

## Book Reviews

### A Review of Network Security

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*Introduction to Network Security*

Neal Krawetz

608 pages

US\$69.95

Charles River Media, 2006

ISBN: 1-58450-464-1

Computer network security is gaining popularity among network practitioners, with organizations investing more time and money to protect their valuable information. Security has also recently attracted considerable attention from network researchers. There's no doubt about its importance and the growing need to understand critical security issues, best practices, and responses to operate networks securely. *Introduction to Network Security* by Neal Krawetz is a timely, easy-to-read guide to computer networks' different parts and related security issues.

### Security's growing importance

Protecting information and other network resources—including physical devices, data, programs, and services—from illegal access is an incredibly complicated endeavor. Maintaining network security is a continuous process and requires comprehensive solutions that cover all design and development phases and span all of the network's components. It poses several challenges to network designers, developers, administrators, and users. Although we can't ensure 100 percent security, it's possible to mitigate security problems acceptably by enforcing comprehensive security policies and applying vast security mechanisms: authentication and access control, data encryption, digital signatures, and so on.

Network attacks exploit vulnerabilities in the design of network protocols at various layers. Cryptography is at the heart of many of the security techniques applied at different network model layers to avoid such attacks and mitigate their effects if they do occur. For example, the Internet community has developed several protocols:

- IPSec (IP security) to provide security at the network layer,
- SSL (Secure Sockets Layer) and TLS (Transport Layer Security) to provide security at the transport layer, and
- PGP (Pretty Good Privacy) to provide security at the application layer.

The increasing number of publications on computer and network security also demonstrate the subject's significance. Contemporary classic books on computer networks generally dedicate at least one chapter to security issues. Other books address security broadly, covering virus attacks, worms, buffer overflow, hacking, denial of service, malware, cybercrime, access control, data encryption, biometrics, and so on. Apart from that, some other books academically focus mainly on network security or cryptography.

## The book in a nutshell

Krawetz's book consists of 25 chapters divided into nine parts, in addition to three appendices, a reference list, and a glossary of network security terms. The first part consists of three chapters that review network security's basic concepts including definitions of security terms, security ethics, network architecture, and elementary cryptography elements. Each of the next seven parts begins by discussing general networking issues related to a layer in the OSI (open systems interconnection) model. It then proceeds to explore and explain that layer's security role, along with security weaknesses and common vulnerabilities, attack methods, mitigation techniques, and common security protocols within that layer. The final part discusses modularity's impact on security and general security issues. Because understanding networking is a prerequisite to dealing with security, the book is organized around the OSI model to provide a security perspective on each network layer. Krawetz uses his expertise in computer forensics, cryptography, and software solutions to provide useful concepts and techniques for designing, developing, and maintaining secure networks—but in a nutshell.

The book's language is fairly understandable and easygoing, and its coverage is comprehensive without delving into the mathematical foundations or protocol details. It provides up-to-date information about network security, making it invaluable for IT professionals, beginner students, or anyone else interested in this field. However, Krawetz devoted too much space to networking. This is undeniably important, but it overshadows the security coverage, even though he stated in the introduction that his primary concern is network security, not general networking. In addition, *Introduction to Network Security* might not be a very rigorous academic textbook for university-level students in computer science or related disciplines. It lacks depth of coverage, and, apart from a few review questions at the end of each chapter, it has insufficient pedagogical content such as illustrations, exercises, laboratory experiments, and open problems.

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- DS Online's Dependable Systems community (<http://dsonline.computer.org/portal/site/dsonline/>)
- "Efficient Hybrid Security Mechanisms for Heterogeneous Sensor Networks," *IEEE Trans. Mobile Computing* (<http://doi.ieeecomputersociety.org/10.1109/TMC.2007.1020>)
- "Dependability in Wireless Networks: Can We Rely on WiFi?" *IEEE Security & Privacy* (<http://doi.ieeecomputersociety.org/10.1109/MSP.2007.4>)

### Cite this article:

El-Sayed M. El-Alfy, "A Review of Network Security," review of *Introduction to Network Security* by Neal Krawetz, *IEEE Distributed Systems Online*, vol. 8, no. 7, 2007, art. no. 0707-o7006.