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U.S.-Funded Internet Liberation Project Finds Perfect Test Site: Occupy D.C.

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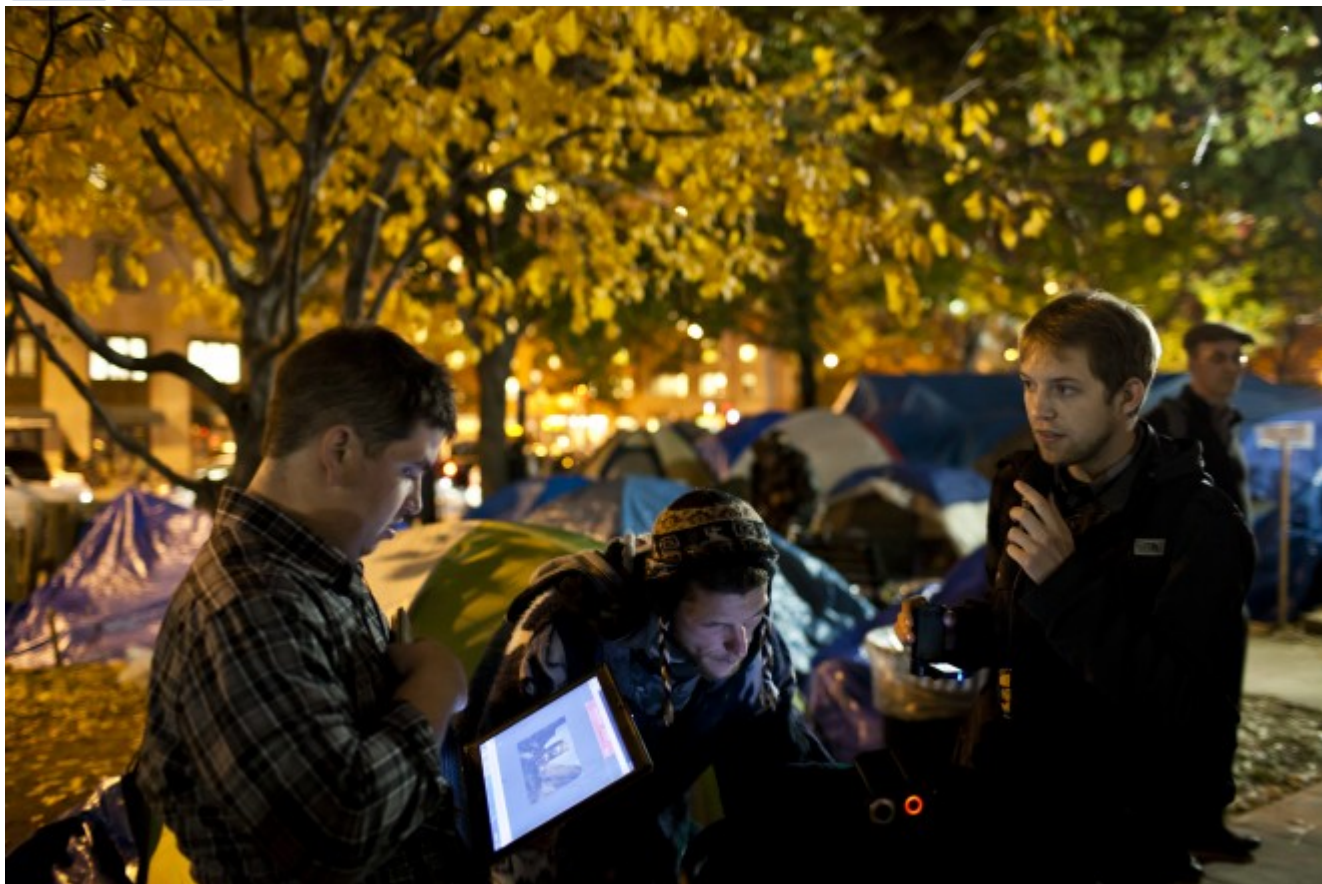
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Occupy D.C. protesters preparing to livestream a solidarity march. Photo: Brendan Hoffman/Wired.com

When Sascha Meinrath saw the Occupy encampment in D.C., he saw something few others would — a testbed for technology.

