Book Reviews

Vesna Hassler

Security Fundamentals for E-Commerce

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E-Commerce and e-business have been main buzzwords on the Internet for the last decade. E-Commerce is a completely new infrastructure for integrating enterprise systems into a Business/IT architecture that extends to suppliers, customers and trading partners. This book describes the technology architectures needed to embrace change and fully enable e-Commerce, and it presents the latest trends in e-Commerce. As e-Commerce processes take place in a public and un-trusted network, many security issues are involved. This book provides an in-depth overview of all the basic security problems and solutions that can be relevant for an e-Commerce application. It is divided into five sections, which lead the reader slowly through the world of e-Commerce security.

The first section contains basic information about security services and cryptographic techniques used in their implementation. Special attention is paid to public key mechanisms, because they represent security solution which is already accepted in e-Commerce and e-Business world. A bit deeper overview of digital signatures mechanisms and key exchange protocols is also given here.

The second section deals more with actual electronic payment security which should be used by today's e-Commerce applications. In this section an overview of electronic payment systems is presented and so are the traditional and electronic payment systems security problems. Basic security requirements for payment systems, such as authentication, integrity, authorization and confidentiality are explained.

Section three encompasses the analysis of infrastructure for exchanging previously mentioned information, the communication network. Description of protocols and their security features, with a special emphasis on the protocols used in the Internet is provided. Beginning with the OSI reference model, a detailed study of network access, internet, transport and application layer security is worked out.

The fourth section presents Web security problems and features. In this section Web's own (as client-server paradigm) security issues are analyzed, as well as the security issues of the new technologies that are added on top of the Web. At the end of the section, mobile code security aspects are (also) analyzed, with special reference to Java and JavaScript safety.

Finally, the last section is dedicated to security issues in mobile technologies. As mobile agents and smart cards begin to enter our everyday lives, more attention has to be given to their security features and problems. The last three chapters of the book address mobile agents, which are a new paradigm in the field of distributed systems. Mobile agents have multiple benefits such as reduction of network traffic, ı of network latency for real-time ap- ınd other enhanced processing capa- mobile devices. However, they also ome new security concerns requiring new protection mechanisms which are analyzed in this section. At the end, main security concepts for smart cards and a brief overview of biometrics are given.

This book is essential reading for e-Commerce and e-Business, as well as security technology practitioners and students who must architect and implement anything involving e-Commerce or e-Business. It provides excellent overview of existing technologies and protocols, their features and possible security problems. However, short reviews of a multitude of protocols and security methods lacking deeper analysis can

confuse potential readers. Comprehensive references at the end of every chapter, though, makes it much easier for the readers to find additional literature about interesting topics.

Bojan Ždrnja
Faculty of Electrical Engineering and Computing
University of Zagreb
Croatia

Mario G. Piattini, Oscar Díaz, editors

Advanced Database Technology and Design

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The book comprises 14 Chapters, written by different authors, structured into three parts: Fundamentals, Advanced Technologies and Advanced Design Issues. It considers new technologies, enhancements on the structural, behavioral and architectural issues throughout their motivation, concepts and influence on the design and application development areas.

Part I: Fundamentals

In the first chapter, a historical overview is given, and problems of current databases and the impact and demands of modern society on the databases are mentioned. Short overview of modern trends and market demands on DB industry are given together with subtypes of databases recently being researched. Scientific and industrial development and commercial acceptance of each of the subtypes are presented.

The second chapter gives an introduction and indicates basic concepts of the conceptual modeling of information systems. A brief review of the abstract architecture of the information systems, engineering requirements and of desirable properties of conceptual schemas is also presented.

Part II: Advanced Technologies

Chapter 3 deals with active databases and semantics, stored in the database as rules, reflecting the reactive behavior of the domain. It provides insight in active rules analysis, design, implementation and maintenance problems. It is illustrated by the active rules in Oracle DBMS.

