Transactional Event Profiling In a Best-Effort HTM System

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Doing better:

We can do better than a simple global summary —

Transactions	Aborts	Serializations
1042	200	10

— in understanding transactional applications.

Rates:

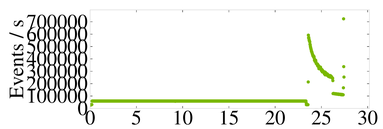
Often it's the **rate** of transactional events we care about

1000 Aborts	1000 Aborts
1 abort / second	1000 aborts / second

We draw different conclusions based on rates!

Change over Time:

Rates change over time:

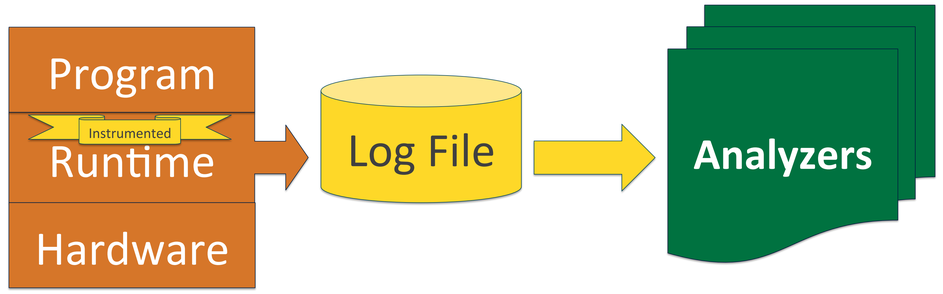


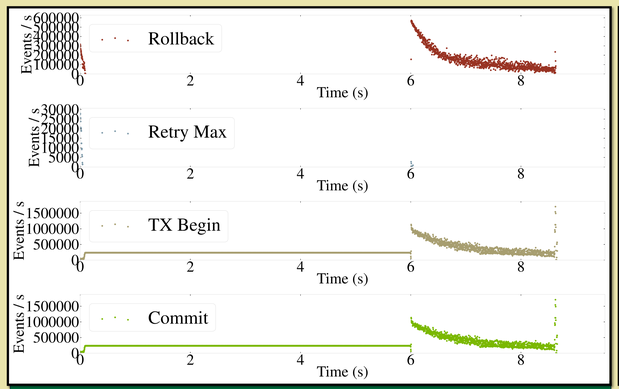
Plotting can reveal trends

Micro data: Also useful!

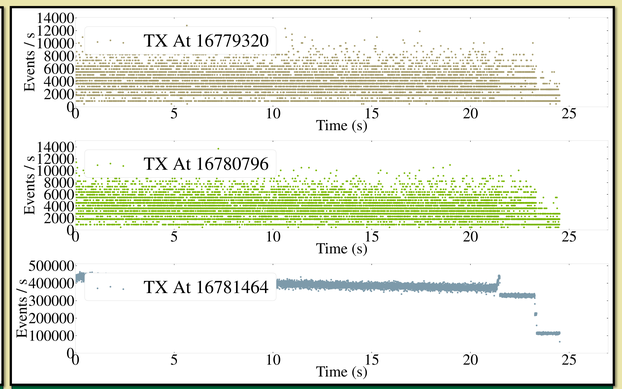
- See restart convoy, maladaptation
- Measure transaction durations, distributions

Capturing Detailed Information about Transactional Execution

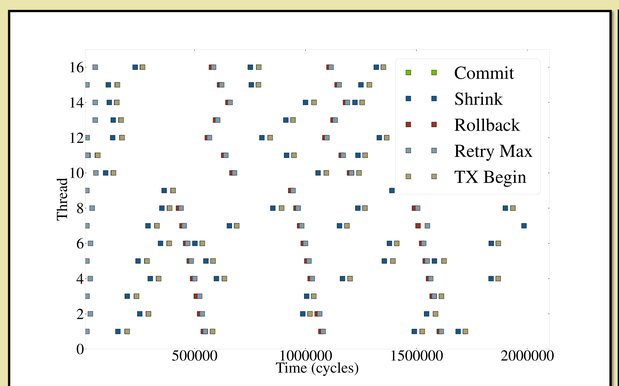




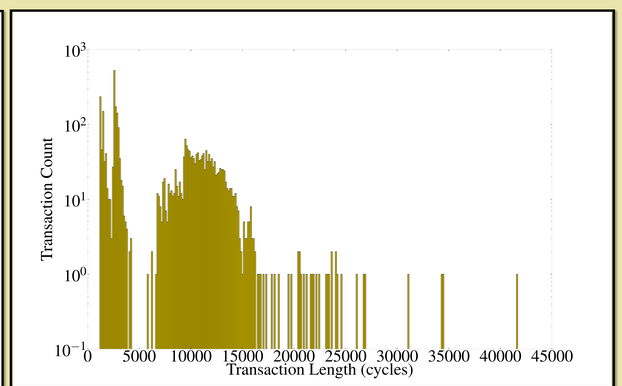
Event Rates



Transaction Occurences



Transaction Lengths



Transaction Lengths

Case Study: Adaptation

BlueGene/Q Can force a transaction to completion: **Serialization**

When?

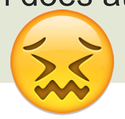
Too little?	Too Much?
Bad performance	Bad performance

Correct decisions requires dynamic information

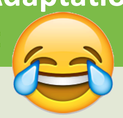
Solution?

Adaptation: Decide on dynamic information.

Problem: Understanding what adaptation does at runtime?



Event profiles for Adaptation schemes:



Log Dynamic Parameters, alongside events!

Allows:

- Visualization of parameter values