

Center for American Progress



PRESENTS:

PUBLIC POLICY AND THE INTERNET

**“THE WITHERING OF THE NET: HOW D.C.
PATHOLOGIES ARE UNDERMINING THE GROWTH
AND WEALTH OF THE NET.”**

INTRODUCTIONS:

**CARL MALAMUD,
CHIEF TECHNOLOGY OFFICER,
CENTER FOR AMERICAN PROGRESS**

SPEAKER:

**LAWRENCE LESSIG,
PROFESSOR, STANFORD UNIVERSITY;
AUTHOR OF *CODE AND OTHER LAWS OF CYBERSPACE*, *THE
FUTURE OF IDEAS*, AND *FREE CULTURE***

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MR. CARL MALAMUD: Hello, my name is Carl Malamud. Welcome to the Center for American Progress. I am really pleased today to be able to introduce Professor Lawrence Lessig. Before we start, I would like to say that at 2:30 Professor Lessig will be leaving sharp at the stroke of 2:30. He has a plane to catch out at Dulles, so I want to apologize in advance: he will not be sticking around to answer questions and things. Professor Lessig has a fairly illustrious career to say the least. He clerked for Richard Posner; he went out and, if that was not enough, clerked for Justice Scalia. He has been on the faculty of University of Chicago and Harvard. He is currently a professor at Stanford University.

Professor Lessig is the author of four books and has had a significant impact on how we view copyright, how we view creativity, how we view the commons. And he is the originator of the Creative Commons Project, which if you are not familiar with you should definitely get familiar with it. It's really an important innovation in simplifying the way we do licensing. If any of you read the *New Yorker*, the current issue, the one with "Just Married" on it has a fascinating article about a law suit against the James Joyce estate. And I think you will find that to be extremely interesting.

So without any further ado, I would like to introduce Professor Lawrence Lessig from Stanford University.

(Applause.)

MR. LAWRENCE LESSIG: Thank you, Carl. So I was looking for a good way to start and I thought I would start by remixing a little bit of this text. See, the big text here begins with this four score and seven years ago. I thought I'd remix it a little bit by taking the four and seven out and putting in a one and a two. And tell you a story about how one score and two years ago, 1984, the Republicans invented the internet. Now, you might be a little bit confused because you might think about the fib that this guy told about something that the guy said, when Declan (ph) suggested that the vice president had taken claim for inventing the internet. That, of course, was just not what the vice president had said, and it is also not true.

It is very important that we recognize that the internet was invented by the Republicans. In 1984, three extremely important things happened – critical events to the future of the internet – that created an environment within which the internet could happen. Now, this environment that made possible this internet is the environment we need to focus on as we think about policies and how they are changing the internet today. So let us talk about these three Republican initiatives.

First, you remember a company that used this logo, a company called AT&T, a company that was founded with a philosophy that said it should have the right to control, using its proprietary power, the design and use of the network it built. So, for example,

in 1921 the technology Hushaphone was developed by the Hushaphone Company. It was a technology to attach to a telephone to make it a quieter device, which the name suggests. In 1948, AT&T finally notice this technology and decided they did not like it, so they issued, in a series of actions with the FCC, complaints. One was the use of a Hushaphone affects more than the conversation of the user; its influence pervades the whole telephone system. What was the influence of this piece of metal? The influence was the idea that someone other than AT&T could innovate for the AT&T network. That idea – that innovation threatened the idea that the network owner controlled the right to innovate and so they acted to try to stop that innovation.

Or in 1964 this hero of mine, a man named Paul Baran, working for the RAND Corporation which was then working for the Department of Defense, invented a technology we would eventually call packet switching technology, technology to make it possible to succeed with redundant communications. The then dominant communication company at the time, a company called AT&T, responded to Baran's invention by saying first it will never possibly work; and second, we are damned if we allow the creation of a competitor to ourselves. So once again this innovation here that threatens the network owner, and that innovation had to be stopped.

But in 1980 this man, Ronald Reagan, won election to the presidency and with him to Washington came this Californian, Bill Baxter. And Bill Baxter looked at a long series of investigations that had proceeded against AT&T and said, okay, enough. The government would launch a process that would eventually lead to the breakup of AT&T. There's Baxter shaking hands with the chairman of AT&T at the signing of the agreement that led to the breakup of AT&T. And that break up, of course, was effective in 1984.

The breakup was effected through a series of regulations, regulations that essentially achieved a kind of neutrality on this newly competitive network; neutrality that echoes the regulations of common carrier regulations, of neutrality, that guaranteed that the physical layer of the network could be added to by these other layers of a network that were foreign to that physical telephone network. So that the physical layer could, when attached to regulations begun with the Carterphone decision in 1968, mean that we could have a free layer sitting on top of another layer; meaning on top of this controlled, owned, physical layer called the telephone network, we could add these other layers that would eventually produce the internet. And, of course, though the internet at its early stages was tiny – the dial up internet – it eventually exploded in to the internet we think of today.

