

guider: a system-wide performance analyzer

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guider?

- A system-wide performance analyzer
 - thread analysis
 - function analysis
 - top analysis
- Open-source contribution
 - <https://github.com/iipeace/guider>

Requirement

- Linux kernel (≥ 3.0)
- Python (≥ 2.7)
- Kernel configuration

Thread analysis

```
# guider record -s ./
```

Press ctrl + c

```
# guider ./guider.dat -o ./
```

View guider.out

Thread analysis

[Thread Info] [Elapsed time: 0.604] [Running: 125] [CtxSwc: 4334] [LogSize: 731 KB] [Keys: Foward/Back/Save/Quit] [Unit: Sec/MB]

Thread Info			CPU Info				SCHED Info				BLOCK Info			MEM Info				
Name	Tid/ Pid	LF	Usage(%)	Delay(Max)	Pri	IRQ	Yld	Lose	Steal	Mig	Read(MB/ Cnt)	WCnt(MB)	Sum(Usr	Buf	Ker)	Rcl	Wst	DRcl(Nr)
# CPU: 4																		
CORE/0	(-----/-----)	--	0.09(14.8)	0.00(0.00)	0	0.00	0	-	-	-	0.00(0/ 0)	0(0)	0(0)	0	0	0	0	0.00(0)
CORE/1	(-----/-----)	--	0.38(63.2)	0.00(0.00)	0	0.00	0	-	-	-	0.00(0/ 0)	0(0)	0(0)	0	0	0	0	0.00(0)
CORE/2	(-----/-----)	--	0.14(22.6)	0.00(0.00)	0	0.00	0	-	-	-	0.00(0/ 0)	0(0)	0(0)	0	0	0	0	0.00(0)
CORE/3	(-----/-----)	--	0.24(40.0)	0.00(0.00)	0	0.00	0	-	-	-	0.00(0/ 0)	0(0)	0(0)	0	0	0	0	0.00(0)
# Hot: 15																		
find	(5546/ 5546)		0.45(74.8)	0.02(0.00)	0	0.00	0	166	298	4	0.00(0/ 0)	0(0)	0(0)	0	0	0	0	0.00(0)
guider	(5578/ 5578)		0.12(20.0)	0.00(0.00)	R90	0.00	1	0	2	0	0.00(0/ 0)	0(0)	0(0)	0	0	0	0	0.00(0)
guider	(24336/24336)		0.05(8.1)	0.00(0.00)	0	0.00	1	35	1	0	0.00(0/ 0)	0(0)	0(0)	0	0	0	0	0.00(0)
Media	(16486/ 3812)		0.03(5.0)	0.00(0.00)	0	0.00	96	23	2	1	0.00(0/ 0)	0(0)	0(0)	0	0	0	0	0.00(0)
kswapd0	(595/ 595)		0.03(4.6)	0.00(0.00)	0	0.00	6	17	5	0	0.00(0/ 0)	0(0)	0(0)	0	0	0	0	0.00(0)
mmcqd/0	(1059/ 1059)		0.02(4.0)	0.00(0.00)	0	0.00	238	79	200	3	0.00(0/ 0)	0(0)	0(0)	0	0	0	0	0.00(0)
WebAppMgr	(3812/ 3812)		0.02(3.0)	0.00(0.00)	0	0.00	23	15	20	0	0.00(0/ 0)	0(0)	0(0)	0	0	0	0	0.00(0)
PmLogDaemon	(1303/ 1303)		0.02(2.9)	0.00(0.00)	0	0.00	49	7	0	1	0.00(0/ 0)	0(0)	0(0)	0	0	0	0	0.00(0)
Chrome_IOThread	(2404/ 2127)		0.01(1.9)	0.00(0.00)	0	0.00	6	8	6	0	0.00(0/ 0)	0(0)	0(0)	0	0	0	0	0.00(0)
PmKLogDaemon	(2121/ 2121)		0.01(1.5)	0.00(0.00)	0	0.00	49	0	15	1	0.00(0/ 0)	0(0)	0(0)	0	0	0	0	0.00(0)
CrTvRenderer	(5420/ 3812)		0.01(1.2)	0.00(0.00)	0	0.00	94	1	82	1	0.00(0/ 0)	0(0)	0(0)	0	0	0	0	0.00(0)
tpQPeriodic	(1860/ 1334)		0.01(1.2)	0.00(0.00)	0	0.00	15	0	15	0	0.00(0/ 0)	0(0)	0(0)	0	0	0	0	0.00(0)
task644	(5428/ 3812)		0.01(1.1)	0.00(0.00)	0	0.00	21	0	0	1	0.00(0/ 0)	0(0)	0(0)	0	0	0	0	0.00(0)
audio-sink-Queu	(5425/ 3812)		0.01(1.0)	0.00(0.00)	0	0.00	21	0	17	2	0.00(0/ 0)	0(0)	0(0)	0	0	0	0	0.00(0)

