

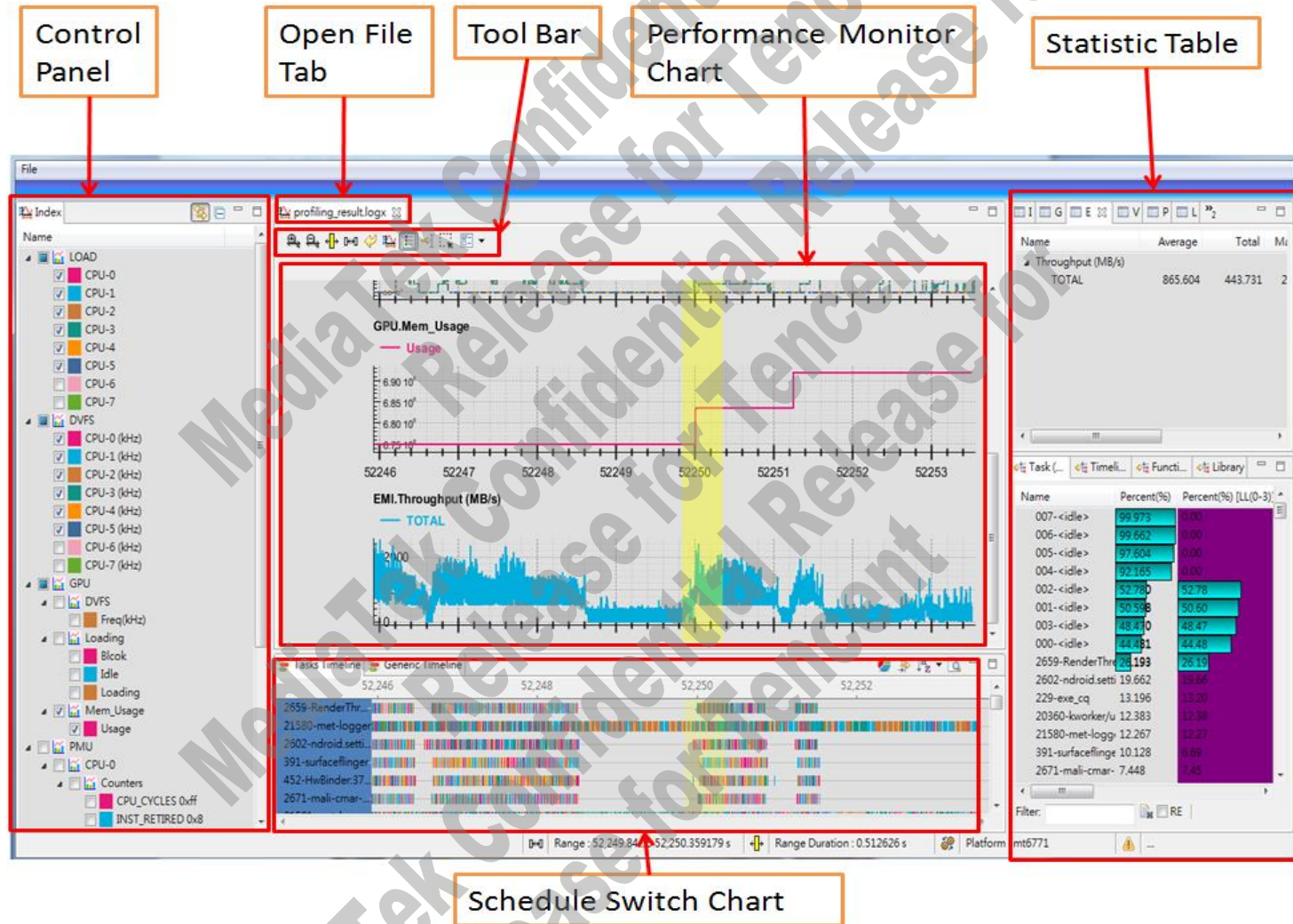
**MEDIATEK**

# 联发平台性能分析工具介绍 -MET

# Outline

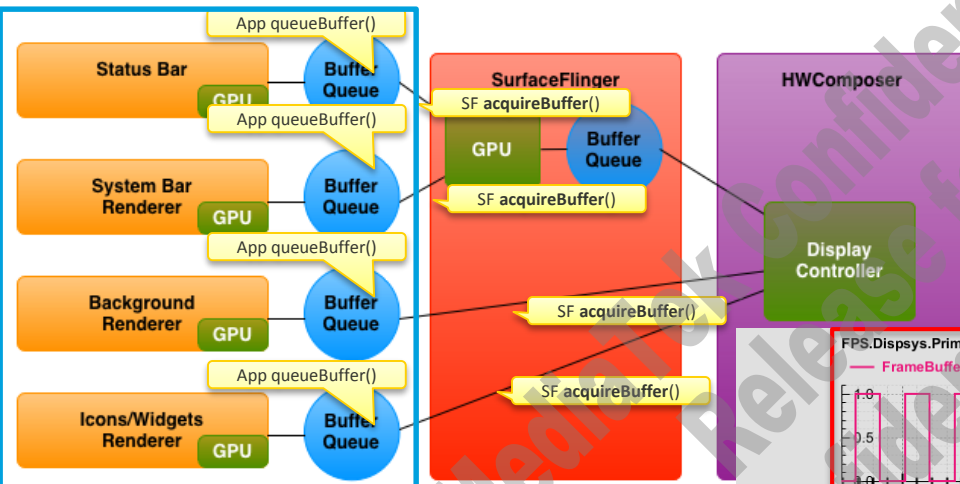
- 使用者介面
- 一般分析流程介绍
  - 定位问题发生点
  - 瓶颈分析
    - 应用处理器 (APMCU)
    - 图形处理器 (GPU)
    - 内存带宽 (DRAM Bandwidth)
- 环境设置

