

Implement the logwatchdog daemon (never die...) program that will read / write the specific directory and its subdirectories.

(Writing a daemon in C (or daemonize a process) for absolute newbie: <https://blog.abhi.host/blog/2010/03/09/writing-daemon-in-c-or-daemonize/>)

The SystemInfoIO program will do the following sequentially.

1. Make a temporary directory file starting with your account under “/tmp”.
2. Under the temporary directory file you just created, create a temporary file starting with “cse” .
3. Whenever a new user logs in the system, detect the login (use utmp(x) / wtmp) and write login user name and login time to your temporary file (Use fread() / fwrite()).
4. Whenever the user logs out the system, detect the logout and then append logout time right after the history information you wrote at step 3 to your temporary file (Use fread() / fwrite()).
5. Every time 30 seconds, your logwatchdog daemon will display the current history log data saved in your temporary file, which was created at step 2 (Please try it. This is very interesting programming skills because the daemon process does not have stdin, stdout, and stderr). If you cannot display the current history log data saved in your temporary file on the monitor, you can use syslog and tail -f commands.

1. Submit your program source with detailed description (comments)

- Program source

```
/*  
 * logwatchdog.h  
 * Hw#4 Make logwatchdog  
 * Lee Jae Yoon(이재윤), 201624548  
 * 유닉스 응용 프로그래밍(CP33357-059)  
 */
```

```
#include <stdio.h>  
#include <stdlib.h>  
#include <unistd.h>  
#include <pthread.h>  
#include <wait.h>
```

```
#include <sys/types.h>  
#include <errno.h>  
#include <utmp.h>  
#include <syslog.h>
```

```

void SystemInfoIO();
void make_files(char *, char *);
void showLog(char *);
void appendLog(char *, struct utmp );

int main(int argc, char* argv[])
{
    pid_t    pid, waitPID;
    if ((pid = fork()) < 0)
        perror("fork error");

    if (pid == 0) { //child
        if ((pid = fork()) < 0)
            perror("fork error");
        else if (pid > 0) {
            printf("1st child's parent process id : %d\n", getppid());
            printf("1st child process id : %d\n", getpid());
            exit(0);
        }
        sleep(1);
        printf("\n2st child's parent process id : %d\n", getppid());
        printf("2st child process id : %d\n", getpid());

        // Start
        SystemInfoIO();

        exit(0);
    }

    waitPID = waitpid(pid, NULL, 0);

    if (waitPID != pid)
        perror("Wait error");

    printf("\n waitPid : %d \n", waitPID);
    return 0;
}

```

```

// make directory and log tmp file
void make_files(char * strFolderPath, char * strFileName) {
    // make directory
    FILE * file;
    int result = mkdir(strFolderPath,0777);
    if (result == 0)
        printf("\nmkdir Success !!\n");
    else
        printf("\nDirectory already exist\n");
    // tmp file not exist
    if (access(strFileName, F_OK) == -1) {
        file = fopen(strFileName, "w");
        fclose(file);
        printf("make log file success !!\n");
    }
}

void appendLog(char * strFileName, struct utmp buff) {
    // append log (all)
    FILE * file;
    file = fopen(strFileName, "a");
    if (file){
        fwrite(&buff, 1, sizeof(struct utmp), file);
        printf("Append log file success !!\n");
    }
    else
        printf("Append Log File Failed!!\n");

    fclose(file);
}

void showLog(char * strFileName) {
    // tmp File size Check
    FILE * file = fopen(strFileName, "r");
    fseek(file, 0, SEEK_END);
    int size = ftell(file);
    fclose(file);
    // Log Count
    int count = size / sizeof(struct utmp);
    // Read Log
    struct utmp log[count];
    file = fopen(strFileName, "r");
    int x = 0;
    if (file)
        x = fread(&log, sizeof(struct utmp), count, file);
    // Send Syslog
    for (int i = 0; i < x; i++) {
        syslog(LOG_INFO, "[Status : %d] id : %s, time : %d\n",
            log[i].ut_type, log[i].ut_user, log[i].ut_time );
        printf("[Status : %d] id : %s, time : %d\n",
            log[i].ut_type, log[i].ut_user, log[i].ut_time );
    }
    printf("syslog Send Success !!\n");
}

```

```

void SystemInfoIO() {
    // variables
    char * strFolderPath = "/tmp/201624548";
    char * strFileName = "/tmp/201624548/cse";
    char * strwtmpPath = "/var/log/wtmp";
    FILE * file;
    time_t log_time = 0;
    // buffer
    struct utmp buff_log;
    struct utmp log;
    // to
    buff_log.ut_time = 0;
    make_files(strFolderPath, strFileName);
    while (1) {
        file = fopen(strwtmpPath, "rb");
        if (file) {
            int x = fread(&log, sizeof(struct utmp), 1, file);
            if (x) {
                if ( (log.ut_time != buff_log.ut_time) ||
                    (strcmp(log.ut_user, buff_log.ut_user) != 0) ) {
                    buff_log.ut_time = log.ut_time;
                    strcpy(buff_log.ut_user, log.ut_user);
                    if (log.ut_type <= 10 && log.ut_type >= 0)
                        appendLog(strFileName, log);
                }
            }
        }
        else {
            perror("Failed to open wtmp");
            break;
        }
        // send log with 30 sec
        if ( (time(NULL) - log_time) >= 30) {
            log_time = time(NULL);
            showLog(strFileName);
        }
        fclose(file);
    }
}

