jetson平台工作模式设置及tegra stats状态查询

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手册更新历史

文档版本	更新日期	更新内容	创建人
V1.0	2020-12	创建文档	项目部-36

本指南提供了 jetson 平台的工作模式设置说明参考

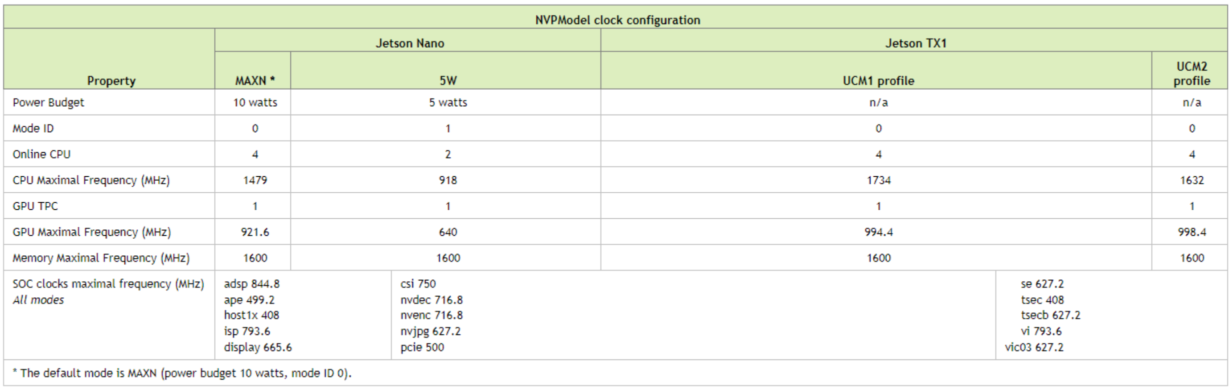
1. 注意事项

为防止不同版本间的差异带来的操作失败等问题，本设置在 R32.4.3 版本验证可行，其他版本应该也可以。

2. 操作说明

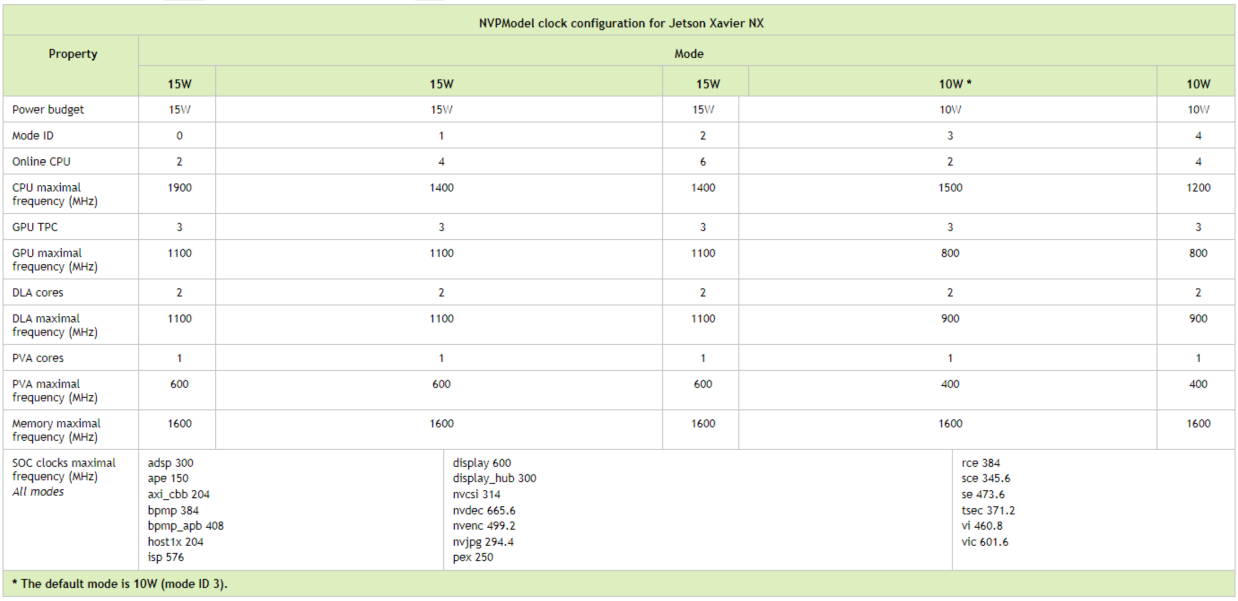
Jetson 平台提供了 nvpmodel 工具用于电源管理模式设置。

下表显示了 NVIDIA nano 及 TX1 预定义的电源模式以及模块资源使用量的相关上限。

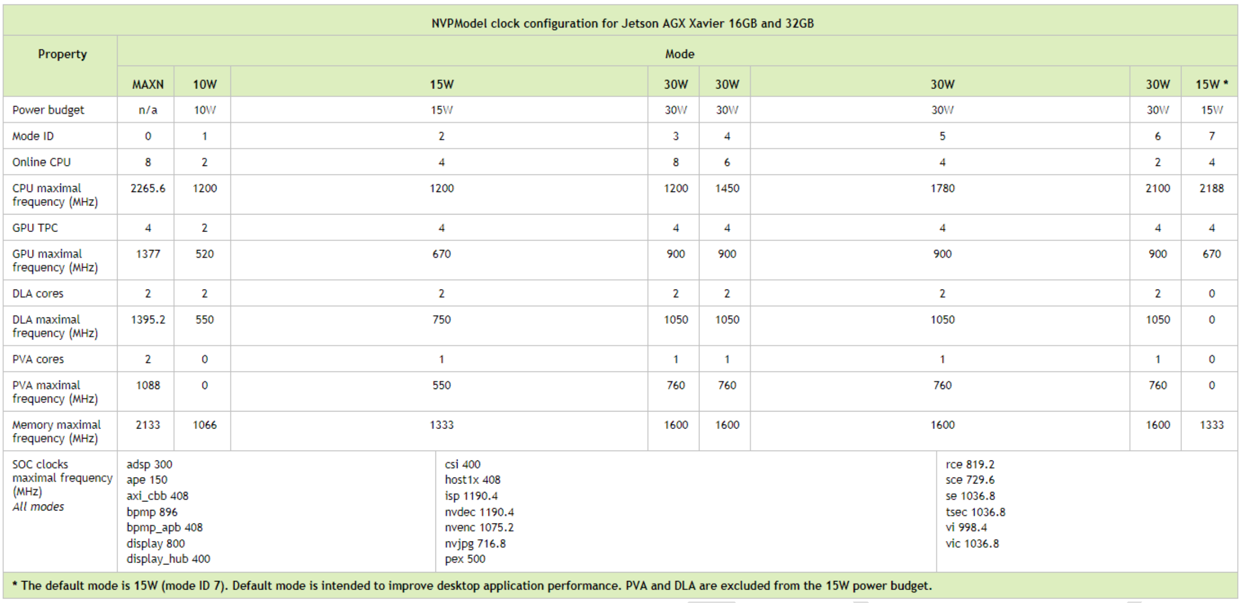


NVPModel clock configuration				
	Jetson Nano		Jetson TX1	
Property	MAXN *	5W	UCM1 profile	UCM2 profile
Power Budget	10 watts	5 watts	n/a	n/a
Mode ID	0	1	0	0
Online CPU	4	2	4	4
CPU Maximal Frequency (MHz)	1479	918	1734	1632
GPU TPC	1	1	1	1
GPU Maximal Frequency (MHz)	921.6	640	994.4	998.4
Memory Maximal Frequency (MHz)	1600	1600	1600	1600
SOC clocks maximal frequency (MHz) *All modes*	adsp 844.8 ape 499.2 host1x 408 isp 793.6 display 665.6	csi 750 nvdec 716.8 nvenc 716.8 nvjpg 627.2 pcie 500	se 627.2 tsec 408 tsecb 627.2 vi 793.6 vic03 627.2	
* The default mode is MAXN (power budget 10 watts, mode ID 0).				