# 使用介面

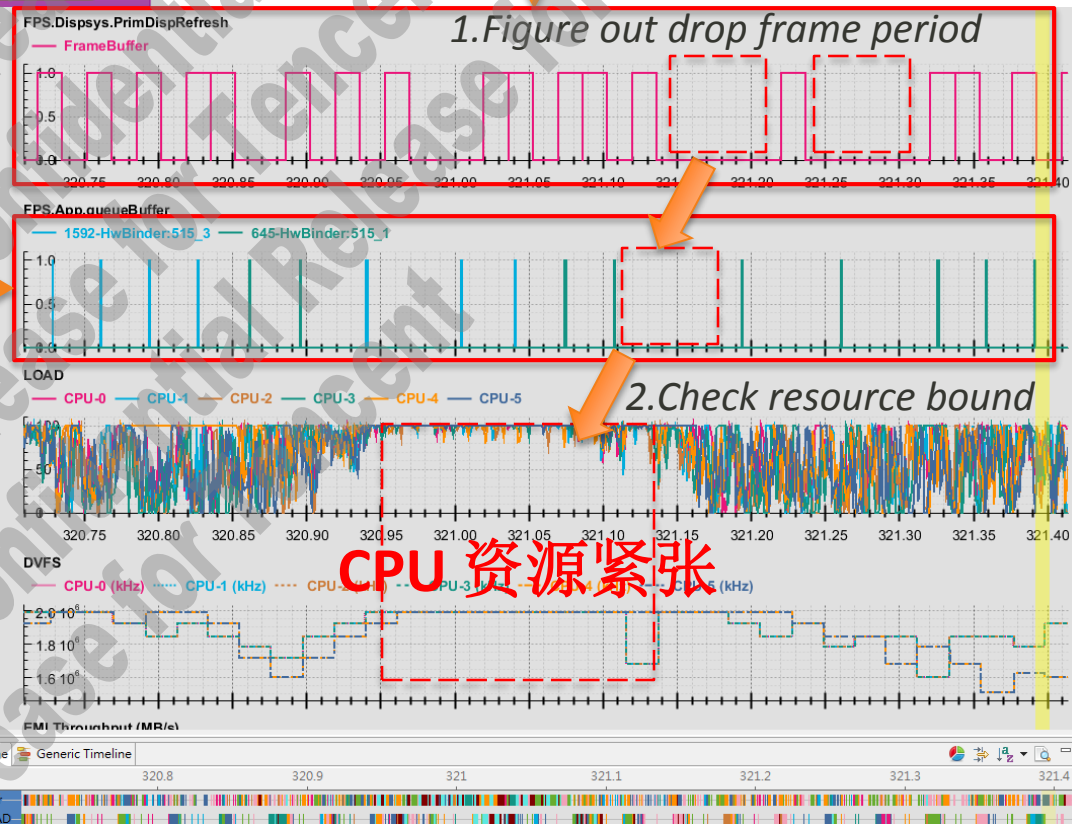


# 分析流程

## 定位问题发生点 → 瓶颈分析



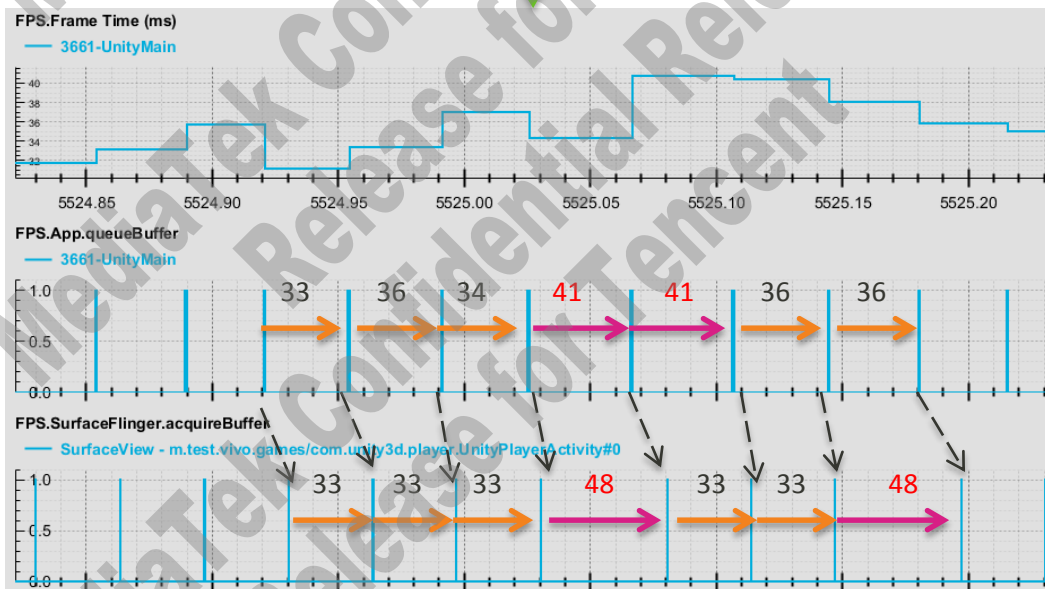
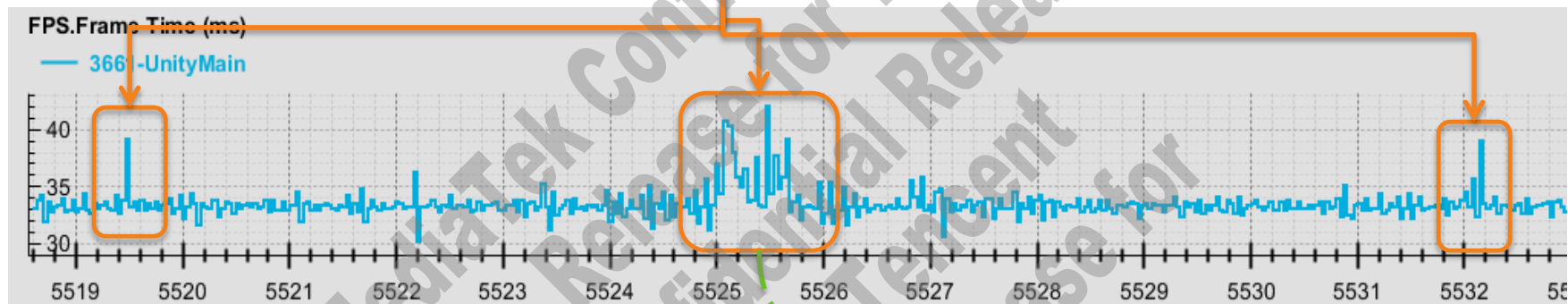
上层: 对应安卓绘图流程



