

Why Is My Internet Slow?

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(PhysOrg.com) -- Most people don't understand how their broadband Internet connection works, they just know when it doesn't. When that happens, they do one of two things: consult the tech wizard in their house, or call their Internet provider.

But what if regular people had information about how their Internet connections were performing at their fingertips? What if they could easily give priority to uploads or downloads on one computer over another, making sure their kids' YouTube antics don't interfere with their work? They may soon be able to do just that.

Marshini Chetty, a Ph.D. candidate in the College of Computing at the Georgia Institute of Technology, details her efforts in testing Microsoft Research's Home Watcher system and talks a bit about another system she's designed and is currently testing, called Kermit. The Home Watcher research will be presented at CHI 2010, the Association for Computing Machinery's Conference on Human Factors in Computing Systems, being held at the Hyatt Regency Atlanta, April 10-15.

Q: What is Home Watcher?

Marshini Chetty: Homewatcher is a system, designed by the Computer Mediated Living and Systems & Networking groups at Microsoft Research, Cambridge, that I tested in the UK as part of a summer internship. It runs on Windows machines to allow you to monitor the bandwidth usage of each machine on your home network. We tested it using six households, with a total of 24 people in all. Three of them had

teenagers, one was a married couple and two of them had roommates.

With Home Watcher, it's a central display that allows you to see the uploads and downloads of each machine in your house. So in the display, each of these little blobs represents a computer in your house. And up on the top, these are the uploads and downloads for each machine. So these little blobs bounce up and down on a little graph, showing you how much bandwidth they're using.

So you can see, this guy (in yellow) is using a lot compared to these other three. It's downloading a lot more. And then here (in orange) you can see no one's really doing much downloading. And you can also drag these ellipses up and down to limit someone. So you could say, "Oh this person is downloading a lot. Let me take them down so they can't download as much."

Q: Sounds simple enough.

Marshini Chetty: The idea with this system is that it's meant to be made so anyone can use it, whereas most other networking tools are designed for someone who's very technically oriented. It's for one machine that is the central machine that would monitor everyone else. This is more like a household tool, like a thermostat, but just for your network.

Q: What were you trying to learn?

Marshini Chetty: So the idea was, you have all this information that people can't access - what happens if you make it visible? How do they react to that? If you actually show them who the bandwidth hogs are in their house, what happens? How does that change how they understand things? Does it help them troubleshoot the network? So that's how the collaboration with [Microsoft](#) Research started.

I was hoping to learn if you make things more visible, does that actually change what people can do? Does it give them more power? Does it empower the people who aren't as technical. And yeah, then people were able to say, through the study, "Oh this uses more bandwidth than I thought," or, "Oh this doesn't really use bandwidth." Something else they were able to see was, "Oh no one is using my computer, but something is going on." And that gave them the idea that there are other processes happening on the computer even when no one's using it.

Q: What did you find?

Marshini Chetty: We found that making this information more visible and accessible to people actually engaged them and helped them learn about what was going on. In other words, even though networking is technical, if you give it to people in a way they can understand, the average person can understand something about bandwidth.

When we started off the study I asked people, "What is bandwidth?" Some people didn't know what that was. When we ended the study, people who didn't know anything about bandwidth before the study were saying, "Oh, I'm gonna limit your bandwidth now and, YouTube uses this...", things that they just wouldn't have said before the study. They were able to learn that and it was nice to confirm it.

What was surprising was, even though we're providing a very strict set of information, we're not showing you URLs that people are going to, nothing privacy violating, people were still worried about what they can infer about the data. So, you have kids saying things like, "Okay, I don't necessarily know that I want people in the house to be able to confirm that I am the bandwidth hog." Or, roommates saying, "Well, does this mean I have to pay more for bandwidth, because I'm the one using a lot?" So, even though it's very basic, people worry about how they're being presented in the system. How are other people going to read them?

And then, there are the control issues. Who gets to be in control? Is it something like a thermostat, where anyone can change it? In this case, it's directly linked to someone's activity on the Internet so it's not quite the same. So those were the two major things. How to represent yourself in the system and then who gets to control it.

It raised a lot of questions, like where should you put a tool like this in the house, should it have a password? Who's going to control it? Is it Mom and Dad? Is it one master roommate?

Q: Did you find that the use of Home Watcher was mainly limited to the guru in the family?

Marshini Chetty: This is actually another goal of mine, to empower people who are not the guru to get involved in networking so they don't have to depend on that person if that person isn't there and the Internet goes down. In some cases it was the guru that we signed up, so they were more interested in it. But in other cases, it wasn't. So, it definitely seemed to appeal to a broader variety of people. Another thing with Home Watcher is I think the computer is very scary to some people. It's just so complicated and so on. So taking it out and making it a separate appliance made it easier. It's like, "Oh I can just do these few things."

Q: How is your system, Kermit, different from Home Watcher?

Marshini Chetty: Because it's getting its data from the router, anything that connects to the Internet shows up on Kermit - iPhones, iPads, PS3s, Macs, Windows machines, you name it. It also shows you who's online, who's hogging the bandwidth and how much [bandwidth](#) each computer on the network is using. The main difference is that it also shows you an estimated speed that you're getting from your provider. Also, Kermit can

run on any computer in the home network and you can control it from any home computer. I'm currently testing it in eight households to find out more about the politics of visibility and control.

Provided by Georgia Institute of Technology

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