下表显示了 NVIDIA Xavier NX、AGX Xavier16G 和 32G 版预定义的电源模式以及模块资源使用量的相关上限。



NVPModel clock configuration for Jetson Xavier NX					
Property	Mode				
	15W	15W	15W	10W *	10W
Power budget	15W	15W	15W	10W	10W
Mode ID	0	1	2	3	4
Online CPU	2	4	6	2	4
CPU maximal frequency (MHz)	1900	1400	1400	1500	1200
GPU TPC	3	3	3	3	3
GPU maximal frequency (MHz)	1100	1100	1100	800	800
DLA cores	2	2	2	2	2
DLA maximal frequency (MHz)	1100	1100	1100	900	900
PVA cores	1	1	1	1	1
PVA maximal frequency (MHz)	600	600	600	400	400
Memory maximal frequency (MHz)	1600	1600	1600	1600	1600
SOC clocks maximal frequency (MHz) *All modes*	adsp 300 ape 150 axi_cbb 204 bpmp 384 bpmp_apb 408 host1x 204 isp 576	display 600 display_hub 300 nvcsi 314 nvdec 665.6 nvenc 499.2 nvjpg 294.4 pex 250		rce 384 sce 345.6 se 473.6 tsec 371.2 vi 460.8 vic 601.6	
* The default mode is 10W (mode ID 3).					



NVPModel clock configuration for Jetson AGX Xavier 16GB and 32GB

Property	Mode							
	MAXN	10W	15W	30W	30W	30W	30W	15W *
Power budget	n/a	10W	15W	30W	30W	30W	30W	15W
Mode ID	0	1	2	3	4	5	6	7
Online CPU	8	2	4	8	6	4	2	4
CPU maximal frequency (MHz)	2265.6	1200	1200	1200	1450	1780	2100	2188
GPU TPC	4	2	4	4	4	4	4	4
GPU maximal frequency (MHz)	1377	520	670	900	900	900	900	670
DLA cores	2	2	2	2	2	2	2	0
DLA maximal frequency (MHz)	1395.2	550	750	1050	1050	1050	1050	0
PVA cores	2	0	1	1	1	1	1	0
PVA maximal frequency (MHz)	1088	0	550	760	760	760	760	0
Memory maximal frequency (MHz)	2133	1066	1333	1600	1600	1600	1600	1333
SOC clocks maximal frequency (MHz) *All modes*	adsp 300 ape 150 axi_cbb 408 bpmp 896 bpmp_apb 408 display 800 display_hub 400		csi 400 host1x 408 isp 1190.4 nvdec 1190.4 nvenc 1075.2 nvjpg 716.8 pex 500			rce 819.2 sce 729.6 se 1036.8 tsec 1036.8 vi 998.4 vic 1036.8		

* The default mode is 15W (mode ID 7). Default mode is intended to improve desktop application performance. PVA and DLA are excluded from the 15W power budget.