底层: 硬件资源使用状况

# 定位问题发生点

绘图时间 > 平均 → 画面延迟

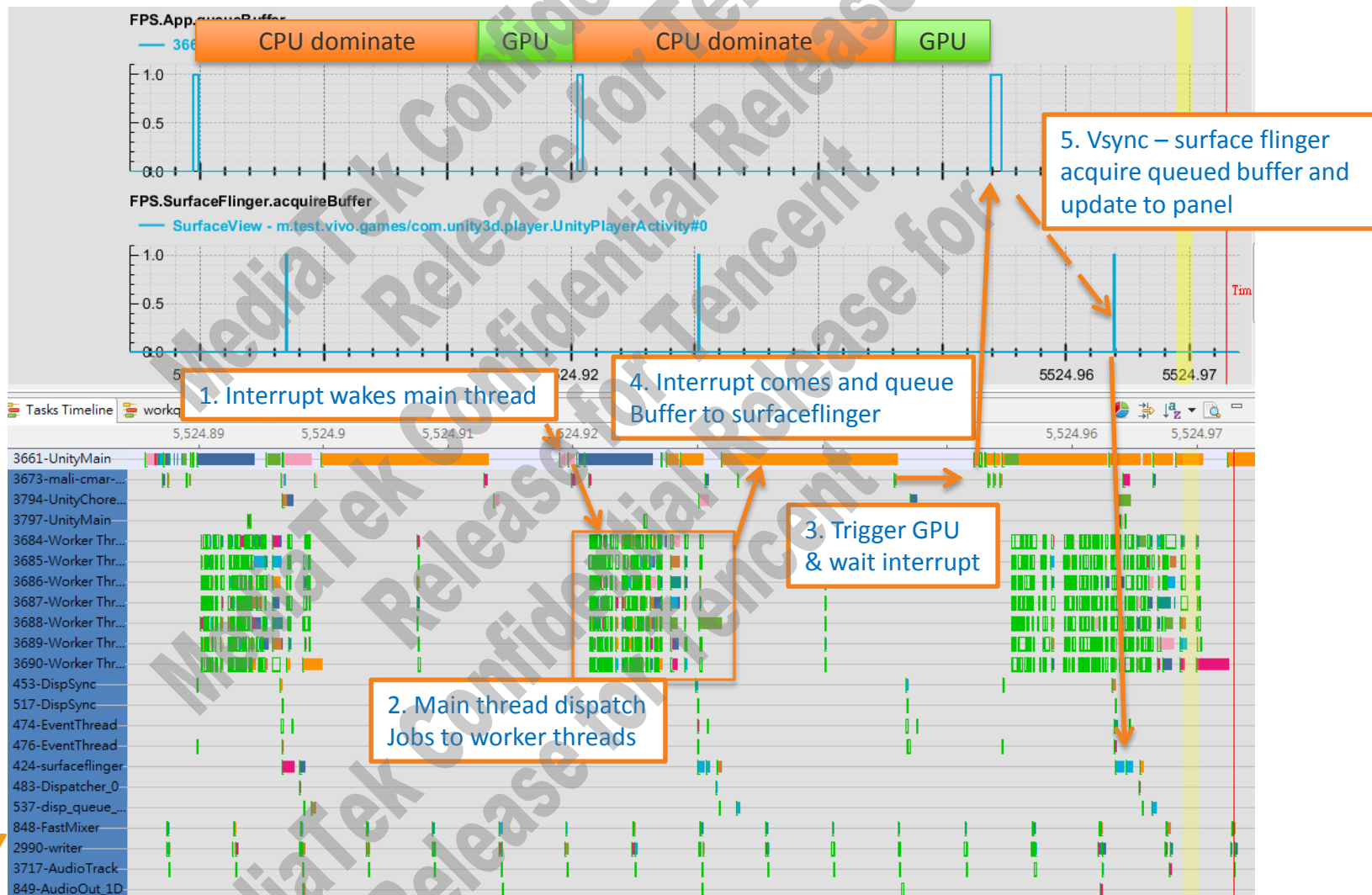


App Queue  
Buffer

Panel refresh  
(60Hz shuttle)

# 描述具体流程

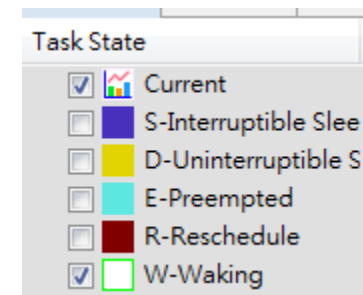
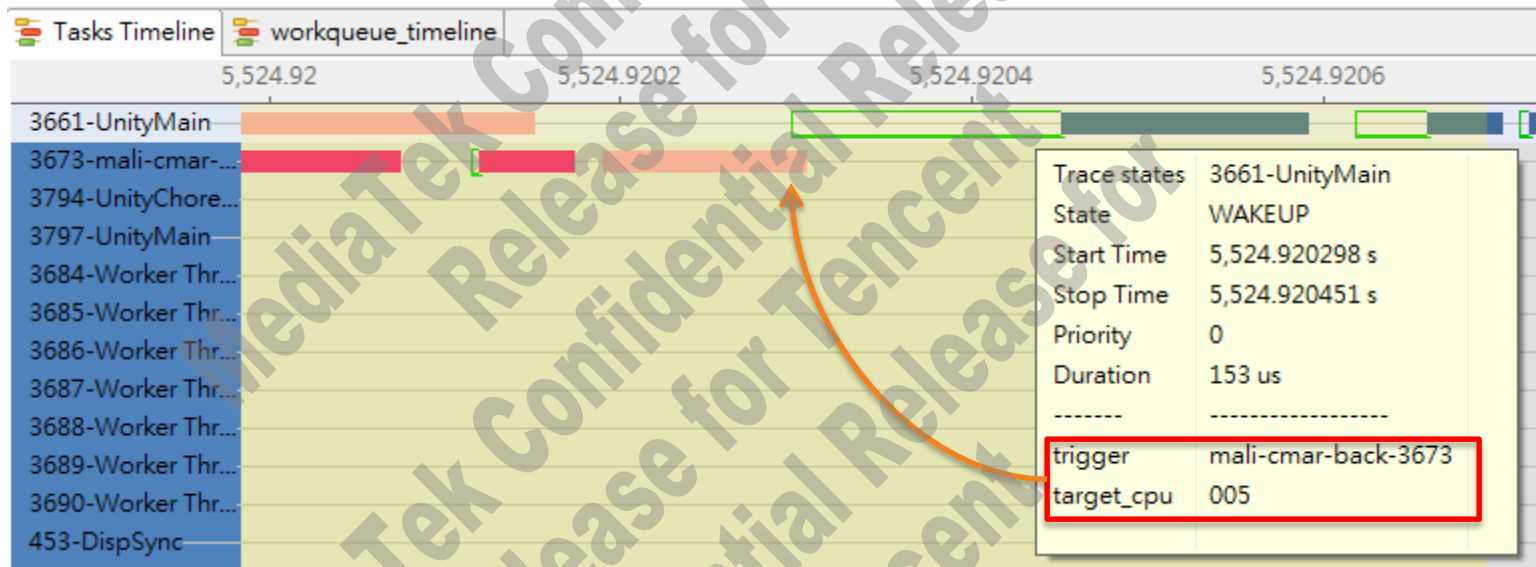
## 连接关键进程与硬件流水线





# 协助重构流程的功能

Move cursor on Tasks in waking state shows who triggers the task in pop up window