This explosion in ISPs – 1994 more than 6,000 of them competitor to drive this innovation, competitive drive pushing penetration of the network in an extraordinarily fast way. Indeed, we were the fastest in the world to come in to the internet age. But there is a certain principle behind this action that guided the way AT&T was architected. The principle was this was infrastructure; this was communications infrastructure and such infrastructure should be regulated to be neutral and competitive.

It was neutrality and competition that would inspire growth on top of that network and drive prices for that network down, and so there were limits on the ability of the network owner to control how that physical property was used. The key here was that this principle drove growth and innovation on top of this network, one that embraced the principle which network architects would call the end-to-end principle. Network to be kept simple; it was the applications attaching to the network that were to be smart, as David Eisenberg put it. This was the stupid network theory or, as Saltzer, Clark and Reed described it, the end-to-end theory of a network. So that is move one in 1984.

Here is move two. On May 21st, 1984, the FCC issued an NPRM, flowing up on an OI issued in 1981. This NPRM was to investigate the possibility of unlicensed spectrum. This was something radically new for the way the FCC thought about spectrum. This is the map of the spectrum allocations, as you see each little part allocated out to a particular use – licensed uses. This map interfered with this technology, the microwave, for the microwave emitted radiation in a certain band of spectrum. That emitted radiation meant it would interfere with any device that used that spectrum in the traditional way. This, therefore, was a spectrum wasteland and the FCC experimented with the idea of just giving it away – unlicensed use of the spectrum.

Now, of course this wasteland inspired the development of spread spectrum technologies using the full band of that spectrum, and that encouraged an extraordinary amount of innovation on top of this resource that was technically a commons. Anybody was free to use and build upon that resource and the technology developed, which you know now by the name of Wi-Fi, that drove explosive growth of the deployments of this network resource. Again, it was because this commons built a neutral, competitive platform on top of which innovation could occur. Limited private control over the resource here maximized the innovation over this resource and, again, so the physical layer of this network could be extended because of this new, free resource of unlicensed spectrum. These foundations were laid in 1984 for this development, and of course it was many years later that it finally kicked in to the effect that it's had on the internet.

And so here is the third event, then, in 1984. This one is a little bit more of a stretch than the other ones but you know, bear with me here for a second. This Republican initiative gets penned by this Republican appointee to the Supreme Court, appointed by this president to the Supreme Court. 1984, the Supreme Court finally issued a decision on a technology that had been in litigation since 1976, the Sony Betamax technology. 1984, this technology, which enabled law breaking – law breaking meaning violation of copyright – but also had independent legitimate uses. This technology was ruled by the Supreme Court in *Sony v. Universal City Studios* not to make Sony responsible for the infringements of copyright that were committed with the technology that Sony designed, designed in a way that allowed people to commit copyright infringements.

But this is a common principle, this principle behind the Sony decision. You could say it is a common GOP principle. For example, this technology has not inspired a big movement in the Republican Party to be regulated, even though that technology can

be used for lots of harmful purposes. Instead, the Republicans are against regulating this technology. And why? Well because this technology is capable of substantial non-illegal uses. Now, I am not sure what they are for some of those technologies but at least in theory there is a substantial non-illegal use that is possible for a handgun and because of that the technology is allowed, even though the manufacturer benefits from the illegal use of that technology.

Indeed after that radically liberal Ninth Circuit struck down Sony's right to release the VCR, this cartoon appeared in newspapers around the country, as you can see. On which items have the courts ruled that manufacturers and retailers be held responsible for having supplied the equipment? Of course it was absurd to think that while you were free to sell guns without any responsibility you were going to be punished if you sold a VCR.

Now, this decision by the Supreme Court gave birth to the consumer electronics industry. The consumer electronic industry's growth is built upon this minimal regulation of technologies in this context. You need no permission to deploy technologies here to innovate; the explosion in innovation here is driven by that freedom. And that explosion expands the potential of applications and content in the internet, and that expansion itself is largely responsible for the growth – the success of the internet.

So three decisions I assert are foundational to the internet; three decisions that allow us to say with some credibility that this is a Republican innovation. Commitment to these basic principles: one, competition; two, minimizing the power of the dead hand of the past to control innovation today. This is a kind of Reaganomics for cyberspace.

Now, this Reaganomics had an important consequence. The internet that was born really in our minds in 1990 explodes, I think, because of the application of this particular structure of regulation to these technologies. Now, I'm going to talk about effects of the physical, application, and content layer of this network – reflect on three particular features of each of these three layers that we have seen produced by this extraordinary innovation of design.

First, I want to talk about the special kind of competition that this network has excited. Second, the economically extraordinarily valuable commerce this network has inspired. And third, the politically and socially revolutionary kind of activity the network has inspired. So first, the special kind of competition. As we said, this network was built on a principle that says that the owner did not have the right to control the innovation that happens on that network. This produced a kind of commons. We could call it an innovation commons, meaning the right to innovate was held in common in this architecture because anyone was free to attach devices and innovate for this network without needing permission of the network owner.