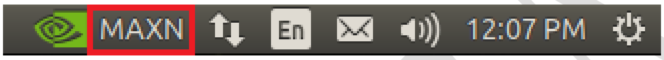
更改电源模式

输入命令：

```
$sudo nvpmodel -m <x>
```

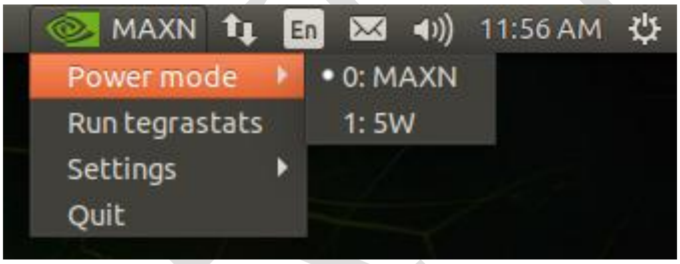
其中<x>是电源模式 ID（即 0、1、2、3、4、5、6）

或者使用 nvpmodel GUI 如下图所示：



当前电源模式显示在 NVIDIA 图标旁边。在上图中，当前模式为 MAXN。

- 要切换当前的电源模式，请单击 NVIDIA 图标以从该图标打开一个下拉菜单。单击“电源模式”以打开电源模式子菜单。



单击您要设置的电源模式。

设置电源模式后，模块将保持该模式，直到您对其进行更改。

显示当前电源模式

- 输入命令：

```
$ sudo nvpmodel -q
```

了解其他选项

- 输入命令：

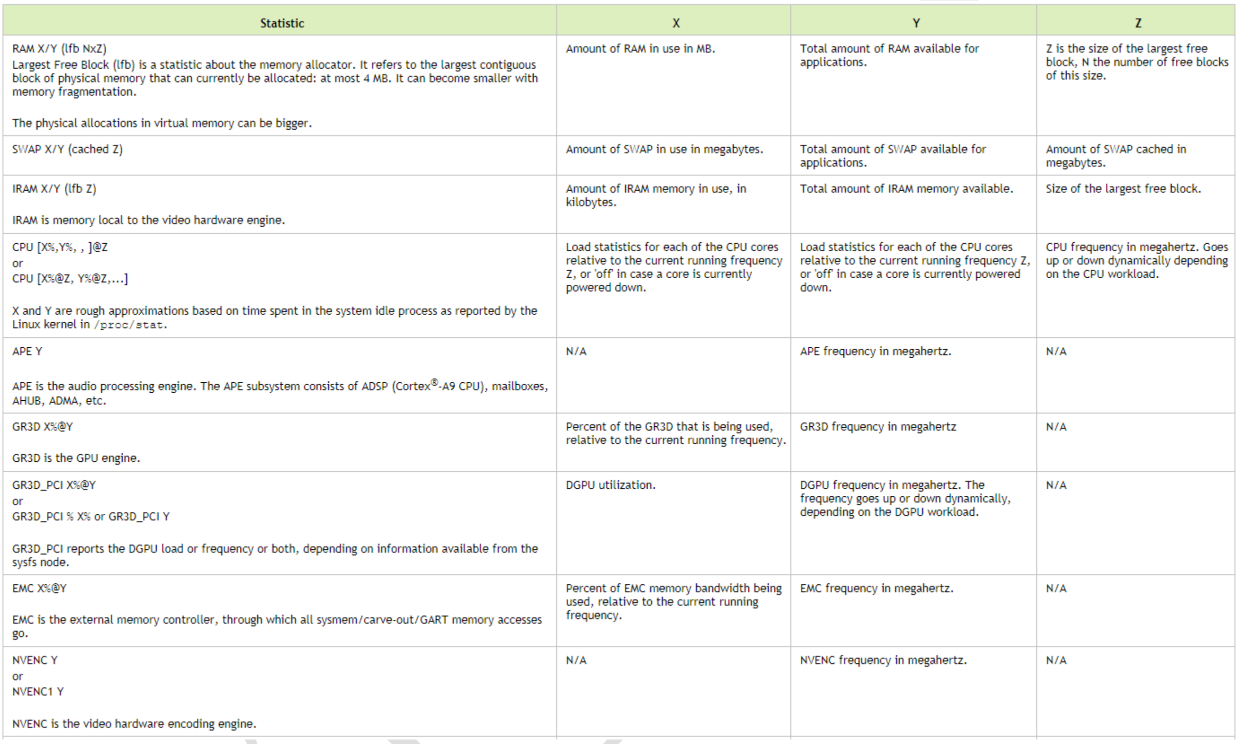
```
$nvpmodel -h
```

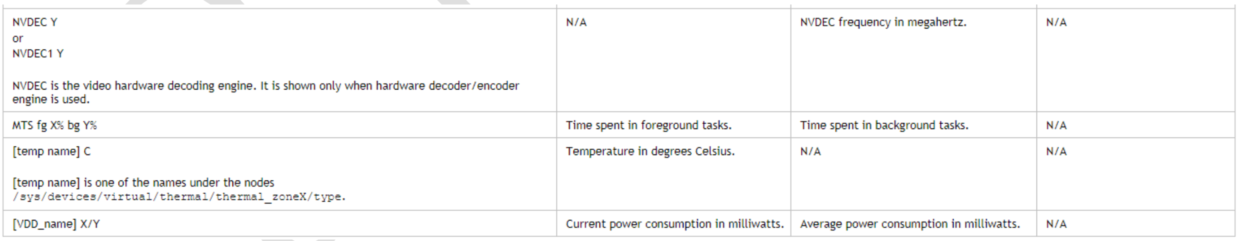
3. Tegrastats utility

使用 tegrastats 工具可以查看当前设备资源的使用及温度、功耗等情况。
您可以在命令行输入以下命令运行该工具：

```
$tegrastats
```

运行后会返回对应的报告日志
报告日志解读：
下表是对各报告日志的解释：





Statistic	X	Y	Z
RAM X/Y (lfb NxZ) Largest Free Block (lfb) is a statistic about the memory allocator. It refers to the largest contiguous block of physical memory that can currently be allocated: at most 4 MB. It can become smaller with memory fragmentation. The physical allocations in virtual memory can be bigger.	Amount of RAM in use in MB.	Total amount of RAM available for applications.	Z is the size of the largest free block, N the number of free blocks of this size.
SWAP X/Y (cached Z)	Amount of SWAP in use in megabytes.	Total amount of SWAP available for applications.	Amount of SWAP cached in megabytes.
IRAM X/Y (lfb Z) IRAM is memory local to the video hardware engine.	Amount of IRAM memory in use, in kilobytes.	Total amount of IRAM memory available.	Size of the largest free block.
CPU [X%,Y%, ,]@Z or CPU [X%@Z, Y%@Z,...] X and Y are rough approximations based on time spent in the system idle process as reported by the Linux kernel in /proc/stat.	Load statistics for each of the CPU cores relative to the current running frequency Z, or 'off' in case a core is currently powered down.	Load statistics for each of the CPU cores relative to the current running frequency Z, or 'off' in case a core is currently powered down.	CPU frequency in megahertz. Goes up or down dynamically depending on the CPU workload.