[Meinrath](#) has been chasing a dream for more than a decade, ever since he was a liberal arts grad student in Urbana, Illinois: community wireless networks. From that small beginning, Meinrath now runs a State Department-funded initiative to create an Internet in a Suitcase — the Voice of America of the digital age.

If he has his way, Meinrath's project will lead to low-cost, easy-to-use wireless connections around the globe, all lashed together in mesh that can withstand the whims of dictators willing to pull the plug on the internet to quash dissent. He and a team of software engineers are developing open-source software to turn cheap wireless access points and Android smartphones into nodes on the network, which could then be used by dissidents to evade censorship and to spread low-cost connections everywhere around the world. Proponents of the plan include the U.S. State Department, which has given Meinrath a \$2 million grant to develop the code.

“This started due to massive naiveté,” said Meinrath, whose official title is Director of the New America Foundation's [Open Technology Initiative](#). “I had no idea of the complexity of solving these problems.”

Before getting funding, Meinrath and his team of collaborators had been building various community networks for years, including a post-Katrina emergency connection network that spanned three states. Community wireless networks in the U.S. have generally failed to find acceptance, but massive scale networks are possible, says Meinrath, pointing to examples in Spain and Greece which are home to networks with thousands of nodes.

With the emergence of an Occupy encampment in the nation's capital, Meinrath found a nearly perfect testbed for the pre-alpha software — the site is weather-challenged, and full of internet-hungry individuals constantly trying to update social networking sites and make their own media. Exactly like what happened in the Arab Spring.



The white router hanging in the center of the tech tent at the Occupy D.C. encampment in McPherson Square is a test of the Internet in a Suitcase project. Photo: Brendan Hoffman/Wired.com

The Internet in a Suitcase project is based off a simple plan: create software that's easy to install and use on cheap hardware which will seamlessly connect to any other access point around it, creating a shared local network.

The custom software is called Commotion. It will work with Android phones and with routers that support custom firmware, like Ubiquiti Networks' low-cost, carrier-grade wireless access points. "The firmware provides auto-configuration capabilities," said Brian Duggan, one of the engineers on the Internet in a Suitcase project, "so you don't need to be an engineer" to install it. "You flash as many nodes as you want, or pick up previous ones."

The idea is that the system will automatically set itself up. Drop a unit near another unit and they'll start talking to one another and trading data. Add another and all three will talk to one another. Add a thousand and you can cover a whole city. Then if one of those routers is hooked up to an internet connection, everyone on the network can connect. If that connection disappears, users can still try to update an application like Twitter or send e-mail to the larger internet and the outgoing notes will go into a holding pattern until the mesh network finds another connection to the greater net.

That's harder to pull off in practice, even under ideal conditions — as anyone who's tried to link even two Wi-Fi access points in their own home could attest. Now throw in the variables that the access points should work in urban and exposed environments, as well as protest zones like Tahir Square. You'll want to protect dissidents with encryption and deniability. And you don't want your beta-testers to be arrested or even killed because of a software bug. All together it's the kind of challenge engineers like to call "non-trivial".

“Finding a place to use the system is difficult,” Meinrath said. “Thank God for the Occupy movement.”

So over the last few weeks, Meinrath’s staff have tried to wire up Occupy DC with a few custom-flashed wireless nodes hooked up to the network via radio link to a nearby office’s donated business connection.

But please don’t take it as an endorsement of Occupy DC’s politics, Meinrath says.

“We hope the Tea Party will launch a sleep-in and we can hit both ends of the political spectrum,” he said.

Right now, the project’s software is in “pre-release” form, though it’s seeped into the wild at Occupy DC. You can find one router in the media tent at in downtown McPherson Square, which is home to about 200 protesters.

