SCREWPUS

- threads
- delayed user space data retrievals
- watch command
- cputime PMU
- RDT support
- event triggers
- group sharing
- bpf command
- build menuconfig
THREADS

• record
• report
• other report tools (c2c, sched, mem..)
THREADS REPORT

- original work from Namhyung Kim
- ~30% speed up
- ended up as RFC only
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```bash
perf record
```
THREADS REPORT

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```
perf record  
perf record --index
```

```
DATA

DATA aux  
DATA cpu1  
DATA cpu2  
DATA cpuX  

perf.data
```

```
DATA

perf.data
```
THREADS REPORT

- original work from Namhyung Kim
- ~30% speed up
- ended up as RFC only
THREADS REPORT

• RFC:

https://lore.kernel.org/lkml/1443763159-29098-1-git-send-email-namhyung@kernel.org/
THREARDS RECORD

- one thread to store all CPUs data
- 1 CPU – 1 MMAP
THREADS RECORD

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THREADS RECORD

- `perf record --aio` (Alexey Budankov)
  asynchronous trace streaming via Posix AIO API
  merged in soon

- `perf record --threads`
  separate threads
  data in separate files
DELAYED USER SPACE DATA RETRIEVAL

- user space data processing out of NMI callchains, stack dump
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DELAYED USER SPACE DATA RETRIEVAL

• taskwork
• trigger window – slow syscall path
• perf tool processing
DELAYED USER SPACE DATA RETRIEVAL

Benchmark for Sysbench

sample length (nanoseconds)

- "user-data-off-0"
- "user-data-on-0"

time (seconds)
DELAYED USER SPACE DATA RETRIEVAL

• RFC post:
  https://lore.kernel.org/lkml/20180124121114.GA17605@krava/

• git:
  https://git.kernel.org/pub/scm/linux/kernel/git/jolsa/perf.git
  perf/user_data
WATCH COMMAND

- watches various system files
- allows:
  - display separate fields
  - plot data
  - zero counters
- sched/int files now
- git:
  - https://git.kernel.org/pub/scm/linux/kernel/git/jolsa/perf.git
  - perf/watch
CPUTIME PMU

- cpumtime subsystem, keeps counters:
  
  \[\begin{array}{ccc}
  \text{CPUTIME\_USER} & \text{CPUTIME\_NICE} & \text{CPUTIME\_SYSTEM} \\
  \text{CPUTIME\_SOFTIRQ} & \text{CPUTIME\_IRQ} & \text{CPUTIME\_IDLE} \\
  \text{CPUTIME\_IOWAIT} & \text{CPUTIME\_STEAL} & \text{CPUTIME\_GUEST} \\
  \text{CPUTIME\_GUEST\_NICE} & & \\
  \end{array}\]

- cpumtime PMU mirrors those counters

- perf stat metric binding
  
  `perf stat --top/--top-full`

- no tick issue
CPUTIME PMU

- RFC post:
  https://lore.kernel.org/lkml/20180606221513.11302-1-jolsa@kernel.org/

- git:
  https://git.kernel.org/pub/scm/linux/kernel/git/jolsa/perf.git
  perf/cputime
BPF COMMAND

- framework for running BPF programs
- like bcc (python binding), but in C
- pre/post handlers
- event/timer handlers
RDT SUPPORT

- Intel Resource Director Technology (RDT) CMT/MBM/CAT/CDP/MBA/CQM
- resctrl file system
- intel-cmt-cat package
- store resctrl in perf.data (as feature)
- report/load of RDT dump
- need rebase to new RDT design
RTD SUPPORT

source: https://github.com/intel/intel-cmt-cat/wiki/resctrl
EVENT TRIGGERS

- allow events to start/stop another event
  
  -e 'cycles,irq_entry/on=cycles/,irq_exit/off=cycles/

- perf_event_event/ioctl interface change
GROUP SHARING

- limit file descriptor usage
- group events do not allocate file descriptors
- perf specific IDs
BUILD/MENUCONFIG

- make menuconfig
- compile out unneeded stuff (tests)
- cut out dependencies
- code separation
THANKS, QUESTIONS

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