairwoman Majoras and Commissioner Kovacic have pointed out in public statements, the FTC has already acted in cases involving discrimination, at the infrastructure layer, by Internet access providers. We ask that this jurisdiction be extended to the applications layer of our communications system.

Because the stakes are so high for those content applications and service providers that are discriminated against, and for consumers, these complaints should be acted upon in an expedited manner.

Secondarily, the FTC should require broadband access providers to disclose, in simple and non-technical terms, their broadband access and usage terms, including: one, actual level of bandwidth; two, the amount of latency; three, any limitations on consumers' ability to access services and content of their choice; and four, to what extent certain content and services get preferential delivery. I got most of this from the Phil Weiser/Rob Atkinson paper, which is quite good.

The FTC should bring enforcement actions against those broadband providers who do not disclose or who misrepresent the features of their service. Disclosure should not be, however, the only or even primary tool for protecting consumers, as it is cold

comfort to those consumers that have little or no real competition, for whom the cost of switching service providers is high. But it can help to complement the FTC's authority over anti-competitive market practices.

So, in closing, I want to make clear that although we believe that the FTC can be helpful in preserving net neutrality, any activity it undertakes pursuant to its current authority will not be sufficient to preserve an open Internet. The FCC is better suited to act quickly on complaints, and we will continue to press the agency and Congress to clarify the FCC's authority to address discrimination by broadband providers.

The FCC and FTC often have concurrent jurisdiction, and the public would be well served if that were the case here, as well. We would also support Congress giving the FTC specific enforcement responsibility over discrimination claims, similar to that provided in H.R. 5417, The Internet Freedom and Non-Discrimination Act of 2006, which was reported out of the House Judiciary Committee last congress. Thank you. I look forward to your questions.

MS. OHLHAUSEN: Thank you, Gigi. I have a question for you, and you can answer in your chair or up in the podium, your preference.

I understand that you believe that competition in the last mile is not sufficient at this point. At what point do you think competition in the last mile would be sufficient to overcome concerns about discrimination? Or, do you think that it is just so much of an inherent problem that it's not the number of providers, it's the inability of consumers to detect, or other issues?

MS. SOHN: I just think we are so far away from a competitive market that it's almost not even worth talking about. I mean, again, to the extent that there are any technologies that are substitutable, it's just cable and DSL.

The other -- you know, I could read off the numbers of the percentage of the market that some of the satellite and fixed wireless broadband have. It's minuscule. It's under one percent, each one. So it's hardly -- I think it's hardly worth even talking about. But you have to get to a place where the different services are substitutable. And nobody is going to give up their DSL or cable modem service for Verizon EV-DO, which won't let you download three-quarters of the things that consumers want.

You know, I just think we are a very, very long way from there. And, you know, when we get there we will

know it. But we are not even close.

MS. OHLHAUSEN: Thank you. Okay. Now we turn to Greg.

MR. SIDAK: Thank you. I would like to present more of an economic perspective on these issues, and tell you why I think much of the views that have been expressed so far this morning are missing the big issue here.

I do not think that blocking of content is the serious issue here. Network operators provide a complementary service to Internet content. They do not have an interest in reducing the supply of a complement. The one exception would be something like VoIP, which competes against the network operators' voice services. All the major network operators have pledged not to block VoIP. The one instance in which it has occurred has been a rural telephone company, and that is not a set of facts from which we can extrapolate to the behavior that would be followed by network operators supplying service to the vast majority of Americans.

A year ago we didn't hear proponents of network neutrality say much at all about the wireless industry. It's interesting to me this morning to hear that that is now the new focus of the blockage issue.

Obviously, there are very different network

architecture considerations for wireless networks than for wireline networks. I am not a network engineer, so I cannot answer the questions that you might have about that. But I think there is a lot more digging that has to be done on that, before we can seriously believe that in markets in which there are wireless competitors, that we have a problem.

If there is a kind of business conduct that is simultaneously pursued by firms in a competitive market, the presumption is that that is a business practice that is efficient, because it is what you see in a competitive equilibrium.

The real issue, I think, in the network neutrality debate is revealed when you ask, "What are the interests of the major adverse economic players in this market?" Follow the money. Who has an ox that will be gored through the enactment of network neutrality regulation?

I think here that the big issue, and the one that has not been adequately addressed yet this morning is the increasing conflict between network operators and Internet content and portal providers. Because of the radically different business models that they employ, network operators traditionally have been subscriber-based services. The Internet companies give away a lot

of stuff for free, because they are advertiser-supported business models.

What will be the ability of network operators to gravitate toward a more advertiser-based business model in the future? It is strongly in the interest of the incumbent Internet content providers and portal operators to try to limit the ability of very large potential competitors from getting into their same kind of business model, and competing for the very substantial amount of revenue that is generated by Internet search-related advertising, for example.

So, it is useful, then, to also ask, "What, specifically, are proponents of network neutrality regulation asking for," apart from the blockage issue, which I think is not the major concern?

What they have been asking for for the past year or so is to prohibit, by enactment of law, a transaction between a network operator and a supplier of Internet content for prioritized delivery of packets. This is the accessed tiering transaction. These transactions don't really occur right now. This is all a hypothetical argument.

The proponents of network neutrality regulation -- and I will take Larry Lessig, of Stanford, as the principal advocate -- do not have a problem with end

users paying for prioritized delivery of content.

In other words, they don't have a problem with network operators and end users contracting for prioritized delivery.

The problem they have is with network operators directly contracting with suppliers of content. Well, why do you need to have a federal law prohibiting one kind of transaction, when you're perfectly happy with the other? The reason, if you follow the money, is to look at the viability of the advertiser-supported business model.

In the event that suppliers of content or Internet portal services have to start competing for prioritized delivery of their content in a world in which there are increasing bandwidth constraints -- if there are no bandwidth constraints, this is an unimportant issue, this is not worth talking about. If there are bandwidth constraints, then priority of delivery matters.

If you are an incumbent Internet content provider, and you do not want to see other firms enter your very lucrative sandbox, you would like to prevent their ability to differentiate their services through prioritized delivery. So it's important to realize that there are potentially anti-competitive effects of enacting a prohibition on access tiering.

A lot has been said about whether the broadband access market is competitive. The FCC, the expert government agency in this area, determined in 2005 that it was.

I, personally, find it very hard to believe that you could look at the data in the United States and conclude that we are moving in the wrong direction, in terms of broadband access competition. Broadband lines and broadband usage is skyrocketing in this country. Prices are going down.

And so, we have prima facie evidence of a competitive market: falling prices; increasing output. And we have announcements, by firms like Sprint, that it will build a WiMAX network, nationwide, by 2008.

In addition, you have Google itself demonstrating the feasibility of Wi-Fi mesh networks as a competing access technology. In Mountainview, California, Google provides free Wi-Fi broadband access to 72,000 residents at a cost of about $1 million. In other words, for about $14 a resident, or roughly the price of a large Domino's pizza, Google has built a Wi-Fi mesh network which, of course, it funds with its advertising revenues.

The executive at Google in charge of this project said that they don't have an intention of going

around the country and building Wi-Fi mesh networks, but they just wanted to show that it's possible to have more broadband competition.

Well, if that's the case, then it seems to me that Google has just removed one of the two principal arguments that have been made in favor by it for network neutrality regulation -- the supposed absence of competition in the broadband access market.

The other justification, of course, that has been presented traditionally for network neutrality regulation is that we have to promote innovation on the edges of the network, as opposed to innovation within the network. I completely agree that innovation is an important consideration. But it is a completely amorphous concept, as it has been discussed so far in the network neutrality debate.

The one piece of advice I would give the FTC or other policy makers in this area is define clearly what the criteria are that you are trying to evaluate here. Obviously, consumer welfare is at the top of the list. And I think it's consumer welfare, with respect to broadband access, as well as consumer welfare in the consumption of Internet content.

In addition to consumer welfare is innovation. And, of course, innovation, over the longer term, plays

into the welfare of consumers. But is there any reason to believe that there is a shortage of innovation on the edges of the network? Indeed, how could we ever prove that there was or wasn't?

In this respect, I think it's interesting just to look at a time line. In December 2001, Larry Lessig declared, "The Internet revolution has ended, just as surprisingly as it began." In February of 2005, YouTube released its first video. In February of 2006, Lessig testified on a panel that I was on in front of the Senate that access tiering would reduce innovation, it would kill this innovation at the edges of the network. In October of 2006, YouTube was purchased by Google for $1.6 billion.

So, there was no shortage of innovation on the edges of the network there. And bear in mind that the argument put forward is that the mere prospect of these access tiering transactions are so threatening that unless there is congressional legislation to prohibit them, those innovators in garages in Palo Alto are -- they're just going to fold their tents. Obviously, the people at YouTube were not intimidated by that prospect.

So, I would conclude just by saying it's important to try to separate the purely hypothetical harms that might occur from the problems that have been

observed and remedied, and also to try to get some specificity in this debate. What is it that the economic interests are advocating, or opposing?

Access tiering, I think, is at the heart of it. Why? Because it implicates the fundamental conflict between two business models that represent the true convergence of traditional telecommunications and Internet services.

MS. OHLHAUSEN: Thanks, Greg. I have a question. You are talking about the broadband last mile providers changing business models to more of an advertising base, where they can get some of the cost of the service paid for by the content providers, rather than by the consumers directly.

One of the questions I have in that regard is that this morning one of the speakers talked about concerns about the abilities as broadband providers have to find out more about consumers, so that they will actually be able to extract more rent from the consumers, based on knowing a lot about them. And things, to me, suggest you've got a business model kind of going one way, and this creates a tension: the broadband providers may have an incentive to get money from the content providers, but someone is suggesting that they have an equal incentive to try to extract more money from

consumers.

So, I was wondering if you had any views on do these things make sense, or are there these tensions between incentives, or does it seem unlikely?

MR. SIDAK: Well, let me react to that. Number one, as I think Bob Pepper pointed out, it is not price discrimination to sell two different products at different prices. If one product is a higher priority delivery of packets than another, and the faster service is more expensive, that's not surprising. That is not price discrimination.

But just for sake of argument, suppose that the product is completely identical in the two instances, and a different price is charged for different customers. Is that a problem?

Well, if I call my travel agent this afternoon and say, "I have to fly to Brussels tomorrow. Can you get me on a flight?" I will pay $8,000 to get a ticket. If I had booked that flight 6 months in advance, I would probably pay $1,100, something like that. How many airlines are there flying from Dulles to Brussels, or some other hub in Europe from which I could connect?

Obviously, we observe price discrimination in competitive markets all the time. If I go buy -- go into Barnes and Noble, and I buy the hardbound copy of the

next Harry Potter book for one of my children, I pay more than if I wait until the paperback comes out. Intertemporal price discrimination. Again, it is a pervasive phenomenon.

So, price discrimination, per se, is not something that is unique to firms with market power. Any firm that has some slight downward slope on its demand curve may have the ability to engage in differential pricing if the other conditions that economists well document are satisfied.

With respect to consumers of broadband access, I am certainly less worried about the network operator exploiting a dossier of personal information about my use of the Internet than I would be about Google doing the same thing. If any of you have read The Search -- a very good book about Google -- there is a phrase that the author uses called "the database of intentions."

And it's really a remarkable concept. Every click, every search, every pop-up you have clicked on, it gets stored. And that's what creates value, in terms of Internet search-based advertising, because when you type in a word like "Casablanca," up will pop something about Humphrey Bogart, instead of a city in Morocco. Why? Because your history of Internet searches, your visitations on the Web, define something about who you

are and what interests you.

I am a lot more concerned about the potential abuse of that database than I would be with -- by -- far less concerned than I would be with respect to some network operator coming close to acquiring the same capability.

But the last thing I wanted to say about price discrimination is there is attention here. We have the welfare of consumers who are not yet on the Internet as broadband subscribers. What is the profile of the marginal consumer of broadband? Economists talk about marginal and inframarginal consumers. Inframarginal consumers are the people who already are consuming something, and who won't walk away if the price goes up a little bit. The marginal consumer is the person who is right on the edge between buying or not buying a product.

In the case of Internet broadband access, a profile of the marginal broadband consumer, the person who hasn't subscribed yet, is that he has lower income, less education, and is more likely to be of a minority or -- a racial or ethnic minority.

Traditionally, we like to bring up the welfare of the marginal consumer. We can do that if it's more affordable for people to subscribe to broadband networks. That's one reason why price discrimination is a good

thing, in the sense that it allows the price to charge the marginal consumer to come down, because there is somebody else who values the product very highly, just like I would value the ticket to Brussels tomorrow, if I had to get there, that helps pay the common cost of running the network.

That objective, that consumer welfare objective, is something that undergirds all of telecommunications for the last century. And it's fundamentally quite different from the objective of trying to promote innovation by the next billionaires in Palo Alto.

MS. OHLHAUSEN: Great, thanks. For questions, please write them on a card, and give them to a staff member. Thanks.

Okay. Well, we have raised a lot of issues here, and I know that there's lots of strong feelings. But I want to start sort of with a baseline issue, which is about the FCC's connectivity principles.

Bob, you mentioned that there is widespread agreement on that. And what I wanted to query the panelists about are, one, is there widespread agreement? And, two, is there widespread agreement on it as a floor, or as a ceiling?

MR. PEPPER: Well, I obviously agree with him,

so --

MS. OHLHAUSEN: You made that comment.

MR. PEPPER: So -- yes.

MS. OHLHAUSEN: But --

MS. SOHN: We think there needs to be a fifth principle, and that is a principle that prevents non-discrimination.

I mean, it's not enough to say that consumers shall have access to all content, that consumers shall have access to information about their service -- which they are not getting -- the consumer shall be able to attach any equipment to the network, which, as Chris mentioned so well, is not happening in the wireless space. And I don't remember what the fourth principle was.

But that doesn't guard against the possibility that a network provider would favor certain applications, content and services -- particularly that which it has a financial interest, or that which it actually owns, outright --

MR. PEPPER: But you do agree with the four -- I mean, because that is --

MS. SOHN: Yes. I would like to see them applied to the wireless space and to the wireline space. I don't have any significant information about what I get

over my RCN line.

And again, as Chris pointed out, the right to attach does not exist in wireless, either for the cellular phone service, or for broadband.

MS. OHLHAUSEN: Anyone down at this end of the table?

MR. LIBERTELLI: Yes, I would just offer that there is agreement that the four principles may be a good place to start, but that there is sort of a necessary, but not sufficient, protection of openness on the Internet.

And, most importantly, I would say, you know, one of those principles talks about the ability to run a consumer's application of their choice. And that, for us, is a very important part of those principles, and it should be carried forward into whatever rules are applied to Internet access providers.

I would also emphasize that this is -- we're talking about a policy statement; we're not necessarily talking about a binding rule of decision. And so, more work could be done to make those principles binding on the network owners.

MR. SIDAK: Hi. I would just add, why not be a little more ambitious? Why are we defining principles that apply to network operators? We are looking at an

industry in which Internet content providers, portal providers, are increasingly providing services that network operators have been providing on a subscription basis -- voice telephony, for example.

If consumer disclosure is good for the network -- traditional network operators, why not for the other companies, as well? For example, when I download Skype, it's very hard to figure out what the impact of Skype software is on the processing capability of my laptop. There is some very minimal language about how Skype will use the computing horsepower of your computer.

Well, is that a big deal, or not? It's very hard to -- for a typical Skype user, I suspect, to really evaluate that.

MR. LIBERTELLI: I would encourage you to go to the Skype share blog to find out how Skype operates on your computer. All sorts of disclosures are made there. It's a very open environment. I think people can understand completely how the software runs on a given computer.

And with regard to your other point, the reason why we're here is because there is a concern that there is market power in the market for broadband Internet access. We can try to change the subject to the privacy policies of Google, or other Internet applications, but

for us, you have to return to that fundamental point, because that is the grounding in economic theory for why we're here, seeking some level of net neutrality safeguard.

MS. SOHN: Yes, and I think we ought to bury -- we really ought to bury -- that right here, right now at noon on Tuesday, that this debate is not about what Google does, or what Skype does. It's about competition in last mile broadband. So let's just bury that one right here, right now.

MR. SIDAK: Well, I fundamentally disagree. It is not about --

MS. SOHN: I know you do, Greg, but it's not what the issue is.

MR. SIDAK: -- competition on the last mile. The FCC has had proceedings about this. And if your position is that the FCC is misinformed, then take it to the FCC.

MS. OHLHAUSEN: One of the questions I want to pose here is do you think network neutrality is consistent with the goals of the 1996 Telecommunications Act, to the extent it sought to eliminate regulatory barriers and allow greater integration of services?

A part of the question here is, Congress and the FCC, did they get it right, or did they get it wrong?

And, what should be done about that?

MR. PEPPER: Well, you know, there is multiple aspects of the 1996 Act. One was, you know, focused on introducing competition, not just in long distance, but also in local networks. And another part of the 1996 Act on advanced services, you know, had a, you know, a report looking at advanced services in broadband.

I think, you know, to a very large -- and then another part of the 1996 Act focused on when there is competition, you know, to actually get out of the business of regulating the way, you know, common carriers are regulated, because I think Congress recognized that that was actually a barrier to, you know, investment in new technologies.

And there again, regulation is not costless, right? And so, you know, there was a -- you know, the balancing that, in fact, you know, when there was competition introduced, then relief was provided to Bell companies on long distance -- you know, Chris, you were part of -- at the Commission.

So, I think that part of the 1996 Act actually, you know, required creating conditions and procedures and regulation for entry, for competition. But then when there was competition, there was a process to, you know, pull back and step back from the regulation.

And I think that that actually is something going to, you know, Gigi's fifth principle, which I think people don't appreciate, and that is that it's so way over-regulatory, that would result in, you know, tarriffing, and regulating things that we have never regulated. It would result in regulating Internet, you know, pricing. It could very easily result in regulation of peering and transit relationships.

And, in fact, even the principle -- you know, the provisions that Gigi referred to in the AT&T/BellSouth condition, saying, "Oh, but these are easy, this is nothing," you know, yes. So, what is prohibited is privileging, degrading, or prioritizing any packet transmitted, based upon source destination or ownership.

Well, I can understand if you don't want to, you know, have, you know, things degraded. But that, essentially, would prohibit pro-competitive, pro-consumer, you know, increase in quality of service and prioritization, based upon a contract that somebody has negotiated in the market place.

That is way overstepping, you know -- actually, I even think, you know, some of the, you know, previous positions that advocates for regulation and -- you know, have been making that was actually agreed to in that, you

know, merger agreement, because they essentially had no choice, if they wanted their deal done.

But it is actually very anti-consumer. It would end up socializing the costs of Internet access, and preventing, right, higher-quality services that -- you know, for example, people have said they would like to pay for, because earlier, Chris and Gigi both agreed that tiering is not an issue, that there ought to be the ability to have, you know, higher prices for better quality. Right?

That would effectively be prohibited, unless you wanted to tariff that, and turn that into traditional common carrier service, a la what the FCC was doing for years, that resulted in this cartel pricing and long distance.

MS. SOHN: I guess I want to make a point about your original question, and then talk a little bit about what Pepper talked about.

There are two sides to the 1996 coin, okay? And some would argue that there is almost nothing left of the 1996 Telecommunications Act anyway, so why should we even care about it. But just assuming that there is, it wasn't just about eliminating barriers to -- you know, regulatory barriers. As Pepper said, it also was about promoting competition, okay?

So, I think you need to look at it from both sides of the coin. And to the extent that the 1996 Act had, as one of its purposes, promoting competition, it was a complete and total abject failure. So, I think that -- and that's why we need Congress and/or the FCC and/or this agency to step in.

But let me just address -- Pepper, I just have to ask you, I just don't know where you get from a non-discrimination principle inevitably leading to price regulation. As I said before, the program access rules are a perfect example of a self-effectuating regulation where cable operators have to make their programming available, on reasonably non-discriminatory terms, to unaffiliated multiple video providers like Verizon FiOS, you know, like --

MR. PEPPER: Right. So --

MS. SOHN: Like satellite.

MR. PEPPER: Right.

MS. SOHN: I mean, that hasn't led to price discrimination. It's a simple regulation. It's like five pages in the CFR. Why can't we have the same -- a similar -- regime here?

MR. PEPPER: Well, actually, first, you know, you -- that -- program access rules talk about reasonably non-discriminatory. It's not non-discrimination, right?

It's more similar to the not unreasonably discriminatory in 202 that actually allows for different deals among, you know, different providers.

MS. SOHN: That's true.

MR. PEPPER: All right? The other point is that it was not under Title II, so it didn't end up in tarriffing.

Point number three is that it clearly recognizes that there are different relationships, based upon, you know, size, geography, programming, and so on. But I also can tell you, having been on the inside on some of these, they do look at prices, right?

And the fact is that the -- you know, and there are people here from the Commission, and some of whom used to work in the cable bureau -- the staff actually does have to look at price, that there -- it does limit the ability to have, you know, different kinds of deals. But the reason that that was done -- again, it only focused on vertically integrated content, and there are still, you know, a range of relationships, which is very different than talking about, you know, quality of service, or talking about basing a -- different arrangements that are negotiated, based upon where your caching servers are, where your server farms are, how many hops across the Internet you go. It's fundamentally

different.

And it did not take place under Title II, and yet a lot of the advocates for regulation here want to put all of this non-discrimination into Title II, which is traditional tarriffing, which is traditional price regulation.

