

## **The Future of Networking -- Can Security Keep Up?**

### **Chair**

Jeff Ingle, National Security Agency

### **Panelists**

Stan Hanks, Enron

Chris Kubic, National Security Agency

Tom Shake, MIT Lincoln Laboratory

Networking has been driven by the explosion of applications in recent years. Many of the commercial, academic and government uses of networks are enabled by varying degrees of security. As we look to the future, there are many views of networking, and even more of the security needed. The obvious path for the future of networking is towards higher speeds, adopting methods like gigabit ethernet, Asynchronous Transfer Mode - ATM, Synchronous Optical Networking - SONET, Wavelength Division Multiplexing - WDM, and all-optical networking. These protocols and communications technologies will lead to some interesting security challenges due to their speed and the services the network may provide. The panelists will explore several futures of networking, addressing if and how security might really “keep up.”

### **Jeff Ingle, NSA: Motivation for Panel and Overview of Panelists**

The explosion in the growth of the Internet and private networks has been driving faster network speeds and increased services. New technologies and protocols are fueling this growth and are expected to meet the increasing bandwidth demands. Security could be an enabling factor in this growth, but there are some strong challenges in providing the security and survivability for future networking. Commercial security needs are driven in part by electronic commerce and the need for reliable communications as a critical part of everyday business. Likewise, the government has similar needs for protected communications and intends to use available technology in shared networks. Some of the security and survivability challenges in future networking include encryption, authentication, key management, data integrity, the role of firewalls and guards, and scaling network and security management.

The panelists' backgrounds afford several perspectives on the future of networking and associated security challenges. Stan Hanks of Enron will bring an outlook from the commercial network world, providing bandwidth and services to a wide variety of customers. His experience in furnishing cutting-edge network technology and dealing with real security threats will provide a good grounding for where networks are going and how much security and robustness is realistic in the future. Chris Kubic of NSA will discuss encryption products for high speed networks and hardening the network infrastructure for more reliable use. Tom Shake will provide a vision of all-optical networking, vulnerabilities in this new technology, and a perspective on how to counter them. The panelists will be asked to briefly paint their own vision of the future of networking, then describe the security that will be needed and whether they think it will become available in time - if ever. The audience will then be invited to interact, exploring the implications of those pictures of security and the future.

Jeff Ingle is the manager of the Advanced Information Security Technology branch in the Division of INFOSEC Engineering at the National Security Agency. He received a Bachelor of Science degree in Electrical Engineering from the University of Alabama in 1985 and a Master of Science degree in Optical Sciences from the University of Arizona in 1989. He has been following the development of optical networks over most of his 15 years at the National Security Agency. Mr. Ingle leads electronics and optics research teams who provide the technology for high speed network security. His interests include network security and survivability, all-optical networks, active network defense, high speed electronics and optics technologies, and technology forecasting.

### **Stan Hanks, Enron**

### **Chris Kubic, NSA: Global Grid Security Products - Protecting the Defense Information Infrastructure**

The National Security Agency's Global Grid Security Program has developed and deployed high speed ATM and SONET encryption products and will begin deployment of IPSec encryptors in late 1999. Mr. Kubic will discuss NSA's strategy to evolve its ATM, SONET, and IP family of security products to meet emerging standards and to keep pace with increasing networking speeds.

Mr. Chris Kubic is Technical Director of the Global Grid Networking Technologies Division in the National Security Agency's Information Assurance Solutions Group. Mr. Kubic is responsible for development of High Assurance In-line Network Encryption products, Network Security Standards, and Infrastructure Hardening initiatives.

### **Tom Shake, MIT Lincoln Laboratory**

Mr. Shake received a B.S.E.E. from Syracuse University in 1980 and M.S.E.E from the University of California at Berkeley in 1981. He has been a member of the technical staff at MIT Lincoln Laboratory since March 1982. He is currently assigned to the Distributed Systems Group.

His work at Lincoln Laboratory has included research and development in various aspects of communication systems, including military satellite system analysis and design, interactions between space-based and terrestrial communication networks, and network security in heterogeneous environments. His current research interests include very-high-data-rate network security, wide-area infrastructure protection, and network management in heterogeneous environments.