

Program 4A

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August 11, 2024

Compile and Execution Linux malloc

```
[rynlynch@csslab15 hw-4a]$ ls -a
.  ..  driver.cpp  malloc.cpp
[rynlynch@csslab15 hw-4a]$ g++ driver.cpp malloc.cpp
[rynlynch@csslab15 hw-4a]$ strace ./a.out l 2>&1 | grep brk
brk(NULL)           = 0x24a2000
brk(NULL)           = 0x24a2000
brk(0x24c3000)       = 0x24c3000
[rynlynch@csslab15 hw-4a]$
```

The screenshot above shows driver.cpp and malloc.cpp being compiled on the UW Bothell lab machine.

It also shows the execution and results of the a.out binary with the 'l' switch passed to it. This result has the fewest system calls made.

Compile and Execution Best Fit

```
[rynlynch@csslab15 hw-4a]$ ls -a
.  ..  driver.cpp  malloc.cpp
[rynlynch@csslab15 hw-4a]$ g++ driver.cpp malloc.cpp
[rynlynch@csslab15 hw-4a]$ strace ./a.out b 2>&1 | grep brk
brk(NULL)           = 0xd98000
brk(NULL)           = 0xd98000
brk(0xdb9000)        = 0xdb9000
brk(NULL)           = 0xdb9000
brk(0xdb916f)        = 0xdb916f
brk(NULL)           = 0xdb916f
brk(0xdb953d)        = 0xdb953d
brk(NULL)           = 0xdb953d
brk(0xdb95ae)        = 0xdb95ae
brk(NULL)           = 0xdb95ae
brk(0xdb9629)        = 0xdb9629
brk(NULL)           = 0xdb9629
brk(0xdb9682)        = 0xdb9682
brk(NULL)           = 0xdb9682
brk(0xdb9789)        = 0xdb9789
brk(NULL)           = 0xdb9789
brk(0xdb97db)        = 0xdb97db
brk(NULL)           = 0xdb97db
brk(0xdb98cf)        = 0xdb98cf
brk(NULL)           = 0xdb98cf
brk(0xdb9c00)        = 0xdb9c00
brk(NULL)           = 0xdb9c00
brk(0xdb9cd5)        = 0xdb9cd5
brk(NULL)           = 0xdb9cd5
brk(0xdb9ee2)        = 0xdb9ee2
brk(NULL)           = 0xdb9ee2
brk(0xdba2ba)        = 0xdba2ba
brk(NULL)           = 0xdba2ba
brk(0xdba4e1)        = 0xdba4e1
brk(NULL)           = 0xdba4e1
brk(0xdba71c)        = 0xdba71c
brk(NULL)           = 0xdba71c
brk(0xdbaa05)        = 0xdbaa05
brk(NULL)           = 0xdbaa05
[rynlynch@csslab15 hw-4a]$
```

The screenshot to the left shows driver.cpp and malloc.cpp being compiled on the UW Bothell lab machine.

It also shows the execution and results of the a.out binary with the 'b' switch passed to it. Less system calls are made here than when the 'f' switch is used.

Compile and Execution First Fit

```
[rynlynch@csslab15 hw-4a]$ ls -la
.  ..  driver.cpp  malloc.cpp
[rynlynch@csslab15 hw-4a]$ g++ driver.cpp malloc.cpp
[rynlynch@csslab15 hw-4a]$ strace ./a.out f 2>&1 | grep brk
brk(NULL)                = 0x1062000
brk(NULL)                = 0x1062000
brk(0x1083000)            = 0x1083000
brk(NULL)                = 0x1083000
brk(NULL)                = 0x1083000
brk(0x108316f)            = 0x108316f
brk(NULL)                = 0x108316f
brk(0x108316f)            = 0x108316f
brk(NULL)                = 0x108316f
brk(0x108353d)            = 0x108353d
brk(NULL)                = 0x108353d
brk(NULL)                = 0x108353d
brk(0x10835ae)            = 0x10835ae
brk(NULL)                = 0x10835ae
brk(NULL)                = 0x10835ae
brk(0x1083629)            = 0x1083629
brk(NULL)                = 0x1083629
brk(NULL)                = 0x1083629
brk(0x1083682)            = 0x1083682
brk(NULL)                = 0x1083682
brk(NULL)                = 0x1083682
brk(0x1083789)            = 0x1083789
brk(NULL)                = 0x1083789
brk(NULL)                = 0x1083789
brk(0x10837db)            = 0x10837db
brk(NULL)                = 0x10837db
brk(NULL)                = 0x10837db
brk(0x10838cf)            = 0x10838cf
brk(NULL)                = 0x10838cf
brk(NULL)                = 0x10838cf
brk(0x1083c00)            = 0x1083c00
brk(NULL)                = 0x1083c00
brk(NULL)                = 0x1083c00
brk(0x1083cd5)            = 0x1083cd5
brk(NULL)                = 0x1083cd5
brk(NULL)                = 0x1083cd5
brk(0x1083ed9)            = 0x1083ed9
brk(NULL)                = 0x1083ed9
brk(NULL)                = 0x1083ed9
brk(0x10840e6)            = 0x10840e6
brk(NULL)                = 0x10840e6
brk(NULL)                = 0x10840e6
brk(0x10844be)            = 0x10844be
brk(NULL)                = 0x10844be
brk(NULL)                = 0x10844be
brk(0x10846e5)            = 0x10846e5
brk(NULL)                = 0x10846e5
brk(NULL)                = 0x10846e5
brk(0x1084920)            = 0x1084920
brk(NULL)                = 0x1084920
brk(NULL)                = 0x1084920
brk(0x1084c09)            = 0x1084c09
brk(NULL)                = 0x1084c09
[rynlynch@csslab15 hw-4a]$
```

The screenshot to the left shows driver.cpp and malloc.cpp being compiled on the UW Bothell lab machine.

It also shows the execution and results of the a.out binary with the 'f' switch passed to it. More system calls are made here than when the 'b' switch is used.