MS. SOHN: I don't know anybody who is talking about going back to Title II. I mean, there are -- there is a very, very limited number of folks. But that is not what this debate is about.

MS. OHLHAUSEN: I would like to give this side of the podium a chance, if you wanted to weigh in either on the question about the 1996 Act, or anything that has come up since.

MR. SIDAK: Yes, I think that the overriding lesson of the 1996 Telecom Act is that it was an incredibly -- and I am speaking of the local competition provisions -- it was -- it turned out, in practice, to be an incredibly complex framework to implement. It produced endless litigation. It went to the Supreme Court two-and-a-half times.

And in the end, it neither produced this independent business model of CLEC that seemed to be sustainable, and it went away, in practical terms, because, ultimately, there were mergers of the two

biggest CLECs, AT&T and MCI, and Bell companies. So, we spent 10 years, and we really didn't have much to show for it.

Now, would it be easier or harder to write a piece of legislation defining network neutrality, and addressing the prices, terms, and conditions that would apply to non-discriminatory access? I think it would be a lot harder. In the 1996 Act, we were talking about some pretty old fashioned technology: twisted copper pairs going to central office switches. I think that the complexity of the Internet is -- would make the task far, far more difficult.

MR. LIBERTELLI: I have lots of things to say about all this, having lived through the 251 proceedings at the Agency. But I will be brief, and make two quick points.

Net neutrality really isn't about the traditional notion of non-discrimination that is found in Title II of the Communications Act. And I think, actually, Chairman Martin, at his Oversight hearing in the Senate, put this question correctly. It is different. What the Internet companies are asking for is different than 251 or Title II-style non-discrimination requirements. But it doesn't lead you inevitably to tarriffing, or all the bad things that Bob was

describing.

The basic point is this. If you want an Internet of commercial agreements, you want a cable television system. And we have one of those. We like the Internet. We kind of like the way it has created innovation, and the ability of users -- of software providers to reach users.

So, you know, nothing about our approach would disturb the cable television model. But what we are asking for is to build a wall between it and an open Internet.

MS. OHLHAUSEN: Actually, Gigi, Chris's remark actually feeds into a question from the audience that says, "You remark that we start with net neutrality, as set forth in the AT&T and BellSouth merger, why isn't the appropriate definition of non-discrimination that found in Title II of the Communications Act, sections 201 and 202?"

MS. SOHN: Well, as I said before, it's not necessary to go there. And we are talking about something that is fundamentally different. And we are not asking for that kind of heavy duty regulation. And we like the AT&T/BellSouth definition, because it doesn't go there, it doesn't go that far.

And it is sufficiently -- I think one of the

things Pepper -- you know, Pepper talked about how broad it is. But I think it's actually quite narrow. It says that you can't -- that AT&T cannot privilege, degrade, or prioritize any packet transmitted, based on its source, ownership, or destination. That still allows you to engage in legitimate network management. You just can't say, "Well, these are Vonage's packets, so therefore, it will get -- you know, it will not get the better priority."

We don't need to go to Title -- back to Title II.

MR. PEPPER: All right, but Gigi -- but how do you deal with the -- so, Google negotiated an arrangement with Verizon Wireless -- or YouTube, now Google, for YouTube delivery of video YouTube content over Verizon Wireless. All right? That was a market-negotiated deal.

Should Yahoo! be able to knock on Verizon's door and say, "I want the identical deal," without having to negotiate --

MS. SOHN: Absolutely.

MR. PEPPER: Well, go explain that to Google, because that's not the answer that they give. I mean, so what's interesting here --

PARTICIPANT: I don't think that is fair, Bob.

(Several people speak simultaneously.)

MS. OHLHAUSEN: Google is on a panel later. Let's hear what Bob has to say now.

MR. PEPPER: But the point is that, you know, when you say -- you know, what you basically want to do is turn the Internet into a common carrier service, where you can't even do what common carriers are permitted to do with large customers.

At the FCC, we actually -- because of the restrictions in 202 -- ended up permitting contract carriage, where you could have carriers negotiate with large users, and cut individualized deals. That's what drove prices down. That's what allowed some of the big, you know, networks to -- you know, user networks, private networks -- to grow out. That also is when you eliminated the umbrella pricing for long distance, which is where you finally got real price reductions for consumer long distance service.

We have been there/done that. I mean, if you want to socialize the pricing -- because you can't talk about, you know, prohibiting privileging or prioritizing, right, and not include price as part of that, you know, privileging or prioritizing. You are now into price regulation, because ultimately, the regulator will have to look at price, based upon whatever that negotiated deal is.

MS. SOHN: Well, looking at price is not the same thing as price regulation, okay?

MR. PEPPER: Oh, come on.

MS. SOHN: Just because a regulator looks at price, doesn't mean they're setting a price.

MR. PEPPER: And act on it. Excuse me.

MS. OHLHAUSEN: And, Greg, you --

MR. SIDAK: I have spent a large part of the last 20 years working on various aspects of price regulation in telecommunications, and I find that statement to be completely untenable.

MS. OHLHAUSEN: Okay.

MR. PEPPER: Which one? Me or Gigi? I think he means everything she said.

MR. SIDAK: No, that you do not implicate price regulation under this regime that she is describing. Just implausible.

MS. SOHN: Okay.

MR. PEPPER: Even in your cable access, it's about price. It's volume --

MS. SOHN: It's about price, but it's -- okay.

AUDIENCE PARTICIPANT: Ask the audience how many people think you have to --

MS. OHLHAUSEN: Okay. Sir, you are -- excuse me, you are not a panelist and you are not a moderator.

So, please, respect the rules of the forum. Thank you.

MS. OHLHAUSEN: Okay. Here is a question from the audience, a written one. Are similar debates on network neutrality taking place in countries outside the United States? And have these debates resulted in regulation? And do you think that has been a positive result?

So, stepping back a little bit, broadening it a little bit, what's going on in the rest of the world?

MR. SIDAK: Not nearly as much as here, in the United States. The U.S. is definitely in the lead. But the OECD countries are interested. This is an issue of -- receiving some attention in Canada, the Netherlands. Those are the main places, so far.

MR. PEPPER: Yes. Maureen, actually, in the European context, the issue has been sort of raised, but the consensus, I think, at the European Commission and among most of the national regulators is that since they work under a competition framework that looks at significant market power, that they believe that this is actually not an issue at this point for them.

And, in fact, I think there are some things that we can learn from that, in terms of looking at this as a competition issue, using -- you know, they talk about SMP, significant market power. Here, we tend to

focus on, you know, the FTC and DoJ, in terms of competition policy.

And I think it's completely -- that's one reason why I actually like -- why I suggested FTC's leadership here, because I think there is a role for competition authorities to look at this, and evaluate, and consider whether there are problems and abuses.

MR. LIBERTELLI: I think that it is fair to say that the debate in Europe and in Asia is different than the net neutrality debate in the United States. But to simplify it, that's because those jurisdictions are actually operating in a world that looks more like the pre-Brand X world than we do.

MS. SOHN: That's exactly right.

MR. LIBERTELLI: And so, you can see things like Ofcom's UK equivalency proceeding as an example of an administration that is looking at non-discrimination as a way of protecting competition at the access layer, which would lead to application layer competition, in addition.

MS. OHLHAUSEN: All right. I am going to turn to a few more audience questions. They jump around a little bit, as you can imagine. This one is for Mr. Libertelli. And it says, "Does Skype allow its users to talk, interconnect directly with other software-based

VoIP services, such as GoogleTalk?"

MR. LIBERTELLI: Right. So, Skype has -- is undergoing an effort to build an interoperability to allow those two systems to talk to each other.

MS. OHLHAUSEN: Okay. And the follow-on is they're assuming that Skype doesn't allow such interconnection. And would that be a network neutrality violation?

MR. LIBERTELLI: Again, this is more subject-changing, but the simple answer is that the -- if you wanted to call a Skype user, for example, you could call that user through the distribution of a traditional telephone number, which we will provide to somebody who is running the application.

So, if you want to talk to a Skype user, Skype has a service that would allow that, you know, a non-Skype user to talk to a Skype user.

MS. OHLHAUSEN: All right. We have about 10 -- 9 minutes left. And I was thinking that, rather than go through some more questions -- and it might make sense to give you all a minute or two to raise any points you didn't get to make, or anything you wanted to re-emphasize, or any last shots you wanted to get in, just to give you an opportunity to do that.

How about we do in reverse order of our

presentations, if that is fair? So, Greg, you're up.

MR. SIDAK: The only thing that I would add is that I have a lengthy article on this that is in the Journal of Computation Law and Economics. It's about 120 pages, so it's got a lot of the detail that would back up some of the things I have been saying.

MS. OHLHAUSEN: So that would be -- Gigi?

MS. SOHN: Well, I just want to make the point that, you know, this is fundamentally about what we want the Internet to look like for the next -- for our kids, okay?

The Internet is not a car, okay, it's not groceries. It's a fundamental means of communication, and the most democratic we have ever had. I mean, I have spent many years struggling over trying to get broadcasters and cablecasters and other, you know, other regulated communications industries to do the right thing, okay? It was an abject failure, okay?

The Internet actually takes away the gate keepers, so people can engage in democratic discourse, eCommerce, innovation. It's been great. And at a certain point, we have to ask ourselves, do we want it to remain that way?

MS. OHLHAUSEN: Actually, that -- just -- not to unfairly change the rules of the game, but one of the

questions --

MS. SOHN: As long as you don't talk about Google, I don't care.

MS. OHLHAUSEN: Okay. So you are saying that there is a lot of public benefit to the network being open this way? There are a lot of externalities. And so, that kind of raises a question, as it's privately funded, however. The private companies provide the services.

Are we asking them to be in an unfair position, where we want to keep a structure a certain way, because of the public benefits, but we want private companies to provide that?

MS. SOHN: Well, first of all, the Internet was not started by private companies, okay? It was started by the government, the Department of Defense. So that's where its roots are.

Yes, I will admit private companies have helped to make the Internet what it is today. But those companies still rely on public infrastructure, all right? A cable operator can't operate in a locality unless a municipality tells it that it can. Okay? Same thing with the telephone companies. They can't do their business unless the local PUC or PSC tells them that it could, you know, use their telephone lines.

So, the notion that it's purely private companies that built the Internet without any public subsidy at all is just false.

MR. SIDAK: So the Internet is different from cars, but it's inherently related to things like telephone poles?

(Laughter.)

MS. SOHN: Greg, you know I didn't -- I'm not even going to answer that, that's such a silly statement. That's just silly.

MS. OHLHAUSEN: Bob?

MR. PEPPER: Yes. So, I think Gigi's right, that this is about what we want the Internet to look like. And I also think that there is broad agreement that one of the terrific characteristics of the Internet as its grown up is the end-to-end characteristics, that, you know, I actually can go anywhere I want, unless of course I subscribe to a service that identifies itself as a walled garden.

But what's interesting -- and this actually does go to, I think, part of -- Gigi -- one of the questions of, you know, so what do we want to require -- or, Maureen, your question is -- you know, we have had attempts at service providers putting together walled gardens. And they uniformly failed, right? AOL was a

walled garden. People didn't want it.

Now, people liked the fact that they could go within that environment and find content that they like, and they want, and they feel comfortable with. But they wanted a gate in the garden to go out to the wild wooly Internet.

At home, on the -- you know, the cable industry's initial attempt to do cable modem service was built as a completely closed-walled garden, and then they realized people wouldn't buy it as that, and the market insisted -- right, consumers insisted through the market mechanisms -- that it be opened up.

I fundamentally believe that this is about the -- you know, what we want it to look like. But I think that the consumer empowerment here -- because we do have choices that are increasing; it's not yet -- I don't think anybody would argue it is, you know, perfectly competitive. But the fact is, we are seeing prices decline, bandwidth go up, and the walled gardens fall.

And I think it's important that that tradition continue, but also remember that this has essentially been an unregulated world and market within which this has developed. And I don't think that there is sufficient evidence today to say that we should start regulating things that were never regulated.

And I don't think that we should be imposing regulation here, other than some -- making sure that these core principles that are embodied in the high-tech broadband coalition principles, that they actually become enforceable, right?

But we don't need a whole rash of new ex ante regulation that is detailed. And the fact is the AT&T/BellSouth conditions would lead, inexorably, to detailed regulation, and it is -- you know, I find it ironic that Gigi said, "Well, program access is easy. It's only five pages in the CFR." Right? Five pages of detailed regulation. That's just for gaining access to cable programming that is being sold, you know, to the -- to cable companies.

So, it's -- regulation has not caused us -- I don't think we're at the point where the benefit cost analysis says we need a new, detailed law and a lot more regulation.

MS. OHLHAUSEN: Okay. Chris?

MR. LIBERTELLI: We look at this net neutrality issue simply and practically. I don't know anything about the intertemporal marginal broadband customer, and if I started talking about it, I think people would keel over, go have a sandwich, or something.

So, you know, we talk about net neutrality as a

way of preserving openness. That openness allowed a company like mine to build a software application that dramatically reduced the costs of people's conversation. And we think that's good for consumers.

If you're worried about the next Skype, the next Google, then you would, as policy makers, adopt a principle and policy of net neutrality that protects innovation, because there are enormous sources of competition out there on the Internet from software-defined services.

MS. OHLHAUSEN: Well, I really want to thank all of our panelists for bringing their knowledge and their passion about these issues.

(Applause.)

MS. OHLHAUSEN: And I just wanted to remind everyone we will reconvene here at 1:30.

(Whereupon, at 12:25 p.m., a luncheon recess was taken.)

A F T E R N O O N S E S S I O N

MS. OHLHAUSEN: We now have Commissioner Leibowitz.

COMMISSIONER LEIBOWITZ: Thank you so much, Maureen. And if everybody wants to get seated, that will be great, and I will get started. But let me first, actually, start by congratulating Maureen Ohlhausen and her staff, for putting together a forum where many of the most important members of the network neutrality debate get to air their positions in front of their most knowledgeable and determined critics.

It's important, because, to some extent, the debate has been about -- it's really been a battle of sort of dystopian worlds, where each side warns of the misery and wretchedness to come, if we don't listen to them.

Now, some of those fears, of course, are legitimate. But as I have listened to the debate over the past few months, it seemed to me that each side listens to the other side sort of just enough to mock it. In order for us to move the debate forward, we need to listen respectfully to the worst case scenarios identified by the proponents and opponents of net neutrality, and absorb the kernels of truth -- and there are, of course, many kernels of truth -- from each.

I hope that the panels during the rest of the day today and tomorrow will help us get to a policy solution that we can all agree with. Or, failing that, one that at least won't keep us up at night, worrying. And I was here this morning, and I watched the first panel. And it seemed to me it was a very good start. I'm not so sure about the second panel.

(Laughter.)

COMMISSIONER LEIBOWITZ: But we will try to make the third panel respectful, in a way that perhaps the second panel -- issues came up in the second panel, hopefully they won't in the third.

First, though, I should say, as we always do as commissioners, that my comments today reflect only my own opinion, and not the Commission's, or that of any other commissioner.

Before I talk about competing nightmare scenarios, let me talk about what we should all have in common. Consumer rights on the Internet should, at the very least, include the four Internet freedoms identified by former FCC chairman, Michael Powell, in 2004.

Consumers must be free to: one, access their choice of legal content; two, run any Internet applications they choose; three, attach any device they choose to any connection in their homes; and four,

receive meaningful information regarding their service plans.

These four Internet freedoms are, it seems to me, table stakes. Any set of principles regarding consumer rights on the Internet should require all companies -- and, really, all entities -- to ante up.

The fourth freedom is particularly important to us at the FTC, though I'm told it's somewhat less important to folks at the FCC recently -- that was a joke. I know you're a geeky audience; it's okay.

(Applause.)

COMMISSIONER LEIBOWITZ: Some of the most critical issues regarding the Internet involve transparency and disclosure. Will carriers slow down or interfere with applications or services? If so, will consumers be told about this before they sign up?

To my mind, failure to disclose such material terms or conditions should be considered unfair, deceptive, in violation of the FTC Act. See, I think -- does anybody disagree with that?

(No response.)

COMMISSIONER LEIBOWITZ: Okay. Then we have unanimity. That's very respectful.

Beyond those four freedoms, things get more complicated. Right now, the last mile to the Internet is

its least competitive. Nearly all homes in the U.S. that get broadband -- I think it's upwards of 98 percent -- receive it either from their cable or telephone company. Among those who do have access, many have no choice among providers, because only one firm offers broadband to their community.

Some fear this lack of competition will translate into reduced innovation elsewhere on the Internet. And in one version of this dystopian world, without net neutrality, broadband providers connect consumers to the Internet through both the slow lane and a fast lane. In this world, emerging YouTubes and eMusics may have to negotiate with these characters -- carriers, sorry. Not a Freudian slip.

(Laughter.)

COMMISSIONER LEIBOWITZ: The carriers could be high-toll gate keepers who would effectively block these new entrants from reaching their own customers at a faster speed, which, of course, could mean not reaching them effectively at all.

Taken to its logical extreme, these new companies could be required to negotiate rates and terms with every single broadband provider in every single neighborhood across the country, simply to reach the very same consumers that they can reach today.

This could turn the Internet into a broadband anti-commons, where new applications never see the light of day, even though their value to consumers could potentially far outstrip their cost, because the cost of negotiating deals and the cost of the deals themselves with each carrier would likely exceed the profits from the services.

In this dystopian view of the future, the Internet simply runs in place, stuck where it is. It may run faster, but the available content and applications stop growing, and creativity atrophies, because of the inability of start-ups, especially, to reach consumers quickly and inexpensively.

And I focus on this world because much of the innovation that has occurred on the Web has been premised on its special economics, where once you get your content or application on the Internet, you can reach potentially, and at a low cost, billions of people.

These economics make possible the phenomenon of the long-tail business model. In the long-tail business model, a product can succeed, even if only a small percentage of people are interested in it, because so many people have access.

According to Chris Anderson, who coined this term, "Many of Amazon's book sales -- perhaps as much as

a quarter or more -- come from books so unpopular that Barnes and Noble doesn't even carry them in their superstores." And my guess is the percentage of movies carried by Netflix is probably much higher than that 25 percent than the percentage carried by the local Blockbuster, or its competitor.

This type of business model, and the accompanying array of choices that give the Internet its vibrancy, could be threatened if cyberspace is subdivided by broadband gate keepers imposing fees, conditions, and surcharges.

Now, in response to this vision of misery and wretchedness, the broadband providers say this. "You know, we have no incentive to treat our own customers so badly," and they do have a point. For example, why would Verizon block Google, if that would make consumers less interested in Verizon services? This argument is particularly compelling when there is competition among broadband providers. Consumers can simply switch to a provider that sells better services.

And this notion that consumers buy more of what they like than what they don't also resonates with many at the Commission, and its implications should not be ignored.

But it is persuasive only if the broadband gate

keepers have a good idea of which new Internet products and services will succeed. The success of YouTube and other firms like it is really a testament to the power of competitive markets to deliver value to consumers, even where that value might be hard to predict.

I mean, does anyone really believe that cable companies or telcoes -- or certainly FTC commissioners -- could ever have foreseen the success of YouTube? I'm not even sure that the founders of YouTube knew just how successful they would be.

Frankly, broadband providers did not have a history of being particularly interested in -- or good at -- developing new applications or content. And whatever their theoretical incentives, the real-world risk of leaving this decision in the hands of broadband providers is that they just might not get it, and though you could never quantify the harm, consumers would nevertheless live with a less innovative, less magical content, and less magical Internet.

On the other hand, the broadband providers can present dystopian visions of their own. In their dystopian world, net neutrality would prohibit them from using their own wires in potentially the most pro-competitive ways.

Many of these companies also argue that they

are spending enormous sums of money to wire communities, because of the profits they expect to make from selling combined television, telephone, and broadband services over those wires. And if they can't charge higher prices for these services, they may not be able to justify big investments in broadband.

To be sure, there has certainly been a lot of new investment in the last mile. And we are currently in the middle of what may be an unprecedented swell of competition between cable and telephony, which have been dominant in their own turf for years, but which are now on the verge of entering each other's markets.

On the telco side, both AT&T and Verizon are spending billions to upgrade their networks with fiber, all so that they can sell video in competition with cable companies. For their part, the cable companies are working to upgrade their own networks to compete, and many are already offering telephone service. I happen to have Comcast telephone service. Moreover, each is expanding broadband Internet services in competition with the other.

At the same time all this is happening, many municipalities are beginning to build sort of semi-fast networks, as well -- for example, in Philadelphia, in San Francisco, in Madison, Wisconsin -- and they are often

using some version of wireless networking, in partnership with companies like Earthlink and Google.

All this is good. Actually, all this is really great for consumers. And we need to be careful not to create a policy that stops this new competition before it really gets underway.

What do I think? Well, like Bill Clinton and Tony Blair, more generally, and Rob Atkinson and Phil Weiser -- I don't know if Phil is here today; I know he is on a panel tomorrow -- more specifically, many of us are looking for a third way. There should be room for broadband providers to compete in the way they want, and there should be incentives for them to innovate.

But at the same time, my sense is that some form of net neutrality, some restriction on their ability to charge for tiered access, may be important and may be very important if we are going to continue to get the types of creative new content and applications from the Web that we have marveled at over the past few years.

One possible approach -- and, by the way, let me just make clear that I haven't reached any final conclusions, and I think all of us at the Commission are really trying to think this issue through -- we always learn something new when we do these workshops. We always learn something new when we write reports.

