

## Analysis of the bug

There are several bugs.

1. There is a one-byte overflow in the `f` operation, when the input string `id` is exactly 16 bytes long. The `strcpy()` will then put the terminator `\0` in the next field of the `cmd` structure, that is, `nselected`. This affects the number of arguments that are passed to the commands.
2. The `froblicate` program assumes that `argc` is always at least 1. If that is not the case, the program will start processing as arguments the contents of memory immediately after the `argv` vector, where the *environment* vector is stored.
3. The `z` command puts a secret in the environment to pass it to a program. In the normal case the process successfully `exec()`s the program and execution does not return to the `child()` function. If the `exec()` fails, however, the `child()` function continues with the secret still in the environment. From there it may be passed to other commands.