NSF supports safer Internet project

Cornell University
By Anne Ju [1]

Cornell computer scientists are sharing in a $7.5 million National Science Foundation grant toward creating a better, more secure Internet.

The three-year grant will allow Cornell and 10 other institutions to revisit many of the core assumptions that have shaped the Internet during its first three decades by creating a project called Nebula, which will be one of four national centers under the NSF's new Future Internet Architectures program. About $1 million of the total funding will support work under way at Cornell.

"Advances in the hardware used to create routers are, for the first time, making it possible to imagine an Internet that can securely and reliably link users to cloud-computing systems," said Ken Birman, Cornell's Rao Professor of Computer Science, who serves on the executive committee that will operate Nebula.

The Nebula researchers envision their work improving lives in everything from hospitals to homes. Birman said, for example, to imagine a patient who needs constant monitoring and adjustments to medication, but wants to live at home.

With Nebula, it should be possible to create computing systems that are secure and reliable enough to let a medical office monitor the patient's status over the network, adjust medical devices remotely and trigger an instant emergency response.

Two other Cornell researchers are involved in the Nebula project. Hakim Weatherspoon, assistant professor of computer science, is an expert in high-speed communication and power-efficient storage systems. The Nebula project, he said, "will let us pursue new kinds of green computing technology, in which cloud computing data centers shift work around to minimize the power expenditure associated with solving problems."

Robbert Van Renesse, principal research scientist in the Department of Computer Science, builds systems that can remain healthy even when under attack. He said he is especially excited that Nebula will help Cornell engage some of the communities that need to build ultra-robust systems and haven't known where to turn, such as the developers of the next generation of computer-supported medical computing systems.

Beyond the medical field, the team sees Nebula applications in finance, controlling the future "smart" electric power grid, and in a wide variety of other important applications. Today's cloud computing systems are cost-effective but not very trustworthy, the researchers say.

Other Nebula participants include Internet researchers at the University of

Pennsylvania (the overall project leader); Stanford University; Massachusetts Institute of Technology; University of California-Berkeley; University of Washington; Princeton University; University of Illinois, Urbana-Champaign; University of Texas-Austin; Stevens Institute; and University of Delaware.

SOURCE [2]

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