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CSCE 313

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Homework 3

1. Suppose a system uses 1KB blocks and 16-bit addresses. What is the largest possible size for this system for the following inode organizations?
   1. 1KB \* 12 = **12KB**.
   2. 16BIT / 8BIT = 2BYTE 🡪 1024BYTE / 2BYTE (ADDR) = 512BLOCKS 🡪 512KB + 12KB = **524KB**.
   3. 12KB + 512KB + 512KB2 = 262,668. However, MAX is 2BYTES ^ 16 = **65,536KB**.
2. A disadvantage of this scheme is that a process can “allocate” the semaphore element for any arbitrary amount of time until it has completed its critical section. There is no way to implement something similar to a multilevel feedback queue like we see in the processor control block that has a concept of aging, priorities, etc.
3. According to recorded data, message queues appear to be slower than pipes:

|  |  |  |
| --- | --- | --- |
| Data | **Pipe** | **Message Queue** |
| **1024** | 2251 micros | 2408 micros |
| **2048** | 2550 micros | 2728 micros |
| **4096** | 2840 micros | 3038 micros |

1. I would first create a software program to listen for input and store it somewhere, and create a UNIX device for it using mknod, say /dev/tplognew. Then, I could simply change the environment variable from /dev/tplog to /dev/tplognew. Now, when any program writes to that environment variable, instead of going to /dev/tplog, it will be picked up to our program on /dev/tplognew.
2. See attached file.