ctf

October 15, 2019

```python
In [7]: import json
        import pandas as pd
        import seaborn as sns; sns.set()
        import babeltrace as bl
```

```python
In [8]: tr = bl.TraceCollection()
        tr.add_trace('sample_traces/jsoo/ctf', "ctf")

        events = []
        counters = []
        allocs = []

        ENTRY = 0
        EXIT = 1
        COUNTER = 2
        ALLOC = 3


        # babeltrace is an evil binding, do not put Event objects directly in a list, need to
        # Events objects are actually references to the head of the iterator, so trying to use
        # the scope of the iterator will results in having the same objects, that is, the last
        # ŕ\_()_/ŕ

        for event in tr.events:
            id = event['id']
            ev = {}
            ev['timestamp'] = event['timestamp']
            if id == ENTRY or id == EXIT:
                ev['phase'] = event['phase']
                ev['id'] = id
                events.append(ev)
            if id == COUNTER:
                ev['name'] = event['kind']
                ev['count'] = event['count']
                counters.append(ev)
            if id == ALLOC:
                ev['bucket'] = event['bucket']
                ev['count'] = event['count']
```

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```python
                allocs.append(ev)

        timeline_set = {}
        timeline = []

        for event in events:
            phase = event['phase']
            if event['id'] == ENTRY:
                if phase in timeline_set:
                    print("overlapping entry for phase: %s, timestamp %d" % (phase, event['time
                else:
                    timeline_set[phase] = event
            elif event['id'] == EXIT:
                if phase in timeline_set:
                    ev_entry = timeline_set[phase]
                    item = {
                        'ts_begin': ev_entry['timestamp'],
                        'ts_end': event['timestamp'],
                        'dur' : event['timestamp'] - ev_entry['timestamp'],
                        'phase': phase
                    }
                    timeline.append(item)
                    del timeline_set[phase]
                else:
                    print("got an exit event with no entry: %s, timestamp %d" % (phase, event[

        for key in timeline_set:
            print("got an entry event with no exit: %s, timestamp: %d" % (key, timeline_set[key