What was the consequence of this particular design? Well, the consequence is that the innovations on this network have a very particular character. Think about the major innovations in the history of the internet, Vince Cerf and Bob Khan were the ones

who came up with the original protocols. In network theory land they were basically kits in network theory. The web was invented in Switzerland by a CERN researcher. ICQ, the first peer-to-peer instant messaging chat service, was invented by an Israeli teenager. Hotmail, html mail is developed by an Indian immigrant. Google and Yahoo! are invented by Stanford dropouts. What do all of these innovations have in common? They are all by kids and non-Americans, outsiders to the ownership of the network and the dominant companies on the network, and this is no accident. It is a consequence of a certain design, it is a design that invites the widest range of innovation. That is the consequence of the end-to-end internet or the innovation commons it produces.

Paradoxically for the control obsessed – paradoxically less control over the right to innovate on this physical platform actually creates more innovation. Now, this innovation happens at two important layers, the application layer and the content layer. That is where the most important competition and the most value is added to the network. That innovation can happen there because it is at the application and content layer, that people are free to develop new technologies for this network. So that is the first point, it builds innovation from innovators who are outsiders to the existing network.

The second one is a bit more obvious: the extraordinarily important economic value that this network has produced. Now, the first obvious Republican point about this value is that it is produced by competition. At the application layer we have an extraordinary range of companies that have developed because they are free to innovate on this network without negotiating with the network owner. And in addition to the application innovation we also saw important content innovation, innovation I'm going to call a little bit mysteriously read-only innovation, but that's the innovation that's affected by companies like Apple's I-tunes, Netflix, EBay. Read-only innovation in a sense of innovation and value that's produced by people who are producing content that others get to consume.

Now, this is a category we should think about it because the internet is enabling it in an extraordinarily important way. The read-only internet is increasingly enabling this massively efficient technology to enable others to buy and consume culture anytime and anywhere, culture that is created elsewhere to be consumed. So the poster child for this is the Apple Corporation, the I-tunes music store, which sells songs at 99 cents which you can download to your IPod and only to your IPod, but you are guaranteed if you download it and play it on your IPod in our culture you will be cool. Right? And it's not just music; it's now video you can download to your I pod for \$ 1.99 and it is not just Apple, others too. Amazon is experimenting with the pay-per-page way of selling books, the E book companies have been experimenting, they're at the very beginning with a pay per read way of selling eBooks. The point is they're developing technologies to increasingly perfect the capacity of content owners to control how people consume culture. This is the read-only internet. It is an extremely important value for this economy. It is an extremely important commercial value to this economy. Important economic growth is being driven by the expansion of this read-only internet.

Finally and in some circles the most importantly, this network is producing important politically and socially revolutionary activity. You can think of this at the other half of the content space, space that I'm going to call mysteriously for the moment the read-write internet, that's the internet being encouraged and build like companies like these. So the read-write internet is of course interested in people consuming culture, but in addition to consuming, they're interesting in encouraging people to create and share their creativity.

Pew did a study recently finding that 57 percent of teenagers had created and shared content on the internet, that's not people who had downloaded music illegally in Napster, that number is more like 99 percent. These are people who've actually created stuff and shared it on the internet. Let's get some examples to make sure we all know exactly what I'm talking about, I hope we can see with this.

First is a technology or a new kind of innovation called anime music video. How many people have seen anime music video? It's a very well educated audience here. Okay so you all know what anime is? Anime are these Japanese cartoons, so anime music video is produced by people talking anime, reediting it, setting it to a music track. So I am going to show you two clips, all of this art is found art reset to this music.

(Start of clip.)

I don't want another heart break,
I don't need another turn to cry, no
I don't want to learn the hard way,
Baby hello, oh no, goodbye,
But you're guided like a rocket,
Shoot straight across the sky.

(End of clip.)

MR. LESSIG: Something a little bit more familiar.

(Music clip plays.)

MR. LESSIG: So these are creators, you can call them recreators. There are literally tens of thousands of these creators that function in communities around the world, this kind of re-creativity that they produce and share with each other freely on the internet. You could call this a kind of remix. It's a remix of anime videos, but it's not just anime music videos that demonstrate this kind of creativity. In the context of music you all know this album by the Beatles called "The White Album," which inspired this album by Jay-Z called "The Black Album," which inspired this album by DJ Danger Mouse called "The Grey Album." It literally synthesizes the tracks of the White Album and the Black Album together to produce something like this.

(Clip plays.)

MR. LESSIG: Or In the context of just ordinary life, in 2004 this film *Tarnation* made it to the debut at Cannes, it was said by the BBC to wow Cannes. It was a film made for \$ 218. The kid took video that he had shot through his whole life and using an iMac given to him by a friend, he remixed it at a level to wow Cannes and to win the 2004 Los Angeles International Film Festival. But perhaps most important is in the context of politics, let me give you three samples.