Michael Salinger has told me that on many occasions -- our head of the bureau of economics.

But one possible approach would be to use the consent order for the recent AT&T/BellSouth merger as a point of departure. In AT&T/BellSouth, AT&T agreed not to charge web-based application and content providers to access AT&T's last mile. The restriction included some exceptions, principally relating to a television subscription service that allows AT&T to use its own network in ways that other could not.

It seems possible that there are other services that could be provided better over a private network, than over the Internet. Perhaps when a carrier can demonstrate that such use is pro-competitive, it should be allowed to do so in an unfettered way.

In the AT&T/BellSouth merger, for example, AT&T wanted to use its network to compete in otherwise very concentrated cable television markets. Broadband providers could also be allowed to do more when the market for the services that it wants to sell is otherwise competitive, as might be the case if there is a third broadband piped to the home, whether that's broadband by power lines, municipal broadband, broadband by implants through the brain, whatever.

(Laughter.)

COMMISSIONER LEIBOWITZ: Or, if unaffiliated companies can provide the same service over the incumbent's own Internet connection.

Finally -- and enough of the substance -- one question that I have been asked recently is, "Well, if Congress ever reaches a stage where it is close to enacting legislation on the issue, or even if it doesn't, because we have existing telecommunications laws and anti-trust laws, what agency should be the one to enforce any rules of the road?"

And, really, it's been a question I have been asked frequently, and very frequently in recent days. Well, look. The FCC is a terrific agency. It has loads of experience regulating the telecommunications industry. It certainly has a major role to play, and I don't think that should change.

But with respect to broadband, it's important to remember that net neutrality touches at the heart of precisely what the FTC does: consumer protection and competition. Law makers who are debating net neutrality measures in the coming months need to keep that in mind. And they also need to keep in mind that we are an enforcement agency, not a regulatory one. Though, from my perspective, that seems as much as a strength as it does a weakness.

Ultimately, picking one agency to enforce net neutrality to the exclusion of the other is sort of a false dichotomy, a false choice. There is clearly room for both, and probably some room for the Justice Department, as long as there is a common carrier exemption.

(Laughter.)

COMMISSIONER LEIBOWITZ: These are just some ideas. Doubtless, you will hear others in the upcoming panel, which includes the legendary Alfred Kahn, Fred Kahn, who has come all the way from Ithaca on this snowy, wintery, mixey day, is full of articulate thinkers with ideas across the philosophical spectrum.

The important thing to remember over the next day, though, is for everyone to listen to the concerns of the other side with the same degree of respect that you have listened to me. Or, better yet, with the same degree of respect with which you listened to the chairman, earlier this morning.

In that way, we can start the process of developing a policy that, even if it doesn't make every interest group happy, does benefit consumers, and doesn't fulfill anyone's worst fears of misery and wretchedness, either.

Thank you so much. I will quit, and maybe I

will take one or two questions, then I will let you guys go to the panel. Unless there are no questions, in which case I will let you guys go right to the panel.

(No response.)

COMMISSIONER LEIBOWITZ: All right. Thank you so much.

(Applause.)

MR. SALINGER: Thank you, Commissioner. As Commissioner Leibowitz mentioned, I am Michael Salinger, I am the Director of the Bureau of Economics at the FTC.

This panel, we are going to talk about what is, in some ways, a new issue, with respect to net neutrality. But in other ways, an issue that has come up whenever we have had to deal with the delivery of content. There was delivery and content, so we -- even going back to movie theaters, at least, and there is probably something going back to ancient Rome.

We have a very distinguished panel today to help us with these issues. We're going to start out with Joe Farrell.

More years ago than either of us would like to admit, I can tell you that Joe Farrell was a great ultimate frisbee player, which was the first time that I realized that he understood the delivery and reception of things through the air.

That is, of course, not the reason we have him here today. He is a professor of economics at Berkeley. He has also had a distinguished career in government, having served as the chief economist, both at the Federal Communications Commission, and at the Department of Justice. So he is certainly well suited to help us think through the relative roles of regulation and anti-trust. So, Joe, will you lead us off?

MR. FARRELL: All right. I am going to try to go fast, because Michael didn't admit to it, but they have us on a very tight schedule here. So, the overview of my little talk.

First of all, I think there are real reasons for concern. I am going to try to be the first panelist of the day -- and maybe the only one of the two days -- whose bottom line on this you will have trouble guessing until the last minute.

I think there are some real reasons for concern, and opponents of net neutrality regulation who claim that there are no problems are mistaken. I see three real reasons for concern.

Number one, for reasons that I am going to try to explain extremely briefly -- and that may well not work -- charges by last mile providers to content providers may, in their true economic incidence, actually

be paid, in substantial part, by customers of broadband competitors. And that raises, potentially, some serious competition policy concerns.

Secondly, there is a concern if you allow last mile providers to make charges on content providers, there is a concern about possible expropriation of successful content providers. And third, there is a possible concern about inefficient or harmful leverage.

However, although these concerns are all, I think, substantial and worth worrying about, at least some of them are quite uncertain. The economic conditions for them to be significant problems are not only real conditions -- that is, they might not be real problems -- but also very hard to observe, and pin down.

So, the real issue is what to do in a case where there are potentially serious problems, but things may, in fact, be okay. And following on Commissioner Leibowitz's suggestion of a third way, I am going to ask whether there is an appealing middle ground.

Okay, so the first issue that I want to raise is actually not, I think, the most important, but is perhaps the clearest, in terms of the incentives. In traditional telephony, we have what has been known as the terminating access problem, and that is the following issue.

When a phone company charges other callers -- or the telephone company of callers -- to call its customers, that's called terminating access charges. Question is, who pays that?

And for reasons that I don't have time to get into, with certain common industry practices -- in this case, mandated by law -- it's not just calls involving this company's customers, whose prices go up. It's all long distance calls.

I think it's very possible -- although not guaranteed -- that, similarly, if Comcast starts to charge Amazon when a Comcast broadband customer deals with Amazon, that the charges will be born not just by Amazon or by Comcast customers, but also by, let's say, AT&T customers.

And this ability to collect money from and/or impose costs on customers of your rival strikes me as if it's large and significant -- which we haven't, of course, established -- potentially a very serious concern.

Second concern, expropriation. Google is very successful. Will Comcast charge Google to access Comcast customers in a way whose price is based on Google's success, and that, therefore, in some sense, very seriously risks expropriating some of the fruits of

Google's success, charging more for such access, since Google, perhaps, has a higher willingness to pay? Or, is it the other way around? Maybe Google would charge Comcast. We don't know.

I am going to skip over the second bullet there. Third, number three, leverage. If the broadband provider is integrated into profitable content -- and in particular, both of the main typical broadband providers that we have these days are integrated into, at the margin, profitable content, TV and phone businesses -- a broadband provider is likely to resist substitutes, unless it can charge them, unless it can and does charge them a comparable contribution. Madison River, arguably, was a case of this.

There is a question of in what circumstances this is actually inefficient, or harmful to consumers. And in what circumstances it merely preserves a historic, and not necessarily very appealing, pricing model, but doesn't necessarily do a lot of harm in itself? And perhaps we will come back to that?

Okay. So, I wrote with Phil Weiser a paper on the internalization of complementary efficiencies, acronymized to ICE, arguing, and then qualifying the argument, that a broadband provider, of course, wants customers to value its product. And at the grandest

level, that desire encourages good platform management, which means, among other things, encouraging attractive applications providers.

But, of course, that's not the only thing that it wants. Okay? And, in particular, given that it does face some competition, there may well be an incentive for a large broadband provider to weaken independent content providers, or assign them to exclusives, in such a way that a smaller rival has less attractive content available to it. And it might be worth doing that, even if, as a collateral cost, the content available to your own subscribers is not quite as appealing as it might otherwise be.

A second reason for concern is the desire -- which I think is going to be very strong in this business, with substantial short-run market power, to say the least, and very large fixed and sunk costs -- second concern is the desire to do price discrimination. Price discrimination, as you have probably all heard many economists say in forums like this, is not necessarily harmful. And that's correct, given the other alternatives available.

But the desire to be able to engage in price discrimination is an important motivator for extending control beyond what is efficient. So, how do we think

about that trade-off?

Okay. So, here is the uncertainty. Predicting what behavior will be like if it is not controlled by some kind of rules is pretty hard, okay? Does that imply, as some might suggest, that we should regulate, because there is a risk of something going wrong if we don't?

So, I think that is the Lawrence Lessig view -- things are working very well, let's try to make sure that they don't get broken by misguided selfishness. Or does it imply we should not regulate, because things might be fine without regulation and/or regulation might provide some problems. That debate tends to be conducted at a very ideological and not very analytical level. And that may, in fact, be the central debate here. So it would be nice if we could raise the level of that.

What should it depend on? Well, it should depend, of course, on the probabilities of there being a problem. But we don't know those probabilities. And it should depend on the ability if you don't regulate, now, to address problems later. Or, if you do regulate now, and see that the regulation is counter-productive, to address those problems later.

So, can you do that? It's often been suggested, I think -- or certainly sometimes been

suggested -- that because these problems are, in a broad sense, competition problems, you could address them ex post with anti-trust. I will hope to say more about this later in the discussion. I am not convinced that anti-trust, as currently enforced, is going to do a good job on those potential problems.

How do you poise yourself to act, then, if that's the way to go? Perhaps you need to establish some clear understanding of what the principles are, and set up some agency -- which could be courts, or could be some other agency, with a will and ability to act.

One interesting point here is there are two models of doing that. One is you're going to prevent problems as they come up, ex post, you're going to cure them. For that, you need rapid and predictable enforcement. Another is you're not going to try to do that; you're going to deter misbehavior through some kind of -- to put it crudely -- punishment strategy. For that, of course, you don't need rapid or predictable enforcement, you just need very hard-nosed enforcement.

All right. Is there a middle ground? Broadband providers mostly say they want to be able to control harmful content, they want to be able to charge for congestion and higher speed, and so on. Net neutrality advocates, I think, mostly say they are

concerned about expropriation and about leverage. I haven't heard many of them talk about the terminating access problem, but you could add that.

There is a gap in there. Does that gap suggest the possibility of win-win rules? And if so, an important thing to do would be to explore those, explore how they work, and make sure they're win-win-win, where the third win is perhaps the most important: consumers, rather than just the participants.

MR. SALINGER: Thank you, Joe. I'm going to turn next to Greg Rosston. Greg is currently the deputy director of the Stanford Institute for Economic Policy Research at Stanford. He also is -- has had a career at the FCC, where he was the deputy chief economist. He has written extensively about the application of economics to telecommunications, and I am sure he will tell us about those principles now.

MR. ROSSTON: Thank you. And it is sort of tough going after Joe, because I agree with almost everything he said. What I will do is I'm going to expand on a couple of ideas that I had that will, hopefully, complement what he has said on these things, and express a little bit more -- as the guy from Silicon Valley, I don't have any Power Point slides.

(Laughter.)

MR. ROSSTON: So, the first thing for me -- and I think an important question for the FTC -- is to think, you know, what is network neutrality? What does it mean? And you get lots of different definitions. And I think that's a key question in order to say, "Should we do something?" Well, what is it you're planning to do, and what do you mean?

And I think that was -- and that's part of what Joe said, was, you know, should we do something? Well, it depends on what "do something" means. Whether, you know, in addition to what's the probability of there being a harm, what's the action you're going to take, in order to do that?

This debate has sort of been, you know, about -- again, you've heard this -- the horribles on one side versus the horribles on the other side. You know, both of them, I think -- I think both sides overstate things. When I hear the cable companies and telephone companies say, "Well, there is no need to regulate because we don't do anything bad, and we're not doing these things you're going to regulate and prevent us from doing," I think, "Well, then you shouldn't have a problem, if you say you're not going to do them."

(Laughter.)

MR. ROSSTON: On the other hand, you know,

there is this problem of regulating and not knowing what the incentive effects are from a regulation. So you need to think about both sides of this, and try again -- I think that putting this as a more dispassionate argument about thinking about what people's incentives are, and what are the effects of regulation, are really the important way of doing this.

Again, to compliment Joe and Phil Weiser, I recommend that everybody read their ICE paper. It is -- it really sets forth the incentives for a vertically integrated firm, or for vertical restrictions by firm. So you should definitely read that paper, if you're at all interested in this issue and the economics behind it.

In that, sort of -- one of the things in traditional anti-trust economics has been that, for vertical integration -- which I -- or vertical problems in -- for vertical issues to arise, you generally have market power at one level in this. We have lots of pro-competitive vertical relationships even when there is a market power at one level. But when you try -- when you get away from market power at one level, you tend to have less problems in vertical relationships if you don't have market power.

The one caveat to that is the point that Joe brought up about the terminating monopoly. In some

sense, you do have a -- you do have market power, still, in this terminating monopoly. But in most other instances, this vertical relationships issue goes away substantially if you have competition instead of market power at the level.

But when you do have this market power, you do have issues -- and I won't go through them -- these vertical relationship -- do have incentives for somebody to exploit it. They can expropriate and cause problems for innovation.

In this case, I think the key that I want to focus on is that -- one of the key policies that should be promoted is, how do you get rid of this duopoly that we have, and get triopoly, quadopoly, whatever you want to call it, and get more competition at the level of bringing broadband access to people's homes? And that would go a good way to solving a lot of the problems.

There have been people who still are concerned with this terminating access problem. I want to -- you know, one of the ideas is that you look at Europe, and the cell phones have extremely high terminating payments for calls. But one of the things that happens there -- and this is where I slightly disagree with Joe -- is that if you call a landline phone in Europe, you pay a different price than if you call a mobile phone. So

there is a price difference.

In these terminating access problems that we had in rural telephone companies in the United States, there was no price difference. So, that way, you leveraged it onto other customers who weren't actually calling those people.

So, if we get -- generally, though, getting more spectrum out, trying to reduce restrictions on broadband over power lines, but the key is making sure, for example, when we get more spectrum out, that we actually enforce the anti-trust laws and make sure that we have the ability to have multiple competitors providing broadband access to the home. And that is going to help alleviate these concerns. In my mind, this is a much better way than trying to mandate network neutrality.

One of the other things that you want to think about is if you're trying to encourage competition, and encourage new entrants to come in, you might want to let them -- you probably want to let them do as much as possible, in order to have the returns to their investment.

And some of these vertical relationships that people are concerned about that may increase the profits of a new entrant may be the thing that is necessary, in

order to get a new entrant, in order to compete.

So, you may want to think about how do we balance between regulations on incumbents versus new entrants. There may be a justification for differential regulation, if you think there is a problem and your whole goal is to encourage new entry.

So -- but on the other hand, you do need to have incentives to -- for the incumbents to upgrade their networks, as well, and to try to provide higher-speed access. So, you want to make sure that people have incentives to upgrade, but also to not have incentives to take advantage of customers and to forestall innovation.

I realize this has sort of been a high-level talk. And not coming down on a particular side, but trying to highlight the issues that you need to be concerned with in thinking about what regulations might be.

The other thing that I want to talk about is what do you do, as a regulator? What would one do if one said, "Okay, you need to think about whether you want to institute a regulation ex post or ex ante" -- or ex-ante regulation or ex-post enforcement. And you want to think about the two pieces that Joe said, the probability and the efficacy of ex-post enforcement, the probability of a harm, but you also need to think about the relative

effectiveness of ex-ante regulation and ex-post enforcement, and also what incentives these create for firms to provide services to consumers.

So, my bottom line is, try to increase the competition to get rid of the market power problem at one level, and worry about -- think about the terminating access problem, but I'm not sure that that's as big a problem as making sure that you get competition there. So I think I will leave it at that.

MR. SALINGER: Great, thank you. Our next speaker is Simon Wilkie. He is the director of the Center for Communications Law and Policy at the USC Law School, and professor of economics at the Annenberg School of Communications. And he is also a former chief economist at the Federal Communications Commission.

MR. WILKIE: I am going to do a multi-media presentation to myself. I have got slides, I have got notes, and I have props. And what I want to do is achieve three things in this talk. The first thing is I want to follow up on Joe and Greg, and basically I am going to be singing the same tune. So you all have heard that before. And in fact, Commissioner Leibowitz set the tone exactly right. Let's find the third way.

Then I am going to -- one of the requests that was put to us is if there is an issue, what do we look

at? What data should we be looking at? I am going to give some examples of what the data looks like, and where you can find it, where the bodies are buried, if you will.

And third, I am going to discuss policy alternatives in the light of what the current real-world situation is. There is a lot of, frankly, nonsense written on this topic, particularly in Washington, D.C. And because I only have 10 minutes, I am actually going to start with the punch line and work backwards.

So, I think the punch line is that, as everybody here has suggested, the rhetoric in D.C. on both sides is too extreme. It's not really reflective of reality.

So, therefore, one extreme I think I would not support, for example, the Markey bill. I think the Markey bill causes a lot of harm, potential harm, by discouraging potential innovation. It is also fairly badly worded, in terms of not defining terms in a transparent manner, I feel. I am not a lawyer; I am just pretending to be one.

On the other hand, I don't accept the proposal that this is a competitive market, and it can be completely deregulated. In particular, for the issues that Joe and Greg have mentioned, that the terminating

monopoly is a real issue. It's an issue in every telecommunication market where people interconnect. And the key point is -- and the language, formal language of economics, when we study two-sided markets, when consumers at one end, single home versus multi-home.

And I will talk about a subtle difference. When I was at the FCC, when I felt that we could completely deregulate a market versus why I think that's an issue here. And it's all got to do with the difference between single homing and multi-homing, something that, again, Joe has written on.

I also want to emphasize a point Greg raised that -- a good point for people to start with is to read Joe and Phil Weiser's paper. And I would suggest, given -- this is where I'm paid off by Joe, here -- I would also suggest that people could also learn a lot by looking at the works that Pat DeGraba did while he was at the FCC, where he studied the rationales for interconnection regimes based on bill-and-keep and Atkinson and Barnekov.

It turns out, for a surprisingly wide level of situations, what we have today is actually optimal. So that suggests that perhaps we don't have to do much. So that's my punch line. So, let me back up to where we are.

Before that, I want to give a pitch. As was mentioned, I am at the Annenberg Center, amongst other things. The Annenberg Center is a fantastic location with lots of money in a beautiful building in Los Angeles. And one of the things that we like to do there is to take people out of D.C., wine them and dine them. We recently celebrated the tenth anniversary of the 1996 Act with dinner at Patina and a couple of cases of 1996 -- seems, how we were looking backwards, we thought we should have French wine. Sorry.

So, one of the things we did is we locked the industry participants, who are normally vociferous in Washington, D.C., in this nice environment, to see if we could come to some consensus. Remarkably, we almost did. And those principles that people, at one level, would agree with -- it's not a complete consensus, as I mentioned -- are on our website, which is www.cclp.usc.edu.

And basically, the idea is to sort of modify, if you will, Michael Powell's four Internet freedoms to say that, rather than enforcing non-discrimination, that, essentially, the gist of the proposal is that consumers should have the choice of a net neutral package being offered to them. That is, we should establish a floor, a baseline level.

So, for instance, at 1.25 megabits per second, we can deliver that to pretty much everybody in America, with the current infrastructure that we have now. So we're not discouraging any new potential investment. So, if firms offered vanilla, which is a net neutral package that everybody can get today, and then above that level all bets are off, that would be one approach.

The caveat might be that you might want to add that tiering and offering higher levels of prioritization are allowable, but they would have to be offered on a non-discriminatory basis, or what economists call "second degree price discrimination," that is, the prices are functions of the level of functionality offered, not the identity of the customer. Okay. So that would, in particular, exclude foreclosure.

So, there was a fair amount of consensus to support those type of ideas. So, working backwards from my conclusion to my second point, which is where are the bodies, as Joe mentioned, the terminating monopoly problem -- and Greg alluded to the issues in Europe -- the data can be found at the end of the FCC's wireless competition report each year, where it compares countries where, like the United States and Canada -- and Hong Kong, where the user pays, or I pay for every call coming in, that means I actually see the entire cost of my phone

bill, right?

So, if my phone company -- if T-Mobile decides to raise the rates to me, then I can switch to Verizon. There is a lot of competitive pressure for me to shop around.

On the other hand, in countries in Europe, the billing goes the other way. That is, it's the person who initiates the call pays the termination fee. That way, if my carrier raises its termination rate, it doesn't affect me. I, the customer, as Joe pointed out, have no incentive. So we have just changed, if you will, the property rights of who is paying for the call. It's not really a regulatory issue.

And the equilibrium changes from a competitive equilibrium to the monopoly equilibrium. There is a great paper written by Jean Jacques Laffont and Patrick Rey in the Rand Journal several years ago, which explains how this change in the rules gets you to the monopoly equilibrium. This is an endemic problem in Europe.

And -- I think Chris Libertelli is in the room -- if you use Skype, you see that Skype-to-Skype calls are free to Europe. I think to a landline it's three cents. As Greg mentioned, there is a disparity in the termination prices, and the disparity shows up in the Skype pricing. I think it's $.03 to a landline, and $.21

-- these are Euro cents -- oh, it's $.02 -- Chris has got two fingers up there -- so it's $.02 to a landline, and $.23 to a cell phone. So the terminating monopoly price is $.21.

