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FORWARD WITH FIBER: An Infrastructure Investment Plan for the New Administration

Essay by Doc Searls, October 30, 2008

In 1803, Thomas Jefferson presided over the country's first economic stimulus package: the Louisiana Purchase. For a sum of $23 million and change, the U.S. doubled its territory and became a world power.

Wouldn't it be cool to do a deal like that today?

We can, through infrastructure investment — not just in roads, electrical service and water systems; but in fiber optic connections to nearly every home and office. Nothing could do more for the economy while costing less.

The future is digital and connected. It follows that maximizing connectivity and network capacity will also maximize economic growth.

We can't see the potential for that growth as long as we're blinded by phone and cable company offerings, which treat the Internet as the third act in a "triple play." We can't see it as long as we look to Congress and the FCC to protect what little Internet we have, rather than to ditch the regulatory harness called telecom and open the digital frontier.

We can't see the digital light as long as the future remains darkened by analog's long shadow. Not surprisingly, that shadow is darkest over telephony and television.

Even though most home phones are now digital, we still "dial" to connect and get billed by the minute. And while analog cell phones are gone, even "smart" digital phones are locked up by phone companies and their phone-making partners.

Next February all over-the-air television broadcasting in the U.S. will go digital, matching cable and satellite TV distribution systems that have been digital for years. Yet we still watch "programs" on "channels," just like we started doing in 1950.

But dawn is breaking.

On the telephony front, Apple's iPhone has become a highly generative platform for countless purposes. In just three months, the number of applications has grown from a handful to more than five thousand. Though the iPhone is still a proprietary platform, it demonstrates how telephony is one among an infinitude of useful purposes, all facilitated by a digital device that can slip into a pocket or a purse.

On the television front, couch potato farming is being marginalized by more active forms of video engagement. Millions of consumers are now also producers, creating and distributing files watched by millions of other users on their laptops, iPhones, Blackberries and flat screens.

And on both fronts, new devices based on open source technologies demonstrate how easy it is to scaffold and build innovative new products and services that make money and expand the scope of civilization.

All of this is happening on the vast digital matrix we call the Internet.

The “backbones” of that matrix are fiber-optic connections. For a lucky few million U.S. households, that fiber matrix extends to them as well.

Our apartment near Boston is served by a strand of fiber from Verizon FiOS. That fiber uses a technology called GPON (Gigabit-capable Passive Optical Network), which can provide throughputs of up to 2.5Gb down and 1.2Gb up. While I am pleased with the 20Mb symmetrical Internet service I’m getting for about $60/month, I’m also aware that this is a tiny fraction of my actual bandwidth, most of which is cordoned off for television, which our family rarely watches.

How many other uses can that connection support? Think about the business possibilities here. Think production, not just consumption.

“Triple play” (telephone, TV, Internet) is a legacy offering made worse by usage restrictions and prohibitive pricing for “business” uses — a captive-market shakedown racket that was modeled by Ma Bell and that prevents far more business than it enables.

It’s time for the carriers to start thinking outside their old monopoly boxes. It’s time to wake up and smell the capacity — especially when they’re the ones brewing it.

Amazon and Google provide huge clues to the possibilities here. In The Big Switch, Nicholas Carr calls Google Apps and Amazon Web Services examples of “utility computing.” Why shouldn’t phone and cable utilities get into that game too? These carriers have huge advantages over Google and Amazon: reduced latency over short-haul connections, local offices to fill with equipment and customer support, skilled installers and maintenance personnel, and existing relationships with millions of customers. They also have the luxury of choice: they can compete with these “cloud” companies, or partner with them.

They could also partner with their own customers, among which are the very people who are revolutionizing the entertainment industry by producing their own music and movies. High-quality audio production got cheap years ago, and already flat-screen owners are discovering that the best video they can watch comes from their own HD camcorders. But the most interesting demand is coming from producers of cinema-quality video (what we call “movies”), who are making use of cheap top-quality shooting and production gear. Check out what’s being done with the Red camera and the RedUser community. This virtual Hollywood is distributed all over the world. Its choke points right now are in that last mile, and in the need for low-latency render farms, among other offsite services. Who is in the best position to help these creators out?

