ITBU 373, Operating Systems Homework 36

Chapter 44, *Operating Systems, Three Easy Pieces*

Readings

Read chapter 44 in the *Operating Systems, Three Easy Pieces* book.

Discussion Questions

Answer the discussion questions in writing.

1. What is the difference between *single-level cell*, *multi-level cell*, and *triple-level cell* flash?
2. Explain the hierarchy of *planes*, *banks*, *blocks*, and *pages* in the context of flash based SSDs.
3. Briefly discuss the functionality, context, and expense of the operations *read*, *erase*, and *program*.
4. What is *wear out*, and what does that have to do with SSDs?
5. What are *disturbances*, and what do they have to do with SSDs? Do you think that they might soetimes be caused by alien space bats?
6. What is the *flash translation layer*, and what purpose does it serve?
7. What is *direct mapped* organization? The book says that it has "many problems both in terms of performance as well as reliability." Name and describe some of those problems.
8. In general, how do *log structured* SSD flash drives work? You don't need to go into much detail. How do they solve some of the problems of direct mapping?
9. What is *wear leveling* and why is it desirable for SSDs?
10. How do SSDs collect *garbage*? You will also need to define garbage and explain what causes it?
11. Why are some SSDs over provisioned? Why is it possibly a good idea?