任务23：看门狗

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配置内核中的硬件看门狗，使得一定时间内不喂狗就重启Acadia或RPi或WRTnode，写一个程序或脚本保 持一定频率的喂狗，当关闭这 个程序或脚本时形成重启。实验报告要记录和表现出重启。。

实现目的

1 掌握看门狗的概念；
2 掌握Acadia或RPi或WRTnode上编写看门狗程序的方法。

硬件

- Acadia或RPi或WRTnode板一块；
- 5V/1A电源一个；
- microUSB线一根；
- USB-TTL串口线一根（FT232RL芯片或PL2303芯片）。

以下为自备（可选）器材：

- PC（Windows/Mac OS/Linux）一台；
- 以太网线一根（可能还需要路由器等）。软件

软件

- PC上的USB-TTL串口线配套的驱动程序；
- PC上的串口终端软件，如minicom、picocom、putty等；
- PC上的SSH软件，如putty等。

实验步骤

1 树莓派添加bcm2708_wdog模块。

编写watchdog.sh

```bash
#!/usr/bin/env bash

echo "[+] Activating Temperature Sensor"
modprobe bcm2708_wdog
echo "bcm2708_wdog" >> /etc/modules

echo "[+]Installing Watchdog"
apt-get -y install watchdog chkconfig

echo "[+]Setting Up Watchdog"
chkconfig watchdog on
sed -i 's/#max-load-1[^5]/max-load-1\ /g' /etc/watchdog.conf
sed -i 's/#\(watchdog-device\t[\ ]*\)\=/\1\t\=/g' /etc/watchdog.conf
sed -i 's/#\(temperature-device[\ ]*\)\=/\1\ \= \/sys\/class\/thermal\/thermal\_zone0\/temp/g' /etc/watchdog.conf
sed -i 's/#\(max-temperature[\ ]*\)\=\ 120/\1\ \=\ 75000/g' /etc/watchdog.conf
sed -i 's/#\(interval[\ ]*\)\=\ 1/\1\ \=\ 10 /g' /etc/watchdog.conf
/etc/init.d/watchdog start
```

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sed -i 's/#\(interval[\ ]*\)\=\ 1/\1\ \=\ 10 /g' /etc/watchdog.conf
/etc/init.d/watchdog start
```

然后运行

```
~/nyle/codes# sudo sh watchdog.sh
```

```
[+]Installing Watchdog
Reading package lists... Done
Building dependency tree
Reading state information... Done
chkconfig is already the newest version.
watchdog is already the newest version.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
```

2. 编写喂狗程序如下

```c
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <fcntl.h>
int main()
{
        int fd = open("/dev/watchdog", O_WRONLY);
        int ret = 0;
        if (fd == -1)
        {
        printf("\n!!! FAILED to open /dev/watchdog, errno\n");
                perror("watchdog");
                exit(EXIT_FAILURE);
        }
        while(1)
        {
                printf("feed dog now \n");
                ret = write(fd, "\0", 1);
                if(ret != 1){
                        ret = -1;
                        break;
                }
                sleep(10);
        }
        close(fd);
        return ret;
}
```

3. 编译并执行

```
root@Acadia:~/nyle/codes# gcc feed.c
root@Acadia:~/nyle/codes# ./a
-bash: ./a: No such file or directory
root@Acadia:~/nyle/codes# ./a.out
feed dog now
feed dog now
```

然后control + c终端程序。发现树莓派重启了。而且灯开始闪烁。

```
root@Acadia:~/nyle/codes# gcc feed.c
root@Acadia:~/nyle/codes# ./a
-bash: ./a: No such file or directory
root@Acadia:~/nyle/codes# ./a.out
feed dog now
feed dog now
feed dog now
feed dog now
feed dog now
feed dog now
^C
root@Acadia:~/nyle/codes# Write failed: Broken pipe
```

```
Bluetooth: BNEP filters: protocol multicast
Bluetooth: HIDP (Human Interface Emulation) ver 1.2
NET: Registered protocol family 33
lib80211: common routines for IEEE802.11 drivers
Registering the dns_resolver key type
VFP support v0.3: implementor 41 architecture 3 part 30 variant 9 rev 4
Bus freq driver module loaded
Bus freq driver Enabled
mxc_dvfs_core_probe
DVFS driver module loaded
kAFS: Red Hat AFS client v0.1 registering.
regulator_init_complete: PFUZE100_VGEN6: incomplete constraints, leaving on
regulator_init_complete: PFUZE100_VGEN3: incomplete constraints, leaving on
regulator_init_complete: PFUZE100_VGEN2: incomplete constraints, leaving on
regulator_init_complete: PFUZE100_VGEN1: incomplete constraints, leaving on
snvs_rtc snvs_rtc.0: setting system clock to 2015-03-31 07:02:51 UTC (142778537)
EXT3-fs: barriers not enabled
EXT3-fs (mmcblk0p1): warning: checktime reached, running e2fsck is recommended
kjournald starting.  Commit interval 5 seconds
EXT3-fs (mmcblk0p1): using internal journal
EXT3-fs (mmcblk0p1): mounted filesystem with writeback data mode
VFS: Mounted root (ext3 filesystem) on device 179:1.
Freeing init memory: 216K
```

感想：

　　学习了linux中看门狗的用法。了解软件出错的时候可以复位计算机系统的硬件电路。

　　了解了喂狗和关闭看门狗的方法。

　　这期间本来使用Acadia进行实验。但是始终不能实现看门狗模块，最后借了小组的树莓派进行实验才成功进行实验。