Databases are ubiquitous and, like many pervasive infrastructure, sometimes we have to remind ourselves to consider their security implications. How often do most people think about the security implications of electrical systems, air-conditioning, data archives, and garbage? Security specialists do, yet I rarely meet security specialists who explicitly include database management systems in their thinking about their organizations’ security. That’s ironic, because the huge data leakages of which we read constantly (see the Privacy Rights Clearinghouse “Chronology of Data Breaches” for an extensive list <http://www.privacyrights.org/ar/ChronDataBreaches.htm>) are almost always related to data from databases (DBs).

But why should databases matter to security experts? Why not just leave DBs to DB Administrators (DBAs)?

At one level, having at least a grasp of the principles of DMBS security is as important to security professionals as having a grasp of programming principles or of telecommunications principles. We need to be able to speak a common language with our colleagues as we discuss information assurance (IA).

At another level, understanding how databases are designed and implemented speaks to our need as security professionals for a supportive relationship to our users, because data requirements and data relationships are at the heart of security requirements. As I’m sure you’ve heard many times, it’s the rare organization where security is the driving force; we serve the strategic goals of the organization and that means we need to understand data requirements. On another level, there are security implications to how programs and data structures work; understanding how databases work gives us insights into why the user interfaces work as they do and, even more important for security personnel, how systems can fail or be abused.

On a practical level, you may yourselves need to create a DB or participate in reviewing the security requirements for a DB and having a solid grasp of the principles will help you assimilate the details of any specific points you need to learn. Similarly, structured query language or SQL is almost universally used throughout the industry, and being familiar with such widely-used tools increases the likelihood of getting good jobs.

In this series of articles, we’ll look at some principles of database management systems (DBMSs), security implications of DB structures and access methods for concurrency control, recovery strategies and effective DB resource management as essential components of good security and business continuity management.

In the next article, we’ll look at the state of data management in the 1960s and 1970s and how the development of the relational DB model measurably improved IA.

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This series of articles is based on the narrated lecture “Introduction to Database Management System Administration & Security” <http://www.mekabay.com/courses/academic/norwich/msia/index.htm> prepared for the MSIA program <http://www.graduate.norwich.edu/infoassurance/> at Norwich University <http://www.norwich.edu>. You are welcome to download the lecture files at any time.

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