(Start of clip.)

Do you ever get the feeling you are living in a virtual reality dream world fabricated to enslave your mind? A live all-war edition of American Juniors. But there is another sound: the sound of good will.

Sorry ladies and gentlemen. I'm far away in a remote place and we'll get these things set in a moment.

(End of clip.)

MR. LESSIG: This is a little simpler to make.

(Start of clip remixing audio samples of President George Bush.)

Sir, in answer to your question I just know how this world works. I see on TV screens how hard it is. We're making progress; it is hard work. You know, it's hard work. It's hard work. A lot of really get people working hard, they can do the hard work. That's what distinguishes us from the enemy. And it's hard work, but it's necessary work and that's essential, but again I want to tell the American people it's hard work. It is hard work. It's hard work. There is no doubt in my mind that it is necessary work. I understand how hard it is, that's my job. No doubt about it, it's tough. It's hard work which I really want to do, but I would hope I never have to – nothing wrong with that. But again I repeat to my fellow citizens, we're making progress. We're making progress there. I reject this notion. It's ludicrous. It is hard work. It's hard work. That's the plan for victory and that is the best way. What I said was it's hard work and I made that very clear.

(End of clip.)

MR. LESSIG: And this is my favorite.

(Start of clip.)

My love, there's only you in my life,
The only thing that's right.
My first love, you're every breath that I take,
You're every step I make.

And I,
And I,
I want to share all my love with you,
No one else will do.
And your eyes,
And your eyes, they tell me how much you care

(End of clip.)

MR. LESSIG: So this is the read-write internet. This is the read write culture that the internet begins to encourage. This is what creativity in a digital platform begins to beg for. This is a kind of democratization of capacity because nothing you've seen here is anything which television studios or film studios couldn't have done for the last 60 years; what's important here is that the capacity to do this has been spread now to anybody who has access to a \$1,500 computer. These tools of creativity thus become tools of speech used to express ideas in the vernacular of our times. We who live with texts, who believe that reading is what unimportant, need to recognize that reading is the new Latin; that the way people speak and communicate is not with text. They speak and communicate in exactly this form, and that now the technologies have exploded this wider range of media from audio and video and graphics to make them as accessible as the pencil and the typewriter were to those of us who grew up with text, this is an extraordinarily important new potential. It is a new potential to speak. It is a new potential to learn. It is literacy in the 21st century.

Now interestingly this new kind of literacy, this new technical capacity has the capacity to reverse a trend that was bemoaned exactly a century ago in this city. When this man, this horrible composer, John Philip Sousa traveled to this place – the United States Congress – to complain about this technology, what he called the talking machines. Sousa was not a fan of the talking machines. This is what he had to say: “These talking machines are going to ruin artistic development of music in this country. When I was a boy in front of every house in the summer evenings you would find young people together singing the songs of the day or the old songs. Today, you hear these infernal machines going nights and day. We will not have a vocal cord left,” Sousa said. “The vocal cords will be eliminated by a process of evolution as was the tail of man when he came from the ape.”

Right now, it's this image I want you to focus on, this image of people gathering together singing the songs of the day or the old songs. Right? That's an image of culture. It's what we would call read-write culture. It's a culture where people participate in the creation and recreation of their culture. It's read-write in that sense. Sousa's fear was that we would lose the capacity to engage in that read-write cultural production because these infernal machines would have taken it away. That would've displaced this practice and in its place we would have the opposite of read write culture: we would have a read-only culture, a read-only culture where creativity is of course consumed but the consumer is not a creator. Culture would be top down in this world. The vocal cords would've been lost.

Now, if you look back over the 20th century in at least the “developed world,” it’s hard to conclude that Sousa was not right. Never before in the history of culture has its production been as concentrated, never before has it been as professionalized, never before has creativity been as effectively displaced by these “infernal machines.”

The 20th century was the century where the read-write culture of our past was displaced by a read-only culture dominating the way most of us get access to the culture around us. But what the internet has the opportunity to do is to reverse this trend. The infernal machines that Sousa complained about are now extraordinarily creative machines offering our culture not to the end of read-only culture, but a compliment to read-only culture – tools to enable a wider range of people to become speakers and creators, a new social and a new political and, importantly, new economic value.

Now, you can celebrate this for lefty value reasons. You can say, self expression, democratic, creative. Right, but that’s a kind of Berkeley justification for this and I’m from Stanford. I want to focus on the righty-like values behind this: money. The read-write internet is justified primarily in this scheme by recognizing one important fact which is almost impossible to deny: the difference between the read-only and read-write internet is that the read-write internet will be massively bigger and more valuable to economic growth. Think about the computers, the bandwidth, the devices, the software, the consequence of allowing this technology to take off would be the explosion of this internet, this internet which again has its roots in very Republican ideals.

