

15.1

What are the specific limitations of a computer system that provides no operating system? What must be done to load and execute programs?

The barebones computer is limited to one program at a time.

The solution to the limitations of a barebones system is to include programs with the computer system that will accept commands from the user and that will provide desired services to the user and to the user's programs.

15.2

For each of the most popular commands in Windows (or Linux if you prefer), identify the type of operating system service that is being provided, and identify the basic module or modules that are involved. Which commands would you assume are memory resident and which loaded as required? Explain your assumptions.

A few systems even provide commands and built-in utilities for access to memory and to secondary storage. Generally, use of these commands is restricted to users with special access needs, such as the people who control and maintain the system. UNIX and Linux, for example, refer to these individuals as "super users". Some commands are built directly into the operating system. They remain in memory for immediate access. These are known as resident commands. Other commands are loaded only as they are needed. These are called nonresident commands.

15.10

Discuss the similarities and differences between memory management fragmentation and disk fragmentation.

The purpose of the memory management system is to load programs and program data into memory in such a way as to give each program loaded the memory that it requires for execution.

15.15

Windows hides most of its configuration in a binary file called the registry. Special Windows tools must be used to read and modify the registry. What are the advantages and disadvantages of this approach versus the use of text-based configuration files?

Windows operating systems store the system configuration within a registry that is normally hidden from the user, and provide, instead, a variety of simple tools specifically for tailoring the system to user preferences and performing maintenance tasks.

The UNIX system provides tools that simplify the tasks of system administration. These tools take the form of commands that can be executed only by the super user and text-based configuration files that can be modified with any text editor.

15.16

Based on the system status report shown in Figure 15.5, describe some of the ways in which the system could be tailored, and explain how the various items in the report would influence your tailoring decisions.

By selecting the operating system program modules to be installed. Typically, an operating system provides a large number of modules that might be used under different circumstances. Only those modules that are relevant to the installation are selected. As an example, a particular installation has an individualized selection of I/O devices. Only those device drivers that are required for the installed I/O devices would be included in the tailored system.

By assigning values to parameters of the system. Parameters are used to provide the details of an installation. On a Windows-based PC system, for example, devices are assigned to specific, numbered interrupt channels known as IRQs; memory locations for each device interrupt driver are also specified. Another example of a parameter would be the number of concurrent users permitted on a multiuser system. On some systems, a parameter might be used to determine whether a module is memory resident or is loaded on demand. Most large systems also provide parameters that tailor the system scheduling mechanism and adjust the behavior of other resource control modules. These and other parameters must be determined by the system administrator to meet the needs of the installation.