```

- I Dont Know How to login or logout So logging almost all and show.

```
Recent Name  
Open [icon]  
  
char * strFileName = "/  
char * strwtmpPath = "/  
FILE * file;  
time_t log_time = 0;  
// buffer  
struct utmp buff_log;  
struct utmp log;  
// to  
buff_log.ut_time = 0;  
make_files(StrFolderPat  
while (1) {  
  
lep@lep-V  
File Edit View Search Terminal Help  
[Status : 8] id : , time : 15920...  
syslog Send Success !!  
[Status : 8] id : , time : 15920...  
[Status : 8] id : , time : 15920...  
syslog Send Success !!  
[Status : 8] id : , time : 15920...  
Append log file success !!  
[Status : 8] id : , time : 1592044154  
[Status : 8] id : , time : 1592044154  
[Status : 8] id : , time : 1592044154  
syslog Send Success !!  
kill 3880  
lep@lep-Virtual-Machine:~/HW/UNIX_Programing/HW4$ make  
make: Nothing to be done for 'all'.  
lep@lep-Virtual-Machine:~/HW/UNIX_Programing/HW4$ ./logwatchdog  
1st child's parent process id : 3884  
1st child process id : 3885  
waitPid : 3885  
lep@lep-Virtual-Machine:~/HW/UNIX_Programing/HW4$  
[Status : 8] id : , time : 15920...  
2st child's parent process id : 884  
2st child process id : 3886  
Directory already exist  
make log file success !!  
Append log file success !!  
[Status : 8] id : , time : 1592044154  
[Status : 8] id : , time : 1592044154  
syslog Send Success !!  
Jun 13 21:58:35 lep-Virtual-Machine systemd[1]: Started Network Manager Script D  
ispatcher Service.  
Jun 13 21:58:35 lep-Virtual-Machine nm-dispatcher: req:1 'dhcp4-change' [eth0]:  
new request (1 scripts)  
Jun 13 21:58:35 lep-Virtual-Machine nm-dispatcher: req:1 'dhcp4-change' [eth0]:  
start running ordered scripts...  
Jun 13 21:58:37 lep-Virtual-Machine dhclient[820]: bound to 192.168.58.105 -- re  
newal in 244 seconds.  
Jun 13 21:58:45 lep-Virtual-Machine logwatchdog: [Status : 8] id : , time : 1592  
044154  
lep@lep-Virtual-Machine:~/HW/UNIX_Progr  
Makefile logwatchdog logwatchdog.c logwatchdog.o  
lep@lep-Virtual-Machine:~/HW/UNIX_Programing/HW4$ cd /tmp  
lep@lep-Virtual-Machine:/tmp$ cd 201624548  
lep@lep-Virtual-Machine:/tmp/201624548$ rm cse  
lep@lep-Virtual-Machine:/tmp/201624548$
```

```
Directory already exist  
Append log file success !!  
[Status : 8] id : , time : 1592044154  
[Status : 8] id : , time : 1592044154  
syslog Send Success !!  
[Status : 8] id : , time : 1592044154  
[Status : 8] id : , time : 1592044154  
syslog Send Success !!  
[Status : 8] id : , time : 1592044154  
[Status : 8] id : , time : 1592044154  
syslog Send Success !!  
[Status : 8] id : , time : 1592044154  
File Edit View Search Terminal Help  
Jun 13 21:50:18 lep-Virtual-Machine logwatchdog: [Status : -12736] id : , time :  
1592044154  
Jun 13 21:50:32 lep-Virtual-Machine logwatchdog: [Status : 5] id : , time : 1592  
044154  
Jun 13 21:51:10 lep-Virtual-Machine logwatchdog: message repeated 3 times: [ St  
atus : 5] id : , time : 1592044154]  
Jun 13 21:52:19 lep-Virtual-Machine logwatchdog: [Status : 8] id : , time : 1592  
044154  
Jun 13 21:53:36 lep-Virtual-Machine logwatchdog: message repeated 6 times: [ St  
atus : 8] id : , time : 1592044154]  
Jun 13 21:53:42 lep-Virtual-Machine dbus-daemon[680]: [system] Activating via sy  
stemd: service name='org.freedesktop.hostname1' unit='dbus-org.freedesktop.hostn  
ame1.service' requested by ':1.129' (uid=1000 pid=2787 comm="/usr/lib/firefox/fi  
refox --new-window " label="unconfined")  
Jun 13 21:53:42 lep-Virtual-Machine systemd[1]: Starting Hostname Service...  
Jun 13 21:53:42 lep-Virtual-Machine dbus-daemon[680]: [system] Successfully acti  
vated service 'org.freedesktop.hostname1'  
Jun 13 21:53:42 lep-Virtual-Machine systemd[1]: Started Hostname Service.  
Jun 13 21:54:06 lep-Virtual-Machine logwatchdog: [Status : 8] id : , time : 1592  
044154  
Jun 13 21:54:06 lep-Virtual-Machine logwatchdog: [Status : 8] id : , time : 1592  
044154  
Jun 13 21:54:17 lep-Virtual-Machine dhclient[820]: DHCPREQUEST of 192.168.58.105
```