How does this impact consumers? Well, in the U.S., we pay -- my data is a year old, because these slides are a little bit old -- an average of -- carriers receive revenue of $.08 a minute, per minute calls. It's now down to $.07, I think. If there is anybody from the wireless bureau? The U.S. consumer yaks on their phone for an average of 680 minutes a month. Some of the cheaper carriers are even higher.

If we go to the UK, which also has five large carriers, it's basically prices are four times higher, and consumers use the phone one quarter of the time. So we go to an average revenue of $.21 a minute from $.07 a minute -- well, 3 times, then -- and they use the phone for about 150 minutes a month.

Germany, it's even worse. So, basically, just that single change of where the fee is recovered for terminating the call, the closer you get to the end point, the bigger the problem. Okay?

We can look at that is it's the same across every country in the world. In the U.S., Greg also mentioned we have the problem with the rural, and the

comparable, we had the problem of the CLEC money pump, that I could set up a CLEC, just take ISPs as my customers, that have a very high termination charge.

By the way, this is going on at the moment. Does anybody use freeconferencecalls.com?

(No response.)

MR. WILKIE: So, here we have this thing going in spades, exactly. You can do it for free, because they are stiffing your carrier of the termination charge.

The other example is in the international settlements arena, where at one of our conferences we had the former chief of the international bureau saying how these international competitors negotiated the deals, where the U.S. would say, "Well, how about $1 a minute," and the other country would say, "Well, why not $2?" And the U.S. is, "$2.50." So, we bargained our way all the way up to the monopoly price.

The U.S. became enlightened, and became the force of bargaining these calls down to zero, which, in the model, turns out to be the efficient optimal price, in many cases. That led to a new phenomenon called whip sawing. So, you know, in the international arena, the U.S. fights this in the WTO. Whip sawing is where a country plays one U.S. carrier against each other, trying to offer monopoly rights to reach that country.

So, it's exactly the type of foreclosure that certain opponents of net neutrality say can never happen. We deal with it all the time in telecom. So, the FTC can look at these cases.

My final example that I wanted to talk about is what happens in Australia, in the Australian cable market. So, for instance, Australia was late to the cable market. Australia is very similar to the United States, in terms of population and demographics. The U.S., we have 88 percent market penetration for cable TV or satellite, for pay-TV -- MVPD, in the arcane lingo of the FCC.

Australia decided to go one better, that rather than licensing monopolies, they would license duopolies, so that we would have two competitors, okay? However, in the U.S., we have what are called the program access rules, which says a cable company couldn't foreclose its competitors by buying programming, vertically integrating, and not selling that programming to its competitors. This has been a very effective tool to spur competition. It's a regulation; no doubt about it.

Australia did not have that. So what happens in Australia? You have two cable systems, both with half the channels. If you want to watch both Cary Grant and Humphrey Bogart, you're out of luck. What's the market

penetration in Australia? Twenty-two percent.

So, again, you get this diminution of consumer surplus by a huge margin. And so, the argument that you can't have this emerging -- this sort of vertical foreclosure emerging in equilibrium is just nonsense, because the incumbents have the maximum incentive to differentiate the product.

That said -- and I am out of time -- on the contra side, there still is this issue of providing enough money to incent the last mile investment. So therefore, try and stop the absolute abuse of monopoly power, but don't stop charging a premium for enhancements. Thank you.

MR. SALINGER: Thank you, Simon. For people concerned about foreclosure of content by delivery providers, I would observe that the FTC is the deliverer of this conference, and we have had a lot of people from the FCC -- former officials from the FCC. But we do have one former FTC official, which is Tom -- briefly -- Tom Lenard worked at the FTC, as well as the OMB and the Council on Wage and Price Stability.

Currently, he is the senior fellow and senior vice president at the Progress and Freedom Foundation. He has written extensively on telecommunications issues, including a recent book about net neutrality. Tom?

MR. LENARD: Well, I think I am going to be less of a third way type than the previous speakers, if that's the way they describe themselves. However, I will join them in heartily endorsing the Phil Weiser paper, which is a great paper.

You know, I think the question really is whether we ought to be concerned about what really are pretty hypothetical concerns about market failure and market power, and those types of issues, when it's really not even clear yet what viable business models for broadband are going to look like, and how we are going to be able to develop viable business models that are going to cover, you know, the really large costs of building out the infrastructure.

It seems to me there are three pretty salient facts about the broadband business. One is that it is a very young business, if not still in its infancy, not very far out of it. The second is that it is a distribution business. And the third, that it is a business that is characterized by very large, up-front costs.

So, you know, as the industry evolves, it is unclear what the viable business models are going to look like for this industry. But arrangements that might be viewed as not neutral, or discriminatory, are very common

in the distribution business -- and they are very common in businesses in which there are a large portion of the costs are up front, which is obviously the case with both the broadband distribution business and with the content that it delivers.

And, in fact, such non-neutral business models may very well be essential to provide sufficient revenues to cover the costs of these investments. In addition, some viable business models are almost certainly going to require that broadband be bundled with content, which is, again, very typical of distribution businesses. So what may be needed for a successful business model may be a bundled product offering that is sufficiently attractive to attract enough consumers to become subscribers at prices that are going to pay off the costs of these very large investments.

While these bundled broadband content business models may be needed to drive the necessary increases in subscribership, it is also going to be the case that consumers are going to demand broad access to the Internet, and to the content that is available. I mean, it is very common for vendors and distribution businesses that sell consumer goods and services to consumers to sell their own products and services, along with those of other vendors.

Competitors content can increase subscribership at very low, or perhaps even zero, marginal cost. So it's not going to be in the provider's interest to block content that consumers want, and thereby lose subscribers that are going to be high-margin subscribers.

And I think it is also critical to think about net neutrality regulation in terms -- and it's been mentioned before, obviously -- of its effect on entry. So, the ability to bundle, make exclusive deals, otherwise have non-neutral business models, may be key to facilitating entry.

So, a possible example of this is the Clearwire Bell Canada deal in which Clearwire entered into some sort of an exclusive deal with Bell Canada to provide services in exchange for a $100 million investment.

Now, Clearwire doesn't block other VoIP providers, apparently, but assume, for the sake of argument, that it does discriminate in favor of its own VoIP provider in some way. A net neutrality requirement would preclude such a deal, and might deter a company like Clearwire from entering the market as a new platform to compete with the incumbent platforms, and certainly would make such entry more difficult, which is exactly the opposite of what we want to do.

And, of course, all of this is before we

consider capacity constraints, because obviously, under congested conditions, efficiency is going to require charging positive prices, and some of these pricing arrangements might also be considered non-neutral, or discriminatory, from a regulatory perspective.

Now, what if there is insufficient competition? In my view, at the present time, even with a relatively small number of competitors, there is pretty intense competition for customers. And the recent FCC data indicates that, actually, that competition is growing pretty rapidly. With the most recent report, all of a sudden, you know, 11 million mobile broadband wireless subscribers.

But even if broadband was a monopoly, the case is pretty tenuous. And again, I read the Farrell/Weiser paper -- it was one of the first things I read a couple of years ago, when I started thinking about the net neutrality issue. And it's such a nice, clear paper. And I was convinced, after reading the paper, that, you know, this is not a real problem. Unfortunately, neither of the authors of the paper were similarly convinced.

(Laughter.)

MR. LENARD: But, you know, the ICE -- you know, the central quote from ICE is -- which is, interestingly, kind of a follow-on to the one monopoly

rent theorem, which claims that, "Even a monopolist has incentives" -- this is a direct quote -- "to provide access to its platform when it is efficient to do so, and deny such access only when access is inefficient." So, it's not, in a monopolist sense, just in general, to try to monopolize an adjacent market and exclude competitors' applications.

So, but what about the exceptions, which were more persuasive to the authors of the article than they were to me? Well, the one that seems to me to be most relevant is the one where, you know, you have a competitor in the adjacent market, which can threaten the primary monopoly. You know, this is what the Microsoft case was all about. A court found that Microsoft had undermined the Netscape browser, because of concerns that it threatened Microsoft's position in the operating system market.

And similarly, net neutrality proponents sometimes argue that broadband providers that are dominant in video or voice markets might discriminate against independent video or Voice over IP, which obviously could potentially occur, but it seems very unlikely that this is going to occur when there is at least some competition in the market. It is hard to envision the Microsoft campaign against Netscape, if

there had been even one significant operating system competitor.

And, of course, when you're talking about new entrants, new entrants don't have any primary monopoly to protect, so that -- it's -- that exception is completely inapplicable. And bundling voice or video with broadband may be the only strategy that makes entry feasible.

This whole debate, net neutrality, is frequently couched in terms of its effect on innovation. You know, and the proponents focus on the harm that compromising the so-called end-to-end principle would cause to innovation, which they maintain occurs at the edges of the network.

There is, unfortunately, a striking lack of concern about the effect on incentives to invest and innovate in the network itself, where broadband providers already, as an indicator, are spending tens of billions of dollars, and where the engineers tell us a lot of innovation is already and will be occurring.

But the advocates of net neutrality raise a specter that applications and content innovators will be deprived of a way to get their new products to consumers, and therefore, will be discouraged from innovating. But it's really difficult to envision this happening in the current broadband environment.

First, there is intense competition in local markets, even sometimes when there are only two providers. And the competition is growing. So, a provider who denies access to content or applications that consumers find valuable is going to reduce the demand for its services.

And moreover, the market for content is not the local market, it is really a national, or even international market. And so, it's very difficult to envision a case where an innovator will not be able to find some outlet for an innovation that truly is worthwhile.

And finally, of course -- which has not really been mentioned much -- there is the well-known distortions associated with common carrier regulation, which is what net neutrality really is. And so, it's really, in my view, much better to apply some sort of a case-by-case approach for alleged abuses to attempt to sort those out that are really anti-competitive. Thanks.

MR. SALINGER: Thank you very much. Our final speaker today literally wrote the book on regulation -- or at least the book on regulation that many of us had to read when we were economics students.

MR. KAHN: A long time ago.

(Laughter.)

MR. SALINGER: He had a distinguished career as a regulator, having chaired the New York Public Service Commission, and he had the ultimate regulatory task of being the chairman of President Carter's Council on Wage and Price Stability. But he is perhaps best known as a deregulator for his stint of having been chairman of the Aeronautics Board, overseeing airline deregulation. He is professor -- I assume emeritus -- at Cornell.

MR. KAHN: Formerly meritorious.

(Laughter.)

MR. SALINGER: Yes. So we are, of course, very pleased to have with us today Dr. Fred Kahn.

MR. KAHN: I am going to have to make a virtue of necessity, and take advantage of my comparative advantage, which is age.

And the thing that I find most distressing about the movement towards network neutrality, apart from -- at least until recently -- its lack of clarity, that it is -- it seems to me to be running the risk of what I have always accused regulators of, which is having a very high marginal propensity to meddle.

Now, I must confess at once that I am going to bring the wisdom of age, and therefore, lack the ability to weigh some of the probabilities that have to be weighed, if one wants to take seriously the arguments of

the proponents of network neutrality. I participated in a time in which we had a remarkable convergence of people who believed in competition, and huge, really diversified proponents of getting the government out of the way, wherever it seemed remotely possible that competition would work.

Let me say in advance that I did, however, have some exposure to Joe Farrell's thinking, and it -- certainly had not ignored my thinking, the danger of the terminating monopoly.

But my very strong inclination, along with the -- Greg Rosston, is it -- and Tom, is to get things right in the first place. And that is to recognize the high degree of ignorance we have about what kind of problems will emerge, if any, number one.

Number two, recognize that a good deal of the advocacy of network neutrality is economically ignorant, and certainly insufficiently cognizant of the kind of consequences of regulating a market that is becoming increasingly competitive.

Let me warn you at the outset that I did have enough contact with the terminating monopolies so as to have a suggestion for -- at least in the interim -- until our ignorance is more nearly dissipated. That may handle the worst concerns of the advocates of network

neutrality.

I certainly begin with a very strong presumption in favor of the deregulation by pointing out, first of all, that I am the only person in the room, I am certain, who ever took a course with Joseph Schumpeter.

(Laughter.)

MR. KAHN: How is that for a qualification? And particularly, in the circumstances that Schumpeter envisioned, in which no one could deny we have the most extreme example of competition by innovation, of the wisdom of being very careful of interfering with those incentives.

Now, I know that every liberal reform in the last -- every reform that has ever been proposed met the objection that it would interfere with investment incentives. But I think also that it's clear that in this particular industry, this dynamic kind of competition is certainly as close to unique as any could be.

And so, I think the lesson of history is be very, very careful that you don't meddle with a process that is clearly characterized by Schumpeterian competition.

The -- now, of course, there is no certainty among economists about the sufficiency of competition

under duopoly. By the same token, it is possible to observe the presence of competition, and the progress of competition. And I testified for Tellus in Canada, that said, "Well, we will talk about deregulation only where we see competition," and particularly facilities-based competition, because facilities-based means low marginal costs, sunk investments.

And therefore, competition, once begun, is not going to be quickly abandoned, particularly when one entrant has a very small part of the market, and has the facilities in place. And in those areas in which the facilities can be reached, and where we have competitive behavior, there above else, the wisdom, I think, of experience is to wait and see what kinds of problems emerge.

Now, the only case I know that has been cited as an argument for some sort of regulatory intervention is the one -- the Madison River case. And a more obvious case of an abuse of a vertical position I cannot imagine. And of course, it was properly treated, pre-emptorially, both in the United States and Canada. That does not get to the sufficiency of the competition in other situations. And the question is the definition of exclusionary tactics. But this, the one that everybody cites, is the most obvious case for which there is a most

obvious answer, I think.

A second observation I want to make is that, so far, in my reading of the literature on network neutrality, I don't see any perception of the meaning of discrimination. Now, the question of what is discrimination or what is not discrimination, it would -- and the opposition to tiering, which seems to be at the heart of the proposal, never -- I never see anybody answer the question whether tiering is discriminatory.

I would have thought that we know that certain uses require much more instantaneous connection -- forgive my using old descriptions -- than voice, VoIP. We know that that is particularly demanding, just as -- God, I hate to go to say something, and now I can't remember what I was going to say -- but the -- I don't see that there is any -- anyone has confronted the question of whether their charging for this preferential delivery is really discriminatory, or whether it does not involve either short-term opportunity costs -- they are slight, I gather.

But it does mean that the people who use e-mail will have slightly less rapid delivery, but without necessarily interfering. There are only certain uses that are particularly demanding of the -- of immediacy of delivery.

I mean, take the wonderful case of remote medical analysis, prescription and, indeed, treatment. Well, if it has opportunity costs in the short run, then it's not discriminatory to charge more for it. And if it has long-term costs, in terms of necessitating more investment in broadband, just as, let's say, video competition by telephone companies with cable companies requires more broadband, then again, it's not discriminatory if it has higher short-term opportunity costs and long-term investment costs.

Now, the one aspect of the network neutrality case that does seem to be demanding of attention is the one that you have described as the terminating access problem. I had certainly, until fairly recently, thought that the presence of competition among originators' access to the Internet would be sufficient to protect a Google in the issuance of access to ultimate customers.

And it was only in time that I became aware that while I saw every reason to charge originators of content, in contrast with some consumer advocates who shall be nameless, who say, "No, all the payments should be made by the ultimate subscribers," well, the analogy to me -- and that's the only way I can think, with analogies -- would be to newspapers.

Would you say that newspapers should be

prohibited from charging advertisers, and should get their money entirely from the people who buy the newspapers? Well, there is the two-sided market, and it is obviously absurd to say that.

Well, the same thing is true of Google, the originators of content, who want access to the public, for purposes of advertising. So again, it is absurd to say charge only you and me, who are the subscribers to DSL or cable modem service. So the two-sided charging is necessary.

Now, that does -- I thought that the presence of competition at the originating level would be sufficient to protect content suppliers in the continued enjoyment of the fruits of their innovation, which I think, of course -- again, Schumpeterian -- I think that's very important.

And I must say that, reading some of the two-sided market literature, and then just looking at Joe's absolutely inscrutable comments, I saw that I was assuming -- I was making a factual assumption that was incorrect, which was that the protection of competition at the originating level was sufficient to protect Google from exploitation, to use a really inappropriate word, not realizing that if Google had found one -- whether it's AT&T or Comcast -- found one to put it on the

Internet, that was sufficient to give it the access to the market that it required.

Fortunately, I have a grandson-in-law who understands that much better than me, and finally said, "No, you have to have some sort of what they call peering agreement, which is that the -- in order for Google to have access to all possible users of its services, even if it originates with one, that does not assure -- if it originates with AT&T, that does not ensure that it gets carried by Comcast, and reverse.

And the light came on over my head, and I said, "Well, what you're really talking about is mandatory interconnection." And that, I gather, the word is "peering." I thought peering was secretly looking in places.

(Laughter.)

MR. KAHN: And so, I see -- again, I think partly influenced by Joe -- that mandatory interconnection seems to be the necessary element to give Google the protection of competition that it requires, and give it the access to the market that, in some sense, it deserves, and avoid being held up at the terminating end.

And, of course, that fits with my basic argument, that anti-trust can and must be sufficient to

handle -- and, remember, mandatory interconnection is an old anti-trust doctrine.

And so, as far as I can see, anti-trust -- I hate to take responsibility away from a regulatory agency, just as I don't like the Trinko decision, which leaves entirely with the ex-post approach, and so I see the intervention of the CRTC in the Madison River kind of thing and the FCC as very important, because it can be done expeditiously.

And finally, of course, if you read the latest article of mine, you will see a repetition of my ancient argument in a book I published with Joel Kerlin 53 years ago, called "Fair Competition: The Law and Economics of Anti-Trust Policy," that fairness of equality of competitive opportunity is the most important aspect of anti-trust, and clearly has to be applied in this kind of situation in the most pre-emptory way possible.

And that, of course, means applying the component pricing, which I call the principle of competitive parity in the cases of people competing with a vertically integrated firm of which they are also dependent.

And beyond that, I would say, for God's sake, don't tinker. We are moving into an age in which liberalism is becoming converted into what people call

"progressivism." And you're going to find that the progressives have a very high marginal propensity to meddle.

(Laughter.)

MR. KAHN: And I am an 18th century 20th century liberal, and it was the combination of those two that played such an important role in the deregulation movement. And on that, I am still unregenerate.

(Applause.)

MR. SALINGER: Well, thank you. Well, one of the themes that has come up is the relative role of regulation, ex-ante versus using anti-trust ex-post, if problems arise.

Joe, you expressed some skepticism about anti-trust. Greg threw in a little jibe about, "Well, if we enforce the anti-trust rules properly." Joe, why don't you tell us a little bit about your reservations about whether anti-trust can -- is up to the task?

MR. FARRELL: Yes. Well, I don't think anti-trust would even take a whack at the terminating access problem. So, I think we are dealing with the expropriation or leverage problems.

I think if you try to bring an anti-trust case these days, where you say, "We were successful. This firm that we essentially have no option but to deal with

is charging us a lot, because we are successful, and that, in the long run, is going to weaken our incentives to innovate and be successful," I don't think you would get past summary judgment. I think the opposing lawyers would say, "Trinko, we don't have to deal with you at all, and so go away."

So, if there are doctrines of fair competition -- and maybe this is an FTC thing more than it's a Justice Department thing -- maybe section five of the FTC Act could and would step in here, I'm not enough of a lawyer to know. But I think Sherman Act, and other kind of primary anti-trust statutes are not going to do much.

I think, Fred, you said Madison River was clear cut, but you also said ECPR, so I am wondering if Madison River had said, "Yes, you can use Vonage, but you have to pay us our quasi-profit for each minute of use of voice telephony that you don't use because you're using Vonage," would that have been okay, or not okay, in your thinking?

MR. KAHN: It sounds to me as though it would not be okay. And I know that the Vonage decision, the intervention by the FCC, didn't handle the terminating monopoly question.

But what I need persuasion, in full recognition of the dangers of regulatory meddling in this situation,

whether the imposition of a requirement of interconnection, in effect, would not suffice to handle the danger of exploitation of the -- at the terminating end. But, of course, that's on the assumption that the competition at the initiating end is sufficient.

And I certainly cannot contend that I assure you that the competition is sufficient. But it's a kind of a -- such a dynamic situation, that I think the costs of trying to impose regulations at that level, I mean, I don't think -- here is an area in which I am totally unqualified, so let me qualify what I am saying.

But if it's true that within a very short time we are going to see the probability of broadband over power lines, and we already have hundreds of cities that have hot spots, Wi-Fi hot spots, and Sprint Nextel is talking about spending -- in conjunction with -- spending several billion, $3 billion over the next 10 years --

MR. FARRELL: Intel.

MR. KAHN: And extending a nationwide WiMAX facility, I mean, for Christ's sake, keep out of the -- expropriate them later, if you will, but don't do it in advance.

MR. SALINGER: Greg, you said something about making sure we enforce the anti-trust laws correctly. What is essential that we need to take the hands off now

and rely on anti-trust later?

MR. ROSSTON: Well, this -- actually, what I said was -- "Make sure we enforce the anti-trust laws," was in response to making sure we get entry in wireless, and it's not that new companies -- that we have multiple companies providing wireless access. It's not that we have the same companies providing both wired and wireless access. So that was what I was saying, was making sure we get additional competition at the last mile level. That was the point about anti-trust laws being enforced correctly that I was trying to make.

MR. SALINGER: Tom, Simon talked about the Australian experience with cable. Why -- how can we be so sure that we are not going to have similar problems with the Internet?

