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Every free and competitive market depends upon effective regulation. From rules that establish property rights, to courts that enforce contracts, to laws that assure competition is sustained, the government is always intimately involved in guaranteeing the conditions under which innovation and growth occur.

The growth of broadband technologies will be no different. It too will depend upon effective--and the right kind of--regulation. In my view, the sole and central purpose of that regulation must be to assure that the network maintains its character as a neutral platform for innovation. That neutrality produced the growth and innovation of the Internet in the 1990s. Corrupting that neutrality will stifle growth within the broadband market, and in markets that are affected by broadband technologies.

This neutrality was originally a feature of the network's technical design. Network architects call that design the "end- to-end" principle. But the ideals of end-to-end neutrality are familiar within many ordinary and important networks. Our highway, or "freeway," system was not built to favor one auto manufacturer over another. Electrical outlets don't function differently if you use a Sony rather than a Panasonic TV. The post office doesn't deliver mail favorable to Republicans any more quickly than it delivers mail favorable to Democrats. All of these networks are instead neutral among a wide range of compatible uses. These networks are not in the business of picking and choosing which applications or uses will be allowed. That neutrality in turn invites an extraordinary range of innovation.

This neutrality in the original Internet is now under threat. Changes in the ownership of the network, and in the legal rules under which the network is owned, increasingly give network owners the power to choose which applications will be allowed on the network, and which content will be preferred. That power in turn will reduce the incentive of others to innovate for this network. Corruption of the original network design will thus stifle growth of the Internet.

Open access regulations were originally intended to resist this corruption. By promising adequate competition at the physical layer of the network, the aim of open access requirements was to guarantee that no single network owner would have sufficient monopoly power to direct the network's evolution. If one provider biased the access it offered, then because of open access requirements,

users would be able easily to switch to a different network provider. The competitive market would thus assure network neutrality without direct government intervention.

There is now a strong resistance to open access regulations. The current administration seems keen to remove any requirements that network providers make their facilities open to competition. The FCC is moving quickly to implement these policies.

Whatever the wisdom of open access, however, it would be a mistake to remove regulatory oversight from the broadband market. The consequence of total regulatory retreat will be an extraordinary concentration in network ownership, leading to less broadband competition, and higher broadband prices.

That concentration will also, in turn, threaten the neutrality of the network, and hence growth and innovation on the broadband network. In my view, it is crucial for Congress to insist that if the FCC intends to remove open access requirements, then it must substitute a different form of regulatory oversight to assure *network neutrality*.

This oversight must guarantee that Internet service providers not corrupt the principles of neutrality built into the original network, by providing biased or non-neutral Internet service. Just as the electricity grid does not discriminate against Japanese televisions, or GE toasters, Internet service should not discriminate against games from Microsoft, or streaming video from Disney.

And thus if regulation at the physical layer of the network (open access) is to be terminated, then regulation at the “logical” layer of the network (to assure neutrality) must take its place. These regulations must assure that consumers using the network have the freedom to deploy legal content and legal applications as they choose, not as the network owner decides.

Separating control over the use of the network from ownership of the wires that make-up the network is a necessary step to restoring the growth and innovation of the original Internet. The “connectivity principles” described by the High-Tech Broadband Coalition are an important step to this end. At a minimum, Congress should require that no change in open access policies be permitted until the FCC articulates a set of principles like the “connectivity principles” to assure that all Internet networks provide neutral Internet service. The FCC should not unilaterally withdraw from regulation without assuring that rules to guarantee network neutrality continue to govern the Internet.

If the FCC implemented a strong set of rules designed to assure neutrality in the network, then it may well be advisable to relax requirements of open access. As a first step, in my view, this is the extent of the change that Congress should allow the FCC to effect. If this proves insufficient to spur growth in broadband adop-

tion, then as with highways, it may well make sense for the government to subsidize further deployment. At this stage, however, I do not believe subsidy is merited.

In addition to these principles of neutrality, Congress should direct the FCC immediately to develop spectrum policies that will enable wireless “Wi-Fi” networks to compete with telecom and cable providers in last-mile service. The greatest innovation and growth in spectrum usage has come within “unlicensed” spectrum bands. This is consistent with the original history of the Internet, and it follows from major technological advances in spectrum technologies. It will soon be apparent that these changes in technology will fundamentally alter the way in which spectrum is allocated. In the meantime, the government could spur a great deal of competition in broadband access by freeing a much greater range of spectrum for unlicensed, or “commons” use.

For the first time in the history of network technologies, the United States is falling behind our allies. Korea, Canada, and even Japan are increasingly outstripping the United States with fast, cheap Internet service. In none of these countries has this deployment been produced by a totally unregulated market. In each case the government has played an important role in assuring that the infrastructure of the digital age get deployed quickly and efficiently. So too should our government.

I have described these principles more fully in the attached article from Foreign Policy magazine, which I submit for the record.