# 应用处理器资讯

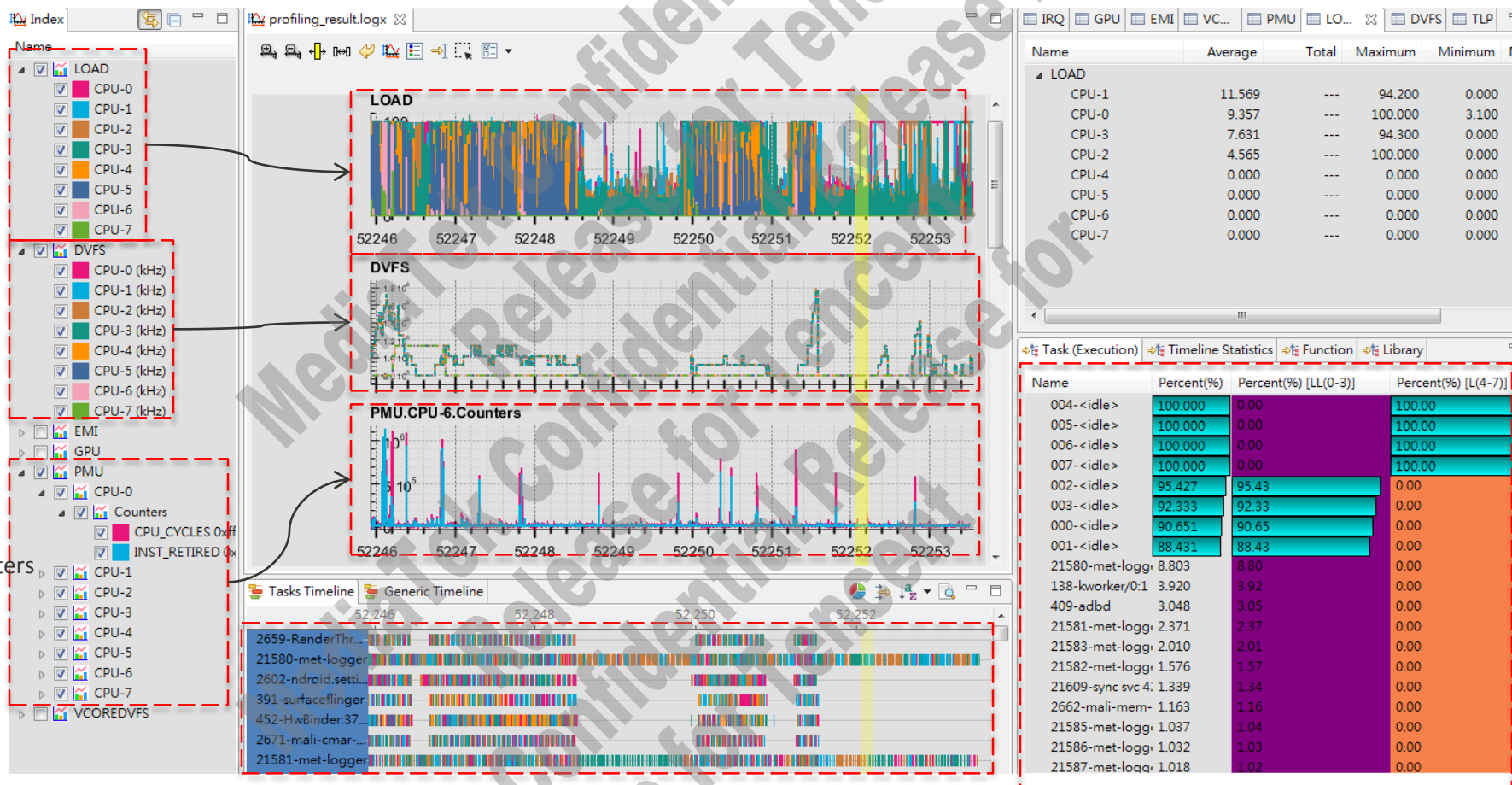
CPU loading

CPU Freq

PMU counters

CPU thread context switch

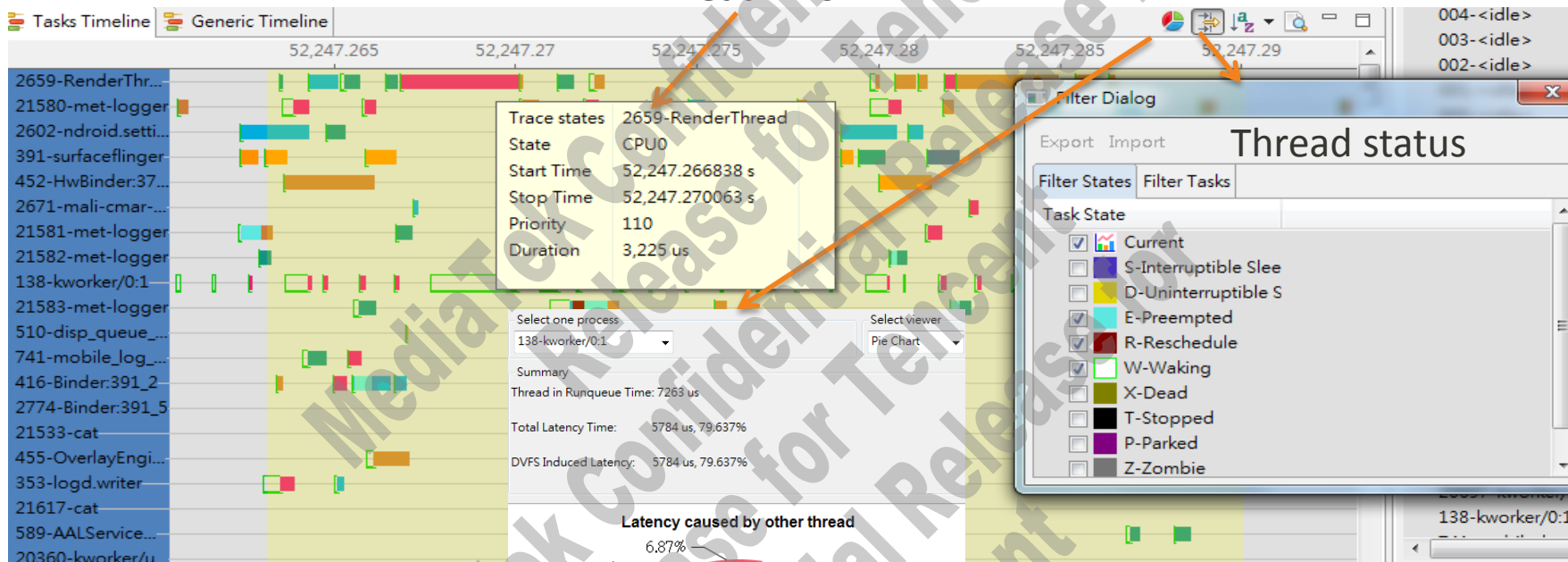
Thread execution time statistics



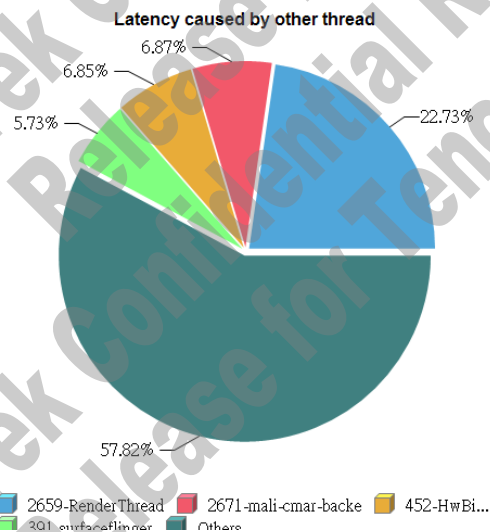


# 应用处理器资讯 - 进程视角

Thread info

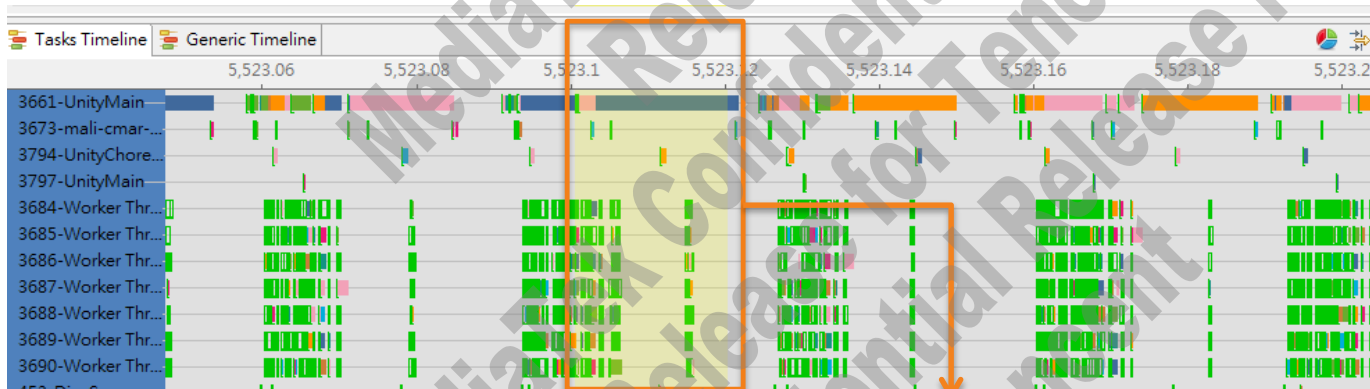


Thread Preemption Statistics



# 如何判别应用处理器资源紧张

- 超过一个以上核心使用率接近100%, 抑或
- 超过一个以上进程执行时间比例接近100%



Per Core loading: light load