Function analysis

```
# guider record -f -s ./ -e m
```

Press ctrl + c

```
# guider ./guider.dat -o ./ -l $(which addr2line) -r /
```

View guider.out

Function analysis

[Function Memory Info] [Total: 2468KB] [Alloc: 36668KB(6118)] [Free: 35624KB(5830)] (USER)

Usage (Usr / Buf / Ker)	Function	Binary	Source
1280K(1280/ 0/ 0)	__GI_memcpy	/lib/libc-2.19.so	
+ 716K(716/ 0/ 0)	<- blink::SharedBuffer::append(char const*, unsigned int) [usr/lib/libcbe.so]		
+ 312K(312/ 0/ 0)	<- blink::SharedBuffer::getAsArrayBuffer() const [usr/lib/libcbe.so]		
+ 60K(60/ 0/ 0)	<- blink::SharedBuffer::append(char const*, unsigned int) [usr/lib/libcbe.so] <- ThumbCode [??]		
+ 36K(36/ 0/ 0)	<- unsigned char* blink::Heap::allocate<blink::HeapHashTableBacking<WTF::HashTable<WTF::String, WTF::KeyValuePair<WTF::Member<blink::MediaSource>, WTF::KeyValuePairKeyExtractor, WTF::StringHash, WTF::HashMapValueTraits<WTF::HashTraits<WTF::String>, WTF::HashTraits<blink::MediaSource>>>, WTF::HashTraits<WTF::String>, blink::HeapAllocator>>>(unsigned int) [usr/lib/libcbe.so]		
+ 28K(28/ 0/ 0)	<- mediapipeline::CustomPipeline::pushDataIntoGstPipeline(unsigned char*, unsigned int, unsigned long long, MEDIA_SRC_MEDIA_DATA_CHANNEL T) [usr/lib/libpf-1.0.so.1.0.0]		
+ 16K(16/ 0/ 0)	<- blink::SharedBuffer::append(char const*, unsigned int) [usr/lib/libcbe.so]		
396K(60/ 336/ 0)	_dl_lookup_symbol_x	/lib/ld-2.19.so	
+ 280K(40/ 240/ 0)	<- _dl_fixup [lib/ld-2.19.so]		
+ 116K(20/ 96/ 0)	<- _dl_fixup [lib/ld-2.19.so] <- 032c95a8 [usr/lib/libcbe.so]		

[Function Memory Info] [Total: 2468KB] [Alloc: 36668KB(6118)] [Free: 35624KB(5830)] (KERNEL)