So there’s the happy part of the story; let me shift now to the corruption of this story – the corruption in particular of these three ideals that set the base of the original internet. These three ideals have not aged well over the past 22 years. Indeed, this month I believe we are going to see the end final of these three ideals. Now, the first of them to go was the principle and ideal embraced in this case – this case, the Sony Betamax case, which minimized the regulation of new technologies, shifting responsibility for illegal uses of those technologies to those engaging in illegal behavior. The new best friends of the Republican Party have become the copyright cabal. I’ve noticed this at the very end. This Republican logo is actually copyrighted if you see down here at the bottom. The new best friend of the Republican Party is Hollywood because the Republicans (heart?) Hollywood here. It’s the fastest growing source of revenue for the Republicans. And the poster child Republican on the side of the content industry is our friend Orrin Hatch.

The GOP now embraces the idea of regulating these tools to control the way content is created and distributed, as well as the behavior that might violate the copyright laws; this increase in regulation to protect one of these two forms of cultural production – read-only cultural production. This system of regulation reinforces and protects read-only culture. The simple rules of Sony are gone and we have massive rent-seeking increasingly replacing this original rule of minimal regulation.

The consequence of this is the chilling of another form of cultural production which is the read-write internet, because the read-write and read-only internets conflict at

the level of copyrights regulation. While copyright embraces and extends the power of the read-only internet because it allows content owners to control content whenever it is “copied,” and every single use of content in a digital network is a use which, “copies that content.” The read-write internet depends upon a broad range of freedom to build upon and transform culture and exactly that freedom is denied by copyright in its current incarnation.

So we strengthen the read-only culture and we thereby weaken the read-write culture, and the consequence is that the potential of this internet is reformed. A smaller, less valuable, less important internet in the read-write space develops while the read-only is the dominant.

Now, you could say there’s a silver lining here: at least if the Republicans have begun to embrace the idea we should be regulating tools that can do harm, we should look forward to some gun control being proposed by the Republican Party, I imagine. Right? You could say it’s a little bit odd that we wouldn’t have done that first because of course no one ever died from downloading music from Grokster, unlike the gun control example. But the point is, this principle, which was foundational to the opportunity of consumer electronics, is now corrupted.

Point two: spectrum, particularly the practice of making unlicensed spectrum available in the commons, that practice that gave birth to Wi-Fi now promises a wide range of extraordinary uses of this spectrum. What we’ve seen in the last four years of this administration is actually a reversal in the principle that gave birth to this unlicensed commons spectrum. Increasing drive to auction or propertize (ph) spectrum has actually led, as the New America Foundation has calculated, to a decrease in spectrum available in the commons by something like 10 percent, so this physical layer available for the spread and development for the internet is actually being shrunk. We’re raising the cost of this physical layer and thereby restricting innovation and, importantly here, shifting the resource spectrum to entities from which it’s easy to fund raise. Government resources become sources of government privilege and that reverses the idea of this open, neutral platform upon which innovation can grow.

And finally the corruption of the neutral network. There is an overwhelming push now in this city to restore the principles that stood behind this company’s ownership of its network. The principle that says the network owners – after all, it’s “our pipes,” Mr. Whitaker said, to control both the contents and the applications that flow across that network, compromising this competition at the content and application layer simply to give a higher return to owners at the physical layer. This compromise of these original principles here, principles that are effectively sold some estimate by \$1 million of campaigning every day around the issues around network neutrality in this area alone.

Now, I started by talking about one score and two years ago, the birth of the Republican Party’s contribution to the internet. One score and two years ago was also the last time that I actually voted for this party, but I was at the time a dyed in the wool Republican. Indeed, in 1980 I was the youngest member of delegation to the Republican

National Convention, so this was my birth. But those ideals have been lost, these principles have been lost. The ideals that were born then of neutral competition and balanced IP are no longer principles guiding this party – corrupted, you could say.

Indeed, as the *Washington Times* in an op-ed today reports, “We are operating off borrowed time. If Congress does not reinstate network neutrality soon, the internet most American’s know and love will be gone.” This is an op-ed authored by the Christian Coalition and MoveOn.org. And as they started, they said, “When MoveOn and the Christina Coalition are writing a letter together, you can bet something deeply troubling is going on in Congress.” More fundamentally, what is happening is that these political movements have lost touch with an important base – an important base of ideals which really explained much of the passion behind this movement.

Now, as a Democrat I guess I should be happy about this because this gives us an opportunity to rally the troops. We can say the environment was sold to Exxon. We could say the war was sold to Halliburton. And now we can say the internet was sold to AT&T. But even a partisan as strong as I can’t seem to rally much energy and excitement over this last particular event at least. It is extraordinary and weird, period, that we’ve lived in the last 20 years where both the right and the left had a coalition of ideals, and it’s that coalition of ideals that made the internet possible. That coalition is finished and as these parties perhaps separate – let’s at least hope that they take different paths – the conditions under which the internet was born will have changed, and the opportunity that we have seen in the last 22 years that that environment produced will be removed.