        # FIXME: none of these should be tolerable besides impromptu program shutdown (segfaul
```

```
got an exit event with no entry: major/mark_final, timestamp 4825128
overlapping entry for phase: major/mark_roots, timestamp 11983480
got an exit event with no entry: major/mark_final, timestamp 13656935
overlapping entry for phase: major/mark_roots, timestamp 21288580
got an exit event with no entry: major/mark_final, timestamp 26077514
overlapping entry for phase: major/mark_roots, timestamp 34357892
got an exit event with no entry: major/mark_final, timestamp 40564907
overlapping entry for phase: major/mark_roots, timestamp 49507346
got an exit event with no entry: major/mark_main, timestamp 59133890
got an exit event with no entry: major/mark_final, timestamp 61191983
overlapping entry for phase: major/mark_roots, timestamp 76844490
got an exit event with no entry: major/mark_final, timestamp 95465765
overlapping entry for phase: major/mark_roots, timestamp 118788736
got an exit event with no entry: major/mark_final, timestamp 125912431
overlapping entry for phase: major/mark_roots, timestamp 194698284
got an exit event with no entry: major/mark_final, timestamp 211612669
overlapping entry for phase: major/mark_roots, timestamp 250176029
```

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got an exit event with no entry: major/mark_final, timestamp 283058871
overlapping entry for phase: major/mark_roots, timestamp 322517850
got an exit event with no entry: major/mark_final, timestamp 377884343
overlapping entry for phase: major/mark_roots, timestamp 427734240
got an exit event with no entry: major/mark_final, timestamp 507464932
overlapping entry for phase: major/mark_roots, timestamp 580211312
got an exit event with no entry: major/mark_final, timestamp 690870591
overlapping entry for phase: major/mark_roots, timestamp 792030298
got an exit event with no entry: major/mark_final, timestamp 918199661
overlapping entry for phase: major/mark_roots, timestamp 1062123183
got an exit event with no entry: major/mark_final, timestamp 1170517771
overlapping entry for phase: major/mark_roots, timestamp 1300095797
got an exit event with no entry: major/mark_final, timestamp 1493961343
overlapping entry for phase: major/mark_roots, timestamp 1635330632
got an exit event with no entry: major/mark_final, timestamp 2099296663
overlapping entry for phase: major/mark_roots, timestamp 2490591161