The Media Tent is built out of a bunch of tarps, with another tarp separating the tent into two rooms. There’s a graffiti-lined front door — an actual door — that is hinged to nothing, a cheeky joke, since you get in by lifting the tarps. Inside is a mess — there’s an office chair with ripped upholstery, milk crates and ladders strewn about and a few tables for desks. The park ground is the floor, augmented by some cardboard and wood planks.

The Internet in a Suitcase hardware is a white Ubiquiti router the size of a couple Snickers bars. It hangs from the makeshift ceiling and is not noticeable unless you look for it.

To use it, you plug one end into the wall, another into a bandwidth source, and you’re to be good to go. In theory. In practice, the test at Occupy DC is drawing at best mixed reviews from protesters, who say the technology is difficult to configure, install and use.



The test network wasn't powerful enough to power this protester's live-streaming baby stroller, demonstrating the bandwidth demands that a dictator-proof network would need to support.

Photo: Brendan Hoffman/Wired.com

“It’s definitely a work in progress,” said Kelly Mears, who seems to be the head of tech for Occupy DC and looks remarkably like Mark Zuckerberg, albeit in a skinny brown tie and cardigan instead of a hoodie. “It’s not exactly point and click. I’m looking at a terminal window, on Linux.”

Kenny, another of Occupy DC’s tech people, is also slightly unimpressed, though not critical of the New America team. He pushes a Dell laptop in a baby stroller to livestream a protest in the occupied McPherson Square’s central square, in solidarity with the Occupy Wall Street eviction. The laptop is notably hooked up to a commercial Clear Wi-Fi hotspot.

“The signal strength [of Commotion] is poor. ... The service itself has been shitty. That’s why we’re using Clear,” Kenny said.

The signal strength starts conking out when you walk the roughly 50 feet from the media tent to the center of the square. There are typically 3 or 4 laptops from the media team simultaneously using Commotion — its not clear how many other devices are also taxing the system. It doesn’t help that there’s a single connection to the net — a 1 Mbps connection at that — which is linked to by a long range antenna. That kind of connection is thin for livestreaming, even for one person in ideal conditions.

Josh King, the technical lead on the project, is excited, even if the protesters aren’t.

“It’s software under development,” King said. “This is a great opportunity to test it, to get this kind of feedback and make changes in real time.”

“It’s a real test bed,” adds Meinrath. “We’re getting the good, bad and ugly ... It’s not as stable as we would like, but we working in real world where we don’t have optimum anything. It’s a pre-alpha release providing connectivity to several hundred people.”

The team is working to augment its internet bandwidth with backhaul from the AFL-CIO and the ACLU. The latter would be ideal, Meinrath says, because it’s unlikely that law enforcement would try to subpoena the ACLU’s connection to spy on protesters.

But for now Meinrath is happy with the test.

When, or if, the team figures out how to build a point-and-click internet in a box, they hope it’ll become a platform that developers can build smart and safe apps on.

Meinrath points to Frank Legendre’s work on what’s known as disaster mode for Twitter (download it at [Twimight](#)) as an example of what an app built for such a network could look like.

“You could have a delay-tolerant Twitter, where people on the local network could see your tweets and then when a connection is restored it could get pushed to the internet,” Meinrath said. “We are in the very infancy of this kind of intranet.”

That’s still a dream that’s a long way off. But Meinrath’s project is not alone. Another community wireless group in Europe won a \$5 million grant to work on implementing such networks, complementing his group’s emphasis on research and development.

Meinrath thinks it’s just a matter of time now before mesh networks become a fact of life for most of the world — in particular the two-thirds of it that aren’t high-income nations.





“Those initial years of having a very utopian but pragmatic vision of connectivity for everyone is still driving this project,” Meinrath said. “Twenty-first century statecraft is aligned with those goals. It’s nice to have Hilary on your side.”

Additional reporting and writing by Spencer Ackerman.

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