Thank you very much.

(Applause.)

MR. LESSIG: Peter?

Q: Peter Swire, Center for American Progress and Ohio State University. It’s been a characteristically elegant, wonderful talk. And read-write, read-only is a – I hadn’t seen it before and it’s going to spread.

The question in Washington on net neutrality, it gets framed from the people who support the phone companies the other way. I’m going to try to play that story and then you tell us what you say back. So the story is, net neutrality is a proposal for massive federal regulation, and if we want to have competition and the ability for people to contract better outcomes, then we should allow people who want to buy bigger pipes, who want to have guaranteed service, who want to have other deals with Verizon and AT&T – we should allow those contracts to go forward because that’s the way we’re going to get the investment that’s going to build better services for everybody.

So why do you favor heavy-handed government micro-regulation, they would say, of all these telecommunications decisions and are opposed to people being able to write contracts that are going to get them to a higher value outcome?

MR. LESSIG: So that's a very fair statement of the position of the other side. There are three points in response. The first is that the 22 years of the internet's life existed in the main under a much heavier form of government regulation. Remember, one half of the broadband infrastructure, the telecom companies, lived under essentially common carrier regulations and open access regulations until this administration came in. And that regulation led, in my view, to the neutral platform on which this other form of networks could take off. So this claim made over and over and over again, which is so factually wrong that people ought to be embarrassed by it – this claim that the internet was born absent regulation is just not true.

Number two, if you look at all the countries around the world who are beating us in broadband penetration – it's a large number of countries; we are 16th and 19th depending on how you want to count – are all countries that embrace much heavier handed regulation than anything network neutrality proponents are advancing. Those regulated economies – those regulated network economies are actually flourishing in the spread of broadband technologies and so the empirical claim that there is some negative relationship between regulation and growth at least has to be explained in the context of everywhere else where this is succeeding.

But the third point is to focus us on how narrow, from a historical perspective and even absolutely, the claims for network neutrality regulation are. Nobody is denying that network owners ought to have a wide swath of freedom to do with their property as they wish, to maximize the return, to have all the incentives in the world to build their property. Just like no one says copyright owners shouldn't have the widest range of freedom to do with their copyrights want they want to earn all the returns they can. But just as in the copyright context, where we insist there are limits on the exercise of that property right – we call them fair use limits – so too here there need to be limits on the exercise of the property right over the physical infrastructure.

Now, what are those limits? Well the anti-network neutrality bill that has now come out of the House embraces four of them that I think are fundamental. Powell's four freedoms. So even the other side has embraced four of what I think are five principles. And the four are that you are free to attach any device – the Carterphone idea, you are free to get access to any legal content, free to run any legal application, and you must have information about what the terms are that are governing your service.

The only additional restriction that I think network neutrality needs is a restriction on something called access tiering. Now, access tiering isn't all kinds of tiering. For example, I think network owners ought to be selling different quality of service to customers based on different prices. So if I want a 100 Mbps – like I could dream to be able to get that in America, but 100 Mbps, I should have to pay much more than you just

getting the 1 Mbps. I think that's fantastic kind of discrimination that would drive incentives to build better broadband.

The particular kind of discrimination that I think network neutrality proponents should oppose is when companies begin to discriminate for like kinds of service between different companies. So there's nothing wrong with the network saying, if you want video quality service, here's the price: saying that to Google Video as well as to Youtube. Or if you want web service, here is the price: saying that to every ISP out there. But when they start saying, well, for you Google, the price for Google Video is X and for you, Youtube, it's 2X, it creates a kind of perverse incentive and creates a barrier to entry into this competitive market that will shrink applications and content competition. But that's the golden egg that this goose has laid: applications and content competition.

The question should be framed, I think, in this way: this one sliver of freedom that we network neutrality proponents would deny network owners, really how critical is that one sliver of freedom to the opportunity of network owners to earn returns to build their networks? They would have it that they need absolute freedom to engage in whatever form of business they want regardless of its effect on competition at the applications and content layer, just like some of the MPAA's say they have to abolish fair use because that's the only way to give them enough incentives to produce creative work. But I believe in both contexts our tradition has recognized that though property rights are central to creating innovation and competition and growth, there are limits to property rights. And this particular limit on a structure that is plainly infrastructure is, I think, crucial to preserving the kind of competition that we see at applications and content layer.

Q: My name is John Williams and I work in the House. This is kind of a related question and I guess it's going at it from an economic perspective. And I liked your image of the commons. I guess the argument that we were hearing from the telcos was kind of a tragedy of a commons argument: that there's this common area out there and all you read-write people are going to send all their cows out to the pasture and eat up all the grass and the commons is going to be ruined. The poor networks are kind of left with this ruined commons area. Their argument was that you need to give us some more property – economic incentives to keep this a good, green pasture and that's why we're opposed to net neutrality.