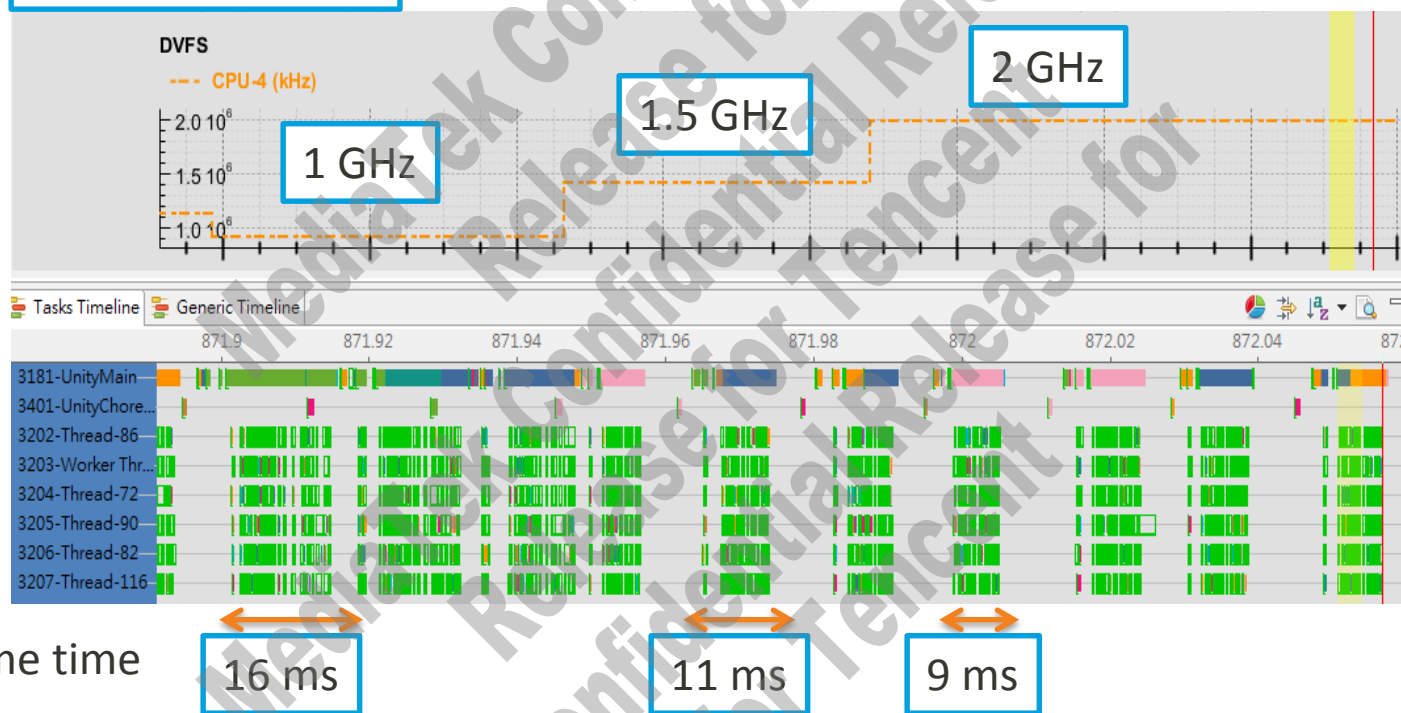
Name	Average
LOAD	
CPU-0	29.780
CPU-1	26.140
CPU-2	23.250
CPU-3	20.860
CPU-4	29.380
CPU-5	40.220
CPU-6	29.610
CPU-7	15.250

Name	Percent(%)
3661-UnityMain	97.475
007-<idle>	87.190
004-<idle>	85.544
006-<idle>	85.251
002-<idle>	79.061
000-<idle>	76.986
003-<idle>	74.825
001-<idle>	74.299
226-irq/38-mt63	40.146
3690-Worker Thr	12.386
005-<idle>	8.437
3689-Worker Thr	5.993
3687-Worker Thr	5.347
3686-Worker Thr	5.175