The leverage we’re talking about is incalculably high because the sum capacity of fiber has oceanic dimensions. One optical fiber is the width of a human hair. A typical fiber trunk fits an 864-fiber cable inside a 1.5-inch conduit. Each fiber can carry 10 gigabits of data. The total comes to 1.6 terabits. Here’s how David Isenberg puts that into perspective:

> If all 6.5 billion people on earth had a telephone, and if they were all off-hook, generating 64 kilobits a second, and all those conversations were routed to this cable, there would be 100 fibers still dark.

Bringing fiber to homes and offices costs between $1000 to $7000 per "drop." Those costs are in the same range as home entertainment systems, which begin depreciating to worthlessness immediately. Meanwhile, fiber's value increases with every new connection you can make through it, and every new application you can run on it. And the costs of fiber, conduit and and installation are coming down while quality goes up. (This photo set provides some visual examples.)

We've all heard reports about how the U.S. has been falling behind other countries in broadband deployment. This is a red herring. The term "broadband" has many meanings, only one of which is data transmission rate. Worse, it's generally associated with telecommunications, a category of business that has been subject to strait-jacket regulation going back to the 1934 telecom act and beyond. As Richard Bennett puts it,

> The Internet is indeed the most light-regulated network going, and it's the only one in a constant state of improvement. Inappropriate regulation - treating the Internet like a telecom network - is the only way to put an end to that cycle.

We need to exit the conceptual space called telecom and see raw connectivity and maximized capacity as the Wild West.

Given the hundreds of $billions flushed into rescue and stimulus boondoggles, what's a few hundred billion more for something that creates immeasurable support for the economy, far beyond the foreseeable future?

David Isenberg tells me a good sum to invest is $300 billion. That would be for "every home passed with more density than about four per road mile and a 50% take rate." The numbers matter less than the intention, which is to open a vast new marketplace where American business can thrive and everybody can participate and benefit.

Our vision needs to transcend more than telecom. It needs to transcend the Net as we know it today. We need to keep the best of what it already gives us, and open our minds to how much more it can be.

Bob Frankston has often reminded us that (for him at least) the Internet began as a "class project" and a "prototype." What matters instead, he says, is connectivity extending from home networking to the whole world — and the emergence in its midst of a "bit commons" that involves and supports everybody who contributes to it.

That commons needs room. Only fiber can provide that, as a base level of infrastructure that goes all the way to every possible edge. From there we can fill in the rest with copper and wireless (which is far less scarce than spectrum-mindedness has led us to believe.)

We need public-private cooperation and partnership, and that must extend to individuals and small contractors as well. Networking is something we already do at home. We should be able to stretch that out to our neighborhoods and beyond.

This also can't be a government project alone, although it needs to involve government at state and local levels as well — not just because those actors might be in the best position to do the work in some cases, but because they often impose regulatory bottlenecks too. We need to make it as easy as possible to drape cabling on poles, trench for conduit, and get the job done without snarls of red tape. We need to keep the goal foremost in mind, and to invest, incentivize and regulate accordingly.

If we fiber up everything we can, with minimum restrictions on use, the economic upsides are limitless.

In a few days we'll elect a new president. We can help that president do what Jefferson did two centuries ago: invest in a vast new frontier.

So let's talk about how we can do that. Two requests for responses. One is to leave old arguments — about Net Neutrality, bandwidth hogs, and who is to blame for what — outside the door. The other is to make constructive and realistic suggestions about what this new administration can do in just one area of infrastructure investment: expanding connectivity and network capacity in ways that open innovation and growth opportunity for everybody.

Doc Searls is a Fellow at the Berkman Center for Internet and Society *at Harvard Law School and Senior Editor of* Linux Journal*. He is also co-author (with fellow Berkman Fellow* David Weinberger *and others) of* The Cluetrain Manifesto*, and one of the world's best-known and widely read bloggers. His work as a journalist, speaker and advocate of the Internet led to a Google-O'Reilly Open Source Award for Best Communicator in 2005. He blogs* here*.*

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