University of Florida is first university to fully connect to Internet2 Innovation Platform's three components

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The University of Florida is the first university to fully connect to the Internet2 Innovation Platform's three components, an achievement that will transform research at UF and provide a national model for research computing.

The move will allow UF researchers to easily share enormous amounts of data at ultrahigh speeds in collaborations with scientists worldwide.

"Universities across the country are following closely our progress and leadership in this area" said UF Vice President and Chief Information Officer Elias Eldayrie. "They are looking to our experience to learn from it, and we are glad to share it."

About 30 other universities are working to fulfill the requirements to use the Internet2 Innovation Platform, which provides the advanced networking opportunities necessary for big data research, such as genome sequencing and climate studies.

"It's exciting that the University of Florida is the first campus to complete the three components of the Internet2 Innovation Platform. Re-architecting the University of Florida network to support software-defined networking, 100G abundant bandwidth and unique support for data-intensive science positions Florida for a new cycle of growth and scientific research," said Rob Vietzke, Internet2 vice president of

network services.

"As other universities also follow Florida's lead to provide researchers advanced networks with their collaborators and the increased capacity of this unique 100 gigabit per second nationwide network, we can expect new scientific, educational, and economic breakthroughs," Vietzke said. "The whole academy of higher education can look forward to seeing how Florida innovators and researchers will use this Internet2 Innovation Platform to develop new applications and services never previously possible."

The Internet2 Innovation Platform provides a high-speed, friction-free computing environment and requires universities that participate to commit to three changes in research computing architecture.

UF is the first to achieve all three: a 100 Gbps connection to Internet2, a Science DMZ, and use of software-defined networking, or SDN.

UF activated its ultra-high-speed 100 Gbps connection in January, a 10-fold expansion of the research standard, 10 Gbps. Only three other institutions are connected to Internet2 at that speed.

UF is a pioneer in the Science DMZ arena, and at a recent Internet2 Innovation Platform meeting was bombarded with questions from other universities about how to make it work, Eldayrie said.

"The University of Florida has led in the DMZ area since 2004 and can provide an example for research that requires this technology," Eldayrie said.

The Science DMZ separates university administrative computing – transcripts and payrolls, for instance – from research computing, which requires a free flow of information without cumbersome firewalls and

switches. UF has had a Science DMZ since 2004, but recently upgraded it from 20 Gbps to 200 Gbps.

Erik Deumens, director of research computing, said the Science DMZ functions as a dedicated network for research on campus, providing a kind of "HOV (high-occupancy-vehicle) lane for research."

The third requirement was software-defined networking, which allows a researcher to program a network so a colleague anywhere on that network can view, share and manipulate data. SDN solves the problem of getting a variety of machines used by different scientists to talk to each other and ends the days of scientists filling portable hard drives with data and shipping them to collaborators.

Deumens said one of the requirements of participation in the Innovation Platform is to test the limits of SDN, which UF will do this summer in collaboration with Fermilab, a high-energy particle physics laboratory near Chicago.

"We will do a high-bandwidth data transfer with Fermilab, test the technology, and see what lessons we learn," Deumens said.

On the commodity Internet, Deumens said, information travels in small packets that sometimes take odd detours and a long time to reach a destination, making huge datasets a problem. SDN allows a researcher to tell a switch at a routing station, "I'm going to send a packet, and a billion more will follow, and I want you to treat them all the same way, let them all through, quickly," Deumens said.

UF is already a key collaborator on several big data projects and one of the top five institutions in contributing computing power to verifying the massive datasets associated with the Higgs-Boson particle discovery. In just one month last year, UF contributed 1,419,000 hours of computing

to that project.

"Our researchers now have tools at their disposal that no one else in the country has. They can lead the big data conversation, and this computing infrastructure will give them a competitive advantage in securing funding," Eldayrie said. "We can recruit the best minds in the world."

Added Deumens: "Our researchers can think up things they couldn't imagine without this infrastructure."

The expansion of research computing on the Internet2 Innovation Platform could have a mind-boggling economic benefit. The original investment in the commodity internet was $400 million over several years. Today, the Internet accounts for more than a trillion dollars a year in economic activity, Vietzke said.

Provided by University of Florida