MR. LENARD: Well, I guess what strikes me again about this is that we -- you know, we're talking about kind of -- we're talking about hypothetical problems, or things that may have happened, you know, elsewhere. But we're not -- nobody here has really mentioned any problems here, other than hypothetical problems, things that could happen, you know. There is -- they are theoretically possible, that they might happen.

But to -- it seems to me to, you know, to -- in

the real world of the way regulatory agencies work, with all the pressures on them, all the imperfections in them, to start to institute a regulatory regime that nobody really has a very good idea of how it would actually work, to solve a -- problems that are hypothetical just -- it seems to me to be just -- I mean, I just don't see any way that that could turn out, you know, happily.

MR. SALINGER: Now, I realize --

MR. FARRELL: I'm sorry, can I --

MR. SALINGER: Yes.

MR. FARRELL: I think the "wait and see" approach is likely to be a good approach if conditional waiting and seeing actual problems, we are prepared in advance, and know how, to some extent, to jump in and deal with them effectively then.

And I am not at all convinced that anti-trust, in its present state, would deal with the concerns that are expressed by those who are concerned here. Is there a way to do a "wait and see" model that would work well, using some other set of principles? Could be. I think that would be well worth exploring.

MR. LENARD: I mean, anti-trust is literally an imperfect tool. But do we know any better how to solve the hypothetical problems than that, if we don't wait and see?

MR. FARRELL: I don't think people have been talking about it, because I think people have been saying, "Let's wait and let anti-trust do it."

MR. ROSSTON: I can sort of give a little bit more about -- you know, cable television started out by investing in programmers, and having this because they wanted to get content on the cable systems. And that was one way of sort of -- vertical relationships between the cable programmers and the stuff that rode along.

Now, we have a very different situation in cable, and one of the things you may be -- some people may be concerned or not about something like the NFL Sunday Ticket, which is an exclusive deal with one provider of broadband services, and it may be the case that you think, "Okay, well, NFL decided that this is what they wanted to do."

It could be that, in other cases, that you might have somebody -- if AT&T or Comcast says, "No, you can only be exclusive on us," and -- so if you were concerned about these vertical relationships, these are some examples that may come up that people might be concerned with about how vertical relationships might work.

Sort of conversely, you think about the AT&T case, and what happened in the AT&T case. It was about

having a separate choice of long distance provider. Right now, I bet almost no one in this room has a separate long distance provider for their cell phone. It's a very different thing. Things have changed a lot. And the integration of long distance with your cell phone doesn't cause a vertical problem in most people's minds, because you have a choice of five providers.

MR. SALINGER: Simon, you were trying to jump in there.

MR. WILKIE: Oh, yes. So, I just -- again, I disagree with the description of these things as hypothetical, because again, we are talking about one level network interconnection. So we can look at what history tells us.

However, I would emphasize that we should proceed with caution, and pretty much I agree with the policy recommendations of Fred, which is that smart economists know exactly what the structure of the problem is, and we have dealt with it before.

I mean, Fred dealt with it in the airline industry. Right? If you have competition in take-offs but a monopoly in landing, not so good.

(Laughter.)

MR. WILKIE: So, that's why sort of Fred got it right, that you don't want a terminating monopoly, you

know, on the landing end.

But to go back to Joe's point about expropriation, we also have evidence right in front of us today, which I am going to do -- here is my cheap stunt -- if I go into the streaming video business, and want to, you know, show goofy videos to people online, if they want to access them with this device, it's perfectly fine. Why? Because of the legacy Title II regulation, much of which shouldn't be swept away.

If I want consumers to be able to access this content with this device, which is under a different regulatory framework, then the carriers in the U.S. demand 50 percent of my revenue, in order to get on to the device.

So, suppose I invent a product with a 40 percent profit margin that creates huge benefits to consumers, it's not going to be delivered to this device in the equilibrium in the United States at the moment.

If we go to Korea -- I just had an international conference of regulators at my center -- in Korea, the number is 20 percent. In Japan, the number is 11 percent. Now, this is actually where I agree. I even say, "Is there a cause for regulatory action and intervention? Should we start regulating content on these devices?" I would say no.

Actually, the problem is the lack of spectrum. This is an identifiable problem. It impedes innovation. And we know it, just by looking at the difference in the video content available for this, versus the video content available for this. So it is a real problem. Don't deny that it's just hypothetical, but I don't think it actually requires regulatory action. So in that sense, I'm right with -- I agree with Fred.

MR. SALINGER: We have a question from the audience.

MR. WILKIE: And Greg --

MR. SALINGER: Fred, you said that, really, all we need to do is mandate interconnection. But that begs the question, interconnection at what price? If we mandate interconnection, are we necessarily going to get into messy price regulation?

MR. KAHN: I don't know the answer, but under the peering arrangement, how -- do you know how the pricing -- the charging by the connecting carrier is arranged, or is it simply this kind of bill-and-keep?

MR. WILKIE: It's bill-and-keep at the tier one level. The big eight guys do bill-and-keep.

MR. LENARD: But they agree to it themselves. That's not mandated.

MR. WILKIE: It's not regulated, correct.

MR. KAHN: It's not regulated, yes.

MR. WILKIE: Right.

MR. SALINGER: So, this is a question for anyone. Do lock-in or substitutability matter? Is it better to reduce lock-in, or increase substitutability through government action, rather than to regulate behavior?

I mean, Greg, you were talking about encouraging entry.

MR. ROSSTON: Right.

MR. SALINGER: Maybe I will start with you on that.

MR. ROSSTON: I mean, you know, there -- when this debate first started as open access in this debate, I think, you know, actually, the debate started in 1887 with the ICC Act. But in this current incarnation, people talked a lot about, "Well, you're locked into your cable carrier, your DSL provider." I don't think the lock-in effects are that high. I have switched between cable and DSL, and I think a lot of people have switched. So lock-in doesn't seem like it's a big problem right now.

If it became -- you know, the bigger problem was e-mail addresses, and it seems like Google has solved that for a lot of people. They're not locked into their

ISP e-mail. So lock-in doesn't seem like it's a big problem, and it should be a big issue in this debate.

MR. SALINGER: Anyone else want to pick up on that?

MR. ROSSTON: Joe is tempted.

MR. SALINGER: Okay. Another question from the audience.

No current wireless provider, including Q Satellite Network, offers Internet connectivity. So, is that --

MR. FARRELL: I don't know that that's factually accurate.

AUDIENCE PARTICIPANT: Just read the card, please.

(Laughter.)

MR. SALINGER: Okay, okay. I will read the card.

AUDIENCE PARTICIPANT: Try not to edit.

MR. SALINGER: They all restrict traffic types that are allowed. How do we get true high-speed Internet connections, when last mile providers restrict both in wired and wireless markets? Terms of service for most wired last mile providers restrict port access, just like wireless now.

I don't think that was a question, so I think

we will move on.

AUDIENCE PARTICIPANT: Excuse me, sir. It was a question.

MR. SALINGER: This is for Joe, and then for the panel to comment.

Do you agree that a goal of our policy should be to encourage investment by the network providers? If so, do you also agree that, to be successful, selling prioritization service depends on the perception of the content provider, that the level of service it will get if it does not buy prioritization will be inferior and inadequate?

In other words, does allowing network providers to charge for prioritization create an incentive for them not to invest in their networks in order to earn more for prioritization?

MR. FARRELL: Okay. So, yes, I certainly think it is a goal, to encourage investment by network providers. And a couple of members of the panel have commented on that.

I would just say one thing about that. I mean, I don't disagree with that; I agree with it. But one of the things -- as I think Gigi Sohn said this morning, one of the things that has been rather special about the Internet is that we really have seen a dramatic success

of the openness and opportunity model, which one can, to some extent, contrast against the control and incentives model.

So, on the Internet, there has been a vast amount of innovation that an economist would look at what's going on and say, "Those people have very little incentive to write for Wikipedia, or to set up an interesting blog," and yet they're doing it.

And I think one of the lessons of the Internet has been, hey, a lot of people actually enjoy creativity, and although, as an economist, I certainly agree that there are kinds of innovation for which you really do need to make sure that the financial incentives are there, I also think it's important to remember that openness to many, many millions of people doing little stuff is quite important.

Now, I think the question on the card was, to some extent, about whether price discrimination creates an incentive to wantonly -- or at least irresponsibly -- not invest in the low-level capacity, so as to be able to charge extra for the higher-level capacity.

There are two conflicting economic forces here. On the one hand, you want the product to be good for everybody, so that you can charge everybody a lot. On the other hand, when you're doing what I would call price

discrimination -- I know Greg Sidak, this morning, claimed that it wasn't, but I think that's an unproductive debate -- when you want to charge differently for different qualities of service in a way that isn't simply charging for the increased marginal cost, there often can be an incentive deliberately, to degrade the low quality service.

The industrial organization book by Tirole, I think, quotes the classic example of the French railroads that spent money to rip the roofs off some railroad cars, so that they could sell really unpleasant service to poor people. So, yes, there is a possibility of that. It is part of the conflicting forces. And we don't necessarily know which direction it goes.

MR. SALINGER: Someone else want to pick up on that?

MR. LENARD: You weren't suggesting that the networks are going to get built by volunteers, earlier?

MR. FARRELL: No, no. I am saying both matter.

MR. SALINGER: If we take a "wait and see" approach, how are -- given that the technology is advancing, how would we know whether there has been a phenomenon of degrading the current slow approach, in order to be able to charge more for the fast approach?

MR. FARRELL: I don't think -- I mean, I

suppose you could do an investigation and find some smoking documents, or something. But I think, in general, it would be very difficult to know. Yes.

MR. WILKIE: I mean, I am -- I think it would be very difficult to know, other than doing, you know, some investigation. And, really, it's a question for the likes of Jon Peha, and the people who look at the protocols inside the router.

MR. FARRELL: But I'm not sure that that's where the complaints are going to come, right? I mean, we haven't heard --

MR. ROSSTON: Oh, no, no, no.

MR. WILKIE: We haven't heard a lot about how the network neutrality concern is that in order to do price discrimination, the networks will keep the ordinary quality of service low. It's a possibility, as I just finished saying, but I don't think that's what people are mostly worried about.

MR. ROSSTON: I think -- yes, I was going to say this is -- you know, there is -- you know, Joe is absolutely right, you know. There is the whole literature about, you know, versioning, and reducing the quality of one good to make sure that people buy the high version.

But is the solution to that saying, "No, you

can't have different versions?" I think that -- you know, the idea of saying you can't charge for higher speed access would probably be substantially worse than this worry about the lower end.

Again, this degrading the lower end becomes less of a problem, the more competition you have for access. And --

MR. FARRELL: Yes.

MR. ROSSTON: And I think that's the key to this question, is thinking about that issue.

MR. FARRELL: Yes. I think some of the issues we have been discussing, I am not convinced that moderate access competition of the kind we have or are likely to get is going to solve it. But on that one, I suspect it would.

MR. KAHN: Simon?

MR. WILKIE: Mm-hmm?

MR. KAHN: You made this contrast between the share that you have to contribute for access of these several countries. Is that simply a description of the inadequacy of competition in the United States in that case? Why is it --

MR. WILKIE: That's a really good question. I couldn't get a good answer when we were asking people, because you sort of have the same market structure,

right? You have different countries with similar numbers of players, and the prices, you know, the rent extraction factor, if you will, varies from 50 to 0.

I think the low numbers in Asia have more to do with the sort of, you know, tacit bullying nature of the government, rather than it being a different equilibrium. That's the best I can come up with, because this -- the only difference is also they have more spectrum.

So, interestingly I guess, Deutsche Telecom -- T-Mobile in Europe is moving towards an open access, or essentially zero termination model. So it might be that they have sufficient spectrum for somebody to break the equilibrium there. That's my conjecture, but it's just a conjecture.

MR. SALINGER: Another question from the audience. If all broadband transports are equivalent, why not have community ownership?

MR. KAHN: Well, I must say that I do not object, in principle, to communities providing their own facilities. It's a form of competition.

Now, you know, I have remarked in the past that differential taxation made the competition unequal. But it's just another form of competitive entry, from my standpoint. I do not regard it with disgust.

MR. FARRELL: I think there are two forms of

the question, and maybe it's worth clarifying.

I think Fred was addressing why not have community ownership of one network, one access provider, in addition, perhaps, to some private ones. I am a big fan of that. I mean, people talk about what a pain it is to compete against the government. At some level, I think the private sector should say, "Bring it on." And we are always talking about how inefficient the government is. Let's prove it by beating you.

The caveat to that, of course, is that if the government provision comes along with a completely bottomless supply of willingless to incur losses, then you can have trouble.

The other form of the question, which is actually the way I was tempted to interpret it, is why have private ownership at all, why not just have community provision? I think that, at least in this country, seems more likely to lead to very serious failure of network investment, and perhaps a failure of helpful imaginativeness in how to run the network. So I wouldn't really be in favor of that. I am in favor of diverse competition, and I think government provision is a legitimate part of that.

MR. SALINGER: Tom, where are you on that?

(Laughter.)

MR. LENARD: The -- you know, the fact is that the studies that have been done -- I think pretty much without exception -- of these publicly-owned, municipally-owned telecom networks show that they are really a terrible deal for the taxpayers who are forced to support them.

They go in, typically, you know, with the rationale that, you know, these services are not being provided by the private sector, they are not -- and that's generally not true, which -- there usually is, typically is, both a telecom company and a cable company.

And when you're talking about, you know, the fiber -- the ones that are laying a lot of fiber, which is very expensive, I think really, without exception, they just lose lots and lots of money, which the taxpayers or the electricity rate payers -- because sometimes these are connected with electric systems -- essentially pay. You know, and citizens are essentially forced to be involuntary shareholders in a bad business.

Now, the wireless ones, I think, are -- in a sense, are too new. But I don't think any of them have been successful, except in very small -- you know, very small areas.

MR. ROSSTON: On the wireless one, you know, it's -- one of the problems is these cities turn around

and act like monopolists again. San Francisco is essentially saying, "We are going to allow one Wi-Fi service to be covering the city. We're going to lease our lights, poles, and conduits to one provider, and we're going to do a deal, and that deal is going to have all sorts of sweet deals for City Hall, and other things like that." It's a really bad idea. It's not serving the citizens, it's serving the elected officials.

What they should do is say, "We like the idea of people providing networks using the city's facilities, but we will allow anybody to use the city facilities, and have more competition." I also -- you know, if this -- if cities do want to put in their own systems, I think -- you know, I think it should be allowed. I am glad I'm not in a city -- that I am paying taxes to a city that is doing it, but I think, you know, for private companies to object to a city coming in would be a really bad thing.

MR. SALINGER: You know, if we look at past technologies where these issues have arisen between -- a relationship between delivery and content, the argument was, "Well, you need to allow -- recognize the potential dangers of vertical integration, but you need to allow investment in content by -- because otherwise, the content is not going to appear, or it's not going to be as good."

With the Internet, it seems like there is ample supply of content. So, what would be wrong with saying, "You're either in delivery or you're in content, but you're not in both?"

MR. FARRELL: I don't think that's a stupid idea. I mean, going back to what I was saying a few minutes ago, an access provider, a delivery provider, does have additional incentives to innovate in content, because they capture the complementarity revenues.

On the other hand, once you allow the access provider to be vertically integrated into something that almost, by definition, is going to be profitable at the margin, you create incentives for them to either exclude or charge -- in a way that's going to be very difficult to keep, aside from expropriation -- rivals in that business.

And so, I am actually -- I would say the vertical separation model is worth exploring. Let me step back. I mean, where are we on this?

I think this topic has been debated, Greg says, since 1800-something. I'm aware of it since 2002, or something.

(Laughter.)

MR. ROSSTON: That's the advantage of gray hair.

MR. FARRELL: Yes. I have to say I think the quality of debate that I have seen has been abysmal, and I hope that we can start to debate things at a somewhat higher level. And it seems like we have lost five years, or something, in not doing that.

So, vertical separation, I think, could be part of the discussion, as could some of these other things. And I think we should get going on a high-level attempt to debate this, and get away from the, "Oh, it's terrible; oh, there is no possible problem" level of debate.

MR. SALINGER: I have a feeling that you're not going to be a fan of vertical separation --

MR. LENARD: I hate to always be disagreeing, but the --

MR. SALINGER: Well, that's why we chose you on the panel.

MR. LENARD: Right. I mean, first -- let me go back -- well, first of all, I don't think there is -- you know, the literature on the results of various vertical separation schemes, I don't think, necessarily supports doing it, especially in something that's so important as the Internet.

And the other thing is that, you know, this -- I am going to go back to the fact that this really is a

pretty young industry, and exactly what -- you know, to freeze -- you know, and a very complicated and fast-moving technology -- and to freeze a particular structure in place now just seems to me to be, you know, when you don't know what the thing would look like in five years, just seems to me to be extremely risky, I mean, just --

MR. KAHN: I certainly agree with Tom, partly out of ignorance. But I think of the times when we had the rules, the financial interest and syndication rules prohibiting broadcasters from having interest in the programming, the trend has been away from that, particularly in the situation of innovation, that to have vertical separation at this time, I -- Joe may want to respond to it, but I would be opposed to freezing this structure.

MR. ROSSTON: There may be efficiencies. You know, there are lots of efficiencies from vertical integration that could arise that -- when you say ample supply of content on the Internet, it's true, there is a lot of stuff out there. But it may not be the right stuff that people want to use that, for example, may cause people to increase their demand for broadband, even though it may be a zero profit on the content side.

So, there are all sorts of relationships that can improve efficiency by having vertical relationships.

And so, I think ruling it out is probably a bad idea. There is -- you know, there are the fears of these ideas of, you know, of expropriation or other things that may come about, but -- and you should worry about those -- but I think ruling out vertical integration is probably a bad idea, at this point in time.

MR. SALINGER: Joe, what would raise the level of debate?

MR. FARRELL: Well, I think, for example, just to talk about -- just talking about vertical separation, what have been the success stories with vertical separation, what have been the failure stories, what do they have in common?

I am pretty interested in that subject, but I don't think I could give you a good answer to that question. And I don't think that the debate on net neutrality has contained any good exposition of the answers to that question.

Can I come back just a moment on vertical integration? I mean, the economic models that say vertical integration helps are, by and large, models that operate at the level of incentives. And incentives are important for innovation, but as I was starting to say a few minutes ago, I mean, I think one of the lessons from the flourishing of the Internet is that incentives are

not the only thing that's important for innovation.

And as Fred was saying, there has been a trend away from vertical separation, and I think that's largely been driven by increased attention to these incentive issues. And I think we want to be very careful not to throw the baby out with the bath water, and lose track of the fact that, although incentives are very important, they are not the only thing that is very important here.

MR. ROSSTON: Fame is an incentive.

MR. KAHN: I got confused about who was the baby, and who was the bath water.

(Laughter.)

MR. LENARD: Let me ask a question. Joe, would it be a bad thing if a network operator wanted to start a search engine?

MR. FARRELL: Wanted to start surcharging for what?

MR. LENARD: Search engine.

MR. FARRELL: Oh, a search engine. Well, I think if -- let me deal with the easy case, first.

I think if the network operator wanted to start a search engine, and not accompany that by either blocking access to Google, or saying to Google, "We now have a private opportunity cost, also known as a lost profits component of private cost of dealing with you, we

are going to charge you some allegedly ECPR-like amount of money."

If neither of those things happen, and they just started a search engine, I think that would be fine. If they did one of those things, that would not necessarily be bad. What that would do was that would enable them to set a pricing structure in which, at some level, whether by money or ads or something, they were charging for the use of the search engine. That would be enabling them to do a more complicated price structure than they would have, otherwise.

And that could help with the second-best pricing problem. It would move us further away from first-best pricing, and it would also raise, I think, a variety of concerns that wouldn't necessarily be a big problem, but that might easily be a problem, having to do with, well, what are they really doing to the incentives of independent content providers? And that's where I think it would get difficult.

MR. SALINGER: WE have five minutes left, and I want to give people a chance to put in a final word. We will go from left to right -- my left to my right.

MR. ROSSTON: Okay. Am I on the far left of the panel?

MR. SALINGER: Yes. I would say, physically,

you are.

MR. ROSSTON: I just -- you know, I think there are -- you know, that my view of this is there are concerns about what a firm, an ISP with market power, can do.

The most important thing, I think, is that the FCC should get more spectrum in the market place, to try to ensure that there are multiple providers of high speed Internet access to consumers, so that consumers have the choice, and that that will help discipline a lot of the problems that we have talked about today.

MR. SALINGER: Simon?

MR. WILKIE: Partially just to echo Greg's comments, but also to add that I think that, you know, to the extent that there is a real issue here, it's not so much the discrimination issue that's been talked about, in terms of speeds.

The tiering is a sensible market approach. But the terminating monopoly problem, the problem of final interconnection is real. And we have something already in place that deals with it. So, just proceed with prudence and caution.

MR. LENARD: Yes, I would kind of stress the Schumpeterian aspect that Fred was talking about, and the relative youth of this industry, that it is, you know,

it's a young, rapidly changing, dynamic industry. And even if things are not, you know, perfect, it is hard to believe -- it's hard to really see how an ex-ante regulatory scheme would make it better.

MR. KAHN: Well, by chance, I have a close analogy between my reference to immediate medical diagnosis, access to records, diagnosis, and treatment requiring this very high-speed access, and an old medical proverb. Above all else, do no harm. And I think that applies to premature efforts to jump in and regulate this industry.