Usage (Usr / Buf / Ker)	Function
1648K(1648/ 0/ 0)	do_page_fault
+ 1212K(1212/ 0/ 0)	<- do_DataAbort <- __dabt_usr <- __GI_memcpy
+ 328K(328/ 0/ 0)	<- do_DataAbort <- __dabt_usr <- __int_malloc
+ 28K(28/ 0/ 0)	<- do_DataAbort <- __dabt_usr <- __GI_memcpy
+ 12K(12/ 0/ 0)	<- do_DataAbort <- __dabt_usr
268K(0/ 268/ 0)	squashfs_copy_cache
+ 224K(0/ 224/ 0)	<- squashfs_readpage_block <- squashfs_readpage <- __do_page_cache_readahead <- filemap_fault <- __do_fault <- handle_mm_fault <- do_page_fault <- do_DataAbort <- __dabt_usr <- _dl_lookup_symbol_x
+ 24K(0/ 24/ 0)	<- squashfs_readpage_block <- squashfs_readpage <- __do_page_cache_readahead <- filemap_fault <- __do_fault <- handle_mm_fault <- do_page_fault <- do_PrefetchAbort <- ret_from_exception <- cc::TransformOperations::TransformOperations()
+ 20K(0/ 20/ 0)	<- squashfs_readpage_block <- squashfs_readpage <- __do_page_cache_readahead <- filemap_fault <- __do_fault <- handle_mm_fault <- do_page_fault <- do_PrefetchAbort <- ret_from_exception <- ViewHostMsg_GetCPUUsage::ViewHostMsg_GetCPUUsage(int*)
208K(0/ 208/ 0)	__getblk_slow
+ 112K(0/ 112/ 0)	<- __getblk_gfp <- squashfs_read_data <- squashfs_cache_get <- squashfs_get_datablock <- squashfs_readpage_block <- squashfs_readpage <- __do_page_cache_readahead <- filemap_fault <- __do_fault <- handle_mm_fault <- do_page_fault <- do_DataAbort <- __dabt_usr <- _dl_lookup_symbol_x
+ 48K(0/ 48/ 0)	<- __getblk_gfp <- squashfs_read_data <- squashfs_cache_get <- squashfs_get_datablock <- squashfs_readpage_block <- squashfs_readpage <- __do_page_cache_readahead <- filemap_fault <- __do_fault <- handle_mm_fault <- do_page_fault <- do_DataAbort <- __dabt_usr <- _dl_fixup

Top analysis

```
$ guider top -a
```

```
/ g.u.i.d.e.r ver.3.7.6 /
```

```
[Top Info] [Time: 2365.490] [Interval: 1.0] [Ctxt: 6639] [Fork: 2] [IRQ: 3906] [Core: 4] [Task: 210/815] [RAM: 3001] [Swap: 599] [Unit: %/MB]
```

```
=====
ID   | CPU (Usr/Ker/Blk/IRQ) | Mem (Free/Anon/File/Slab) | Swap (Used/ InOut ) | Reclaim | BlkRW | NrFlt | NrBlk | NrSIRQ | NrMlk | NrDrt | NetIO |
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Total | 17 % ( 3 / 14 / 3 / 0 ) | 37 ( -6 / -1 / 4 / 1 ) | 7 ( 0 / 0 / 0 ) | 40/0 | 20/0 | 2 | 0 | 1659 | 3 | 0 | 3K/9K |
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Core/0 | 5 % ( 1 / 4 / 0 / 0 ) | ##### | | | | | | | | | | 984 Mhz [585-984] |
Core/1 | 8 % ( 1 / 7 / 1 / 0 ) | ##### | | | | | | | | | | 984 Mhz [585-984] |
Core/2 | 50 % ( 11 / 39 / 10 / 0 ) | ##### | | | | | | | | | | 984 Mhz [585-984] |
Core/3 | 7 % ( 0 / 7 / 2 / 0 ) | ##### | | | | | | | | | | 984 Mhz [585-984] |
=====
```

```
=====
Process      ( ID / Pid / Nr / Pri) | CPU(Usr/Ker/Dly) | Mem(RSS/Txt/Shr/Swp) | Blk( RD / WR /NrFlt) | Yld | Prmt | FD | LifeTime | SignalHandler |
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
guider ( 7801/ 7798/ 1/c 0) | 5( 5/ 0/ 0) | 10( 5/ 0/ 2/ 0) | 0( -/ -/ 0) | 1 | 24 | 512 | 0: 0: 3 | 1800084ee |
kswapd0 ( 595/ 2/ 1/c 0) | 3( 0/ 3/ 0) | 0( 0/ 0/ 0/ -) | 0( -/ -/ 0) | 12 | 43 | 32 | 0:39:25 | |
tvservice ( 1334/ 1/ 138/c 0) | 3( 1/ 2/ -) | 1117( 37/ 20/ 21/ 1) | 0( -/ -/ 0) | 0 | 0 | 512 | 0:39:23 | 180018eee |
mmcqd/0 ( 1059/ 2/ 1/c 0) | 2( 0/ 2/ 0) | 0( 0/ 0/ 0/ -) | 0( -/ -/ 0) | 330 | 129 | 32 | 0:39:24 | |
PmLogDaemon ( 1303/ 1/ 2/c 0) | 1( 1/ 0/ 0) | 14( 1/ 0/ 1/ 0) | 0( -/ -/ 0) | 54 | 4 | 32 | 0:39:23 | 18000c4ee |
kbase_event ( 3922/ 2/ 1/c-20) | 0( 0/ 0/ -) | 0( 0/ 0/ 0/ -) | 0( -/ -/ 0) | 0 | 0 | 32 | 0:38:27 | |
dbus-daemon ( 1268/ 1/ 1/c 0) | 0( 0/ 0/ -) | 4( 0/ 0/ 0/ 0) | 0( -/ -/ 0) | 0 | 0 | 32 | 0:39:23 | 18000c4e9 |
*sleep ( 7810/ 7740/ 1/c 0) | 0( 0/ 0/ -) | 4( 0/ 0/ 0/ 0) | 0( -/ -/ 2) | - | - | 32 | 0: 0: 0 | 84e8 |
=====
```


