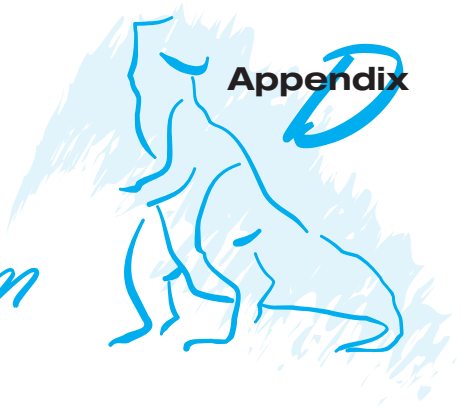
Appendix D

The Mach System



Exercises

D.1 What three features of Mach make it appropriate for distributed processing?

D.2 Name two ways in which port sets are useful in implementing parallel programs.

D.3 Consider an application that maintains a database of information and provides facilities for other tasks to add, delete, and query the database. Give three configurations of ports, threads, and message types that could be used to implement this system. Which is the best? Explain your answer.

D.4 Outline a task that would migrate subtasks (tasks it creates) to other systems. Include information about how it would decide when to migrate tasks, which tasks to migrate, and how the migration would take place.

D.5 Name two types of applications for which you would use the MIG package.

D.6 Why would someone use low-level system calls instead of the C threads package?

D.7 Why are external memory managers not able to replace internal page-replacement algorithms? What information would the external managers need in order to make page-replacement decisions? Why would providing this information violate the principle behind the external managers?

D.8 Why is it difficult to implement mutual exclusion and condition variables in an environment where similar CPUs do not share any memory? What approach and mechanism could be used to make such features available on a NORMA system?

D.9 What are the advantages of rewriting the 4.3 BSD code as an external, user-level library, rather than leaving it as part of the Mach kernel? Are there any disadvantages? Explain your answer.