Project Four Writeup

Spring 2017

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Abstract

This is our write up for the project Four. *Encrypted Block Device*.

1 Write Up of Project Four Solution

Wed started by getting the slob.c file set up. We read through the slob.c file to understand how it worked so we could figure out how to best implement the best-fit algorithm. Here is the algorithm we implemented:

```
size(block) = n + size(header)
Scan free list for smallest block with nWords >= size(block)
If block not found
    Failure (time for garbage collection!)
Else if free block nWords >= size(block) + threshold*
    Split into a free block and an in-use block
    Free block nWords = Free block nWords - size(block)
    In-use block nWords = size(block)
    Return pointer to in-use block
Else
    Unlink block from free list
    Return pointer to block
```

2 Questions Regarding Project Four

1) *What do you think the main point of this assignment is* The main point of the assignment was to understand how the Linux system implemented memory management. As well as the importance of allocating memory effciently. In large systems that require a lot of memory, having slow algorithms can drastically slow down the program.
2) *How did you personally approach the problem? Design decisions, algorithm, etc.* After reading through the program description, which suggested we took a look at the slob.c file, we searched for the file and read through it. Using this file, and editing it, we were able to implement the best-fit algorithm.
3) *How did you ensure your solution was correct? Testing details, for instance.* We created a test file to run input through our program as well as generating print statementsboth to the screen and to the system log files. We also use GDB to set break points to test the program to ensure it's working correctly.
4) *What did you learn?* As we mentioned earlier, large programs that allocate a lot of memory can be very slow. Ensuring you're using effective algorithms for memory allocation is important for better efficiency. Having efficient memory management is also for important for the entire operating system.

3 Version Control Log

File Version	Group Member(s)	What Was Done
V1	Shaui	Created the program file to work from
V2	Shaui	Used slob.c file
V2	Andrew	Started and set up the writeup
v3	Shaui	wrote program logic
v4	Shaui	Wrote testing
v4	Andrew	Finished write up
v5	All	Compiled it all together

4 Work Log

Date	Group Member(s)	Start Time	End Time	Total Time Worked	Accomplished
June 3rd and 4th	All	N/A	N/A	Throughout day	Talk about the assignment and Set up our working environment Reviewed project information Typed out program logic Start/End times are N/A because is was online meeting throughout day
June 8th and 9th	All	1:00pm	N/A	Most of the Day	Started testing and debugging the program started writeup finished program and testing finished the writeup

5 Citations

References

[1] Linux *System call information*. url: man7.org/linux/man-pages/man2/syscall.2.html

[2] Alan Kaminksy *Code assisting with best-fit algorithm design*. url: https://www.cs.rit.edu/ ark/lectures/gc/03_03_03.html