cadets and Red Team could operate safely—was critical to maintaining student ownership. The NSA helped us establish identical, first-class networks, but an effective exercise does not require having top-of-the-line equipment. Most organizations can make a capable network with very little funding. We built our first isolated laboratory using leftover and obsolete equipment.

John graduation, all USMA cadets become officers in the US Army, and many will be responsible for the security of critical Army information systems. With a firm foundation in the fundamentals of information assurance, these officers will have the intellectual skills needed for the continued self-education that is vital in evolving technical disciplines.

With two more schools participating and with our lessons learned from running the 2001 exercise, we expect the 2002 cyberdefense exercise to be even better. Of course, in an exercise this complex, it is impossible to anticipate all problems; the key is to react quickly in dealing with the problems that do arise.

We encourage other organizations to follow our lead. Information assurance is a topic that is becoming integral to US national security. We can no longer rely solely on our armed forces to defend the nation. Professionals in the commercial and government sectors must do their part to defend our critical information infrastructures from cyberattacks. A competitive exercise such as the one we have described is a first step in strengthening those additional defenses.

## References

- 1. "Critical Foundations: Protecting America's Infrastructures," Government Printing Office, Washington, D.C., Oct. 1997; http://www.info-sec.com/pccip/pccip2/report\_index.html.
- 2. M. Vatis et al., "Cyber Attacks During the War on Terrorism: A Predictive Analysis," tech. report, Institute for Security Technology Studies, Dartmouth College, New Hampshire, Sept. 2001.
- 3. B. Schneier, "Attack Trees: Modeling Security Threats," *Dr. Dobb's J.*, Dec. 1999, pp. 21-29; http://www.ddj.com/print/documentID=12345.

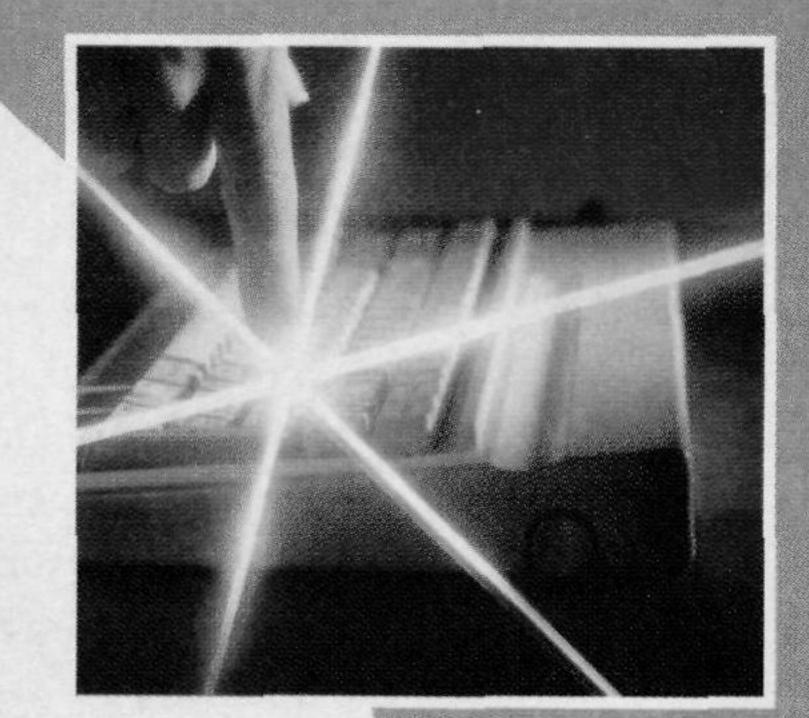
Donald Welch is an associate dean at the United States Military Academy at West Point. His research interests include information assurance education, information warfare, and simulation of

information security. He received a PhD in computer science from the University of Maryland, College Park, and is a senior member of the IEEE. Contact him at welch@usma.edu.

Daniel Ragsdale is an assistant professor of computer science at the United States Military Academy at West Point and director of USMA's Information Technology and Operations Center. His research interests include information assurance education and intrusion detection. He received a PhD in computer science from Texas A&M University and is a member of the IEEE. Contact him at Daniel-Ragsdale@usma.edu.

Wayne Schepens is the NSA Visiting Fellow at the United States Military Academy at West Point. His research interests include public-key infrastructures, secure software construction, and information assurance education. He received an MS in civil engineering from Virginia Polytechnic Institute and State University. Contact him at Wayne-Schepens@usma.edu.





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