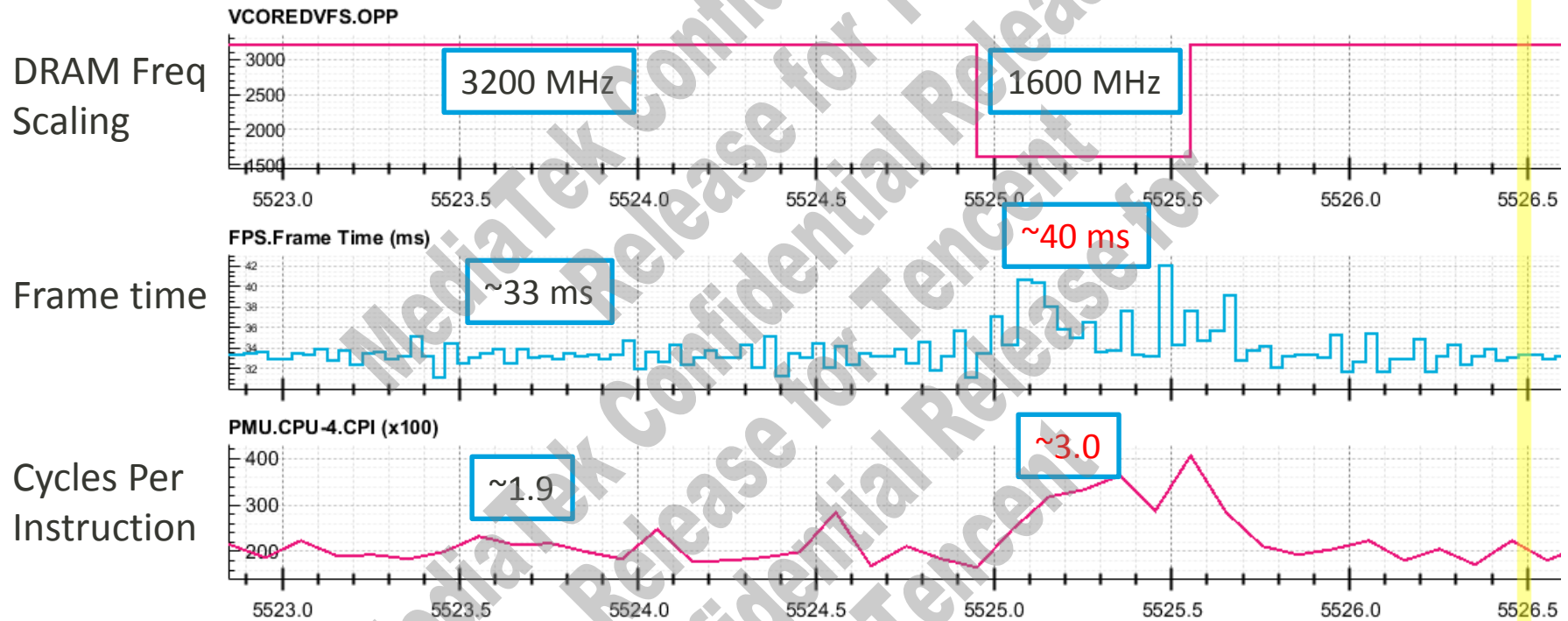
Per task loading: Heavy load

# 动态频率调整过低引发的CPU bound

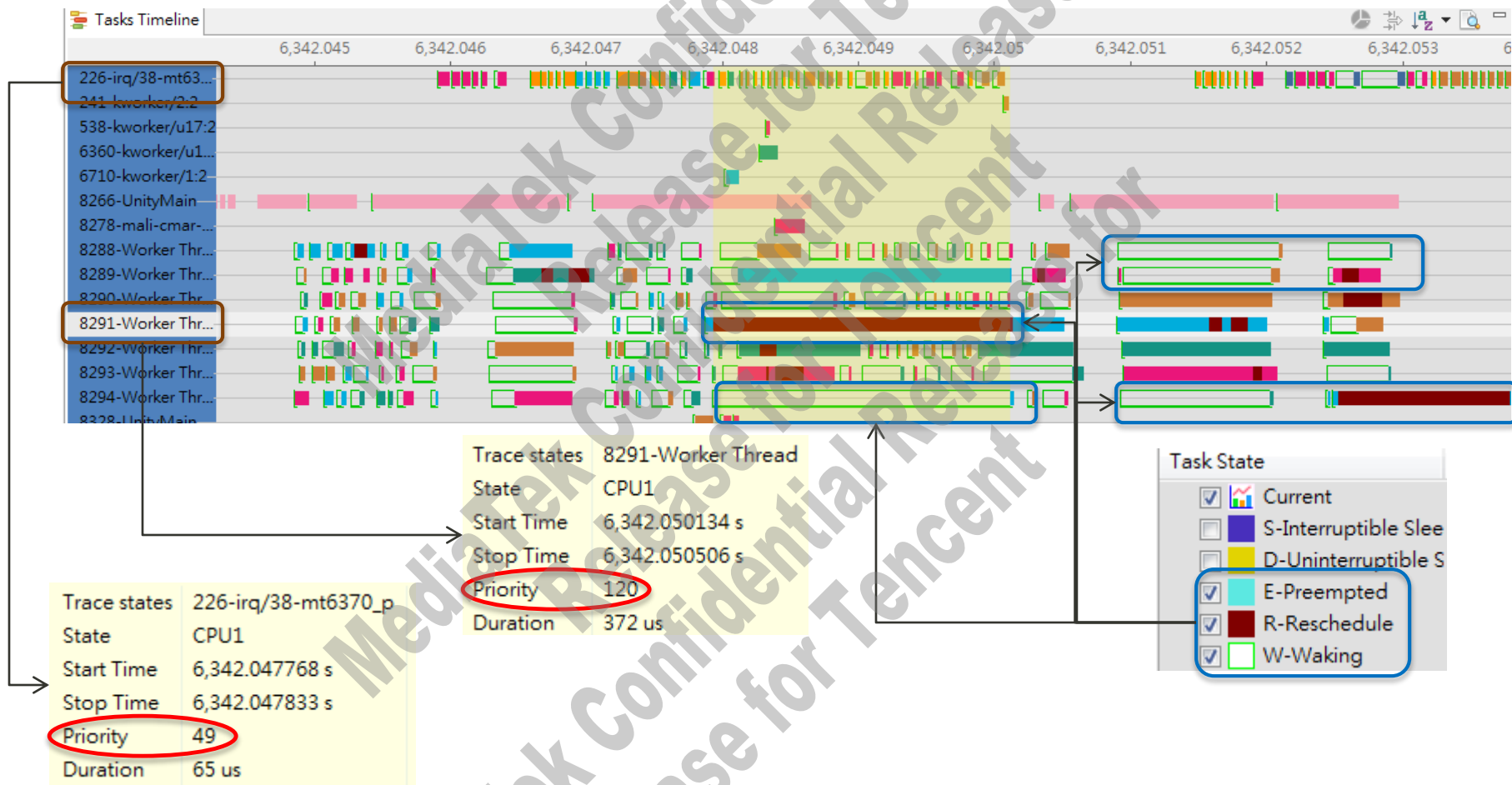
## Frequency scaling



# 内存访问延迟造成的 CPU Bound

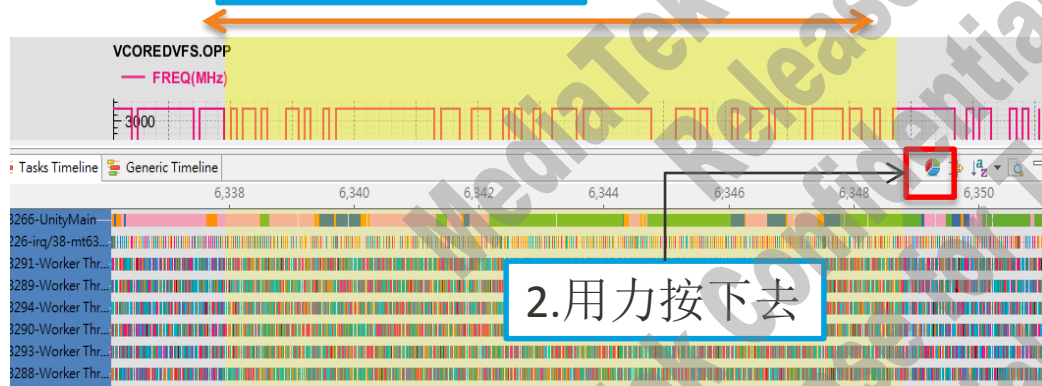


# 进程间抢占造成的执行过久



# 进程抢占统计功能

1. 选取掉帧区间



2. 用力按下去

3. 选取关键进程

Select one process

8291-Worker Thread

Select viewer

Pie Chart

Summary

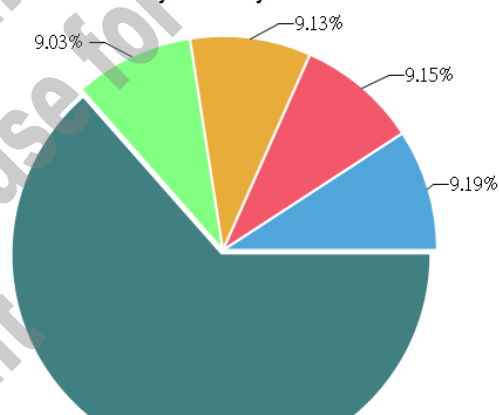
Thread in Runqueue Time: 2077661 us

Total Latency Time: 1154031 us, 55.545%