APE Y APE is the audio processing engine. The APE subsystem consists of ADSP (Cortex®-A9 CPU), mailboxes, AHUB, ADMA, etc.	N/A	APE frequency in megahertz.	N/A
GR3D X%@Y GR3D is the GPU engine.	Percent of the GR3D that is being used, relative to the current running frequency.	GR3D frequency in megahertz	N/A
GR3D_PCI X%@Y or GR3D_PCI % X% or GR3D_PCI Y GR3D_PCI reports the DGPU load or frequency or both, depending on information available from the sysfs node.	DGPU utilization.	DGPU frequency in megahertz. The frequency goes up or down dynamically, depending on the DGPU workload.	N/A
EMC X%@Y EMC is the external memory controller, through which all sysmem/carve-out/GART memory accesses go.	Percent of EMC memory bandwidth being used, relative to the current running frequency.	EMC frequency in megahertz.	N/A
NVENC Y or NVENC1 Y NVENC is the video hardware encoding engine.	N/A	NVENC frequency in megahertz.	N/A
NVDEC Y or NVDEC1 Y NVDEC is the video hardware decoding engine. It is shown only when hardware decoder/encoder engine is used.	N/A	NVDEC frequency in megahertz.	N/A
MTS fg X% bg Y%	Time spent in foreground tasks.	Time spent in background tasks.	N/A
[temp name] C [temp name] is one of the names under the nodes /sys/devices/virtual/thermal/thermal_zoneX/type.	Temperature in degrees Celsius.	N/A	N/A
[VDD_name] X/Y	Current power consumption in milliwatts.	Average power consumption in milliwatts.	N/A

Jetson TX1 的示例输出

```
RAM 1179/3983MB (lfb 120x4MB) IRAM 0/252kB(lfb 252kB) CPU
[1%@102,4%@102,0%@102,0%@102] EMC_FREQ 7%@408 GR3D_FREQ 0%@76 APE 25 AO@42.5C
CPU@37.5C GPU@39C PLL@37C Tdiode@42.75C PMIC@100C Tboard@42C thermal@38.5C VDD_IN
2532/2698 VDD_CPU 76/178 VDD_GPU 19/19
```

