KWORT LINUX

IMPLEMENTATION

Implement System Calls

To better understand how the kernel interacts with user-level programs, I implemented a simple C program using the execv() system call. This function is part of the unistd.h library in Unix-like systems and replaces the current process image with a new one — typically another executable.

Source File:exec_test.c

The code

```
#include <unistd.h>

#include <stdio.h>


int main() {

   char *args[] = {"/bin/ls", "-l", NULL};

   execv(args[0], args);

   perror("exec failed");

   return 1;

}
```

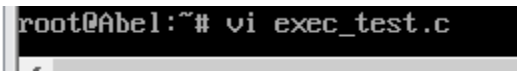
How it works:

- **Explanation: Execv (path, args): This system call executes the program specified in path (here, /bin/ls) with the arguments in args.**

- **If successful, the current process is replaced and does not return to the caller.**
- **If it fails, perror() displays the error.**

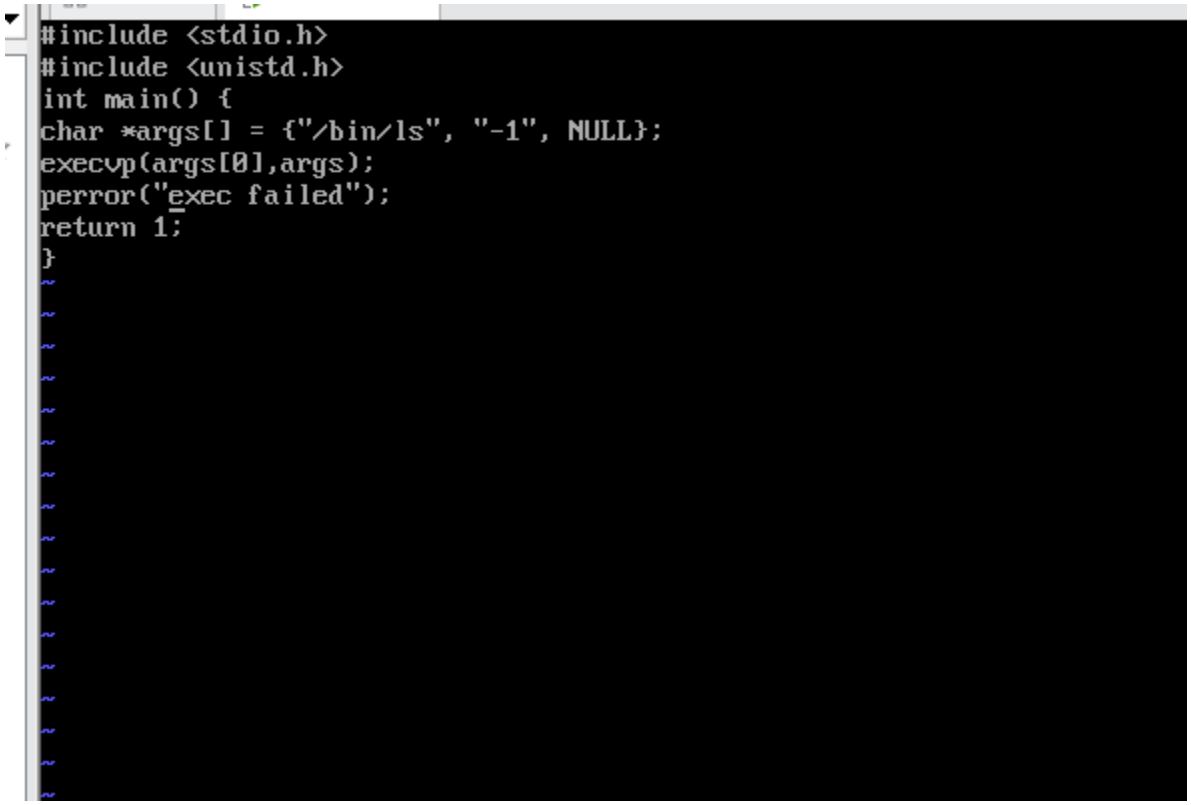
Compilation & Execution

To compile: Run : vi exec_test.c



Next type i in order to be able to write in the compiler

now we can write the code



```
#include <stdio.h>
#include <unistd.h>
int main() {
char *args[] = {"/bin/ls", "-l", NULL};
execvp(args[0],args);
perror("exec failed");
return 1;
}
```

Then

To Exit and Save Changes Press: Esc

Type :- :wq

Press: Enter

Finally RUN: gcc exec_test.c -o exec_test

Then ./test

```
root@Abel:~# gcc exec_test.c -o test
root@Abel:~# ./test
bootloaders
exec_example1.c
exec_test.c
test
root@Abel:~#
```

What the exec() System Call Did:

Most likely, your C program (exec_test.c) called exec() (e.g., execlp() or execvp()) to **replace the current process image** with the ls command. That means:

- The test process was started.
- It immediately used exec() to run ls, effectively replacing itself with the ls process.
- Therefore, you see the output of ls instead of anything from the original C code that might have followed the exec() call.

Summary:

The exec() system call **replaces the current process** with a new one — in this case, ls. Your program successfully demonstrated this behavior by printing the contents of the directory and exiting without returning to the original C process logic.