LinuxCon Europe 2013

Cloud Monitoring and Distribution Bug Reporting with Live Streaming and Snapshots

EfficiOS

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Presenter

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EfficiOS

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Author/Maintainer of

- Userspace RCU,
- LTTng kernel and user-space tracers,
- Babeltrace.

Content

- New and upcoming features since Tracing Summit 2012
  - LTTng
  - Babeltrace
- Cloud monitoring
- Enhanced bug reports
- LTTng project roadmap

LTTng Reminder

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LTTng Features Since Tracing Summit 2012

- LTTng 2.1 Basse Messe (December 2012)
  - Network Streaming (TCP)
  - Session daemon health check
  - Event field filtering (LTTng-UST)
  - ARM, MIPS sysem call tracing (LTTng modules)

LTTng Features Since Tracing Summit 2012

- LTTng 2.2 Cuda (June 2013)
  - Per user ID buffers (LTTng-UST)
  - On disk file rotation (maximum stream file size)

LTTng Features Since Tracing Summit 2012

- LTTng 2.3 Dominus Vobiscum (September 2013)
  - Flight recorder tracing
    - Stop and non-stop snapshots
    - Core dump handler integration
      - LTTng Tools extras/

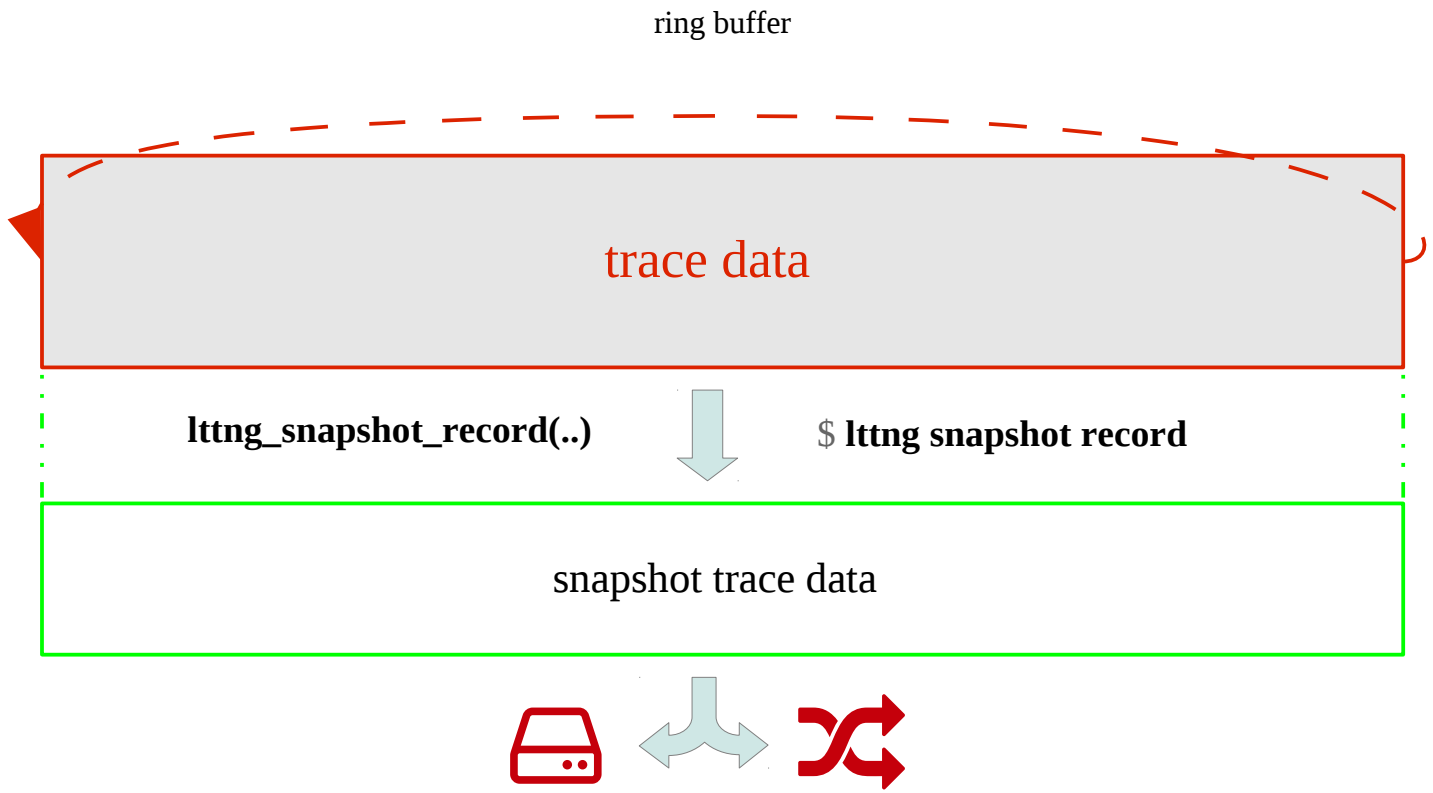
Flight recorder session + snapshot

```
$ lttng create --snapshot
$ lttng enable-event -k sched_switch
$ lttng enable-event -k –-syscall -a
$ lttng start
$ ...
$ lttng snapshot record
Snapshot recorded successfully for session auto-20131019-113803
$ babeltrace /home/julien/lttng-traces/auto-20131019-113803/snapshot-1-20131019-113813-0/kernel/
```