Jetson TX2 系列的示例输出

```
RAM 1345/7829MB (lfb 1290x4MB) SWAP 0/512MB (cached 0MB) CPU [2%@345,off,off,off,off,off]
EMC_FREQ 13%@40 GR3D_FREQ 0%@114 APE 150 BCPU@35C MCPU@35C GPU@41C PLL@35C
```

AO@35.5C Tboard@35C Tdiode@36C PMIC@100C thermal@35.5C VDD_IN 2003/2658 VDD_CPU 320/518 VDD_GPU 400/735 VDD_SOC 400/415 VDD_WIFI 0/0 VDD_DDR 240/348

Jetson AGX Xavier 的示例输出

```
RAM 1903 / 15692MB（lfb 3251x4MB）CPU [1%@ 1190,1%@ 1190,2%@ 1190,0%@ 1190,0%@ 1190,0%
@ 1190,0%@ 1190,0%@ 1190] EMC_FREQ 0%GR3D_FREQ 0%AO@32.5C GPU @ 32C Tboard @ 32C
Tdiode@34.75C AUX@31.5C CPU@33.5C Thermal@32.9C PMIC @ 100C GPU 0/0 CPU 216/216 SOC
864/864 CV 0 / 0 VDDRQ 144/144 SYS5V 1889/1889
```

在 Linux 设备上运行 tegrastats 时，它会将统计信息打印到 stdout。打印信息如上所示。

要在后台运行 tegrasta ts，请执行以下命令：

```
$ tegrasta ts --interval <int> --logfile <out_file>&
```

其中：

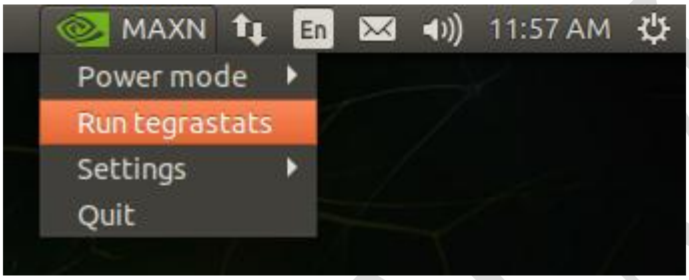
<int>是两次日志打印之间的间隔（以毫秒为单位）。

<out_file>是 tegrastats 将日志打印内容写入到的输出文件的路径名。

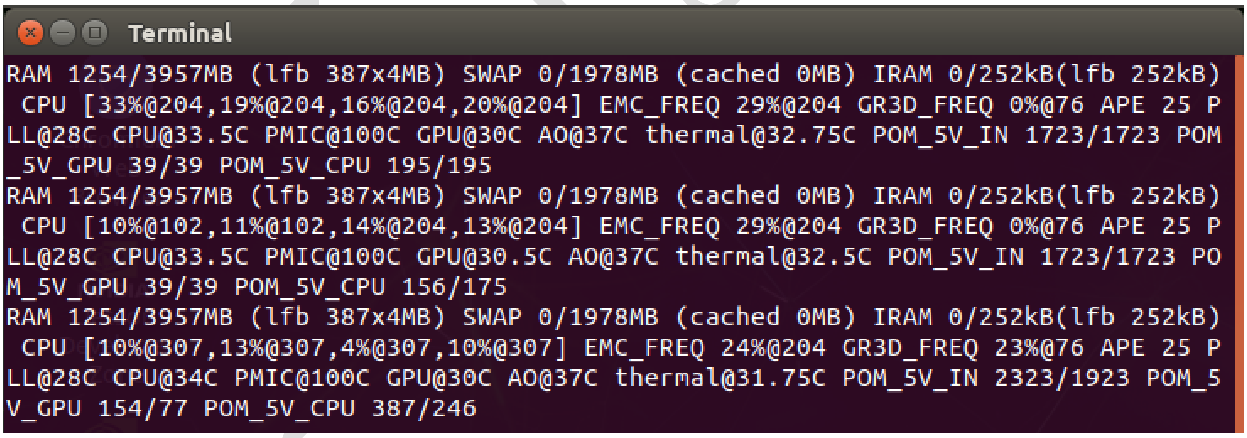
要运行 tegrastats 在前台，省略后面的“ & ”。您也可以省略--logfile 选项，以允许日志输出转到 stdout：

```
$ tegrasta ts --interval <int>
```

