Chapter XIV

Biometrics for Access Control

Introduction

In today’s highly wired, mobile, and multitasking information society, the problems of verifying, identifying, and authenticating an individual continue to pose a great challenge. To see how complex this problem is we will take a look at all current technologies used in personal identification and authentication. All these technologies need you to present something that you have that uniquely identifies you or something you know that nobody else knows. Something you have can be a key or a token, like a card or driver's license, and something you know could be your password, your Social Security number, or personal identification number (PIN). The danger with all these approaches and the technology associated with them is that they all can be spoofed easily. For example, something you know can be forgotten.
and access then will be denied. Something you know can be given away to somebody hostile to you under duress; and something you have may be taken away under similar circumstances or it can be lost. Because we naturally forget, we lose things we are not supposed to lose; we can be forced to surrender things we hold dear. In other words, we are human. The current technologies for personal identification, verification, and authentication, as we discussed them in Chapter 10, cannot be relied on anymore in this new information society.

New technologies and new techniques must be found to create a more reliable and more secure environment. In this quest for a superior solution, biometrics verification techniques are fast emerging as the most reliable and practical method of individual identity verification. Biometrics refer to technologies and techniques that rely on measurable physiological and personal characteristics and attributes that can uniquely identify and authenticate an individual. Recall we briefly discussed biometric technologies in Chapter 10. In this chapter, we revisit biometric technology, and we are going into a more detailed discussion of this emerging security technology.

History of Biometrics

The word biometrics is made up of two Greek words *bio* meaning life and *metric* meaning to measure. The first reported uses of biometrics were in 14th century China where merchants, according to Portuguese explorer Joao de Barros, took palm prints and footprints of their newborns for identification purposes (Chirillo & Blaul, 2003). It is interesting to note that we are still using the Chinese system of foot printing of our newborns. Over the years, the practice has been adopted by many cultures. In Europe in the 1800s, a French anthropologist named Alphonse Bertillon developed a technology that used multiple body measurements to help with the problem of identifying criminals in Paris. The technique, which was later named after him, the Bertillonage technique, became popular, and it was used widely by police authorities throughout the world. However, its weakness was that more than one person could be identified from the same set of measurements, which caused its demise. After the Bertillonage technique fell out of use, fingerprinting, developed by Richard Edward Henry of Scotland Yard and based on the Chinese model, come into wide use.