Snapshot

At **any** point in time, a snapshot can be taken of a the **current** trace buffers.

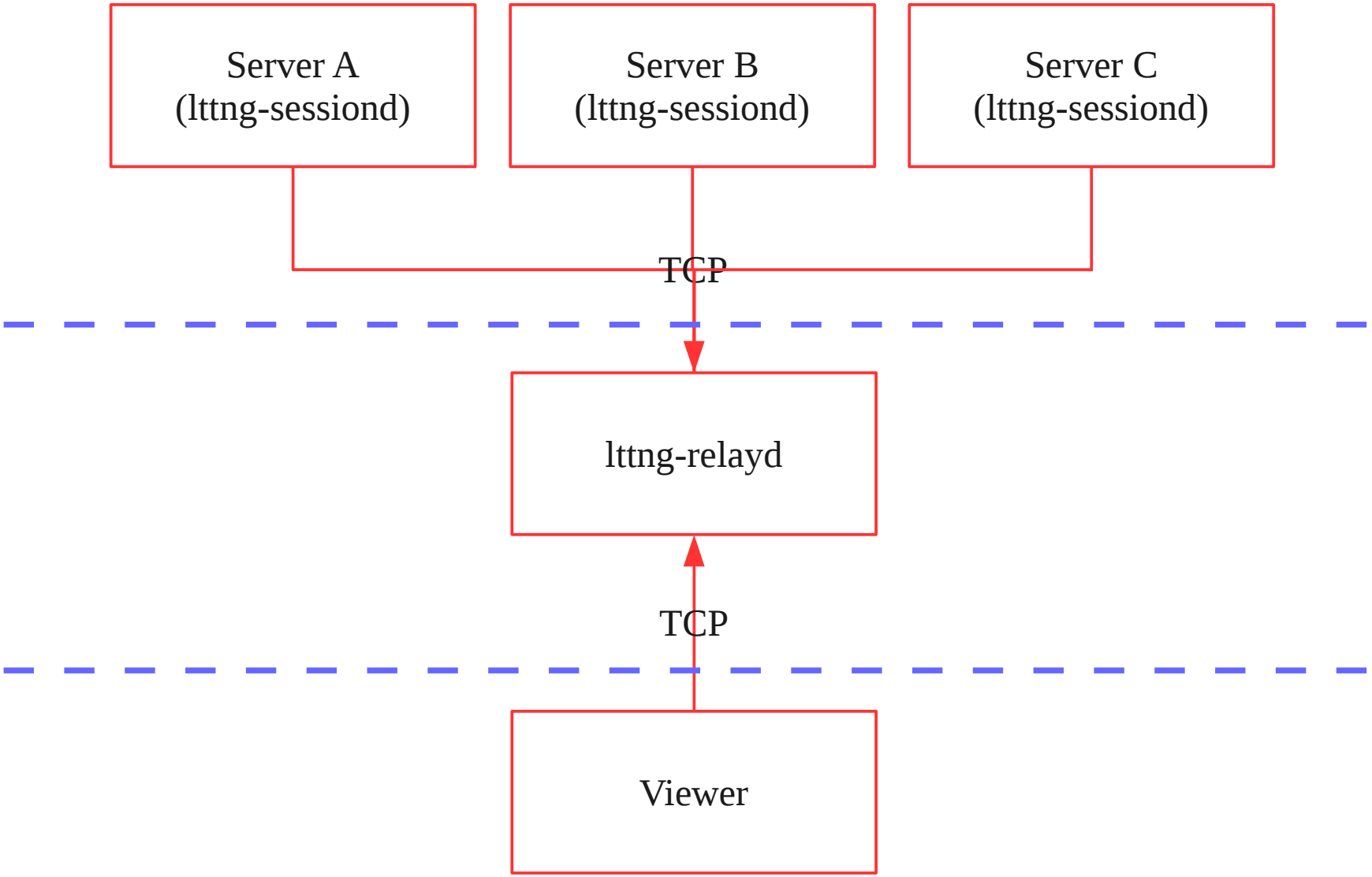
Overwrite mode meaning flight recorder



LTTng Features Since Tracing Summit 2012

- LTTng 2.4 Époque Opaque (upcoming)
  - Java Util Logging (JUL) tracing
  - Live streaming
    - Analysis of live traces
  - Consumer and relay daemon health check
  - Packet index generated by consumer daemon
    - Faster load of large traces in viewers afterward

Live Network Streaming Deployment



Live Network Streaming Session

On the server to trace :

```
$ lttng create --live 2000000 -U net://10.0.0.1
$ lttng enable-event -k sched_switch
$ lttng enable-event -k --syscall -a
$ lttng start
```

On the receiving server (10.0.0.1) :

```
$ lttng-relayd -d
```

On the viewer machine :

```
$ lttngtop -r 10.0.0.1
```

Live Trace Streaming Usage

As the trace is being created, you extract and can analyze the data.