got an exit event with no entry: major/mark_final, timestamp 2728797746
overlapping entry for phase: major/mark_roots, timestamp 2978264669
got an exit event with no entry: major/mark_final, timestamp 3365051615
overlapping entry for phase: major/mark_roots, timestamp 3752049014
got an exit event with no entry: major/mark_final, timestamp 4213815712
overlapping entry for phase: major/mark_roots, timestamp 4773473417
got an exit event with no entry: major/mark_final, timestamp 4867381081
overlapping entry for phase: major/mark_roots, timestamp 5244432043
got an exit event with no entry: major/mark_final, timestamp 5384739792
overlapping entry for phase: major/mark_roots, timestamp 5591135483
got an exit event with no entry: major/mark_final, timestamp 5738045294
overlapping entry for phase: major/mark_roots, timestamp 6097403181
got an exit event with no entry: major/mark_final, timestamp 6234878457
overlapping entry for phase: major/mark_roots, timestamp 6629145536
got an exit event with no entry: major/mark_final, timestamp 6833722761
overlapping entry for phase: major/mark_roots, timestamp 7631653769
got an exit event with no entry: major/mark_final, timestamp 7659529071
overlapping entry for phase: major/mark_roots, timestamp 7721659376
got an exit event with no entry: major/mark_final, timestamp 7821715956
overlapping entry for phase: major/mark_roots, timestamp 7885020297
got an exit event with no entry: major/mark_final, timestamp 8029802278
overlapping entry for phase: major/mark_roots, timestamp 8115721144
got an exit event with no entry: major/mark_final, timestamp 8231446913
overlapping entry for phase: major/mark_roots, timestamp 8422551363
got an exit event with no entry: major/mark_final, timestamp 8594427040
overlapping entry for phase: major/mark_roots, timestamp 8903335494
got an exit event with no entry: major/mark_final, timestamp 8953525683
overlapping entry for phase: major/mark_roots, timestamp 9261368236
got an exit event with no entry: major/mark_final, timestamp 9364798938
overlapping entry for phase: major/mark_roots, timestamp 9473523337
got an exit event with no entry: major/mark_final, timestamp 9587774617
overlapping entry for phase: major/mark_roots, timestamp 9707670096
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got an exit event with no entry: major/mark_final, timestamp 9788359022
overlapping entry for phase: major/mark_roots, timestamp 9960560125