MR. SALINGER: Joe, you get the final word.

MR. FARRELL: Thank you. Well, I think I led off by saying you might not be able to tell where I come out. And, actually, probably five years ago now, Tom Lenard organized a conference on this, where he said he wanted to put together a balanced panel, and I offered to be a balanced panel all by myself.

(Laughter.)

MR. FARRELL: I am very well aware of, I think, most -- certainly a reasonably representative sample -- of the arguments on both sides. I am certainly well alert to the dangers of regulation. I am well aware of the importance of providing good incentives for network, as well as content, investment, and innovation.

So, it's very easy to be the famous two-handed economist. And I'm pretty good at that, actually.

I thought, however, it would be a little irresponsible not to let you know what I would say if I were woken up at 3:00 in the morning and asked to make an immediate decision. And so that's what I would like to leave you with.

Being aware, as I am, of all the -- or many -- good, sound, serious arguments on both sides, as a consumer, I would regard it as very worrisome if I woke up one morning and there was AT&T or Comcast plunging in to the kind of integration and negotiations that we have been talking about.

I have to disclose that that worry is, while informed by my professional expertise, not implied by my professional expertise. It's perfectly possible to be an expert economist and not worry about that. But to be honest, I worry about it. And so, I would like to feel that there is some kind of protection against that kind of thing happening, and against the Internet becoming balkanized.

Whether or not that would be profitable, whether or not it's a very likely concern, I would like to feel protected against it.

MR. SALINGER: Well, thank you to the

panelists.

(Applause.)

MR. BLUMENTHAL: Well, good afternoon, everyone. I am Bill Blumenthal, the Agency's general counsel. And I would like to welcome you to the last panel of the afternoon. We're going to go until about 5:15 today.

The good news, as I say that, you know, for those of you who haven't heard, the federal government is closed. It closed at about 2:00 p.m. So by 5:15, the congestion problem on the roads should have been largely solved. But at the same time, the roads are pretty slick, and I suspect the experience is going to give new meaning to the term "jitter."

Although in all seriousness, the salt cruiser is out there, so the extra hour or two may actually work to your benefit.

For this panel, we're going to be focusing on prioritization, and the charter of the panel is up on the screen. I will just flag quickly what we're going to be talking about, which is quality of service, peering, the prospect of charging fees for prioritized delivery, and there are a whole lot of things that that, in turn, maps into.

The topic, in many ways -- you know, the title

is different from the title of the last panel, but prioritization isn't all that different, conceptually, from discrimination.

And I suspect that the talk is going to focus on many of the same issues. We're going to try to be a little bit more of sort of a technical bias, as opposed to a policy bias, but we will see what emerges, and you know, those of you who are Shakespeare fans know that Richard III is playing a few blocks down the street, and you know, if you run that two or three or four times, the way we're running similar types of themes, there is somewhat different variation in how it actually presents. So, we are going to be going through, again, familiar issues, but with a slightly different twist.

Each of the panelists is going to speak for about 10 minutes with a kick-off set of comments. You know, if they're a little bit long, I'm not going to give them the cane. I will tell you, though, in all seriousness, our order of presentations was chosen by lot, and there is a story behind that, but I am not going to share it right now.

First off will be Alan Davidson, who is Washington policy counsel for Google, a company that I am sure is known to all of you.

Those of you who are in the industry would know

Level 3, as well. But those of you who are not regulars in the industry, our second speaker, John Ryan, is senior vice president and assistant general counsel for Level 3. And Level 3, for those who are not in this stuff day-to-day -- well, anybody who is in it day-to-day would know that Level 3 is one of the six tier one backbone suppliers in the U.S., basically something that emerged from the old Peter Kiewit Sons, way back when.

But it is mainly in the -- well, is it fair to say, John -- the wholesale side of things?

MR. RYAN: Arguably, now in the retail side of things, after the past year.

MR. BLUMENTHAL: In the retail, as well. Best known, probably, though, as a backbone supplier.

Third speaker is going to be Walter McCormick, who is the president and CEO of the United States Telecom Association, which is a trade association representing -- well, the term that is used is the "converged telecommunications industry." I think probably fair to say that most often associated with kind of big telecom. Fair to say? No?

MR. MCCORMICK: Well, our 800 small members think that --

(Laughter.)

MR. MCCORMICK: We have 2 large members, AT&T

and Verizon, and we have 800 smaller members.

MR. BLUMENTHAL: Fair enough. Fourth up is Marius Schwartz, who is the -- a professor of economics at Georgetown, and has a lot of experience in the telecom industry, including years ago at the DoJ antitrust division, if I recall correctly.

And, finally, the fifth speaker is going to be Barbara Tulipane, who is the president and CEO of the Electronic Retailing Association, which is a 500-member trade association based here in D.C. that represents a large portion of the electronic retailing industry.

So, with that -- actually, one more reminder. We are taking questions in the manner that was specified earlier in the morning. I think there are questions cards, and if you do have a question, hold up the card and someone from FTC staff will come on down.

Probably we are going to be going 50 minutes, 60 minutes of straight-through talk, but with Q&A after that. So, with that, let me turn it over to our first speaker, Alan Davidson.

MR. DAVIDSON: Thank you. I would like to just start by saying thank you to the FTC and its staff, for organizing another of the very thoughtful workshops that they have become known for, that are so valuable in exploring these complex and, I guess apparently, abysmal

discussions, here in Washington. So we really appreciate that.

I am Alan Davidson, I am senior policy counsel with Google here in Washington. And I just really wanted to quickly touch on three things that I wanted to cover briefly: first of all, why we believe net neutrality is so important for the health of a competitive Internet, very briefly; secondly, the problems that -- and risks -- that we see with certain types of last mile router-based prioritization, which I really think are the core of the issue that we're here to discuss; and the third thing is to just talk briefly about some of the myths that we see surrounding prioritization and the net neutrality debate.

So, first, net neutrality is critical for the health of a competitive Internet. I have heard a lot about this already today. The Internet has created one of the most innovative and competitive markets in history. Services that we could never have imagined, even a few years ago, now drive economic growth, democratic discourse around the world, and the free exchange of ideas.

And much has been said about this. Success has many fathers. But I think many people acknowledge that this innovation has been made possible by the architecture of the Internet, the open architecture of

the Internet.

On the Internet, consumers choose what they're going to see and do, what services they have access to, what content they are going to access. There are no gate keepers to tell them what they can see and do online. And that principle was a conscious design choice made by the founders of the Internet. It has enabled innovation at all layers of the network, not just at the edge, but in fact, in the network itself. And we value that innovation.

It's that principle that actually enabled companies like Google to rise. Google didn't exist eight years ago. We're a second grader. And we now help nearly 500 million people, users around the world every month, find information and reach services online, billions of searches done here in the United States alone, each month.

As our founders have said, two graduate students in a dorm room with a good idea would not have been able to create this service if the first thing that they had to do was to hire an army of lawyers and try to reach carriage agreements with providers all around the world.

And so, we are very eager to preserve the innovation and openness of the Internet that has allowed

companies like Google to develop. I sense that there is actually a lot of agreement around that idea.

You know, we are here because there has been a change at that -- that puts that openness in jeopardy. It's all the things that people have been talking about. We will continue to explore the situation, in terms of competitiveness in the last mile, the change in the long-standing rules that have governed the openness of the on-ramps in the Internet, and the stated intentions of some of the last mile providers, in terms of what they hope to do and achieve in this environment.

And because of that, we think it's very important that we are having these discussions, and that we have a dedication to try to preserve network neutrality. And I think that's why we have seen such an outpouring of small businesses, consumers, public interest groups from the right, from the left, the Christian Coalition, the AARP, Consumers Union, a million Internet users who signed a petition last year in a "Save the Internet" campaign to preserve the openness of the Internet. So this is something that is obviously of great concern -- and should be of great concern -- to Internet users.

My second point is that prioritization in the last mile creates real concerns. Particularly, we are

concerned that prioritization through router-based discrimination in the last mile degrades computing services, and creates incentives to relegate some of those computing services to a slow lane.

So it's this very particular set of prioritization approaches that we are concerned about. Because in that -- what we're worried about is in that context, the power to prioritize in the last mile effectively becomes the power to control the applications and content that customers can effectively use.

So, imagine, for example, that a last mile provider with market power might be able to use prioritization to, for example, relegate a competing Voice over IP provider to a lower quality slow lane. It might prevent a competing video provider -- prevent a competing video service from accessing a higher tier of priority necessary to provide good service, and preference its own services instead.

Not all network management is anti-competitive prioritization. And there are a lot of things I think many of us agree that are not problematic in this context. So, charging end users, whether it's businesses or consumers, more for more bandwidth, not a problem here.

Providing caching services, like Akamai does?

Not a great concern. Created dedicated IP TV channels for television services? None of us have argued that last mile providers shouldn't be able to do that. We welcome that kind of competition for the existing cable television networks. Stopping denial of service attacks? Not a problem. We think those are all the kinds of reasonable network management that should not be precluded by network neutrality.

The problem is really with this very small set of prioritization activities in the last mile. The ones that give carriers the incentive to degrade competing traffic, and pick winners and losers in the last mile. So what we're worried about is, you know, prioritizing some traffic at the router level in the last mile, at the expense of other traffic. That's one thing that we're worried about.

We're worried about blocking traffic in order to preference other traffic. We're worried about degrading traffic, the same way that Rogers Cable in Canada degraded network video traffic there. We are concerned about creating a fast lane tier of traffic that is susceptible of exclusive dealings. So, things that provide an incentive for there to be a slow lane.

And that's really, you know, I think the core of the concern, is that the only way that you can have a

fast lane that you can charge for, that is useful, is if there are also slow lanes that are less useful, and less attractive.

And so, prioritization that provides an incentive to create slow lanes so that you can charge people for the fast lanes is something that we think is problematic.

Some of the biggest impacts of that kind of prioritization, probably the first and foremost is that it puts new entrants at a major disadvantage, that only those with the ability to pay will be able to benefit from this prioritization. And so, we are quite concerned that the next Google will have a very difficult time being able to get access to these faster lanes.

And as I have said, that that could give a great deal of control over the future services that consumers have access to, to the last mile providers. I would also note that it's not clear to us exactly how this is going to work. You know, it's -- you can't control priority, end to end, right?

So, last mile providers who want to give some sort of priority service, you know, only have control over their own network. It's not obvious to us how you can offer this kind of end-to-end service. It's not obvious to us how you identify the traffic in order to

segregate it, that you're going to give priority to. And how do you do this segregation without degrading other traffic?

Very quickly, a couple of the myths surrounding prioritization. You know, in most cases, prioritization is a solution in search of a problem. It's not clear that there is a compelling need for last mile router-based prioritization. Voice over IP is a great example. There are in excess of 100 million happy Skype users who are getting excellent voice service over the Internet without a prioritization regime in place.

A lot of Voice over IP providers are providing that service without -- over narrow band connections. So this notion, for example, that we have already heard mentioned a couple of times today, this notion that you need prioritization to be able to make services like VoIP work, is just simply not true.

In most cases, the best way to deal with any concerns about prioritization is to provide better broadband, higher bandwidth offerings to consumers. And that's going to be the way to deal with prioritization.

You know, the other thing that we would note is that prioritization is not needed to fund network roll-out. Another argument that is made is, "Hey, if you don't let people do prioritization, they are never going

to be able to fund all this investment in high bandwidth networks."

And you know, there are billions of dollars being spent by consumers and businesses to access the Internet. There are billions more in special access fees being shared by broadband providers. There are going to be new IP TV offerings, there are going to be caching services. All of those are excellent things, and should be -- and we welcome the chance for broadband providers to have these great incentives to invest.

It is simply this very small set of prioritization activities that we worry about. And also that are a tiny, tiny part of the full pie of income that's going to pay for this broadband roll-out, we really actually question how valuable these prioritization services are going to be, ultimately, to the providers.

And so, we think -- you know, I would just summarize by saying, first of all, we welcome the FTC's involvement here. There has been a number of ideas put forward about the potential role of the FTC investigating complaints, requiring disclosure -- which we think is a very welcome idea, and won't be enough to protect consumers, but is a very, very good starting place -- and the kinds of approaches that have been put forward in the

-- for example, by the House Judiciary Committee, in their bill last year. All of those are good places for us to look, in terms of ways to deal with the real concerns here.

There is a good deal of agreement about the fact that more broadband deployment, open broadband deployment, is good for our country, and for consumers. A thriving Internet market place is good for consumers and for the industry. Providing incentives to deploy broadband is critical.

We are in a symbiotic relationship here. The broadband providers -- our industry, let me say, the Internet industry, needs more broadband deployment to get our services out there, and we welcome it. At the same time, we are providing the services and content that drive the demand for those, for that new broadband. And so we need each other, and we need to find ways to work through this.

Hopefully, we will find that there are actually a very small set of things that we really need to work on, and we look forward to working together, with all parts of the industry, and the Commission, and the consumer groups, to find ways to get America the open broadband that it needs. Thanks.

MR. BLUMENTHAL: Alan, thank you. John Ryan,

agree or disagree?

MR. RYAN: Well, agree, in some respects, with the overall principle. But I think we do have a slightly different take on what has to happen. I will start with a confession, which is, generally, you people scare me.

There is a fair amount of intelligence in this room that I can't hope to match, as is evident from the questions that I got, even during the break. I will start by giving -- I want to touch on three areas. I will start by giving you some perspective on our view of the debate, a little bit of open disclosure on what we think the solution is to this risk.

Then I want to touch on the current network reality. We operate a very large IP network, the -- by some measures, the biggest in the world. I think we can share with you what we're seeing happening in the network, or potentially happening in the network, from a prioritization perspective. And then, finally, I would like to discuss some existing and possible future incentives to avoid what I will call anti-competitive prioritization by access network operators.

It seems to me that we have two competing policy objectives here. One is, we want to preserve an open and dynamic and ever-changing Internet experience for all of the subscribers. And the second is, we need

to encourage the continued migration to broadband services, and frankly, encourage and increase the speed and the performance of the broadband services that are delivered to subscribers.

Broadband, in the hands of consumers, is an extremely powerful tool. Sometimes contains powers that even the networks that deployed it didn't understand. And I will demonstrate this by giving you an absurd, or ridiculous, hypothetical.

Let's assume it is five years from now, and broadband over power line has become perfected, and it's being delivered in the market place. And let's assume, at the same time, some innovative applications designer figures out a way to create a marketplace for the purchase of electricity so that you can buy electricity from competing electrical providers over your BPL connection.

Now, it doesn't take a Ph.D. in economics to figure out that that's going to cause concern to the BPL providers. They now have a potential conflict between these two principles. If we permit blocking, or degradation of those electrical purchase bits, the subscriber's use of the Internet is potentially impacted.

On the other hand, if we prohibit blocking, the companies with the ability to deploy broadband might not

do so, because they're going to cannibalize their core revenue.

This absurd and ridiculous hypothetical already happened. Companies in the late 1990s and at the turn of the century were deploying broadband over DSL, only to find out two years later, bingo, Vonage. And those same companies that were deploying DSL suddenly realized they're putting into the hands of their subscribers a tool to make them irrelevant.

So, these are two very important objectives, from a policy perspective. We need to keep our eye on how to satisfy both of those objectives, as we look at potential legal solutions, or policy solutions, to these issues.

We are not an advocate of a network neutrality mandate. Given the choice between regulation to solve a problem, and allowing the market place to solve the problem, we are fans of the market. I was listening earlier, when somebody said that what we're really talking about is looking at regulating, or somehow addressing IP interconnection.

Well, our company has experience on both regulated interconnection with the public-switched telephone network, and non-regulated interconnection on the IP side. And I have to tell you, regulated

interconnection stinks. It may have gotten us where we are on the public switch telephone network, but it is horribly inefficient.

And if you look at the innovation that has been done on the PSTN over the last 100 years -- namely, zero -- you will realize that one of the reasons for that is regulated PSTN interconnection. When you're sitting down and talking to those folks, they do what's in the regs, and that's it.

I have five full-time attorneys and a $2 million outside counsel budget to handle PSTN interconnection. I have half an attorney and zero outside counsel budget to handle IP interconnection. So, if you want to regulate IP interconnection, understand the wet blanket that you're potentially throwing on what appears to be working right now.

Now that we have covered some of the background, I would like to discuss what prioritization is happening. The OECD, I think, has a paper circulating that actually has a very good discussion of packet prioritization. I will borrow a little bit from that, but I will tell you that I am going to correct a little bit, in terms of erroneous terms that I see in the OECD discussion.

They separate prioritization into three

different areas: what they call best efforts prioritization; what they call needs-based prioritization; and then, what they call active prioritization, which I will call source, or type prioritization. That's what Alan was referring to as the third type of potential prioritization.

First, let me be clear. IP networks do prioritize. They have, from the beginning of time. The prioritization that they had in the network at its inception was basically a first in line prioritization, first in/first out. So it's prioritization based on time, and time alone.

That appeals, I think, to our fundamental sense of fairness as a society, although I now am a frequent flyer, so I get to violate that. But it's like the cuts in line that you see at the airport. Doesn't seem fair. "Gee, that guy got to cut in line. Doesn't seem fair." So this notion that first in/first out is the fairest, and therefore, should be the mandated approach to prioritization, we think is a little bit too broad.

The second is needs-based prioritization, and this is happening in the network right now. Needs-based prioritization is a situation where the customer or the user of the network identifies the packets that require delivery quickly. So there are certain time-sensitive

applications that are already running over the Internet.

Video over IP is one example, live streaming video. Our customers don't like delay. And they don't like jitter. And there are ways to reduce delay and jitter by giving packets prioritization. Largely, this occurs in the network right now through the purchase of what are called IP VPNs, or virtual private networks, that operate on an IP basis. It's the functional equivalent of a dedicated circuit, but it operates IP.

And then, within that dedicated circuit, frankly, those customers then will prioritize some of their packets over others. So that is needs-based prioritization. Then there's source or type-based prioritization and this is the one that gets the most play, which is reading a header in a packet.

Every packet has a header that tells you what port it's destined for, and kind of where it's coming from, and what sort of packet it is. The routers now have advanced to the point where you can read that header, and then you can tell the router to treat that packet differently, based on what's in the header.

Priority, frankly, matters most in a constrained capacity environment. We do prioritize on our network at times, but our backbone network runs on multiples of 10 Gig E, and so we've got 2-1/2 networks,

effectively deployed, where one would be sufficient, in order to account for bursts in traffic, in order to account for a portion of the network being pulled down, and those routers having to route traffic over a different physical structure.

So, on our network, I can tell you we will put two packets in at one end in Los Angeles, and say, "Hey, let's give one priority and let's not give the other one priority, and see what happens when they arrive in New York City," and the answer is, you can't tell the difference between the two, at least not right now, on the backbone.

Now, on the access networks, priority does matter, because those networks are not built out to 10 Gig E. And frankly, those networks are not built out to even handle -- if you took all of the subscribers who sit behind a Particular LEC central office, for example, and you said, "Everybody is purchasing 4 megs of traffic, so cumulatively, we have 100 people purchasing 4 megs of traffic, there should be 400 megs of capacity into that LEC's CO and out of it," that capacity is not there. Right?

It's theoretically there, for all of those users, but the truth is, if everybody is using at capacity, the network can't handle it. So that's where

prioritization matters, is in those last mile networks.

Well, what's the risk of -- let me back up. I will say I am not willing to concede that all forms of source or type prioritization are anti-competitive. And likewise, I am also not willing to concede that first-in/first-out routing is always pro-competitive. So, let me give you two examples of why.

First, let's assume there is a new application that somebody has developed that requires a little bit better network performance on the edge of the network, in order to operate. And that better network performance can be achieved by prioritizing the packets associated with that application. I am not sure that I am willing to concede that it's anti-competitive for Verizon to say, "Geez, I would really like to deliver that to my subscribers, so I am going to prioritize it."

Now, if they are able to give away priority, I am also not sure that I see the difference -- meaningfully different -- between giving it away and selling it. Because if you allow them to give it away, I will tell you, eventually they will get value for it in some way, shape, or form.

At the same time, first-in/first-out may not be pro-competitive in every instance. There are circumstances where a first-in/first-out theoretically --

I think it's only theory right now, as Alan indicated -- where first-in/first-out doesn't treat time-sensitive packets sufficiently well, and could be viewed as anti-competitive.

MR. BLUMENTHAL: Well, thank you. Walter?

MR. MCCORMICK: Bill, thank you. I want to join with Alan and John in thanking you and the Chairman and the members of the Commission for organizing this event today.

This is a very, very important public policy debate. This is the information century. We are an information-based economy. Some people refer to this as a net neutrality debate. But what we're really talking about today is regulation of the Internet. It's about whether the government should create and establish rules that would dictate what kinds of services can and cannot be offered, and how broadband networks can and cannot be engineered and operated.

What do we all really want to see next? What we want to see next is a better, faster, and more robust Internet. It is getting easier and easier to imagine a world in which you can sit at home and talk to your doctor, as he or she looks over your blood pressure or heart rate in real time, or work collaboratively with a team from the office without ever leaving your home and

spending an hour in traffic; a world where, if your child needs tutoring, or if you have a sick parent, they can get the help that they need, help that is far more sophisticated, in terms of the communications technology, than a plain old telephone call.