Top profiler

```
$ guider top -o ./
```

Press ctrl + c

View guider.out

Top analysis

***** Detailed Statistics *****

[Top Info] [Time: 2520.700] [Interval: 1.0] [Ctxt: 9460] [Fork: 5] [IRQ: 5481] [Core: 4] [Task: 210/813] [RAM: 3001] [Swap: 599] [Unit: %/MB]

ID	CPU (Usr/Ker/Blk/IRQ)	Mem (Free/Anon/File/Slab)	Swap (Used/ InOut)	Reclaim	BlkRW	NrFlt	NrBlk	NrSIRQ	NrMlk	NrDrt	NetIO
Total	24 % (0 / 24 / 7 / 0)	30 (-12 / -2 / 14 / -2)	22 (-2 / 0/0)	98/0	39/0	11	0	4104	3	0	2K/1K

Process	(ID / Pid / Nr / Pri)	CPU(Usr/Ker/Dly)	Mem(RSS/Txt/Shr/Swp)	Blk(RD / WR /NrFlt)	Yld	Prmt	FD	LifeTime	SignalHandler
find	(8032/ 7740/ 1/C 0)	67(0/ 67/ 0)	4(0/ 0/ 0/ 0)	33(-/ -/ 0)	1389	3	32	0: 0:25	84e8
kswapd0	(595/ 2/ 1/C 0)	13(0/ 13/ 2)	0(0/ 0/ 0/ -)	0(-/ -/ 0)	23	202	32	0:42: 0	
mmcgd/0	(1059/ 2/ 1/C 0)	5(0/ 5/ 0)	0(0/ 0/ 0/ -)	0(-/ -/ 0)	749	293	32	0:41:59	
tvservice	(1334/ 1/ 138/C 0)	4(1/ 3/ -)	1117(27/ 20/ 12/ 3)	0(-/ -/ 0)	0	0	512	0:41:58	180018eee
PmLogDaemon	(1303/ 1/ 2/C 0)	3(2/ 1/ 0)	14(1/ 0/ 1/ 0)	0(-/ -/ 0)	104	23	32	0:41:58	18000c4ee
surface-manager	(1345/ 1/ 22/C 0)	2(1/ 1/ -)	540(206/ 0/109/ 1)	1(-/ -/ 8)	-	-	256	0:41:58	18001c4e8
guider	(8065/ 1/ 1/C 0)	2(2/ 0/ 0)	10(4/ 0/ 1/ 0)	0(-/ -/ 0)	1	44	256	0: 0: 8	1800084ee
*python	(8088/ 8085/ 1/C 0)	1(1/ 0/ -)	5(2/ 0/ 1/ 0)	0(-/ -/ -)	5	-	32	0: 0: 0	1800084ea
[+]exe	(8085/ 7733/ 1/C 0)	0(0/ 0/ -)	4(0/ 0/ -/ -)	0(-/ -/ 0)	-	-	-	0: 0: 1	-
[+]python	(8088/ 8085/ 1/C 0)	1(1/ 0/ -)	5(2/ 0/ 1/ 0)	0(-/ -/ -)	5	-	-	0: 0: 1	-

