INFORMATION SECURITY MANAGEMENT HANDBOOK

by Micki Krause and Harold F. Tipton, Editors
Fourth Edition, October 1999, - 728 pages
CRC Press - Auerbach Publications. ISBN: 0849398290

Completely revised and updated, the new edition reveals the precise nuts and bolts of exactly how to secure systems against all intruders and security threats, no matter where they come from. It provides dozens of case studies and analyses showing exactly how to protect systems and data using the latest tools. It is also one of the most important references used to prepare for the Certified Information System Security Professionals examination. It will give the IT professional an appreciative look at security, computer crimes, and legal aspects of performing technical investigative duties.

The book's thirty-three articles are organized in ten domains as follows:

- Access Control Systems and Methodology;
- Telecommunications and Network Security (secured connections to external networks, internet firewalls, internet security, extranet access control issues, firewall management, network layer security, transport layer security, application layer security protocols for networks, security of communication protocols and services);
- Security Management Practices (security awareness program, enterprise security architecture, risk analysis and assessment, protecting high tech business secrets, information security management in the healthcare industry);
- Applications and Systems Development Security, i.e., security models for object oriented databases;
- Cryptography (fundamentals of cryptography and encryption, principles and applications of cryptographic key management, implementing kerberos in distributed systems, PKI);
- Security Architecture and Models (microcomputer and LAN security)

- Operations Security, Threats;
- Business Continuity Planning and Disaster Recovery Planning;
- Law, Investigations and Ethics;
- Physical Security.

CODING IN CELLULAR COMMUNICATIONS

by Metodi Popov
ProCon, Sofia, 2000, 348 pages, ISBN 954-90121-6-6, Edition in Bulgarian
Book Series: On the Way to Information Society

The ever increasing use of cellular communications in Bulgarian society, business and everyday life put on the specialists' agenda the task to master the fundamentals, modern principles and approaches to building and operating this type of communications systems. That is why ProCon Ltd. published the monograph "Coding in Cellular Communications" by Metodi Popov at the end of this year. The book is devoted to information coding in second generation cellular systems and is a logical consequence of two previous books by the same author - "Cellular Communications" and "Systems and Networks for Personal Communications" provided by the same publisher in 1996 and 1998 respectively.

The book contains an introduction, six chapters and appendixes. The features of cellular communications systems, considered by the author as smart communications systems, are outlined in the first chapter. The main system elements, interrelationships, encoding/decoding and modulation processes in the most common model of a smart digital communications system are described.

The second and the third chapters are devoted to encoding/decoding voice sources with instantaneous (scalar) and vector (model) quantization. There are plenty of books about the scalar quantization encoders, while books on vector quantization encoders are still rather rare. The well known and fundamental result of the Rate Distortion Theory stipulates that better performance can be achieved by quantizing vectors instead scalars, even if the continuous amplitude source has no memory. Additionally, if the signal samples are statistically dependent, that dependency can be exploited by jointly quantizing block of samples or parameters for achieving better efficiency compared with the one achieved by scalar quantization. That is why

various approaches for constructing LPC-vocoders in many cellular standards are described and analyzed in this book. I believe the comparative analysis will be of interest to many communications specialists.

The forth chapter is devoted to channel encoding (decoding) of digital information. Digital information from the voice encoder's output has very low redundancy. The main function of the channel encoder is to protect the data stream against the noise and fading which are inherent in radio channels. In cellular communications the data stream is protected in five stages: convolutional coding; cycle redundancy check (CRC) generation; reordering and division; interleaving and burst generation. That is why channel with no own memory transforms into independent error channel, including both interleaver and de-interleaver. The trade-off is an increased data rate.

In order to reduce CRC bits, adding into the digital information stream, the latter is divided in two classes. The bits of class I are the most significant bits and they must be protected against noise and fading effects (convolutional codes are usually used in this case). In addition, k of these bits are very important for high quality decoding (these bits are called the most perceptually significant), and they must be CRC-encoded The block (n, k) codes are usually used in this case. The class II bits are not protected. Encoding only significant bits—class I bits—reduces the bit rate in the system. Practical issues of the implementation of second-generation cellular system channel encoders (decoders), i.e., in terms of effectiveness, are analyzed and compared in the fifth chapter.

The approaches of cellular systems channel coding improve system's performance by expanding the bandwidth of the transmitted signal by an amount equal to the reciprocal of the code rate. The resulting coding gain is achieved at a cost of doubling the bandwidth of the transmitted signal and, of course, at the additional cost in the implementation complexity of the receiver. In other words, channel coding is an effective method for trading bandwidth and implementation complexity for transmitter power. Therefore, as a rule this method applies to digital communications systems that are designed in the power-limited region.

The cellular systems are characterized with strongly limited power in the up link and, in this aspect, the same approach of channel coding is described as currently satisfying. But the consequent instantaneous increase of frequency deficit when the system signal power is assigned calls for implementing means of effective transmission. This is facilitated from the fact of instantaneous power adaptive adjusting, emitted from mobile user having limited power. This is possible when coding and modulation are treated as an integrated process, combining trellis-codes and multilevel phase modulations, such as ASK, PSK, DPSK or QAM. In this case a performance gain can be achieved without expanding the signal bandwidth.

The problems of the coded modulation are discussed in chapter six. The widely used in core cellular network subsystems V-modems (V.32, V.33 and V.34) are also described in this chapter. The structure of the cellular system IS-54 mobile station is given in one of the appendixes as an example of implementing ideas, principles and methods of coding and decoding, described in this book.

I reckon that the monograph "Coding in Cellular Systems" will appeal not only to radio and telecommunications engineers, but will be a useful reading for students, postgraduates and doctoral students who are working in the field of communications networks and systems. The long teaching experience of the author is a guarantee for that.

Georgi Todorov