

Gig.U and the Next Generation of Broadband

In an ambitious project that stands the Google model on its head, more than two dozen universities are collaborating to make their communities test beds for high-speed networks and new applications.

By Masha Zager ■ *Broadband Communities*

In July, 29 public and private research universities across the United States joined forces to launch a unique broadband project. Local governments and civic organizations in many of the universities' home cities also signed on as partners.

The Gig.U project, housed at the Aspen Institute and led by Aspen Institute fellow Blair Levin (developer of the FCC's National Broadband Plan) and former FCC policy advisor Elise Kohn, aims to accelerate the deployment of ultra-high-speed networks to leading U.S. universities and their surrounding communities. The organization is acting as a catalyst, not as a network deployer or operator.

Gig.U, formally titled the University Community Next Generation Innovation Project, attempts to redefine community-service provider partnerships.

Unlike earlier multicomunity projects, such as UTOPIA in Utah and EC-Fiber in Vermont, which are building large, publicly owned networks, Gig.U proposes a series of separate, privately owned networks across the country. The member universities hope to entice service providers to build next-generation networks in their communities by aggregating demand and offering themselves as attractive test beds for new services.

Levin, the project's executive director, explains, "If a single university were to do this, it would be less likely to get the attention of service providers. ... Similarly, if a single provider were to say, 'I'd like to do a Google,' it would be overwhelmed. We're giving them a focused target." Though a number of

"What we don't know is how many great ideas and revolutionary products wait to see the light of day while network bandwidth and computer resources play catch-up. ... Separately, we can make the world a better place – but together, we will."

– Hugh Hallman, mayor of Tempe, Ariz.

additional universities plan to join the project, Levin says he doesn't want it to get "so big it's not manageable."

Even though Gig.U was in many ways inspired by Google's Fiber for Communities project, it won't have 1,100 communities to vie for providers' attention, let alone mayors who jump into lakes or name their children for service providers.

THE CHICKEN AND THE EGG

In the United States today, large-scale gigabit networks are being built in only two situations, neither of them commercial. Google is in the early stages of building its network in the Kansas City area, and several public operators, such as UTOPIA and Chattanooga EPB, are building advanced fiber networks to serve their communities. Google's net-

work is intended as a proof of concept, and the public networks are by definition noncommercial.

Because of the small number of gigabit-capable households (or even symmetrical-100 Mbps households), few applications have yet been developed to exploit fiber's unique capabilities. As a result, the nation's 7 million subscribers to FTTH services, though they may enjoy blazing-fast, reliable Internet access and crystal-clear HDTV reception, aren't yet doing anything significantly different from what other broadband users are doing.

Market researcher Michael Render of RVA refers to this as a "chicken-and-egg problem" because application developers won't design new applications without a large potential customer base and network builders won't build gigabit

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networks if the applications aren't there.

Levin's insight – his solution to the chicken-and-egg problem – is that neighborhoods around major universities, unlike other neighborhoods, present opportunities for service providers to build profitable ultra-high-speed networks *even before compelling new applications are developed.*

WHY UNIVERSITY COMMUNITIES ARE ATTRACTIVE

University communities tend to meet all the traditional criteria for desirable broadband markets: high density, strong institutional and residential demand, favorable demographics, significant network assets and stable economic bases. However, they also share a unique advantage that sets them apart from typical upscale suburbs.

Today's academic research projects require high-performance computing, which relies on supercomputers, computer clusters and massive databases. To support such projects, research universities have invested heavily in research and educational networks. On campus, faculty and students are usually well served with extremely high-speed connections. However, even the most dedicated researcher isn't in the lab 24/7.

Levin says, "We'd like to see those kinds of networks extended into the communities. Professors would like to do similar [research] from home – it's that kind of seamless networking that we want."

Kohn, Gig.U's program director, adds that telecommuting isn't the only need that ultra-high-speed networks fill. Many university researchers go on to found start-up companies that do similar kinds of data-crunching; biomedical research centers affiliated with universities also require massive data.

She says, "A lot is about getting the connectivity there, too, to make sure they can attract leadership and innovation. Business connections are as important as residential connections – in some places, that's where it starts and accelerates." Of course, workers at these start-ups and off-campus research facilities also want to telecommute.

Because so many members of university communities already have a "need

"The vision is to deliver transformative services to the community and realize a mutually enriching relationship between the university and its neighbors."

– Brian D. Voss, VP of information technology and CIO, University of Maryland

for speed," service providers can be assured of having a market for ultra-high-speed Internet access without waiting for exciting, new consumer services to come along. This makes installing advanced networks less risky for them.

In addition, Levin points out, building high-speed networks in university communities is apt to yield a high public benefit because subscribers there are likely to use their massive bandwidth not just to consume but also to create.

