



测试报告

G2L 核心板内存压力和稳定性

Rev1.0
2022-02-06

版本记录

版本号	修改说明	修改人	修改日期
V1.0	初始文档	yuge	2022-02-06

1、测试目的

维芯科推出的 WTB-G2LS 工控板（包含 WTC-G2LS 核心板 V03）支持 DDR4 内存，容量可以支持 512Mbyte 和 1GByte，本次测试为了针对内存进行压力测试和稳定性测试，进而保证产品能够长期稳定的运行。

2、测试结果

基于 WTC-G2LS 核心板的 WTB-G2LS 工控板（以下简称 G2L 工控板）测试内存压力和稳定性，经过 120 小时测试，测试没有报错，测试合格。

测试了 GD 的 512MB DDR4,三星的 512MB DDR4,镁光的 1GB DDR4,三星的 1GB DDR4 都是通过的。

3、测试工具

内存测试用测试工具为 memtester 和 stressapptest 两个工具，这两个软件在 G2L 工控板上都移植好了，不需要重新移植。

3.1 Memtester

Memtester 主要是捕获内存错误和一直处于很高或者很低的坏位，其测试的主要项目有随机值，异或比较，减法，乘法，除法，与或运算等等。通过给定测试内存的大小和次数，可以对系统现有的内存进行上面项目的测试。

命令说明

```
memtester [-p PHYSADDR] <MEMORY> [ITERATIONS]
```

参数说明:

MEMORY 申请测试内存的数量, 单位默认是 megabytes(兆), 也可以是 B K M G。

ITERATIONS 测试的次数, 默认是无限。

3.2 stressapptest

stressapptest 是 Stressfull Application Test 的简称。该软件更多的时候测试的是内存控制器和总线接口, 而不是存储单元的功能。测试是会最大化总线和内存的交换量, 从而使交换失败的概率会增加。该软件采用多线程对内存进行拷贝和磁盘接口读写, 占用 85% 的内存块, 而且每个线程都是随机进行读写操作, 一般每个处理开启 2 个线程, 磁盘也是。

该软件在测试系统接口方面比较好, 可以评估一些内存信号完整性或者内存芯片、接口总线及磁盘方面的情况。

3.3 还需要如下设备

电脑

USB 转 TTL 串口线

4、测试过程

因为测试 log 比较多, 建议使用我们制作的测试脚本, 能够将测试 log 存到文件中, 在串口终端中输入测试命令:

```
/home/root/test_utils/memstress512.sh &
```

或者

```
/home/root/test_utils/memstress1024.sh &
```

分别用来测试 512MB 和 1024MB 内存,上面两个脚本使用的就是 Memtester 和 stressapptest 两个命令。放在后台跑一段时间,这里我们运行了 5 天时间。

4.1 stressapptest测试log

Stressapptest 一个循环 log 信息

下面是开始测试的 log:

```
20220709175005 Start memtest...

LOGFILE: /data/mt-20220709175005.log

=== do STRESSAPPTTEST, 1

2022/07/09-17:50:05(CST) Log: Commandline - /home/root/test_utils/stressapptest -v 10
-M 650 -s 3600
2022/07/09-17:50:05(CST) Stats: SAT revision 1.0.9_autoconf, 64 bit binary
2022/07/09-17:50:05(CST) Log: billy @ ubuntu on Sat May 14 10:30:50 CST 2022 from
open source release
2022/07/09-17:50:05(CST) Log: 1 nodes, 2 cpus.
2022/07/09-17:50:05(CST) Log: Defaulting to 2 copy threads
2022/07/09-17:50:05(CST) Log: Prefer plain malloc memory allocation.
2022/07/09-17:50:05(CST) Log: Using mmap() allocation at 0xffff96133000.
2022/07/09-17:50:05(CST) Stats: Starting SAT, 650M, 3600 seconds
2022/07/09-17:50:05(CST) Log: Starting fill thread 1
2022/07/09-17:50:05(CST) Log: Starting fill thread 0
2022/07/09-17:50:05(CST) Log: Starting fill thread 7
2022/07/09-17:50:05(CST) Log: Starting fill thread 6
2022/07/09-17:50:05(CST) Log: Starting fill thread 3
2022/07/09-17:50:05(CST) Log: Starting fill thread 4
2022/07/09-17:50:05(CST) Log: Starting fill thread 2
2022/07/09-17:50:05(CST) Log: Starting fill thread 5
2022/07/09-17:50:06(CST) Log: Completed 4: Fill thread. Status 1, 81 pages filled
2022/07/09-17:50:06(CST) Log: Completed 1: Fill thread. Status 1, 81 pages filled
2022/07/09-17:50:06(CST) Log: Completed 0: Fill thread. Status 1, 81 pages filled
2022/07/09-17:50:06(CST) Log: Completed 6: Fill thread. Status 1, 81 pages filled
2022/07/09-17:50:06(CST) Log: Completed 3: Fill thread. Status 1, 81 pages filled
2022/07/09-17:50:06(CST) Log: Completed 7: Fill thread. Status 1, 83 pages filled
2022/07/09-17:50:06(CST) Log: Completed 5: Fill thread. Status 1, 81 pages filled
```

```
2022/07/09-17:50:06(CST) Log: Completed 2: Fill thread. Status 1, 81 pages filled
2022/07/09-17:50:06(CST) Log: region number 2 exceeds region count 1
2022/07/09-17:50:06(CST) Log: Region mask: 0x1
2022/07/09-17:50:06(CST) Log: Starting copy thread 1: cpu 1, mem ffffffff
2022/07/09-17:50:06(CST) Log: Starting copy thread 2: cpu 2, mem ffffffff
2022/07/09-17:50:06(CST) Log: Starting system error poll thread 0
2022/07/09-17:50:16(CST) Log: Seconds remaining: 3590
2022/07/09-17:50:26(CST) Log: Seconds remaining: 3580
2022/07/09-17:50:36(CST) Log: Seconds remaining: 3570
2022/07/09-17:50:46(CST) Log: Seconds remaining: 3560
2022/07/09-17:50:56(CST) Log: Seconds remaining: 3550
2022/07/09-17:51:06(CST) Log: Seconds remaining: 3540
2022/07/09-17:51:16(CST) Log: Seconds remaining: 3530
2022/07/09-17:51:26(CST) Log: Seconds remaining: 3520
2022/07/09-17:51:36(CST) Log: Seconds remaining: 3510
```

