
高通用户体验性能优化期刊

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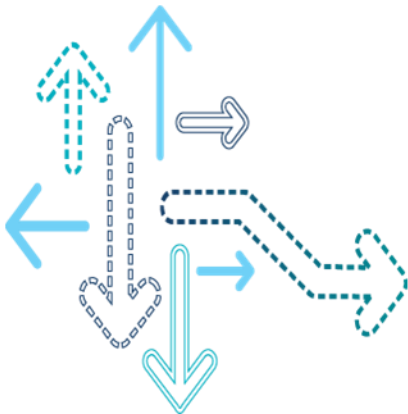
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EMMC性能问题分析



EMMC性能问题分析

EMMC性能主要是通过顺序读写，随机读写来体现。可以通过下面几个方式来测试它的性能。

- dd命令测试
 - 主要测试顺序读写性能
- Benchmark测试
 - 包括顺序读写和随机读写性能测试
- Driver level performance测试
 - 从驱动层面来反应EMMC的性能差异

EMMC性能问题分析

- dd命令测试

- 让给所有CPU都工作在performance模式，并且关闭LPM。

- adb shell stop thermalld
- adb shell stop thermal-engine
- adb shell "echo 4 > /sys/devices/system/cpu/cpu0/core_ctl/min_cpus"
- adb shell "echo 4 > /sys/devices/system/cpu/cpu4/core_ctl/min_cpus"
- adb shell "echo 1 > /sys/devices/system/cpu/cpu1/online"
- adb shell "echo 1 > /sys/devices/system/cpu/cpu2/online"
- adb shell "echo 1 > /sys/devices/system/cpu/cpu3/online"
- adb shell "echo 1 > /sys/devices/system/cpu/cpu4/online"
- adb shell "echo 1 > /sys/devices/system/cpu/cpu5/online"
- adb shell "echo 1 > /sys/devices/system/cpu/cpu6/online"
- adb shell "echo 1 > /sys/devices/system/cpu/cpu7/online"
- adb shell "echo performance > /sys/devices/system/cpu/cpu0/cpufreq/scaling_governor"
- adb shell "echo performance > /sys/devices/system/cpu/cpu1/cpufreq/scaling_governor"
- adb shell "echo performance > /sys/devices/system/cpu/cpu2/cpufreq/scaling_governor"
- adb shell "echo performance > /sys/devices/system/cpu/cpu3/cpufreq/scaling_governor"
- adb shell "echo performance > /sys/devices/system/cpu/cpu4/cpufreq/scaling_governor"
- adb shell "echo performance > /sys/devices/system/cpu/cpu5/cpufreq/scaling_governor"
- adb shell "echo performance > /sys/devices/system/cpu/cpu6/cpufreq/scaling_governor"
- adb shell "echo performance > /sys/devices/system/cpu/cpu7/cpufreq/scaling_governor"
- adb shell "echo 1 > /sys/module/lpm_levels/parameters/sleep_disabled"

EMMC性能问题分析

- dd命令测试 (续)
 - 通过dd命令来测试不同bs, count组合下的EMMC读写速度。
 - 常用的bs, count组合有2k*512, 4k*256, 8k*128, 16k*64, 1m*1024
 - 根据前面条件测试出来的结果可以比较客观的反映出EMMC器件本身的读写能力, 如果出现和spec有明显差距的情况, 需要寻找供应商解决
 - 现实使用过程中, 更多的是随机读写的场景, 因此需要后面2种方式来测试性能。

EMMC性能问题分析

- benchmark测试
 - 常用Androbench 的Micro项来测试。可以选择测试/data还是/sdcard分区
- Driver level performance
 - kernel配置CONFIG_MMC_PERF_PROFILING=y
 - 和Imdd同样设置CPU，以及关闭LPM
 - Adb shell “echo 0 > /sys/class/mmc_host/mmc0/perf”
 - Adb shell “echo 1 > /sys/class/mmc_host/mmc0/perf”
 - 开始测试，可以是benchmark或者实际的case
 - 测试结束后，Adb shell “cat /sys/class/mmc_host/mmc0/perf”
 - 最后cat出来的就是驱动层的性能指标，如果和spec或参考机的差距比较大，先检查该mmc的clock是否正常：
 - 先关掉clock scaling: echo 0 > /sys/class/mmc_host/mmcX/clk_scaling/enable
 - 然后读取频率ex: gcc_sdcc1_apps_clk is for eMMC
 - cat /sys/kernel/debug/clk/gcc_sdcc1_apps_clk/measure
 - 另外还可以检查sys/block/mmcblk0/queue/read_ahead_kb这个值和参考机是否一致。如果是T卡，那么应该是mmcblk1，OTG的U盘可能是类似sys/block/sda这样的路径，需要具体确认。
- 注：以上几种方式也可以用来测试SD卡的性能，但是不能用来测试OTG外接U盘的场景。

如何抓取离线Systrace

如何抓取离线Systrace

Systrace是性能调试分析的重要工具。对于某些问题，可能无法在连接USB时复现，那么对于这样的问题，如何抓取正确的Systrace呢？

- 通过WIFI连接adb
 - 确保PC和手机都已经连接到同一个WIFI网络
 - 设置tcpip端口 `adb tcpip 5555`
 - 连接adb `adb connect <ip addr>:<port>`
 - 通过adb over WIFI形式抓取Systrace可能会增加WIFI负载
- 通过Atrace抓取离线Systrace
 - `atrace -z -b 51200 gfx input view wm am hal res dalvik rs sched freq idle load -t 10 > /data/local/tmp/trace_output &`
 - -z 压缩trace dump
 - -b N 设置trace buffer为N kb
 - -t 抓取trace时间
 - -s N sleep for N seconds before tracing [default 0]
 - 运行命令后即可断开USB连接

Questions?

<https://support.cdmatech.com>

