

Homework 11

Problem 1

Express the difference between the procedure of static link and the procedure of dynamic link (with shared library). You can draw a picture to show that.

Problem 2

- 1) Draw a Linux run-time memory image to show the location of GOT, PLT and shared library.
- 2) Express the function of PLT and GOT. And how to use them?
- 3) When the GOT is generated, and when the items of it are relocated?(Two situations: PIC Data References and PIC Function Calls)

Problem 3

Suppose we have **main.c** and a shared library **foo.so**. In **main.c**, we called a function "void **flag()**" which is in the **foo.so**.

Complete the following Codes in **main.c** to call the **flag()**.

```
#include <stdio.h>
#include <stdlib.h>
#include <dlfcn.h>

Int main()
{
    // Your codes here.

    flag();

    return 0;
}
```

Problem 4

Answer the following questions about **malloc()** and **free()** implementation:

1. If we want to be able to coalesce blocks in both directions (next/previous) when freeing a block, which strategy can we use? Draw the block structure to illustrate it.

2. Suppose the gray block is the one to be freed, draw the memory after free() to this block is called. The free() function adopts the above strategy.

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