也可以图形操作运行 tegrastats，请单击 NVIDIA 图标以打开下拉菜单。



单击“运行 tegrastats”以生成终端窗口并运行 tegrastats。



```
RAM 1254/3957MB (lfb 387x4MB) SWAP 0/1978MB (cached 0MB) IRAM 0/252kB(lfb 252kB)
 CPU [33%@204,19%@204,16%@204,20%@204] EMC_FREQ 29%@204 GR3D_FREQ 0%@76 APE 25 P
LL@28C CPU@33.5C PMIC@100C GPU@30C AO@37C thermal@32.75C POM_5V_IN 1723/1723 POM
_5V_GPU 39/39 POM_5V_CPU 195/195
RAM 1254/3957MB (lfb 387x4MB) SWAP 0/1978MB (cached 0MB) IRAM 0/252kB(lfb 252kB)
 CPU [10%@102,11%@102,14%@204,13%@204] EMC_FREQ 29%@204 GR3D_FREQ 0%@76 APE 25 P
LL@28C CPU@33.5C PMIC@100C GPU@30.5C AO@37C thermal@32.5C POM_5V_IN 1723/1723 PO
M_5V_GPU 39/39 POM_5V_CPU 156/175
RAM 1254/3957MB (lfb 387x4MB) SWAP 0/1978MB (cached 0MB) IRAM 0/252kB(lfb 252kB)
 CPU [10%@307,13%@307,4%@307,10%@307] EMC_FREQ 24%@204 GR3D_FREQ 23%@76 APE 25 P
LL@28C CPU@34C PMIC@100C GPU@30C AO@37C thermal@31.75C POM_5V_IN 2323/1923 POM_5
V_GPU 154/77 POM_5V_CPU 387/246
```