[Top Info] [Time: 2519.680] [Interval: 1.0] [Ctxt: 8486] [Fork: 0] [IRQ: 4845] [Core: 4] [Task: 208/811] [RAM: 3001] [Swap: 599] [Unit: %/MB]

ID	CPU (Usr/Ker/Blk/IRQ)	Mem (Free/Anon/File/Slab)	Swap (Used/ InOut)	Reclaim	BlkRW	NrFlt	NrBlk	NrSIRQ	NrMlk	NrDrt	NetIO
Total	24 % (2 / 22 / 5 / 0)	41 (6 / -2 / -4 / -1)	20 (-2 / 0/0)	99/0	28/0	0	0	4069	3	0	1K/1K

Process	(ID / Pid / Nr / Pri)	CPU(Usr/Ker/Dly)	Mem(RSS/Txt/Shr/Swp)	Blk(RD / WR /NrFlt)	Yld	Prmt	FD	LifeTime	SignalHandler
find	(8032/ 7740/ 1/C 0)	74(5/ 69/ 0)	4(0/ 0/ 0/ 0)	24(-/ -/ 0)	1044	9	32	0: 0:24	84e8
kswapd0	(595/ 2/ 1/C 0)	13(0/ 13/ 0)	0(0/ 0/ 0/ -)	0(-/ -/ 0)	24	113	32	0:41:59	
tvservice	(1334/ 1/ 138/C 0)	4(4/ 0/ -)	1117(27/ 20/ 12/ 3)	0(-/ -/ 0)	0	0	512	0:41:57	180018eee
mmcgd/0	(1059/ 2/ 1/C 0)	4(0/ 4/ 0)	0(0/ 0/ 0/ -)	0(-/ -/ 0)	642	237	32	0:41:58	
guider	(8065/ 1/ 1/C 0)	3(3/ 0/ 0)	10(4/ 0/ 1/ 0)	0(-/ -/ 0)	1	8	256	0: 0: 7	1800084ee
PmLogDaemon	(1303/ 1/ 2/C 0)	2(2/ 0/ 0)	14(1/ 0/ 1/ 0)	0(-/ -/ 0)	103	39	32	0:41:57	18000c4ee
ksoftirqd/0	(3/ 2/ 1/C 0)	1(0/ 1/ -)	0(0/ 0/ 0/ -)	0(-/ -/ 0)	-	-	32	0:41:59	