DEVELOPING THE BUSINESS MODEL

In mid-August, Gig.U sent leading Internet service providers and other entities an open letter that outlined its goals, principles and assumptions for the Request for Information (RFI) process; as of press time, it planned to issue an RFI in September and then host a workshop at the University of Chicago for interested private-sector entities and other stakeholders. After that – probably early in 2012 – members will begin to issue RFPs based on the results of the RFI process.

Gig.U members have tried to keep open minds about the project's direction. According to Levin, preliminary discussions with possible partners – including telcos, cable companies and "nontraditional" deployers – generated a surprising amount of interest, given today's challenging economic conditions. He says, "They all appreciate that there's a need for these kinds of test beds. They all agree that the strategy of building in university communities makes a lot of sense."

However, he says, "Different potential and existing service providers are all thinking about next-generation networks, but they have different technical and business approaches. ... Some might

say they need a critical mass of communities, and others might say they could have a better vehicle [working with a particular community]. The process will reveal the best way to proceed – it's not for us to prejudge. It's similar to an issue that arose when I was at the FCC in the early 1990s, when we developed the methodology for holding spectrum auctions. There were debates then about whether to issue national licenses, local licenses or regional licenses. What you want to do is let the market itself give you the feedback about the best way to get to your goal."

Depending on the responses to the RFI, Gig.U members could decide to issue a single, national RFP and negotiate contracts with a single provider, or – more likely – they could organize themselves into groups by region or another differentiating factor, issue multiple RFPs and negotiate contracts with multiple providers.

A second decision up for grabs is what is meant by "community." How far beyond campuses will these networks extend? Levin says, "We've been conscious of using 'community' instead of 'city.' In some strategies, it can really be an entire city. Other approaches might provide great connectivity at low cost but only in certain neighborhoods." Where to deploy the networks will also be determined by the RFI/RFP process.

Finally, the process should reveal appropriate models for partnerships among universities, communities and private-sector providers. Levin points out that most of the communities submitted applications to the Google Fiber for Communities program, so they understand the value of high-bandwidth networks and are prepared to enter into

“Information – whether it be massive data, real-time, high-definition video or things we haven’t thought of yet – is the lifeblood of innovation.

– Michael R. McPherson, associate VP and deputy CIO, University of Virginia

creative partnerships. He says, “As to what the university has to do and what the community has to do, that will become clearer as we evaluate the responses to the RFI. One indicator is the kind of commitments that Kansas City gave to Google and that Google provided to Kansas City. A traditional franchise agreement is another (though with a different set of obligations). But I can envision a lot of different ways it could work. The idea is to find the kind of collaborative partnership that enables a new, incremental investment of private capital.”

TURNING THE TIDE

The university members of Gig.U believe that extending ultra-high-speed networks into their communities will help them attract the best and brightest students and faculty. Local government members anticipate that the networks will support research-based start-ups and other businesses in their communities and thus boost their economies.

Gig.U’s most important benefit, however, may be that it jump-starts the next generation of broadband applications and thus eventually justifies building more gigabit networks in more commu-

nities. New approaches to health care, education, job training, public safety and other critical social needs may arise once a large group of consumers, businesses, academics, local governments and service providers are given unfettered access to virtually unlimited bandwidth.

“If we’re looking for innovation, we shouldn’t be looking at the model we once relied on, which was centered on organizations like Bell Labs,” Levin says. “That kind of R&D won’t exist anymore. But once we have very abundant bandwidth in the hands of lots of different communities, we’ll see that the American genius for ingenuity has not gone away. With next-generation tools in their hands, they will develop tremendous new things that we can’t even conceive of today.”

Gig.U appears to be swimming against today’s broadband tide. At a time when many service providers seek to limit, control, meter and monetize broadband use – to lead users back toward conditions of bandwidth scarcity even as bandwidth becomes more abundant – Gig.U proposes to let users be creative and exploit their networks’ potential to full advantage.

This requires a degree of confidence and vision on the part of service providers – or at least a willingness to experiment with new models. Levin explains, “Either a provider wants to drive innovative applications because of the value it will create in other markets, or it doesn’t. If a service provider thinks that it has a long-term path to success by increasing the margin on existing uses, then the Gig.U opportunity is probably not going to be attractive to them.

“But I think a number of service providers recognize the need for test beds and the value of technological leadership – and those service providers will see an opportunity to demonstrate, and benefit from, that leadership in offering next-generation networks and services in Gig.U communities.”

If Levin is right and the project succeeds, it will demonstrate that service providers can profit more by encouraging broadband use than by limiting use. In that case, Gig.U will not only have bucked the tide but also have reversed it entirely. ♦

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