Influential Operating Systems

Exercises

A.1 Discuss what considerations the computer operator took into account in deciding on the sequences in which programs would be run on early computer systems that were manually operated.

A.2 What optimizations were used to minimize the discrepancy between CPU and I/O speeds on early computer systems?

A.3 Consider the page replacement algorithm used by Atlas. In what ways is it different from the clock algorithm discussed in Section 10.4.5.2?

A.4 Consider the multilevel feedback queue used by CTSS and MULTICS. Suppose a program consistently uses seven time units every time it is scheduled before it performs an I/O operation and blocks. How many time units are allocated to this program when it is scheduled for execution at different points in time?

A.5 What are the implications of supporting BSD functionality in user-mode servers within the Mach operating system?

A.6 What conclusions can be drawn about the evolution of operating systems? What causes some operating systems to gain in popularity and others to fade?

A.7 Explain why a capability-based system such as Hydra provides greater flexibility than the ring-protection scheme in enforcing protection policies.

A.8 Discuss the need for rights amplification in Hydra. How does this practice compare with the cross-ring calls in a ring-protection scheme?

A.9 Does the Hydra system allow module designers to enforce the need-to-know principle?