以下是这一个循环测试通过的 log

```
2022/07/09-18:49:36(CST) Log: Seconds remaining: 30
2022/07/09-18:49:46(CST) Log: Seconds remaining: 20
2022/07/09-18:49:56(CST) Log: Seconds remaining: 10
2022/07/09-18:50:06(CST) Log: Completed 2: Copy thread. Status 1, 1508652 pages
copied
2022/07/09-18:50:06(CST) Log: Completed 1: Copy thread. Status 1, 1518961 pages
copied
2022/07/09-18:50:07(CST) Log: Finished system error poll thread 0: 0 errors
2022/07/09-18:50:07(CST) Log: Starting Check thread 3
2022/07/09-18:50:07(CST) Log: Starting Check thread 7
2022/07/09-18:50:07(CST) Log: Starting Check thread 6
2022/07/09-18:50:07(CST) Log: Starting Check thread 5
2022/07/09-18:50:07(CST) Log: Starting Check thread 8
2022/07/09-18:50:07(CST) Log: Starting Check thread 4
2022/07/09-18:50:07(CST) Log: Starting Check thread 9
2022/07/09-18:50:07(CST) Log: Starting Check thread 10
2022/07/09-18:50:07(CST) Log: Completed 8: Check thread. Status 1, 48 pages checked
2022/07/09-18:50:07(CST) Log: Completed 5: Check thread. Status 1, 51 pages checked
2022/07/09-18:50:07(CST) Log: Completed 4: Check thread. Status 1, 46 pages checked
2022/07/09-18:50:07(CST) Log: Completed 3: Check thread. Status 1, 54 pages checked
2022/07/09-18:50:07(CST) Log: Completed 6: Check thread. Status 1, 51 pages checked
2022/07/09-18:50:07(CST) Log: Completed 9: Check thread. Status 1, 50 pages checked
2022/07/09-18:50:07(CST) Log: Completed 10: Check thread. Status 1, 46 pages checked
2022/07/09-18:50:07(CST) Log: Completed 7: Check thread. Status 1, 44 pages checked
2022/07/09-18:50:07(CST) Stats: Found 0 hardware incidents
2022/07/09-18:50:07(CST) Stats: Completed: 6055226.00M in 3600.97s 1681.55MB/s,
```

with 0 hardware incidents, 0 errors

2022/07/09-18:50:07(CST) Stats: Memory Copy: 6055226.00M at 1681.87MB/s

2022/07/09-18:50:07(CST) Stats: File Copy: 0.00M at 0.00MB/s

2022/07/09-18:50:07(CST) Stats: Net Copy: 0.00M at 0.00MB/s

2022/07/09-18:50:07(CST) Stats: Data Check: 0.00M at 0.00MB/s

2022/07/09-18:50:07(CST) Stats: Invert Data: 0.00M at 0.00MB/s

2022/07/09-18:50:07(CST) Stats: Disk: 0.00M at 0.00MB/s

2022/07/09-18:50:07(CST)

2022/07/09-18:50:07(CST) Status: PASS - please verify no corrected errors

2022/07/09-18:50:07(CST)

到这里，这个循环就测试好了，差不多 1 个小时的时间，显示测试 PASS

4.2 Memtester测试log

Stressapptest 一个循环 log 信息

下面是开始测试的 log:

```
=== do MEMTESTER
```

```
memtester version 4.3.0 (64-bit)
```

```
Copyright (C) 2001-2012 Charles Cazabon.
```

```
Licensed under the GNU General Public License version 2 (only).
```

```
pagesize is 4096
```

```
pagesizemask is 0xffffffff000
```

```
want 650MB (681574400 bytes)
```

```
got 650MB (681574400 bytes), trying mlock ...locked.
```

```
Loop 1/25:
```

```
Stuck Address      :
```

以下是这一个循环测试通过的 log

```
Compare XOR        : ok
```

```
Compare SUB        : ok
```

```
Compare MUL        : ok
```

```
Compare DIV        : ok
```

```
Compare OR         : ok
```

```
Compare AND        : ok
```

```
Sequential Increment: ok
```

```
Done.
```

=== memtester OK.

到这里，这个循环就测试好了，差不多 8 个小时的时间，显示测试 PASS

4.3 测试实物图

为了避免误触屏幕导致 app 运行，对内存测试的干扰，将触摸屏拔掉了。