got an exit event with no entry: major/mark_final, timestamp 10073951034
overlapping entry for phase: major/mark_roots, timestamp 10174445531
got an exit event with no entry: major/mark_final, timestamp 10289754054
overlapping entry for phase: major/mark_roots, timestamp 10574287546
got an exit event with no entry: major/mark_final, timestamp 10656694697
overlapping entry for phase: major/mark_roots, timestamp 11205460968
got an exit event with no entry: major/mark_final, timestamp 11351559488
overlapping entry for phase: major/mark_roots, timestamp 11635824955
got an exit event with no entry: major/mark_final, timestamp 11837322064
overlapping entry for phase: major/mark_roots, timestamp 12026483849
got an exit event with no entry: major/mark_final, timestamp 12192500510
overlapping entry for phase: major/mark_roots, timestamp 12381684475
got an exit event with no entry: major/mark_final, timestamp 12487036085
overlapping entry for phase: major/mark_roots, timestamp 12665799016
got an exit event with no entry: major/mark_final, timestamp 12841273654
overlapping entry for phase: major/mark_roots, timestamp 12971735084
got an exit event with no entry: major/mark_final, timestamp 13105502885
overlapping entry for phase: major/mark_roots, timestamp 13309786748
got an exit event with no entry: major/mark_final, timestamp 13442618466
overlapping entry for phase: major/mark_roots, timestamp 13566654657
got an exit event with no entry: major/mark_final, timestamp 13714670984
overlapping entry for phase: major/mark_roots, timestamp 13869053057
got an exit event with no entry: major/mark_final, timestamp 14005690719
overlapping entry for phase: major/mark_roots, timestamp 14362559551
got an exit event with no entry: major/mark_final, timestamp 14567846636
overlapping entry for phase: major/mark_roots, timestamp 14713706140
got an exit event with no entry: major/mark_final, timestamp 14952685362
overlapping entry for phase: major/mark_roots, timestamp 15266114344
got an exit event with no entry: major/mark_final, timestamp 15446310460
overlapping entry for phase: major/mark_roots, timestamp 15735715071
got an exit event with no entry: major/mark_final, timestamp 15964232283
overlapping entry for phase: major/mark_roots, timestamp 18917065824
got an exit event with no entry: major/mark_final, timestamp 19156692461
overlapping entry for phase: major/mark_roots, timestamp 19333929041