How would you respond to that? It's kind of the same argument – the more economic argument we were hearing.

MR. LESSIG: Right, so let's make sure we're distinguishing two kinds of commons here. I described the innovation commons. The innovation commons is technically a commons produced by granting to everybody in end-to-end network the right to innovate equally. Now, that is a non-rival resource, so there can't be a tragedy of the innovation commons.

Q: (Off mike.)

MR. LESSIG: I understand. I want to get to the second commons, but I want to make sure we clearly understand non-rival resources, like ideas as Jefferson said, are not resources that can suffer a tragedy because they're out there and many people can consume them at the same time. Indeed, some non-rival resources like languages, the more people consume them the more valuable they are to everybody. That's a comedy of the commons not a tragedy of the commons.

But the second kind of resource, the one that evokes Garrett Hardin's idea of the tragedy of the commons is a resource where there is a rivalrousness (ph), and no would doubt that networks face exactly that kind of rivalrousness. But the kind of discrimination that I have explicitly endorsed here would be the kind of discrimination necessary to deal with that tragedy. So there are people called bandwidth hogs – I call them creative people, but other people call them bandwidth hogs, who are sucking up all the bandwidth in like my cable network where I connect because they're sharing their latest movie with their grandmother and five friends.

There is no reason why, under network neutrality, you couldn't be charging people by the amount they're consuming. Charged by bits, that's fine. Or charge at certain levels. Like you want to be able to distribute just what you would use with your e-mail every month, you get less than if you're going to be distributing these huge amounts of content. That's perfectly fine. That's consumer tiering.

And at the producer end, of course, when Google sends out stuff on Google Video, they already pay more to their ISPs for the stuff that they're sending out than they do if they don't sent out stuff on Google Video. So the particular thing you've pointed to as a tragedy, the system can easily build into, consistent with network neutrality, all of the incentives necessary to avoid that kind of tragedy.

Now, I don't deny that they could have one more tool in their toolbox that would be access tiering. No doubt that that could in principle be used to avoid exactly this kind of tragedy, but it could also be used to create the kind of perverse incentive that would restrict competition of applications (in?) the content layer. So rather than giving him this tool that can have two uses, one which is legitimate and one which is illegitimate, I follow the reasoning of the Grokster case and say they should be banned to use that tool because even though it could be used for a legitimate purpose I'm worried that it will be used for an illegitimate purpose. And instead, leave them all the other tools which, you know, are lots of tools to be able to deal with this particular problem in what I agree it is a potential tragedy of the commons.

Q: I'm Michele Rosenthal. I'm a student at GW Law School. My question is about the brand X decision by the Supreme Court to label broadband providers as not common carriers and so with that obviously they do not follow the same requirements in the telecom act as far as discrimination. Do you think that had the case turned out the other way that we wouldn't need net neutrality laws? Do you think that what is currently provided in the telecom act would actually prevent this type of discrimination among network owners?

MR. LESSIG: Well I do think that if the brand X had gone the other way and broadband providers had across the board been thought of as providing telecommunication services rather than information services, then a lot of the need for network neutrality regulation would go away. I'm not convinced that there wouldn't still be a need for telecommunications reform. I was a big believer in the open access movement that starts around 1998 and peters out with this administration's coming to power because I thought open access would be a great way to facilitate competition at the ISP level and that competition would create the conditions for network neutrality.

Now I've become less of a fan of open access for two very different reasons. One is we've seen that, unlike network providers around the world, our network providers don't obey the law. Open access was the remedy that Japan, Korea, France adopted, which exploded all of their network opportunities for broadband – an extraordinary amount of competition out there. But our network providers found every little trick they could to make it so open access just didn't work. It was impossible for the FCC really to police it because they had to go open up the boxes to see what was actually happening in a particular connecting station. So where you have people who are resisting the law like that and it's hard to police that law, then I don't think you have conditions for good regulation.

And the second thing is work by Barbara Von Shavek (ph) seems to me pretty compelling to argue an economic theorem to demonstrate that even under a perfect competition network providers have the incentives to discriminate. So the kind of discrimination we're trying to avoid wouldn't necessarily be guaranteed by competition and therefore it's the principle of neutrality that we should be focusing on, not the construction of this kind of competition.

Now, people then say, well, won't network neutrality regulation suffer from the same difficulty of enforcement? And the answer is no. They are fundamentally different in the way in which they would be enforced. The kind of neutrality regulations I'm talking about would be restrictions on the kind of business proposals that network owners are allowed to offer people in the world. So they're not allowed to offer Google a special price over Yahoo! for the same kind of service. Well it's pretty easy to police that. Of course, they might try to do it secretly. They might try to have these secret deals where they strike and there's a problem with internal versus external content, no doubt, but the point is what regulation should be trying to do here is to create enough incentives for network owners to build a business model that doesn't depend upon discrimination.