Deductive DBs, discussed in chapter 4, contain intensional information, exposed as views and integrity constraints, in addition to extensional information. This chapter presents several problems encountered when dealing at run time with intensional information, and provides an overview of previous research in this area. Summary of deductive DBMS prototypes is presented.

In chapter 5, problems concerning temporal data in databases are introduced. Problems concerning constraints, keys, queries and database design are discussed. Authors offer ideas how DBMS should be enhanced to improve temporal data support. All issues are demonstrated using simple examples.

Object relational databases, described in chapter 6, are the natural evolution of pure object-oriented and relational DBs. More complex systems and new complex data types are the main factors that have led to the development of the ORDBMSs. There are several characteristics that have to be adopted to achieve a true object-relational structure, like user-defined data types with retrieval and integrity mechanism, object meta-model that includes classes, types, methods, encapsulation, and support the SQL3 ANSI standard. Some benefits of OODBMS are briefly considered in the chapter 7, as well as the main limitations of the relational technology. The review of basic concepts of object-oriented database model and ODMG standard is given. Some products (GemStone, ObjectStore, POET), based on the ODMG standard, are also discussed.

Chapter 8 introduces basic terminology and addresses the main problems in Multimedia DBMS technology. This chapter proposes a formal language for description of IMDs (a set of single-media objects interacting in spatial and temporal domain). The chapter discusses the retrieval problem and suggests the use of R-trees for multidimensional data indexing. At

the end, the main achievements of Multimedia DBMS are discussed, and some problems are addressed, especially content-based retrieval of single media documents.

In Chapter 9 basic concepts of distributed databases are presented, offering alternative DDB architectures, their classification, information exchange mechanisms and distributed data independence. Design methods, fragmentation, data replication, processing and optimization of queries and global transactions control are described, together with some current trends and challenges in the field of distributed databases.

Mobile computing, discussed in chapter 10, allows users to access the data stored in DBs from anywhere and anytime. A new framework of mobile computing brings new problems: limited functionalities of mobile computers, autonomy of batteries, small screen size, narrow bandwidth and loss of connection. This chapter examines the impact that these issues have on data management, particularly on transactions, on data dissemination, query processing, caching and interfaces.

Chapter 11 supplies an overview of developments in secure DB systems. Discretionary and mandatory policies are introduced along with the basic concepts of access control. Administration policies are presented with a review of DAC models, commercial developments and mandatory security. Data models, architectures, prototypes and commercial products are examined with a summary of new developments and trends.

Chapter 12 introduces "componentware" idea in database systems. The authors discuss the benefits and flaws of those DBMSs that provide component support. The major part of the text refers to typology of component DBMSs, with each type described in detail and accompanied by examples of DBMSs that are commercially available or are currently in research stage.

Part III: Advanced Design Issues

An overview of CASE tools concentrating on database design is given in chapter 13. There are various approaches and activities in conceptual design: conceptual modeling, schema validation, logical design and quality assessment. Each activity and supporting CASE tools are explained. The authors conclude that CASE tools can help in database design but a human arbitration is still needed because existing informal processes in design cannot be fully automated and left completely to CASE tools.

In chapter 14 the difference between product quality and process quality and their relation to DB quality issues is described. Lack of generally accepted guidelines for evaluating of data models is a significant problem, making data modeling process a craft, instead of engineering discipline. As a solution, authors propose and describe several elements to support objective evaluation of data models: quality factors (e.g. completeness, correctness, minimality, etc), stakeholders (users, DB designers, etc.), quality concepts (syntactic quality, semantic quality, etc.), improvement strategies, quality metrics, and weightings.

To a reader, having at least basic knowledge of databases, the book can provide interesting information about new trends in DB, state of the art and industrial acceptance of new technologies.

Mirta Baranović with colleagues
from the Computer Science Group,
Faculty of Electrical Engineering
and Computing
University of Zagreb
Croatia