# 任务 23: 看门狗

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# 资料:

#### 什么是看门狗程序?

看门狗程序就是一个健康监控程序,每间隔一定时间(默认 10 秒)检查一次是否在设定的健康工作范围内,如果超过即启动硬件复位程序,让设备重新启动,恢复健康。

#### 树莓派支持硬件自动复位?

是的,开源的 BCM2708 芯片让树莓派拥有了硬件看门狗芯片功能,加上 linux 内核编译好了的 bcm2708\_wdog 模块,树莓派通过 watchdog 程序实现硬件看门狗功能,达到自动复位功能。

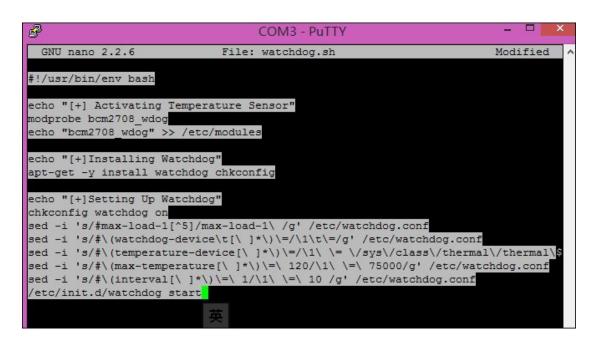
#### 看门狗能做些什么?

比如 CPU 占用过高假死一定时间,系统严重报错无法响应, CPU 温度过高...各种状态均可。

# 实验步骤

1. 编写看门狗程序并编译;

程序:



```
#!/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/\sharp\ (watchdog-device\t[\] \ast\)\=/\1\t\=/g' /etc/watchdog. conf
sed -i 's/\#\(temperature-device[\]*\)\=/\1\\=
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
```

#### 程序解释:

去掉 watchdog-device = /dev/watchdog 前的#号,让看门狗设备对应树莓派的硬件看门狗。

去掉 max-load-1 = 24 前的#号, 当 1 分钟 load 进程超过 24 个的时候就会重启

还可以设置高温复位:

去掉 temperature-device = max-temperature = 120 前的#号,改为 temperature-device = /sys/class/thermal/thermal\_zone0/tempmax-temperature = 80000 温度超过 80 度就会引起重启,保护 CPU。

还可以设置内存耗尽就重启,如 min-memory =1 前的注释#号去掉 还可以设置监控的间隔,如 interval = 1 前的注释#号去掉,该 1 为任意数字,单位是 秒,默认是 10 秒一次健康检查

### 2. 运行程序;

#### 命令: sudo sh watchdog.sh

```
root@Acadia:~# sudo sh watchdog.sh
[+] Activating Temperature Sensor
FATAL: Module bcm2708 wdog not found.
[+] Installing Watchdog
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
 chkconfig watchdog
0 upgraded, 2 newly installed, 0 to remove and 0 not upgraded. Need to get 76.9 kB of archives.
After this operation, 267 kB of additional disk space will be used.
WARNING: The following packages cannot be authenticated!
 chkconfig watchdog
Authentication warning overridden.
Get:1 http://ports.ubuntu.com/ubuntu-ports/ precise/universe chkconfig all 11.0-
79.1-2 [9222 B]
Get:2 http://ports.ubuntu.com/ubuntu-ports/ precise/universe watchdog armhf 5.11
```

```
* Stopping watchdog keepalive daemon...

* Starting watchdog daemon...
```

## 3. 对程序进行验证。

运行下面程序让内核崩溃:

### : (){ :|:& };:

运行这一串字符会让系统内核立马崩溃,测试一下死机后会不会重启,就可以测试出看 门狗程序是否正常工作。

输入程序,观察10秒(默认10秒)后系统是否自动重启:

```
root@Acadia:~# : (){ :|:& };:
```

从 下 图 看 出 Acadia 意 外 重 启 , 说 明 看 门 狗 正 常 工 作 :

```
root@Acadia:~# : (){ :|:& };:
[3] 4219
root@Acadia:~# Out of memory: Kill process 2817 (mysqld) score 37 or sacrifice c
hild
Killed process 2817 (mysqld) total-rm:315620kB, anon-rss:28368kB, file-rss:472kB
imx2-wdt imx2-wdt.0: Unexpected close: Expect reboot!
```

重启成功:

```
Last login: Thu Jan 1 08:08:35 CST 1970 on tty1

* Stopping watchdog keepalive daemon...
imx2-wdt imx2-wdt.0: Unexpected close: Expect reboot!
Welcome to Linaro 12.11 (GNU/Linux 3.0.35-2666-gbdde708 armv71)

* Documentation: https://wiki.linaro.org/
root@Acadia:~# [ OK ]

* Starting watchdog daemon... [ OK ]

* Starting web server apache2 [ OK ]
init: plymouth-stop pre-start process (3203) terminated with status 1
init: tty1 main process (3204) killed by TERM signal

root@Acadia:~#
root@Acadia:~#
root@Acadia:~#
```