

Program 3

Due Date: November 12, 2008

Points: 100

Program

1. (100 points) Modify the MINIX kernel to add a system call *get2pid* with the following interface:

```
int get2pid(pid_t *mypid, pid_t *parentpid)
```

This system call returns the PID of the current process in the variable at the address contained in *mypid*, and the PID of the current process' parent in the variable at the address contained in *parentpid*. If either argument is the **NULL** pointer, nothing for that particular variable is returned.

The system call returns 0 if both pointers are valid for the calling program or **NULL**; otherwise it returns -1 . Be sure to check that the addresses lie within user space for the calling process!

Write a program to demonstrate your call works. Validate the results using *getpid* and *getppid*.

Hint: To add the system call into the kernel, see how *getpid* and *getppid* work.

Extra Credit

1. (80 points) Modify the MINIX kernel to add a system call *getchpid* with the following interface:

```
int getchpid(int n, pid_t childpid[])
```

This system call returns the PIDs of up to *n* children of the current process in the array *childpid* and returns the number of PIDs entered into the array. If either *n* is non-positive or *childpid* is **NULL**, the system call simply returns the number of child processes of the current process.

If *childpid* points to an address outside the process' user address space, or an error of any kind occurs, the system call returns -1 .

Write a program to demonstrate your call works.