Continous Analysis

- Extract data with live streaming for analysis on an other machine

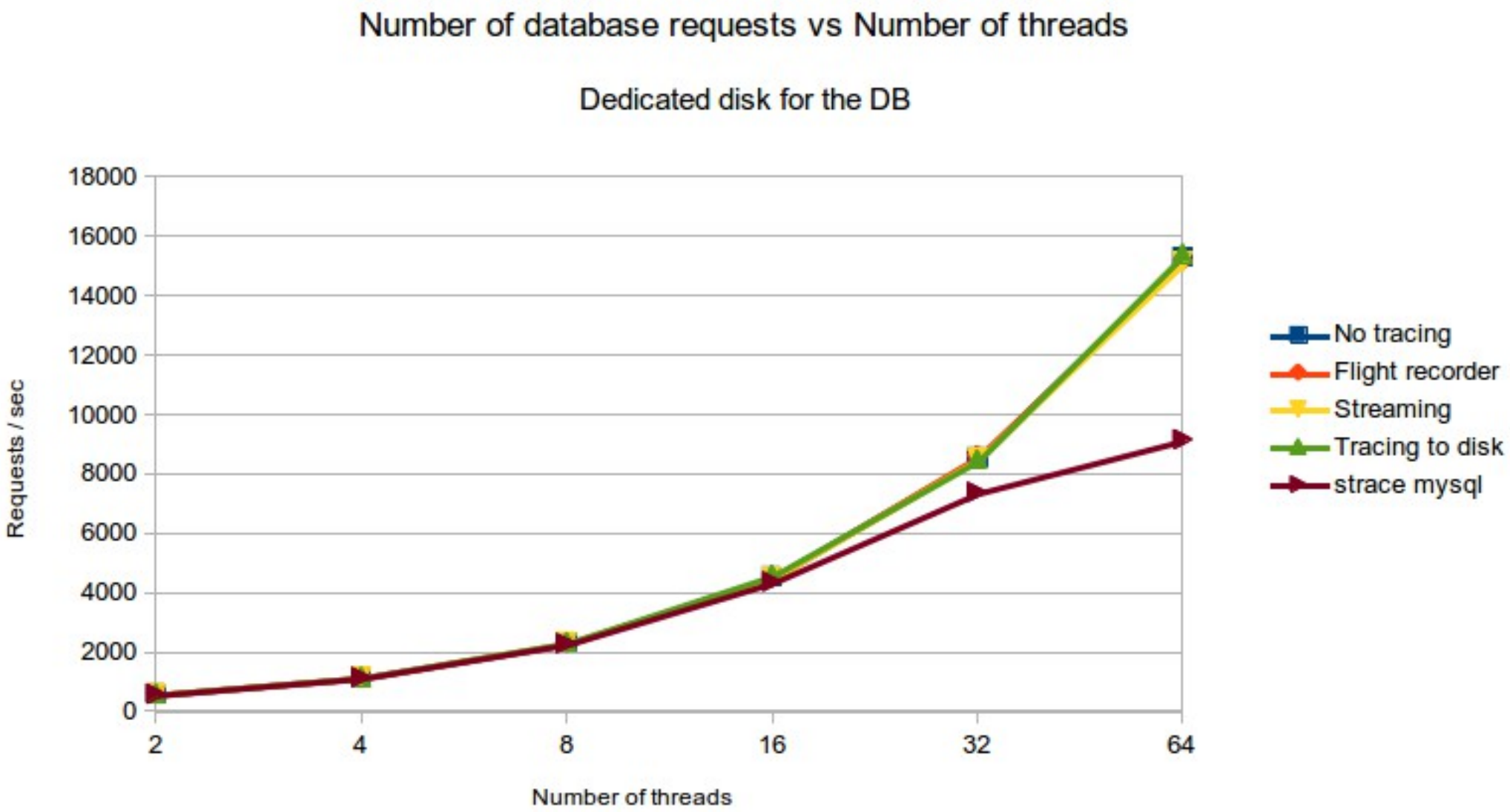
Cluster-level analysis

- Gather traces from multiple machines
  - Load balancing analysis
  - Latency detection

System Administration

- Get data of faulty machine “on-demand”

Performance Results



Babeltrace Features Since Tracing Summit 2012

- Babeltrace 1.0 (initial release, October 2012)
- Babeltrace 1.1 (API namespacing fix, March 2013)
- Babeltrace 1.2 (upcoming)
    - Common Trace Format (CTF) Writer API
    - Python bindings
    - Nexus to CTF converter
    - Live trace stream read support
        - Connect to LTTng relay daemon

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Cloud Monitoring

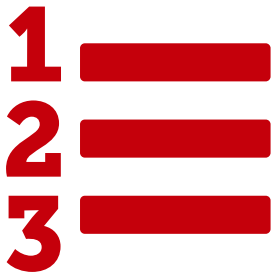
- Live network streaming
- Flight recorder tracing and snapshots
- Bytecode interpreter
    - On traced target or separate dedicated machine,
    - Triggers:
        - Start tracing
        - Stop tracing
        - Gather snapshot
    - Aggregation

Enhanced Bug Reports

- Flight recorder tracing
- In production
- Extremely low overhead
- When error is encountered
    - Gather snapshot
    - “Do you want to send a detailed bug report ?”
    - Very detailed trace of trace leading to the problem sent along with bug report

LTTng Project Roadmap

- Save/restore trace session configuration to/from files
- Support Perf PMU counters from LTTng-UST
- Dynamic instrumentation of user-space (dyninst)
- Listing libraries shared objects (LD_PRELOAD)
- Hardware tracing (ARM, Freescale, Intel, ...)
- Triggers and aggregation in LTTng-UST bytecode interpreter
- LTTng modules bytecode interpreter
- Android port for LTTng modules and UST



Questions ?

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