要停止 tegrastats

- 如果 tegrastats 在后台运行，请执行以下命令：

```
$ ps
$ kill -9 <pid>
```

其中<PID>是 PS 命令所报告的 tegrastats 进程 ID。

或者，您可以运行：

```
$ tegrastats --stop
```

- 如果 tegrastats 在前台运行时，按 CTRL + C 的窗口，它正在运行。

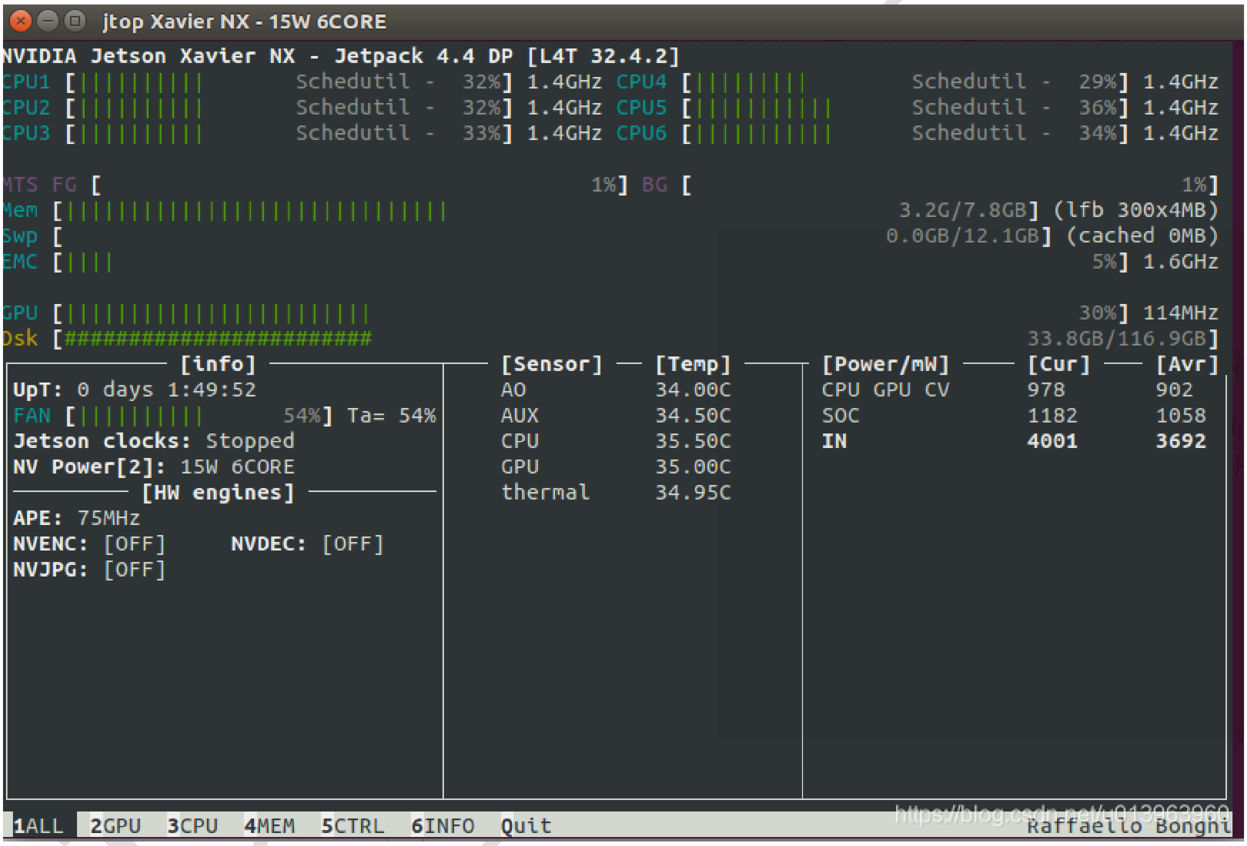
同样你也可以使用 Jtop 进行内存/CPU/GPU 等等资源监视

原文链接：https://blog.csdn.net/u013963960/article/details/107360244

Jtop 是老外的一个 Jetson 开发者为 Jetson 系列开发的一个小 App，可以通过 pip 安装，用来监视系统资源使用，温度等等一些关键参数，可以为你代码运行调试阶段提供一些支持，也可以查看整体的资源占用率，查看当前温度和内存使用是否处于危险的状态。

命令行，安装命令如下：

```
$ sudo apt-get install python3-pip
$ sudo -H pip install jetson-stats
$ sudo jtop
```



```
jtop Xavier NX - 15W 6CORE
NVIDIA Jetson Xavier NX - Jetpack 4.4 DP [L4T 32.4.2]
CPU1 [||||||||||        Schedutil -   32%] 1.4GHz CPU4 [|||||||||        Schedutil -   29%] 1.4GHz
CPU2 [||||||||||        Schedutil -   32%] 1.4GHz CPU5 [|||||||||||      Schedutil -   36%] 1.4GHz
CPU3 [||||||||||        Schedutil -   33%] 1.4GHz CPU6 [|||||||||||      Schedutil -   34%] 1.4GHz

MTS FG [                                  1%] BG [                                         1%]
Mem [||||||||||||||||||||||||||||||                          3.2G/7.8GB] (lfb 300x4MB)
Swp [                                                       0.0GB/12.1GB] (cached 0MB)
EMC [||||                                                             5%] 1.6GHz

GPU [||||||||||||||||||||||||                                        30%] 114MHz
Dsk [########################                                  33.8GB/116.9GB]
 ────────── [info] ────────── [Sensor] ── [Temp] ───── [Power/mW] ──── [Cur] ── [Avr]
 UpT: 0 days 1:49:52           AO         34.00C      CPU GPU CV       978      902
 FAN [||||||||||    54%] Ta= 54% AUX      34.50C      SOC              1182     1058
 Jetson clocks: Stopped        CPU        35.50C      IN               4001     3692
 NV Power[2]: 15W 6CORE        GPU        35.00C
 ───────── [HW engines] ───── thermal    34.95C
 APE: 75MHz
 NVENC: [OFF]     NVDEC: [OFF]
 NVJPG: [OFF]

1ALL  2GPU  3CPU  4MEM  5CTRL  6INFO  Quit          https://blog.csdn.net/u013963960 Raffaello Bonghi
```