The existing set of absence of regulations, since August 5th, 2005, creates the incentives for them to build a business model that depends upon discrimination, and now they're open about it. You know, when we in 1998 said we've got to defend open access because they want to build networks that discriminate, we were called paranoid. Why would they ever do something so stupid? Well, everything that we predicted is in their press releases right now. So the point is they're now openly embracing this idea of discrimination and what we've got to do is create regulations to change the return from

that business model and force them to go to other business models. And that, I think, is easier to enforce than ones that try to make sure that the connections are actually equivalent.

Q: Henry Farrell, political science at George Washington University. Getting back to the open access question, do the new technologies that make the (sort of?) last mile a lot easier to transcend transform this debate to some extent? Here I am thinking particularly of Benkler's suggestion in the end his book really more or less says one possible solution in regulations to encourage municipal wireless, new forms of broadband, things like that to kind of try and reintroduce some of these forces – not necessarily competitive forces, but at the least ways in which people can access the internet without being subject to these kinds of roadblocks.

MR. LESSIG: So first important point is if you had not memorized Yochai's book yet, you should do it before Monday. It is the most important book published in the last 15 years on these issues I believe. So, yes, Yochai describes the kind of end run around this monopoly problem. But it's interesting is to see the parallel that he's creating, so remember circa 1995 the obsessive focus of the government and everybody was on the Microsoft monopoly – the Microsoft monopoly at the operating system level. And American businesses that had tried to compete with that monopoly by creating other operating systems that would compete directly with Microsoft's – other proprietary operating systems, like IBM tried to do it and of course Apple had an operating system, too, and those failed. So Microsoft was the monopoly winner and it took government intervention in the form of an antitrust case to try to deal with that particular problem.

But at the same time that the government is intervening, there's an explosion in a kind of operating system which in 1993 you had to be crazy to believe could ever be produced. That's GNU/Linux. In 1993, if you had said at Microsoft, "You know, we should be worried that there will be hundreds of – literally thousands of volunteers around the world who will use this new technology called the internet to volunteer to build an operating system that can compete with yours," you'd be certifiable in 1993. In 1995, it was entertainable, but within Microsoft it was deemed still crazy. Today it had proven itself. There is this free software version of an operating system that in an important sense creates pressure on Microsoft's monopoly; not directly at the desktop level, but if you think as Nick Negroponte talks about, the next billion PCs – the billion PCs in Africa and in China and in India – those billion PCs will not be running operating systems that cost \$100 a pop to deploy.

So this was an interesting, totally out of leftfield development of an operating system that changed the debate around that monopoly question. What Yochai is talking about is the same thing happening with the monopoly problem and the physical and transport layer. So we're fighting about regulation is necessary to make sure that the physical and transport layer has the right kind of competition and of course the standard theory is we need to have overbuilding in the space, and what the standard theorists never explain is how do over-builders get a return from their overbuilding if they're going to change the price now to be just a competitive market price? Well, the only way they get

a return is by discriminating in the content and application space. That's how they earn their return. But this is the standard theory: that we're going to have this kind of facilities based competition and that's what's going to solve any kind of monopoly power problem here. It might, but it creates problems that the application and content layer.

But what Yochai is talking about is the equivalent of GNU/Linux at the physical and transport layer because to the extent people start building mesh networks, self-funded, self-financed mesh networks and you start having areas that have mesh network clouds, like municipalities or even not necessarily municipalities, and anybody in that mesh network can get an access point to the internet, you create an extraordinary potential for competition from – to the basic wire-line service.

Now, one example of this – and I just don't think the wired services are paying enough attention to the potential here – San Francisco has just been arguing about whether we're going to have free wireless, 308... I can't remember if it's 640 or – one of those very small number of kilobits per second, 380 or 640 I can't remember, but it's a tiny bit of kilobits per second.

One of my heroes in this work is Duane Hendrix (sp), who has a company, Gandlin (ph) which is now deploying a wireless network in a Native American reservation in Arizona. The Native American reservation I think is 1,300 square miles; San Francisco I think is 26 square miles. The 1,300-square-mile Native American reservation is going to get 100 Mbps symmetrical. San Francisco might get 640 Kbps one way. Now, that wireless infrastructure – off the shelf, standard technology – begins to create a huge potential if we can imagine all of those clouds being connected to the dark fiber that now exists in the backbone, creating real pressure on the way this other internet develops. So I think it is a great opportunity.

Now, we've got to be able to walk and chew gum here. That doesn't mean that in the short term we don't need to worry about network neutrality regulation because that infrastructure will take time. It's not clear exactly how it gets developed. But we have to be doing both, but I do think that that's a really important potential on the other side.

Is that it? I'm finished. Thank you very much.

(Applause.)

MR. MALAMUD: Thank you very much. In mid-July we are going to be having a third in a series of these talks: Dave Farber and Vince Cerf will be having a debate on what exactly is net neutrality, so watch for our announcement on that one.

Thanks a lot for coming.

(END)