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FAIRBANKS, ALASKA—This weekend our local University of Alaska Fairbanks computer security club won their regional in the Collegiate Cyber-Defense Competition (CCDC). They will now go on to represent the university at the national finals in San Antonio, Texas starting April 25.

In this weekend-long computer security contest, a team of eight students play defense to keep a computer network running as an elite “Red Team” of attackers try to infiltrate and disrupt their computer systems, such as web and email servers, routers, and a network camera. This year, they played as the system administrators for a branch of a cable news network, and in addition to installing, configuring, and protecting their network services, they also have to protect information such as the identity of confidential sources. When the contest phone rings, the team needs to decide if it's really a news agent who needs a new password, or if it's an attacker trying to gain access.

In a computer security contest like this, it's important to limit any damage to stay within the bounds of the contest computers. At the national competition, this is done by building a separate dedicated physical network for the competition, which not only requires tens of thousands of dollars of equipment per team and an enormous amount of labor to run cables and move hardware, but requires all the teams to travel to the same place, which is quite expensive for teams in distant places like Alaska and Hawaii. For this regional contest, UAF faculty member Dr. Brian Hay pioneered the use of a technique called virtualization to allow the contest to run entirely on virtual machines within a separate dedicated virtual network. He and Vincent Nestler now run a country-wide "at large" regional on the Remotely Accessible Virtual Environment (RAVE) infrastructure that he and UAF professor Dr. Kara Nance designed. This NSF-funded online resource allows people around the nation to perform computer security experiments remotely.

The UAF team has competed in a regional contest every year since 2009, and has made it to nationals in 2012 and 2013. The team captain, Will Showalter, and alternate captain Brahm Lower, are both returning from last year's team, along with Greg Klupar and Tadge Pruce. New team members include Syler Clayton, Bucky Frost, Caleb Hellickson, and Arsh Chauhan. The UAF team coach is Dr. Orion Lawlor, an Associate Professor of Computer Science.

This year, the winning UAF team prepared extensively for the contest, building their own virtual environment, and holding practice sessions every weekend. Coach Orion Lawlor says “Practice is vital—the first time you install and configure a new service, it's a slow and confusing; the second time, it starts to make sense; by the tenth time, it's simple!”

Teams competing at the virtual regional contest included several Alaska teams, such as UAF (who took first place), and UAA (who took second place); a team from Honolulu Community College (who took third place); as well as Penn State and several other institutions.

A number of other UAF alumni and staff helped to organize the contest and prepare scenarios and problems for the teams. Kevin Galloway acted as a judge this year, but in past years he's been on the other side of the contest as a student. Lucas McDaniel helped coordinate judging with the "Red Team" of attackers. Erik Talvi, Paul Gentemann, Nate Helms, Tom Johnson, and Mark Morlino helped prepare problems for the teams and judge their responses. The role of law enforcement was played by FBI Agent Clark Harshbarger.

UAF team coach Dr. Orion Lawlor said, "This contest is more than a pastime—between economic tools like email, computer-aided manufacturing, and computerized utilities like power and water, computer security is critical to modern civilization." UAF is certified by the Committee on National Security Systems (CNSS) to produce Information Systems Security (INFOSEC) Professionals, and is a Department of Homeland Security/National Security Agency certified Center of Academic Excellence in Information Assurance Education.

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