

許家文 408530049

By stackoverflow

<https://stackoverflow.com/questions/13932932/why-does-stdout-need-explicit-flushing-when-redirected-to-file>

Why does stdout need explicit flushing when redirected to file?

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- The behaviour of `printf()` seems to depend on the location of `stdout`.
1. If `stdout` is sent to the console, then `printf()` is line-buffered and is flushed after a newline is printed.
 2. If `stdout` is redirected to a file, the buffer is not flushed unless `fflush()` is called.
 3. Moreover, if `printf()` is used before `stdout` is redirected to file, subsequent writes (to the file) are line-buffered and are flushed after newline.

When is `stdout` line-buffered, and when does `fflush()` need to be called?

stdout 改成file 的話 需要加入fflush()否則並不把所有累積在buffer的字元輸出到file中。而最後一行execvp會輸出原因可能為程式執行完畢後會flush所有buffer中的內容。

註解掉1

原本代表從/dev/nul輸入，註解掉恢復成標準輸入。

對4: 因為修改輸入並不會影響到該程式的輸出結果而就原本程式(沒註解掉123來說)，執行結果應該會把 i: hello;0<=i<=10 寫入到stdout.log這個檔案中，但又因為程式沒加入fflush()並不會flush，所以i: hello;0<=i<=10 不會寫入到stdout.log中。

對5: 原本stdin會從/dev/null輸入，註解掉後使用者須自行輸入10個char。

對7: 並無影響 會把ls -R寫入到stoud.log中

```
g u 5 stdout.log u x M makefile u C lovelyRon.c u
stdout.log
/:
bin
boot
cdrom
Desktop
dev
etc
home
lib
lib32
lib64
libx32
lost+found
media
mnt
opt
proc
root
run
sbin
snap
srv
swapfile
sys
tmp
usr
var

/boot:
config-5.15.0-71-generic
config-5.15.0-72-generic
efi
grub
initrd.img
initrd.img-5.15.0-71-generic
initrd.img-5.15.0-72-generic
initrd.img.old
memtest86+.bin
memtest86+.elf
memtest86+.multiboot.bin
```

註解掉2

原本代表輸出到stdout.log, 註解掉恢復輸出到標準輸出。

對4: 原本會輸出到stdout.log 改成輸出到stdout

```
ulohg@ulohg-VirtualBox:~/Desktop/system-program/hw12$ ./lovelyRon
0: hello
1: hello
2: hello
3: hello
4: hello
5: hello
6: hello
7: hello
8: hello
9: hello
試著在20秒內切斷連線
```

對5: 並無影響 還是會從/dev/null 中輸入

對7: 原本會輸出到stdout.log 改成輸出到標準輸出上

```
8f589640d34b7dc9042c8d453f7c8b9c-le64.cache-7 0cc790b03b123a6a90ee260fcdad32a9-le64.cache-7 c19814c0-3fe7-4cbd-b00f-0c5caa011b24-le64.cache-7 fonts.conf
bf7329c52933ffd510edef78f73874cfd-le64.cache-7 0d60b7d0-469b-4b93-b7cb-284eda6e51e7-le64.cache-7 c2243f64-6105-4abc-b7c4-c1461a4c5e99-le64.cache-7
f8cc9b99-ca8c-4694-a6c3-04bfff1a5133-le64.cache-7 707971e083b4a6ec8121c3a920e507f5-le64.cache-7 c4a020df-e6c5-41ab-b36f-1c75d6dda204-le64.cache-7

/var/spool:
anacron cron cups libreoffice mail rsyslog

/var/spool/anacron:
cron.daily cron.monthly cron.weekly

/var/spool/cron:
crontabs

/var/spool/libreoffice:
uno_packages

/var/spool/libreoffice/uno_packages:
cache

/var/spool/libreoffice/uno_packages/cache:

/var/tmp:
systemd-private-279a3b0e2c804da7b24672e5b9a86797-color.service-IJbYJl systemd-private-279a3b0e2c804da7b24672e5b9a86797-switcheroo-control.service-qTDUQe
systemd-private-279a3b0e2c804da7b24672e5b9a86797-fwupd.service-vLA5Lj systemd-private-279a3b0e2c804da7b24672e5b9a86797-systemd-logind.service-J0zARh
systemd-private-279a3b0e2c804da7b24672e5b9a86797-ModemManager.service-9oFEVh systemd-private-279a3b0e2c804da7b24672e5b9a86797-systemd-resolved.service-px3Qpg
systemd-private-279a3b0e2c804da7b24672e5b9a86797-redis-server@openvas.service-HgJPng systemd-private-279a3b0e2c804da7b24672e5b9a86797-systemd-timesyncd.service-ouMBLj
systemd-private-279a3b0e2c804da7b24672e5b9a86797-redis-server.service-7CKY8e systemd-private-279a3b0e2c804da7b24672e5b9a86797-upower.service-T1AXI4
```

註解掉3

原本3代表error會輸出到stderr.log, 註解掉恢復原本預設輸出到螢幕上。

對4: 並無影響

對5: 並無影響

對7: 原本error會輸出到stderr.log, 註解掉恢復原本預設輸出到螢幕上

```
ulohg@ulohg-VirtualBox:~/Desktop/system-program/hw12$ ./lovelyRon
*****ls: cannot open directory '/boot/efi': Permission denied
ls: cannot open directory '/etc/cups/ssl': Permission denied
ls: cannot open directory '/etc/polkit-1/localauthority': Permission denied
ls: cannot open directory '/etc/ssl/private': Permission denied
ls: cannot open directory '/lost+found': Permission denied
ls: cannot open directory '/media/ulohg/VBox_GAs_6.1.30': Permission denied
ls: cannot open directory '/proc/1/fd': Permission denied
ls: cannot open directory '/proc/1/fdinfo': Permission denied
ls: cannot open directory '/proc/1/map_files': Permission denied
ls: cannot open directory '/proc/1/ns': Permission denied
ls: cannot open directory '/proc/1/task/1/fd': Permission denied
ls: cannot open directory '/proc/1/task/1/fdinfo': Permission denied
ls: cannot open directory '/proc/1/task/1/ns': Permission denied
ls: cannot open directory '/proc/10/fd': Permission denied
ls: cannot open directory '/proc/10/fdinfo': Permission denied
ls: cannot open directory '/proc/10/map_files': Permission denied
ls: cannot open directory '/proc/10/ns': Permission denied
ls: cannot open directory '/proc/10/task/10/fd': Permission denied
ls: cannot open directory '/proc/10/task/10/fdinfo': Permission denied
```

註解掉6

需考慮兩種情況

1.使用者讓程式繼續執行，照原本沒有註解123的情況，會從/dev/null getchar()且output到 stdout.log中 且error 也會output在stderr.log中，並且等待20秒後執行ls / -R 最後執行完畢。

```
ulohg@ulohg-VirtualBox:~/Desktop/system-program/hw12$ ./lovelyRon  
ulohg@ulohg-VirtualBox:~/Desktop/system-program/hw12$
```

2.使用者在程式執行前就terminal，原本 signal(SIGHUP, SIG_IGN); 會ignore 終止執行的 signal，所以在關閉terminal後程式還是會繼續執行。

但註解掉這行的話在關閉terminal後，程式就停止執行了。