DVFS Induced Latency: 1154031 us, 55.545%

被抢夺时间比例

Latency caused by other thread



抢夺者列表  
(依照比例排序)

Process	Percentage(...)
8293-Worker Thread	9.187
8290-Worker Thread	9.149
8289-Worker Thread	9.126
8292-Worker Thread	9.034
8294-Worker Thread	8.569
8288-Worker Thread	8.485

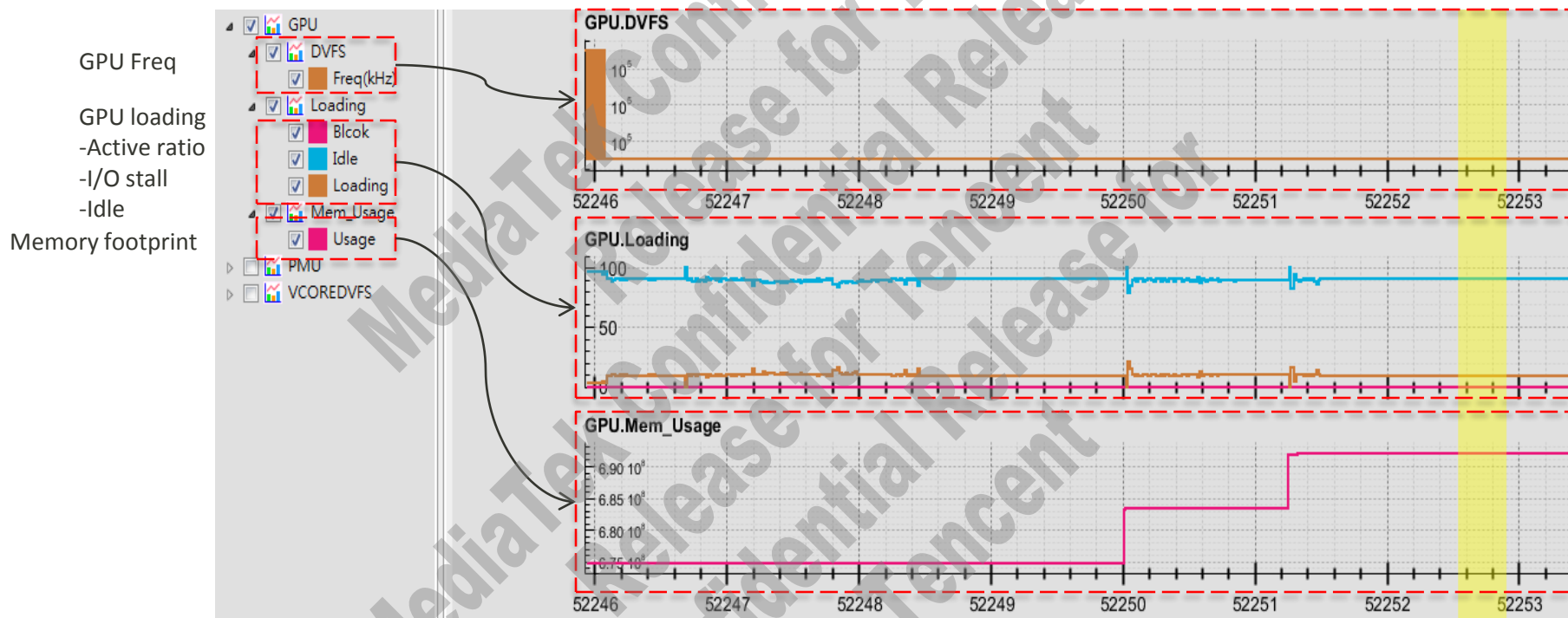
被抢夺的时间区间  
(依长短排序)  
(双击可直跳该区间)

Timestamp	Latency(us)	Type
6341.441136	5504	Wakeup
6342.461698	4968	Wakeup
6342.837756	4635	Wakeup
6347.213651	4292	Wakeup
6342.939423	4197	Wakeup