We are confident that a broadband future means a variety of consumer applications that have enormous societal benefits. Broadband can make it possible. But it will take policies that will encourage investment. It will take policies that understand how the Internet works, and reflect the importance of network management, quality of service, and prioritization.

A better Internet doesn't simply come by adding capacity. Like road networks, rail networks, electrical networks, and traditional telephone networks, the advanced networks that comprise the Internet cannot function efficiently and cost-effectively without management. No network has ever been built without regard to prioritization of traffic, peak loads, and capacity management.

Indeed, as John said, traffic is managed on the Internet today. Network management reduces spam, it controls viruses, it enables a host of privacy and security measures which protect consumers. It allows us to manage jitter and latency, making possible phone calls

over the Internet that we can actually understand. It makes possible video streaming.

With regard to prioritization in particular, no doubt that we can all agree that certain services are objectively more important. A communication about your health, for example, is clearly more important than how quickly your kid can download a video featuring the antics of someone's pet hamster.

Those who say outlaw prioritization, prohibit discrimination among bits, require that all packets be treated the same and travel at the same speed -- which is exactly what legislation introduced on Capitol Hill right now would require -- would prohibit a wide array of practices that currently increase the value of the Internet for consumers, and they ignore the need to address the capacity issues that present real challenges, going forward.

One recent report noted that if YouTube alone goes high-def, that would double the capacity needs of the entire Internet. The data involved in one hour of video can equal the total in one year's worth of e-mails.

I am joined on the panel today by Alan. Alan's company and the companies I represent, don't usually sing Kumbaya in a circle. But this past week, Google's chief of TV technology expressed concern that the capacity

being required by new Internet video services -- file swapping and downloads -- may overwhelm existing Internet offerings and degrade consumers' overall quality of service.

MR. DAVIDSON: I actually don't think that's what he said, so I look forward to having that conversation in the Q&A, but I just want to set the record straight.

MR. MCCORMICK: Okay, we can --

MR. DAVIDSON: That is really not what he said.

MR. MCCORMICK: Seems like the quotations around his comments were taken out of context.

MR. DAVIDSON: I think they were.

MR. MCCORMICK: But these remarks, these concerns about capacity are a welcome acknowledgment, if so, if Google has any concerns about capacity. Concerns about capacity, I think, are a welcome acknowledgment that consumer interest in a better Internet cannot come from policies that limit innovation to edge services.

We need investment in innovation, in intelligence, in the network itself, and the freedom to engage in network management.

So it's important that any national policy regarding the Internet do some prioritization of its own, focusing first and foremost on the consumer. Consumers

deserve to have a constantly improving Internet, which requires investment and network management.

Consumers deserve to have an Internet where they can access any lawful website, where their access is not blocked, impaired, or degraded. Consumers should be able to run any legal application. Consumers should be able to attach any lawful device. As service providers, we have made these commitments. Initially, we made them because they represent good business practices.

But today, they carry with them an FCC mandate. It is one that the Chairman of the FCC has made clear that he has both the authority and the will to enforce. Consumers can go anywhere they want on the Internet today. They will continue to be able to do so tomorrow. There is no problem that requires regulation.

And perhaps most importantly, the market is competitive. Speaker after speaker after speaker today has said that, "Where there is market power, where consumers lack a choice, there may be a problem. If there is market power or consumer's lack of choice." The FTC is an agency of expertise. There is a rigor and a dispassion and an intellectual discipline to the FTC's approach to competition policy and antitrust analysis. It is an analysis that examines trade practices without regard to the technology in question, but rather, with

regard to the characteristics of the market and the behavior in question.

So let's examine the market. First, is it competitive? Do consumers have choices for last mile access? They do. Today, there are more than 1,200 broadband service providers in our nation. You can obtain high speed Internet access from your telecom company, your cable company, your wireless company, your satellite company, in coffee shops and on airports and on college campuses, and in many municipalities, you can access the Internet via Wi-Fi hot spots.

Electric utilities are beginning to invest in delivering broadband over power line. In fact, analysts expect 2.5 million Americans to get their high speed Internet in this way within 4 years. That's a six-fold increase.

So, second, do telecom companies have a dominant share of the broadband market, the last mile market? No, we do not. The latest FCC data shows that DSL's market share is at about 36 percent. Cable's market share is at about 44 percent. And we see a rapidly growing other category of about 20 percent, led by wireless broadband, that saw a 58 percent increase in the first half of last year.

So, neither the entire DSL industry, nor the

entire cable industry, has a market share that rivals one single company's control of the Internet search market. Google is the gateway through which the vast majority of Internet searches go today -- some estimate as high as 70 percent.

Third, do telecom companies have market power, defined as the power to control price? Clearly not. Broadband prices are coming down, with entry level offerings as low as $15 a month. Speeds are going up -- and these are signs of a healthy, competitive market. And Google and others are readying plans to offer broadband service themselves, for the eminently attractive price of free.

Finally, is the market contestable? Absolutely. With the availability of unlicensed spectrum, the rising tide of municipal Wi-Fi, and rapidly expanding BPL options, this market is open to anyone who is willing to invest.

In fact, if you think of all the different companies and all the markets that play a defining role in the ability of a consumer to access and navigate the Internet, the broadband access market is among the most competitive pieces of the puzzle.

Just consider this. In order to access the Internet, you need a computer with a chip. There are two

companies, Intel and AMD, who share a 60/40 split of the chip market. That's two companies, not two industries. You need an operating system. Microsoft and Apple are your basic choices. You need a browser. Microsoft's share of that is -- that market -- is 85 percent. And Internet networks depend on routers to direct traffic. You're back to two big players, Cisco or Juniper. And finally, you need a search engine. Here, as I mentioned, Google controls a share estimated by some to be as high as 70 percent, and climbing. One company.

My whole industry has nowhere near the market share in Internet access that Google has in Internet search. So, from the standpoint of the FTC's jurisdiction, there is competition. Consumers have choices. There is no dominance in the last mile. The market is contestable to anyone willing to invest, and consumers are experiencing no problems.

Therefore, we say, "Why would anyone now start asking for government regulation of the Internet?" Let consumers continue to drive the market, and they will reap the greatest benefits from the next generation of broadband innovation. Bill, thanks.

MR. BLUMENTHAL: Walter, thank you. And Alan, I know you're going to want to rejoin. But before we do that, let me hear from our last two speakers.

MR. RYAN: And really, you have something to say?

MR. BLUMENTHAL: Let me turn the floor over to Professor Schwartz.

MR. SCHWARTZ: I will stand. It's the professor in me. If I try to do something different, it won't work.

So I was worried that you might dismiss my remarks as being too hands off, but now I can be the more reasonable man. So, thank you.

(Laughter.)

MR. SCHWARTZ: Let me agree with many of the speakers today, who said we should try to get past the labels and drill down into the issues. And exhibit one here is the term "net neutrality." The traditional model of the Internet, where traffic is treated uniformly or first come first served priority-based, really is not neutral, right? If different applications require different network performance, then uniform treatment is not neutral. Point one.

And so, the question is, what kind of departures from that model are sensible? To date, the debate in the U.S. has focused over what departures would be allowed by residential broadband network providers -- access network providers, on the perception by some that

that's where there is a fair bit of market power, and more so than in other segments. As you can see, that claim is being contested, and I am sure we will have more of it.

But I don't want to get into that question of just how much market power there is there, because that's the subject for tomorrow's panel. Let me just make one remark on that, which is we are not in a monopoly model. That's for sure. So, there are two strong platforms, DSL and cable. And economics tells us that even a "duopoly" can be quite different from a monopoly. Behavior in duopoly can range from perfect collusion, on the one hand, to quite competitive, on the other.

So, we're not -- you don't want to presume it's a monopoly, firstly. And secondly, it's not a blockaded duopoly. There are prospects for entry. How strong, I don't know, but it's not blockaded. All right? Now, let's keep that thought in mind as we move forward.

The -- so broadband providers seek discretion to prioritize, they say, in order to get better network performance -- prioritize and price, based on priority. And in order to finance investments. Okay? Net neutrality opponents say, "Well, wait a minute. You guys have market power. If we give you unfettered discretion, you can abuse this discretion." And what constitutes

abuse?

So, we agree you need some discretion to control viruses, spam, et cetera, but we're worried that if we leave it completely unfettered, you can abuse it. And what's abuse? Well, largely, the concerns have been about discriminatory treatment of content and applications, as opposed to quality tiers for consumers. So I'm going to focus on the content and application.

And to sharpen the analysis, I think it's helpful to show two classes of concerns. One is foreclosure, or leverage, that was discussed in the previous panel. That is the broadband provider reduces competition in adjacent markets for applications of content -- I will say "applications" for short, from now on -- by either giving preferential treatment to its own affiliates, or to favored partners. Okay? So that's foreclosure.

The second concern is what I am going to call value-based pricing, that network owners are going to tailor the pricing that they charge for transmission services, access services, to how much the consumers or the suppliers of the applications are willing to pay. Okay?

And they can do that, according to net neutrality proponents, by threatening that unless you

pay, your quality gets degraded. And that's a risk of allowing discretion on quality, or any kind of prioritization. It could be misused as a lever to extract payments, under this story. That's the so-called tax on applications harm, okay? And the result is potentially also to harm consumers, although I'll come back to this. Potentially, not necessarily.

So, take these -- foreclosure has been addressed. I will just make two quick remarks on that. First of all, while there can be gains to a broadband access provider from foreclosing, there can also be losses.

And Joe Farrell, I thought, presented a fairly nuanced discussion of those trade-offs. The potential losses come from the fact that, because the applications are a complementary service to the broadband access, if you degrade that supply by freezing out lower-cost providers of applications, or reducing the variety, that's going to reduce how much consumers are willing to pay for the access service in the first place. Okay? So it's not a slam dunk, but it does hit as a trade-off there.

And many of the examples that have been put forth as illustrating the "obvious incentives to foreclose" are drawn from a different era, from a

regulated monopoly era, where there are strong incentives to foreclose, and those examples cannot be directly transplanted into this setting. Okay? If we have time, I can flesh that out.

The second point I would make is if foreclosure does rise to the level of a serious competitive problem, the right response is to address it at the time, on a case-by-case basis -- at least that's my view. All right.

Stricter remedies, like equal access rules or prohibition against vertical integration as a pre-emptive measure, are things we typically reserve only for a regulated monopoly regime, as was done with AT&T, historically, under the line of business restrictions. Okay?

So, let me now turn to value-based pricing. This concern can be quite independent of foreclosure. So if the network operator simply says, "I am going to charge all applications of voice X dollars for the right to use the pipes, and I am going to charge video providers Y dollars," okay, I am not going to say foreclosing either voice or video, I am just "taxing" their services.

All right. Now, let's subdivide that into two pieces, this issue. The first is, should the broadband

provider be allowed to treat and price traffic differently, depending on the underlying application?

The second question is, should the broadband provider be allowed to "charge" applications provider, as opposed to charging only his consumers? That's the two-sided market question that we have heard of. All right.

So, let me take the first one, the differential network treatment and pricing. Jon Peha, this morning, gave, I thought, a very nuanced discussion of the issue, which is, differential treatment can be good, can be bad. It can be -- you can't easily pigeon-hole it.

The claim that maybe we don't need any prioritization, let's just build bigger, dumb networks, that may be true in a particular context. It may be true that in the backbone today there is excess capacity. I don't think you want to put it forth as a general design principle. Economically, it doesn't make sense that the solution is always to build more. That's going to involve carrying a lot of excess capacity, which is going to be expensive.

So, tools like prioritization are going to help you reduce the amount of capacity. You don't have to size it for maximum congestion, for maximum traffic use. You, instead, cope with congestion to prioritization and other tools, and in doing that, it makes sense to use the

price system as a signal of which things merit priority. Okay.

The -- so, that's -- and I think that most nuanced net neutrality advocates would agree that just building bigger and dumber pipes is probably not the universal answer.

Now, what they say, though, is, "Okay, let's try" -- the net neutrality proponents, or some of them -- "let's try to preserve the good aspects of traffic management and prioritization, while keeping out the bad." So, two proposals I have heard over time. One is called consumer tiering, but not application tiering. And the other one is, allow application tiering, but not for pay. Unpaid application prioritization. So, let's take these in turn.

Consumer tiering, the idea as I understand it, is -- so today we can get a different quality of service, but that's largely confined to the size of my connection. You could think that, down the road, that superior quality may extend deeper into the network. I'm not an engineer, but I can imagine it happening. And the idea is let's allow that. If you want to buy a higher quality of service for all your traffic, fine. But I am not going to allow different prices and different qualities tailored to the particular application, okay?

Well, the problem with that, of course, is that consumers may not require a uniformly higher quality for all their applications. They may require and be willing -- two minutes? Two Biblical minutes.

(Laughter.)

MR. SCHWARTZ: So, that's a problem with that. Okay.

The unpaid application tiering, what's the logic behind that? Logic behind that is let's allow the network operator to prioritize, because then he will make a judgement. If voice really needs it, let's prioritize that ahead of other stuff. But we won't let him charge for it, because if he has the ability to charge, he can use the threat of withholding priority and degrading quality as a vehicle to shake out payments from the suppliers. Okay? So that's the idea.

The problem with this solution is who decides which things deserve and which things don't deserve priority? The consumers and the application suppliers, really, are in the best position to decide that. And that gets revealed by their willingness to pay for it. Okay?

Moreover, the requirements for priority can differ, even for a particular application across different suppliers. If I am supplying an application

that's high quality, high price, and another guy is supplying a low quality, low price version, I may be willing to pay for priority, but the other guy may not. Okay?

The push-back is using this as a price discrimination device, which I have mentioned. All I am going to say on that is, yes, price discrimination is not always good, not always bad. Awfully hard to tell it apart, and I am skeptical that you can do it in a way that doesn't throw out the baby with the bath water.

Let me take two minutes, I promise, just on the last -- second and last point, which is should we -- should broadband parties be allowed to charge application providers, like Google, say?

Okay? Well, the theory on two-sided economics and two-sided markets approaches the problem as follows. It says, the broadband provider is an intermediary. He needs to get both application providers to use the platform, and the residential consumers, okay? If he overdoes it, and charges too much on the application side, and chokes that off, that's going to drop how much he can charge on the other side.

Now, nobody knows what the right pricing structure is. I don't claim to know it; nobody does. There is no presumption that the right structure is to

recover all of the cost of consumer broadband networks from consumers alone. No presumption of that.

What would happen if you did allow them to charge something to search engines, let's say, that derive their income from advertising?

What economics predicts -- and it's independent of a monopoly or -- it's independent of the degree of competition in broadband access -- the prediction is if you allow them to charge content providers, in their own interest they will now reduce price to consumers, and therefore, encourage penetration. Okay?

So, I will be happy to flesh that out later in the Q&A. Bottom line, you know, I am not a reflexive anti-regulation person, but I am -- I think to say I am worried, and then "let's regulate," without really thinking hard about, well, "What are you going to do that's not going to be a disaster?" is really not a solution. So I am willing to listen to suggestions, but I think we need to, you know, be a little bit more concrete about what exactly we plan to do.

MR. BLUMENTHAL: Marius, thank you. Barbara, all yours.

MS. TULIPANE: Okay. The last panelist on the last day, or the last hour. So everybody shake it up, move around in your chairs. I can see eyes starting to

close. So I will be quick and to the point.

I want to thank the Federal Trade Commission and Maureen, especially, although I came kicking and screaming today to today's panel. I find these things very frustrating, because I see a lot of talking like this, and I don't think it's productive. I mean, for every statistic that somebody can throw out, I can show you another one that disputes it. So, I just don't think it's productive to go there. I think we need to kind of shift the focus, and talk about what we can agree on, and move on from there.

I would say, however, that my members are e-retailers. They sell directly to the consumer, and they do that over the TV, the Internet, or the radio. So -- and they're a little bit unique in that they kind of grew up in the cable model. So, when we talk about theory and hypothetical models, as we have today, and "Nobody really knows what it's going to look like," and you know -- I do.

I have been there. We -- my members, right now, work in a closed network. And it ain't pretty. So I want to share with you some of their frustrations, and what they go through, and maybe we can make some -- we can draw some conclusions from that, and so we don't go down that road with the Internet. Before I do that,

however, I think it's productive if we separate broadbands -- the other application services -- from the Internet.

I only want to talk about the Internet. I get it, the telcos need to recover on their investments. They can do that. But just don't do it on the back of the Internet.

So, the ERA membership started as a community for those selling products on cable networks. Cable is an example of a closed network. Carriage is not guaranteed. Pricing is both arbitrary and discriminatory, and businesses must negotiate with regional cable providers throughout the country to reach their consumer.

Now I am going to walk you through the steps of what somebody has to go to to get carriage. Take a company like QVC or HSM. What they must do to reach their customer. Step one: they have to get carriage. The negotiations begin with each regional cable network provider, each with the power to decide if they will add the live shopping channel to their programming mix.

If they're successful with step one, then they move to step two, which is pricing. Pricing can be based on the number of cable subscribers and/or percentage of sales. In most cases, my members have to pay both. And

it doesn't stop there. The live shopping company must then negotiate with the cable provider over channel placement. The winners get placed next to premium content, while the losers are regulated to outer space, or the higher channels.

Often, these decisions are impacted by existing deals other live shopping companies have already negotiated. That is how a closed network works for retailers. Carriage is not guaranteed, and companies can be discriminated against by being placed in the slow lane, or higher channels. These decisions determine if a live shopping company can survive.

Within the last two years, we have seen two large live shopping channels with revenues of over $100 million cease operation, due to problems associated with a closed network. This problem is not exclusive to live shopping, however, as other small content providers struggle with the same deal-makings.

The model is this. Large players, like ESPN, are paid for their content, leaving smaller players to foot the bill. And that's if they can get carriage at all. We have all seen the commercials, "If you would like a certain program, call your local cable provider." Consumers are essentially told, "Here is the deal, here are your 500 channels. We packaged it with what works

for us, and what makes us the most money." Hardly a consumer-friendly environment.

I share this with you because the cable model is an example of how a closed network prioritizes content. It is solely based on the network provider's ability to maximize its profits.

Contrast this closed cable system to what an e-retailer experiences today on the open Internet. Today, a retailer simply has one business relationship to gain access to the world, as does the consumer. What more needs to be said?

Under an open network scenario, the Internet has thrived. Today, however, it is under attack by those that are building broadband networks. They claim that they need to recoup their costs. Although, I would argue they have already been paid for their build-out through public subsidies and incentive programs.

We do not disagree that they should be able to sell additional broadband services, like video and phone. It is important, however, to distinguish between these applications and the Internet. The Internet is comprised of interconnected networks that do not distinguish service based on source or content.

As such, I want to be very clear. As we discuss net neutrality today, I am not advocating for

regulation that represents a return to the old telecom rules for provider's broadband offerings, as some might suggest.

Rather, I am making the case that basic rules are needed for the Internet, much like those recently agreed to by AT&T, as it sealed the deal with BellSouth. We applaud AT&T for taking this step, and helping to define net neutrality. This position keeps the Internet as open network, where my small retailers can continue to provide consumers with the content the consumer wants.

Because in today's world, the consumer is in charge. In fact, there is currently a revolt against top-down, force fed content. So why would network providers want to model their next generation Internet in a similar fashion, as the closed cable model?

We often hear that someone has to pay for the additional capacity providers are offering on the Internet. Those in my industry have never asked for a free ride, and, in fact, pay their own way. That's right. They are already paying millions of dollars to access the Internet.

However, they are now being asked to subsidize the roll-out of broadband providers' triple-play: phone, Internet, and television. All that we ask is that the Internet portion of these offerings remain a viable

market place, where providers can recoup their -- viable market place, with fair rules of the road. We believe that providers can recoup their investment and create additional revenue streams by charging for non-Internet-related broadband applications.

In fact, we encourage their efforts to provide video or television on the broadband. But let's not mix Internet with a broadband -- other applications. In our industry, innovation is the norm. To compete against large brick and mortar retailers, e-retailers have perfected their sales efforts to meet the consumers' changing shopping habits.

In other words, they meet the consumer on the consumer's term. First on television, and now on the Internet. But what's interesting about ERA membership is that the small players today may very well be a Google or an eBay tomorrow. Their model for success is their ability to innovate.

In fact, innovation is the backbone of our industry. We encourage the network providers to follow our members' examples. Innovate, rather than dictate. It is no longer enough to build a walled garden and expect monopoly rents. Today, content providers on the Internet are second to none, because they have been forced to innovate. We encourage network providers to

take the same path, as this is a proven ingredient for success.

I hope that we can separate broadband services from the Internet. Today, let's talk about the Internet. As we do this, remember that prioritization based on source or content will result in a closed network, just like the cable system today.

I would like to thank, again, the Federal Trade Commission and Maureen Ohlhausen.

MR. BLUMENTHAL: Well, thank you to all of the panelists. I am going to get out of the way for the Q&A.

(Laughter.)

MR. BLUMENTHAL: Actually, I just wanted to stretch. But I suspect that various panelists would like to rejoin with comments on what some of the other folks had to say. And I know that Alan had some thoughts about Walter. So --

MR. DAVIDSON: Well -- no, I would appreciate it. I will just -- I would like to hear the questions from the audience.

I will just say, first of all, to the extent -- this question of this misquote from a Google engineer in Europe, I would just start by saying that was really not what he said, and we have -- there is a letter -- actually, one of our folks has it here, if anybody would

like to see it, that we have sent to the Hill, in response to the letter that our friends at USTA sent to the Hill just, I guess, maybe yesterday.