got an exit event with no entry: major/mark_final, timestamp 19547936648
overlapping entry for phase: major/mark_roots, timestamp 20084463630
got an entry event with no exit: major/mark_main, timestamp: 19546706309
```

```python
In [9]: # From here, refer to https://github.com/Engil/gc-tracing/blob/master/metadata to know
        # the various phases and counters available.

        def counters_by_name(name): return [ev for ev in counters if ev['name'] == name]
        def events_by_name(name): return [ev for ev in timeline if ev['phase'] == name]

        s = pd.DataFrame(counters_by_name('minor/promoted'))
```
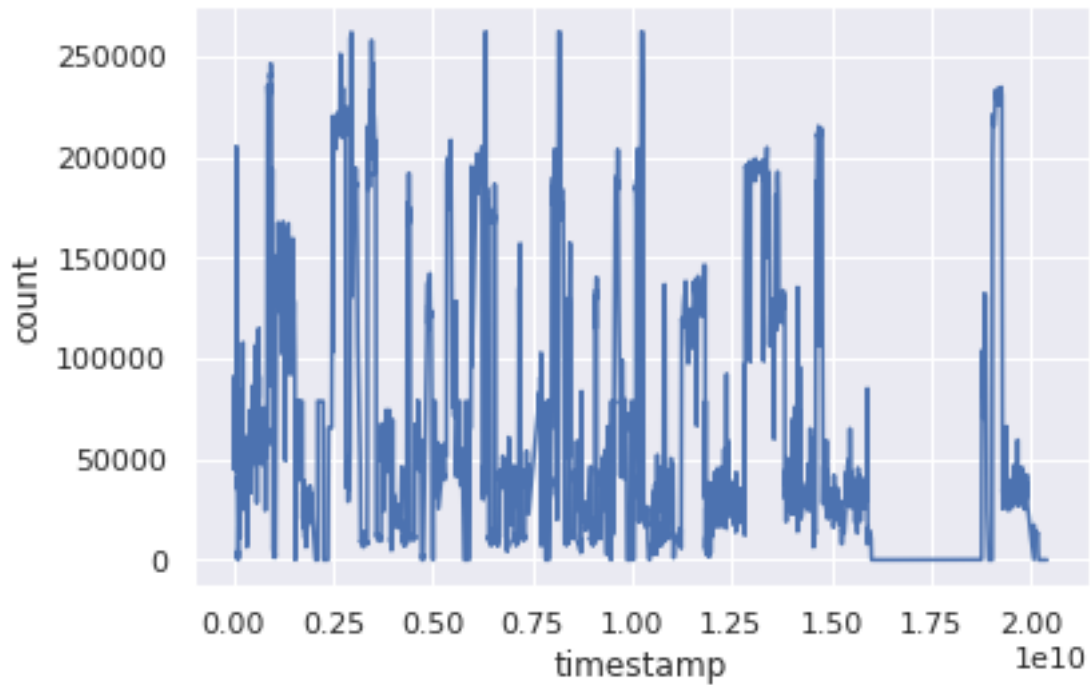
```
s['timestamp'] = s['timestamp'].astype('timedelta64[ns]')

sns.lineplot(x="timestamp", y="count", data=s)
```
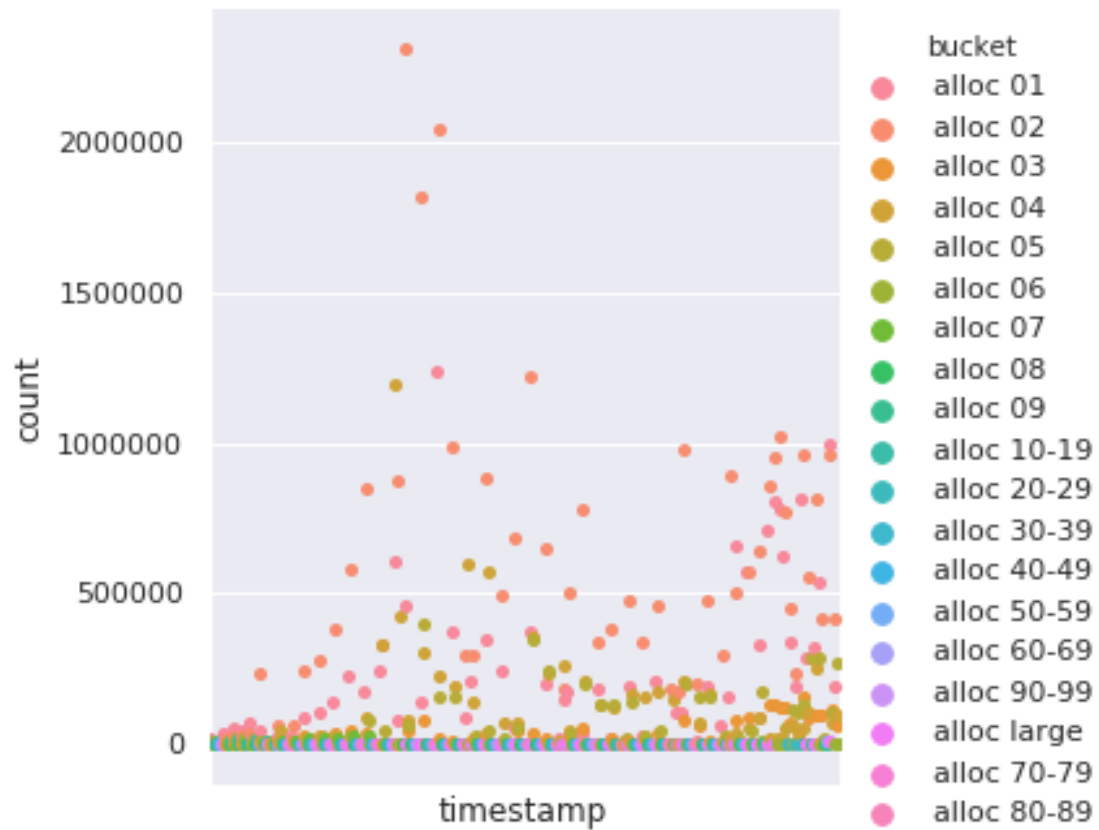
Out[9]: <matplotlib.axes._subplots.AxesSubplot at 0x7fd9676b0e48>


```
In [10]: # Visiting allocations during the lifetime of the program, by buckets

s = pd.DataFrame(allocs)

ax = sns.catplot(x='timestamp', y='count', hue='bucket', data=s)
ax.set(xticks=[])
```
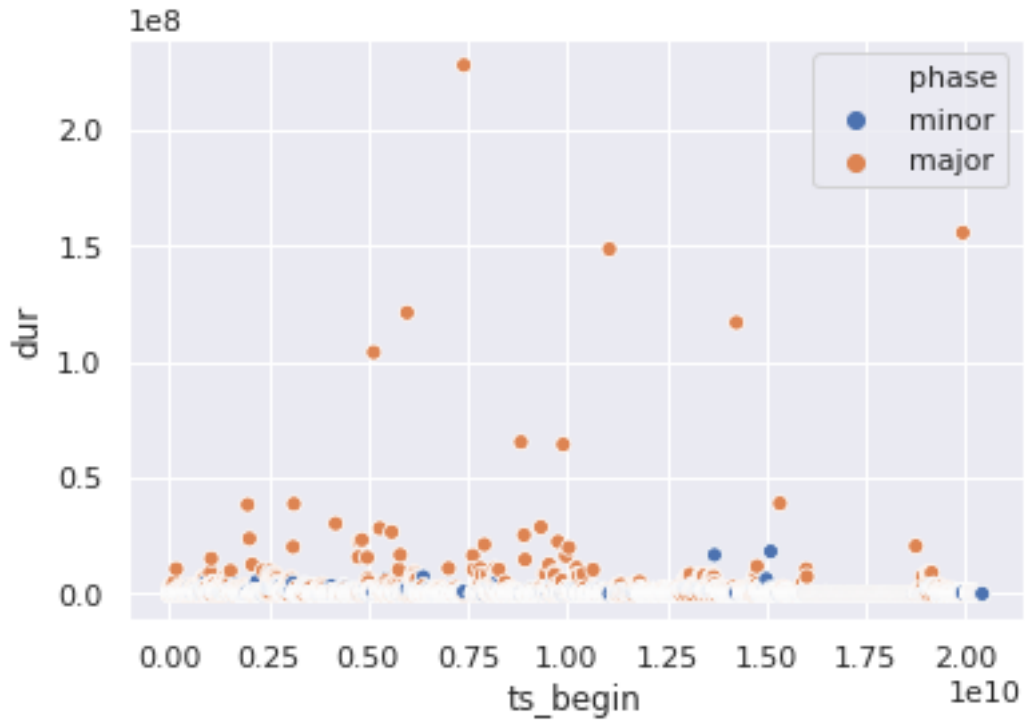
Out[10]: <seaborn.axisgrid.FacetGrid at 0x7fd973daaf28>

```
In [11]: # minor and major dispatches, duration on the Y axis
         s = pd.DataFrame([ev for ev in timeline if ev['phase'] == 'major' or ev['phase'] == 'n
         ax = sns.scatterplot(x='ts_begin', y='dur', hue='phase', data=s)
```

```
In [12]: def gc_phase_quantile(name):
            s = pd.DataFrame(events_by_name(name))
            #s['timestamp'] = s['timestamp'].astype('timedelta64[ns]')
            return (s['dur'].quantile([.1, .25, .50, .75, .95, .99]))

In [13]: gc_phase_quantile('major')

Out[13]: 0.10        8234.40
         0.25       162240.00
         0.50       477792.00
         0.75      1172755.50
         0.95      3855911.30
         0.99     10411310.18
         Name: dur, dtype: float64

In [14]: gc_phase_quantile('minor')

Out[14]: 0.10        77132.40
         0.25       149607.00
         0.50       396085.00
         0.75       692175.00
         0.95      2578264.40
         0.99      3257261.36
         Name: dur, dtype: float64
```

```
In [15]: gc_phase_quantile('major/sweep')

Out[15]: 0.10        2395.20
         0.25      119395.50
         0.50      350880.50
         0.75      627666.75
         0.95     2317725.45
         0.99     4270188.74
         Name: dur, dtype: float64
```