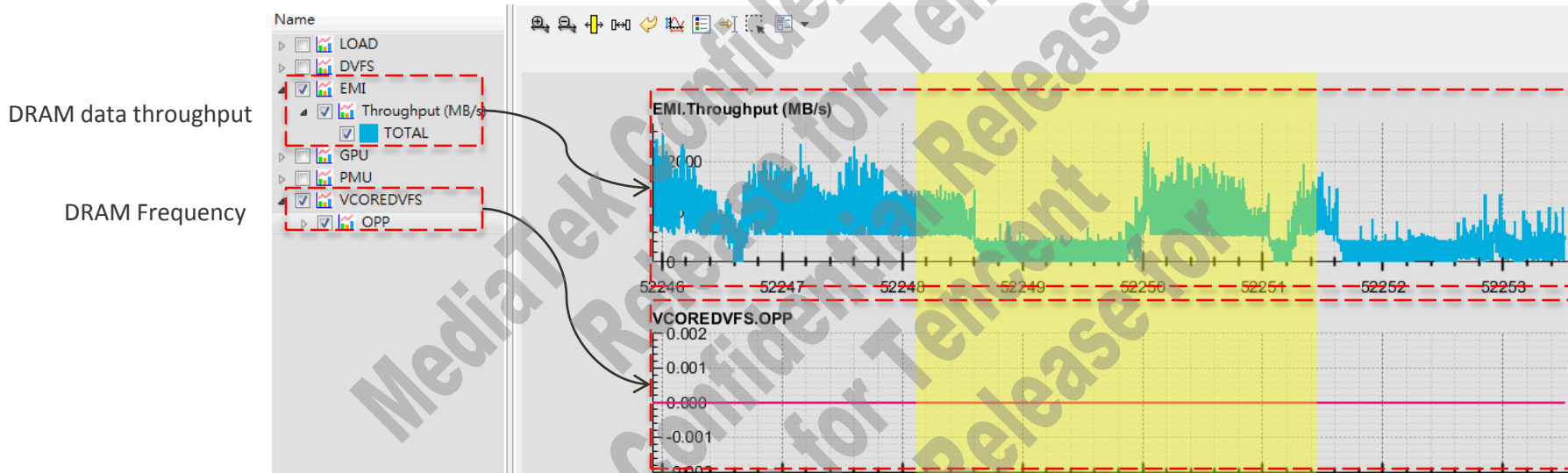
Back to Initial Time Range



# 图形处理器资讯



# 内存流量资讯



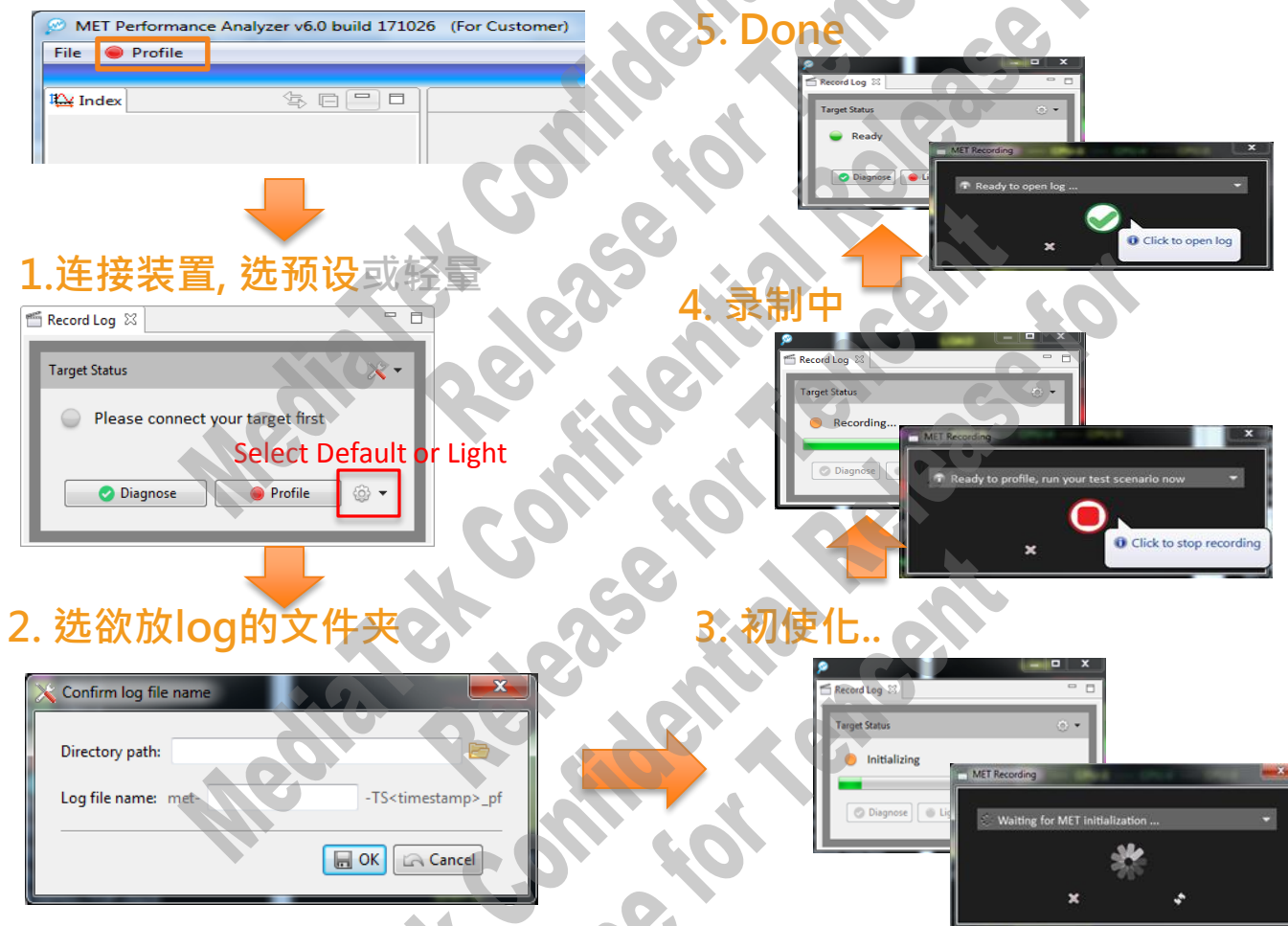
内存最大流量限制:

~ DRAM freq x 2(Dual Data rate) x Channel count x Bus width x utilization

Ex. LPDDR3200, 16bit width, single channel, max t/p ~ 5GB/sec

较少带宽消耗: 降低I/O 阻塞(性能 ↑ ), 较好的能源效率

# 操作方式 (5 步骤)



# 系统需求

- 装置端
  - 取得Root 权限的联发装置平台(请联络PM)
- PC端
  - OS:  $\geq$  Microsoft Windows 7
  - $> 8$  GB RAM

## APPENDIX