

# Introduction



An **operating system** is a program that manages a computer's hardware. It also provides a basis for application programs and acts as an intermediary between the computer user and the computer hardware. An amazing aspect of operating systems is how they vary in accomplishing these tasks. Mainframe operating systems are designed primarily to optimize utilization of hardware. Personal computer (PC) operating systems support complex games, business applications, and everything in between. Operating systems for mobile computers provide an environment in which a user can easily interface with the computer to execute programs. Thus, **some operating systems are designed to be convenient, others to be efficient, and others to be some combination of the two.**

Before we can explore the details of computer system operation, we need to know something about system structure. We thus discuss the basic functions of system startup, I/O, and storage early in this chapter. We also describe the basic computer architecture that makes it possible to write a functional operating system.

Because an operating system is large and complex, it must be created piece by piece. Each of these pieces should be a well-delineated portion of the system, with carefully defined inputs, outputs, and functions. In this chapter, we provide a general overview of the major components of a contemporary computer system as well as the functions provided by the operating system. Additionally, we cover several other topics to help set the stage for the remainder of this text: data structures used in operating systems, computing environments, and open-source operating systems.

## CHAPTER OBJECTIVES

- To describe the basic organization of computer systems.
- To provide a grand tour of the major components of operating systems.
- To give an overview of the many types of computing environments.
- To explore several open-source operating systems.