You know, it would be better if, instead of digging up random quotes from Google employees overseas, we actually had a conversation about what, you know, we really mean, which is that we really do believe that net neutrality is an important issue, and we value the role that broadband providers play, which is what our engineer said. And I look forward to working with everybody to have more broadband.

And I would just say, you know, I hope that we can stick to a discussion about the problem that we're here to talk about, which is the broadband market, and not all the other markets that got mentioned, I think. They are radically different markets, and we could talk about why, but I think everybody understands that.

MR. BLUMENTHAL: Did any of the speakers want to comment on Barbara Tulipane's comments? In particular, the proposal to distinguish between broadband and Internet services, and in particular, to recover future investment from the broadband side, alone?

MR. RYAN: Well, I can -- let me make a couple of observations. First, is I am not sure that there is an accepted definition or understanding of what the

Internet is. I know that there is an accepted definition of what broadband is, which is absurd, frankly.

But the notion that the Internet itself -- I mean, I think there is this perception that the Internet -- and partially, we're to blame for it, because our engineers draw a cloud to represent the Internet. It's not a cloud. It's a series of tubes.

(Laughter.)

MR. RYAN: But there are a series of, I would say, blunt, not very sophisticated commercial arrangements between network operators that form the Internet.

Those agreements, which -- sometimes they're referred to as peering agreements, sometimes they're traffic exchange agreements, they have a variety of terms -- they are not sophisticated, at all. And they, frankly, need to be. And I think it is incumbent upon the folks who operate the Internet to show that those commercial arrangements can result in solutions to these problems.

But I think there are opportunities to solve this problem, in particular, prioritization of traffic through those peering agreements. Because there is a sense between the eight or so -- certainly between the eight or so tier one networks, there is a sense, truly,

of mutually assured destruction. And that encourages good behavior.

So, as those agreements mature, I think that there is a possibility that these problems can be addressed.

MR. MCCORMICK: I guess I would like to respond to Barbara's comments, too. I mean, I understand the concern. I mean, hearkening back to a day when the cable industry had a monopoly, and video delivered by wire, a day when the telephone industry had a monopoly and voice telephone service delivered by any means, I understand the concern.

And today, it's an entirely new world. I mean, for example, over the air broadcasting you now get on your cell phone. And those who are broadcasters are concerned about is there going to be a new bottleneck? The cable industry is delivering voice telephone service. The telephone industry is beginning to deliver video.

We have come to the place where all of these services are being delivered -- or will be delivered -- pursuant to a technology that is basically Internet protocol technology.

So, when Jon says, "Well, what's the Internet?" everything is going to be -- is moving towards sort of an IP-based delivery mechanism, whether it's being delivered

wirelessly, whether it's being delivered by satellite, whether it's being delivered by a cable wire, or whether it's being delivered by a fiber or a twisted copper pair by the telephone industry.

At the end of the day, I think that the basic concern is the traditional antitrust concern. Is there market power? Is there a market where the consumer doesn't have choice? Is the market contestable? And what we see in the Internet market is that technology has brought us to the place where the market is competitive.

For those of you sitting right here in this room, you can access the Internet by Wi-Fi -- because I can tell that it's on in the room -- which then connects to a landline, or you can access it pursuant to EVDO, that's being offered by several different providers, right here in this market, right in this room, right here today, you can access the Internet in a variety of ways. You have a variety of choices.

So, the traditional analysis of whether there is market power, whether the market is contestable, whether or not there is the power to control price, those are the right analyses. And we support an analysis in that regard. And if there is a problem, address it in the traditional way that is done through trade regulation by the FTC. But let’s not engage in hypotheticals or

reach out to grab problems that really don't exist.

MR. SCHWARTZ: Can I ask a question to Walter? This is a theme that Barbara raised, and Alan and also the gentleman from Skype, which is that if we start charging content providers, if they need permission to get on, then the transaction costs are going to be so big, that just the transactions alone could stall the innovation process.

And that is an argument I have heard, also, in the case of wireless spectrum, an argument for, "Let's have unlicensed spectrum, just to avoid the hassle costs, the transaction costs." What's your reaction to that argument?

MS. TULIPANE: Who are you asking?

MR. SCHWARTZ: Walter.

MR. MCCORMICK: Well, I -- you know, I mean, this is the difficulty of dealing with hypotheticals. But let's take somebody who wants to offer a new business.

Let's say that somebody wants to go into the business of offering some advanced home health monitoring application that is going to require some level of prioritization in the last mile, that the individual is offering it as an entrepreneurial endeavor, that the individual wants to charge for it, but the individual has

to be guaranteed a quality of service in the last mile offering, and that the individual would like to be able to offer it at a fairly low cost to the consumer, but the only way to do that is to spread the cost into the network, as opposed to doing the device as a last mile device.

I think that it would make sense for a network provider to be able to offer to such an entrepreneur the ability to go into that kind of service. You know, when you look at VoIP services, VoIP does require prioritization.

I mean, here is a situation where there is an independent examination by the Washington Examiner of service that was offered by Vonage, and he didn't like it. But now, Vonage is offering a device for $199 that you can add on to your Vonage service that makes sure that when you're using VoIP services, it prioritizes the packet, over others, coming from your computer network.

So, I mean, this is a last mile add-on, $199. Well, why do we necessarily have to charge the consumer $199 if we could offer to Vonage the ability to build that into the network, as a network service?

So, again, I think that this kind of flexibility is important, and there is nothing bad about it when we have a competitive environment, when consumers

have choices.

This is traditionally the case. When you go into McDonald's, you can't order a Pepsi. And when you go into Kentucky Fried Chicken, you can't order a Coke, because there are relationships. When you go on Google, and you put "buy books," you are going to have a prioritization that's going to give you Amazon, because they have done a deal with Amazon.

I mean, in fact, if any of us want to kind of envision what prioritization on the Internet might look like, I mean, I think the clearest understanding of what we know prioritization would be is looking at a Google search page.

MS. TULIPANE: But, see, this is what I mean about not productive conversation, because it's such a silly argument to say the two relate -- that the Pepsi/Coke -- I mean, the reality is, you can go to McDonald's, and if you don't like that they serve Pepsi, you can go right next door and make a different choice. So that's choice.

But let's be very clear. I mean, the GAO had a study that came out and said that we absolutely have a duopoly. So there is not choice. So -- and I don't want to get into tit for tat, because I don't think it's productive. And what I always see are the arguments

thrown at the Google. And I get it. It's hard to feel sorry for a big company. So, let's put those companies aside, and let's talk about the average retailer out there, and what that will mean to them.

MR. DAVIDSON: And I would just say there is so much to talk about in Walter's example, starting with the fact that I think that many providers of Voice over IP do not believe that they need prioritization in order to offer their service, including, you know, Google has a -- not a PSTN connected voice over IP but a voice product that we offer, and I could tell you our engineers think it works plenty fine without prioritization.

But really, the example is actually a really interesting one, because think of the mind-boggling complexity now, for a small business that wants to get online, but now feels that it needs to enter into some sort of carriage agreement with all of these providers out there.

The transaction costs are enormous because it's not just here in the United States. The Internet has blossomed, these companies blossom, because you get online -- Barbara's retailer gets online, and their services can be available all over the world. So a small business in a rural part of America can be offering services anywhere in the world.

Now, what do you do? How do you this? To try to start entering into these agreements, not just with the 8 or 10 large broadband providers and shrinking here in the United States, but all the smaller or medium-sized ones, and all the people around the world? How do I go and negotiate in Canada, in the UK, in, you know, Thailand, in Japan, so that my services can be seen?

I mean, the beauty of the model that we have right now is that there is one interface for content providers. Application edge services get online, and they are available everywhere. And that -- actually, that transaction cost, I think, is a really big part of why this --

MS. TULIPANE: Right.

MR. MCCORMICK: But I just don't even understand that, because there is not -- a consumer can access any website they want. They are not being blocked, impaired, or degraded in any way by any service provider in this country. So --

MR. DAVIDSON: And we want to keep it that way.

MR. MCCORMICK: But to lay out an entirely hypothetical concern, when if any service provider attempted to do that, the consumer has the ability to immediately shift service providers. So --

MR. DAVIDSON: Well, I think that there is some

disagreement about that. But even beyond that, I think this is where we are in agreement, which is that there shouldn't be this kind of blocking. And we welcome the fact that -- Walter said this in congressional testimony, I think it's great, and companies have said that.

I think what we're hearing -- and this gets to the nub of the argument -- is that prioritization itself, of certain kinds, can be tantamount to blocking, because what happens if you don't pay for the prioritization? Are you relegated to a degraded service, or a slower service, that doesn't get consumers what they need? And that's, I think, the issue that we need to keep discussing.

MR. MCCORMICK: But today there is not a single instance of any prioritization occurring that somebody is suggesting is bad. So --

MR. DAVIDSON: So what's wrong with --

MR. MCCORMICK: So what you're saying is that let's try and now define what services may be created in the future that can be prioritized, and cannot be prioritized. How does government do that?

MR. DAVIDSON: Well --

MR. BLUMENTHAL: Let me make one observation, and then move on to some slightly different questions, if I may.

The one observation, just harking back to a discussion about five minutes ago, I suspect that most of you in the room are drawn predominantly from the Internet and telecoms community, and not from either the antitrust or the soft drink community.

(Laughter.)

MR. BLUMENTHAL: But having represented Coca-Cola for many years before joining the FTC, I would just point out to you that Coke and Pepsi actually litigated this issue. It was very lucrative for the law firms, and it went on for about a decade before ultimately getting resolved, I think, in some settlements.

But the issue of selectivity and foreclosure is not clearly ordained, one way or the other, and that's true even in a duopoly or a triopoly situation. I want to come back to the duopoly/triopoly point in a second, but let me just sort of -- one point of characterization. I have the same question somebody from the floor had passed up.

Is there agreement, when we focus on prioritization, that it's a last mile issue? Do all of you agree with that?

MR. DAVIDSON: I think that we are here to talk about the last mile prioritization issue, and I think there are other forms of prioritization that broadband

providers might engage in that we don't see as problematic.

So, for example, offering local caching, for example, in the way that Akamai does. Now, Akamai is not here, and we will see what they have to say about that.

But I think that many of us have said that that form of prioritization, for example, doesn't create these concerns because it doesn't -- it's not something that we are providing that necessarily inherently degrades other content in the last mile at the router level, and it's also not something -- again, well, there we also believe that there is a market for different providers to provide that service.

MR. MCCORMICK: When you say prioritization in the last mile, are you talking about all last mile services? So, cable modem, DSL, wireless, satellite, Wi-Fi, WiMAX, and broadband over power line? Any prioritization in any last mile service would be subject to regulation --

MR. DAVIDSON: I think that we have already said -- and many other folks have said -- that there are lots of different kinds of network management that is not what's at issue here, right?

And so -- and also, I think it's fair to say that what people are worried about is anti-competitive

prioritization, and that's really part of the thing, this discussion.

And I would note, you know, that there is quite a bit of disagreement about the level of competition, and you have painted a picture that I think most people would argue is not entirely accurate, in terms of the --

MR. MCCORMICK: But I'm just asking, with regard to last -- would you treat all last mile exactly the same, and make it subject to some sort of government-regulated approach to what traffic would be prioritized?

So, for example, I mean just on your wireless phone, you know, you receive -- on my wireless phone I receive an e-mail, I receive -- I can access the Internet, I get voicemail. Would there be some regulation, with regard to what receives a priority? An e-mail?

MR. DAVIDSON: Well, there is --

MR. MCCORMICK: A voicemail or a telephone call?

MR. DAVIDSON: And as you know, there is a great deal of, you know, question about these different markets, and about how much competition there is there, and whether there are differences.

We have been talking about the last mile in the wireline context, where I think many of us agree the

biggest concerns are. There are others who have talked about the wireless environment, and the extent to which there are issues there. And the openness there. I think that --

MR. MCCORMICK: But specifically, what are you advocating, Alan?

MR. DAVIDSON: Right. No, I think that --

MR. MCCORMICK: I'm not sure I exactly specifically --

MR. DAVIDSON: -- what we have -- sure.

MR. MCCORMICK: -- what it would be --

MR. DAVIDSON: Right.

MR. MCCORMICK: So the government would say that, with regard to last mile services --

MR. DAVIDSON: Right.

MR. MCCORMICK: Which services would be covered?

MR. DAVIDSON: Right. Well, I think we have said -- you know, we have said that it is the last mile services.

MR. MCCORMICK: Of all last mile providers?

MR. DAVIDSON: Yes. It's very much similar to what was in the AT&T agreement, merger agreement, and that's exactly the sort of approach that all of us -- it's quite simple. It's really -- it's one sentence.

It's the notion that there cannot be this kind of discrimination in the last mile, based on the source or content of a communication.

And, you know, it has been very simply put by the FCC in that merger agreement. We would be the first to say there might be multiple ways that you can get at this problem, and that's why it's great to be here, talking at the FTC about this. But it's actually an extremely simple set of things.

And the only reason I use these examples is simply to give everybody some sense -- we're not talking about some massive regulation of the Internet, or some kind of regime that people weren't living under until about a year-and-a-half ago, anyway. I think we're talking about something that is very simple, and is not a heavyweight kind of regulation, and it's aimed at a very particular set of practices.

MR. MCCORMICK: Well, just one more question, then I will shut up. I still don't understand the something, but if I have some concept of it, then a last mile provider by WiMAX, such as Google is, and Google will offer WiMAX access for free, if you agree to take a prioritized delivery of advertising from Google, that would be outlawed?

MR. DAVIDSON: No, our network is offered in a

neutral way, our Wi-Fi network in Mountain View. And we would encourage others to do exactly the same thing.

MR. MCCORMICK: So when I call it up and I get an ad, that's a prioritized delivery that that advertiser is paying to Google.

MR. DAVIDSON: That's not a -- I don't see where that's a prioritized delivery, honestly. We offer a neutral network you can --

MR. MCCORMICK: If it's the first one I receive over the WiMAX network?

MR. DAVIDSON: You know, I think that there are -- we -- I would like to know what you're talking about, because honestly --

MS. TULIPANE: Could we move the Google and the USTA conversation to another time? It always ends up to be about Google, and I think that's a switch and bait, and not productive.

MR. BLUMENTHAL: Fair enough. I was actually about to say, Walter, same question back to you with a slight variation.

First, just to clarify, is it -- I understand that your position is that there are enough sources of competition right now that the issue ought to be moot. But if there were not enough sources of competition, if there was, say, a single provider in a particular

locality, would you, in that case, acknowledge the legitimacy of the concerns that the neutrality --

MR. MCCORMICK: I would say several things first. Is the market contestable?

MR. BLUMENTHAL: Okay.

MR. MCCORMICK: Second, is there a real definable problem that merits government intervention?

MR. BLUMENTHAL: Okay.

MR. MCCORMICK: And, third, what are the ancillary costs of dealing with that particular solution that is being offered?

MR. BLUMENTHAL: Okay.

MR. MCCORMICK: In this instance, I can't quite get a handle on exactly what the problem is. Number two, there is competition. And number three, the market is clearly contestable. I mean, so that -- I think those are the --

(Laughter.)

MR. BLUMENTHAL: I'm not sure if that was a chuckle of support or not, but it was one way or the other.

MR. MCCORMICK: I don't know.

MR. BLUMENTHAL: But let me just ask two follow-ups to just make sure I understand.

First, for purposes of market share

calculation, since you are identifying all of the different technologies that presumably are hitting this building one way or another, but the bulk of the traffic out of the building is going on one particular one, for purposes of market share measurement, is it your view that we should be doing sort of a one-over-N analysis where all of the different technologies are given equal share, or for purposes of measuring shares, should we actually look at the amount of traffic going over the different modalities?

MR. MCCORMICK: Well, I think if you're going to start defining the relevant market, you know, you have to begin with what exactly is the market that we're looking for? I think that if --

MR. BLUMENTHAL: Assume it's broadband services.

MR. MCCORMICK: If it is last mile broadband access, the FCC's own statistics show that the growth in that area -- which was 26 percent growth in the last mile broadband connections in the first 6 months of 2006 --

MR. BLUMENTHAL: Right.

MR. MCCORMICK: -- showed that 58 percent of those new connections were wireless.

MR. BLUMENTHAL: I --

MR. MCCORMICK: And so, what I am saying is

that you do have a variety of providers. I mean, you're not going to --

MR. DAVIDSON: I think you have really got to look at what most people have access to. I mean, if you look at those broadband statistics -- and we will hear all about it tomorrow, and they're terribly flawed -- but 99.6 percent of Americans are getting their broadband access through their incumbent cable or telephone provider. And almost 34 percent of Americans only have 1 option for a broadband provider; 13 percent have none, right? That's from the latest statistics, okay, right?

So, there is going to be a whole panel tomorrow to discuss this part of it, but I think you really got to look at what kinds of stuff people actually have access to.

MR. BLUMENTHAL: All right. Well, we will sort out the facts.

MR. MCCORMICK: Oh, sure.

MR. BLUMENTHAL: And I was just trying to get to that doctrinal issue. Is it a one-over end, or is it actual analysis? But that is -- you know, for those of you who are from the antitrust community, you know that is a pretty familiar type of analysis. So we will look at that.

Walter, the one other question I had for you on

market share measurement, to the extent that the providers of the wireless broadband services are subsidiaries of the same companies that are providing the DSL, typically we would aggregate those. Do you have any issue with that, or do you think those should be disaggregated?

MR. MCCORMICK: Well, I think that the way in which a lot of those services are now being marketed is as full alternatives. And so, I think that it should be disaggregated at this point in time. Because what we're talking about are completely alternative services for purposes of last mile Internet access. And I think that what we're going to see in the future is we're going to see even greater kinds of mixes of services being offered, both wireless -- wireline and wirelessly, so --

MR. BLUMENTHAL: Let me --

MR. MCCORMICK: I think disaggregated, for now.

MR. BLUMENTHAL: Okay. Let me ask, I guess, one last question. It may end up being the last question that we have time for this afternoon, but I wanted to come back to the two-sided market issue, and in particular, some -- well, it was triggered in a bunch of places.

Barbara's comments about the difficulty of getting carriage triggered it, but much earlier -- my

notes from the various speakers -- and back when Alan was speaking, I jotted a note down to myself that simply said, "Settlement mechanism?"

And the basic intuition is that when you look at two-sided markets, you know, a blanket licensing by ASCAP and BMI, stock exchanges, Mastercard and Visa, there are well-established mechanisms for figuring out how financial settlements is going to occur, so that you don't have to have 80 different contracts, or 80,000 contracts, you simply have one payment from any given player.

To the panel as a whole, to the extent that people are thinking about some surcharges, or some selective charges, other than to one of the players at either point, but somebody who is not in privity with one of the players at the end, would have a mechanism for surcharging somebody who is not their historical customer, what's the settlement mechanism you're all thinking about?

MS. TULIPANE: We're not.

MR. BLUMENTHAL: Okay.

MR. RYAN: I don't think anybody is, actually.

MS. TULIPANE: Yes.

MR. RYAN: And that was one of my observations about how intercarrier compensation works or doesn't work

on the public-switched telephone network. It's horrible. And it's highly regulated, but still horrible.

I don't think anybody -- even the incumbents who have indicated that they have a desire to eventually charge for priority access, we sit down and talk to our engineers and say, "How would it work?"

And the answer is, "Not very well at all." It's not particularly feasible to implement -- and I will date myself, and give you a sense of what my TV watching habits were as a kid. I used to watch "Battle of the Network Stars." I think you're going to have a gargantuan battle of the network engineers the moment that any one of the incumbents attempts to charge for priority access.

And it's not that hard to get around any of the priority schemes that you can envision being implemented, at least at this point in time.

MR. DAVIDSON: I would just say I agree. I think it's extremely difficult to imagine how you would do this, especially internationally. And, you know, I also wonder if we really know which way all those revenues would flow?

MR. RYAN: I agree.

MR. DAVIDSON: I mean, you know, that -- whether it wouldn't be content providers who ultimately

end up charging to make sure that their content is seen. I just think we don't know about it, and so we are left with this kind of miracle of the network that we have right now, which is where people are able to get online by paying, and paying, you know, quite a bit to their own service provider, to get access to the network.

MR. BLUMENTHAL: Well, we are running long as it is. So, with that, let me draw this panel to a close. To those of you who sent forward questions that we didn't have a chance to get to, I apologize for that. I am going to make sure that we have them in the hands of the organizers, for purposes of tomorrow's panels, where I suspect these same issues will come up, perhaps with a slight twist.

But let me ask you to join me in thanking the panel for the comments.

(Applause.)

(Whereupon, at 5:20 p.m., the meeting was adjourned.)

C E R T I F I C A T I O N O F R E P O R T E R

DOCKET/FILE NUMBER: V070000

CASE TITLE: BROADBAND CONNECTIVITY POLICY

HEARING DATE: FEBRUARY 13, 2007

I HEREBY CERTIFY that the transcript contained herein is a full and accurate transcript of the notes taken by me at the hearing on the above cause before the FEDERAL TRADE COMMISSION to the best of my knowledge and belief.

DATED: 2/23/2007

_____

C E R T I F I C A T I O N O F P R O O F R E A D E R

I HEREBY CERTIFY that I proofread the transcript for accuracy in spelling, hyphenation, punctuation and format.

_____