Top analysis

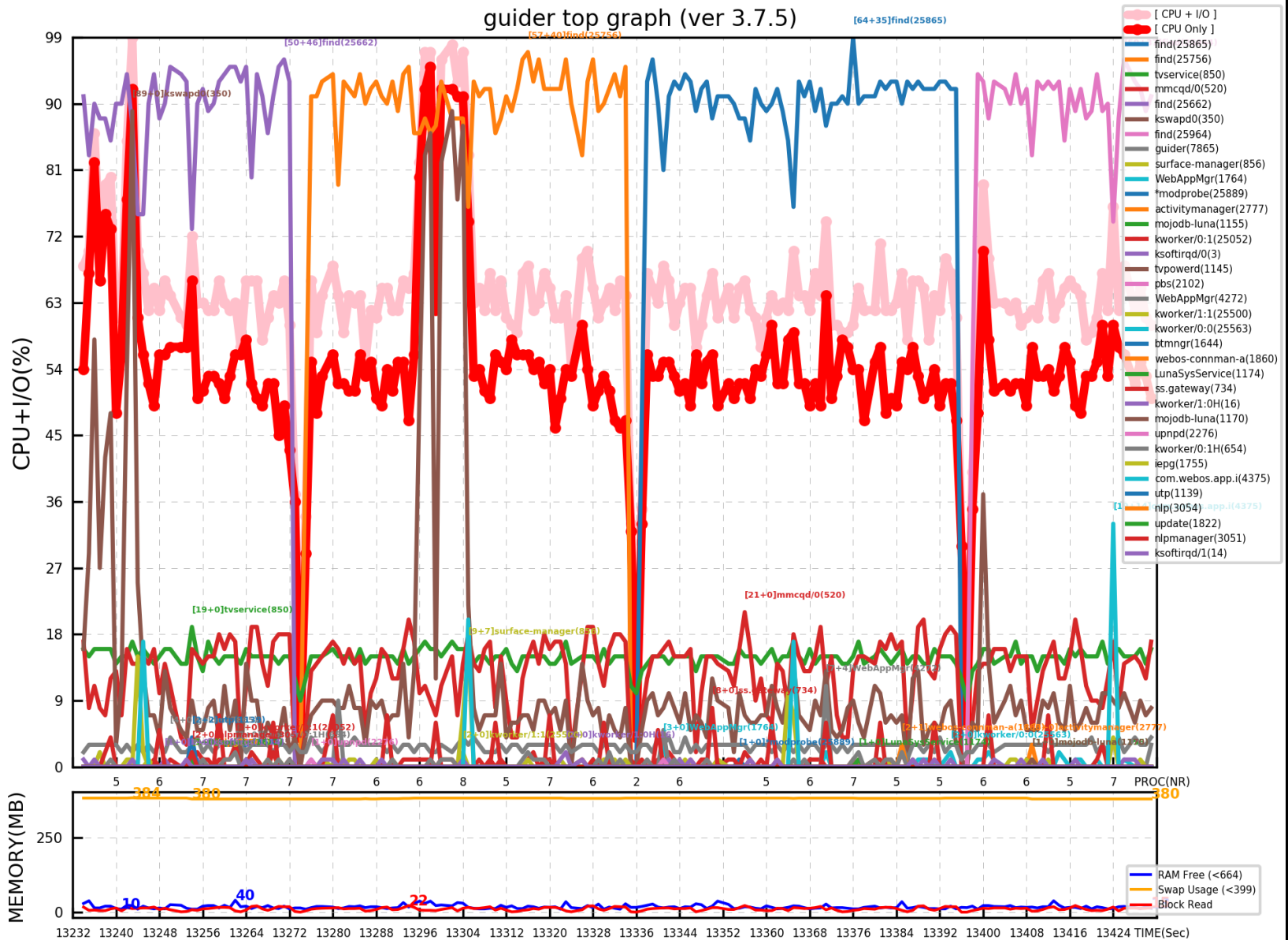
```
$ guider top -o ./
```

Press ctrl + c

```
$ guider top -I guider.out -e g
```

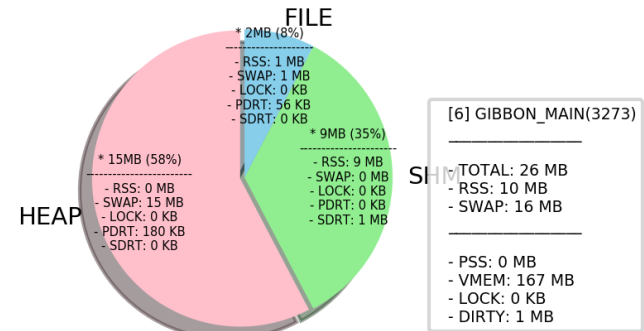
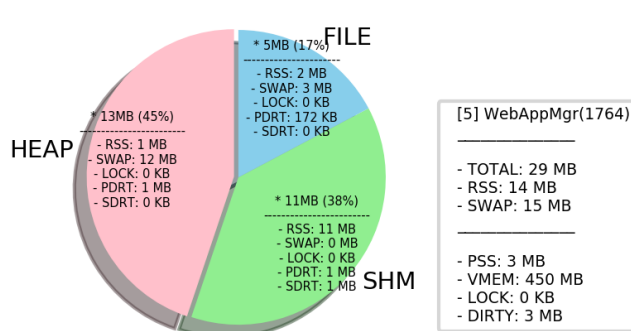
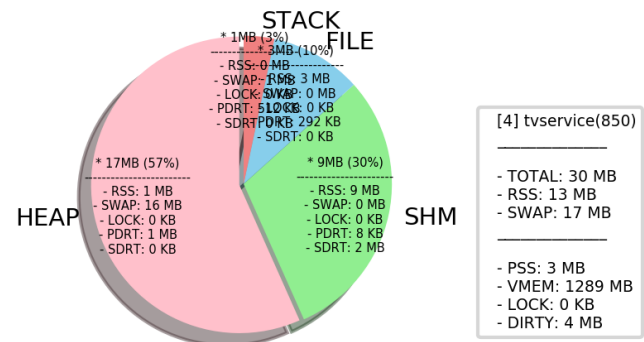
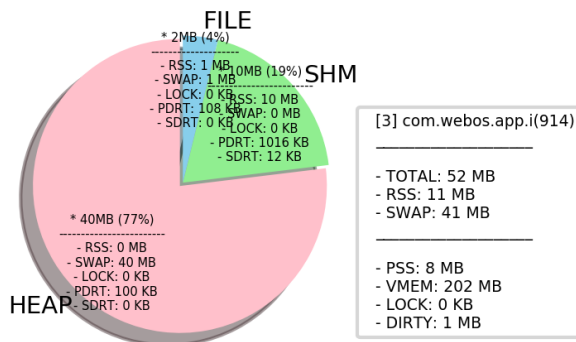
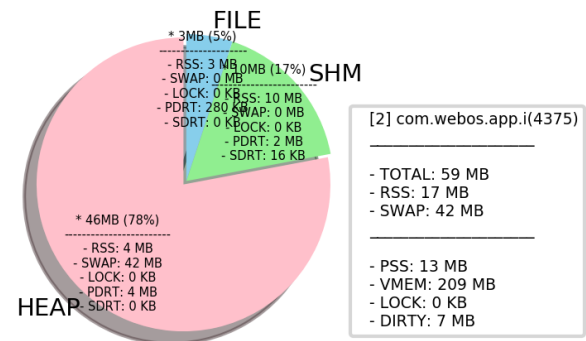
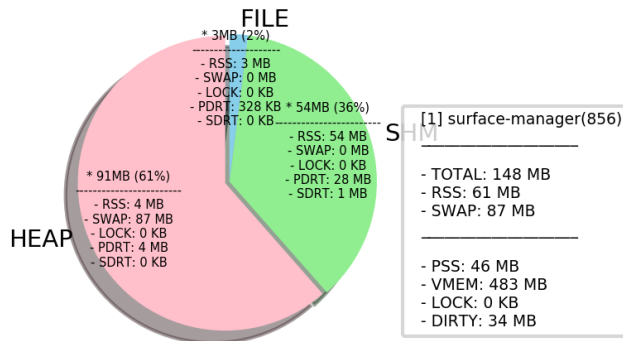
View guider_graph.png, guider_chart.png

Top analysis



Top analysis

guider top memory chart (ver 3.7.5)



Others

- Additional information
 - interval, tree, signal, syscall, ... [thread]
 - custom events, kernel graph, ... [function]
 - memory details, wchan, disk, wfc, ... [top]
- Additional functions
 - file / page / system analysis
 - background tracing
 - real-time event monitoring
 - network communication

Thanks 😊

<https://github.com/iipeace/guider>