Review of

Magpie

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What is the problem?

System behavior is hard to map and debug without tools and analyzing them is imperative to improving performance. There are not many tools to do so presently.

Summary

Magpie toolchain takes standalone events generated by the operating system, firmware, middleware and applications to correlate them and analyze them to form a workload model. Magpie is able to precisely capture control flow and resource consumption because of its novel application specific event schema that it generates.

Key Insights

- Magpie is an application-agnostic method of extracting resource consumption and a tool to map control path of individual requests.
- They validate their workload models' accuracy using synthetic data.

Strengths

- In Magpie, the request structures are learned by observing and tracking a real system that is under a realistic workload. This in turn gives a detailed view of the complex system behavior that pertains to request serving.
- Magpie is impervious to unrelated activity taking place at the same time and is able to attribute resource usage to the right requests individually even when there is a large degree of concurrency.

Weaknesses

- Although Magpie does provide information and ways to infer root causes of some anomalies, it is unable to diagnose why the observed they occurred in the first place. This could also be an open question.

Summary of Key Results

- The authors highlighted the fact that the difference between using the ETW infrastructure in offline mode and real-time mode is negligible.
- Using Magpie, we cab record the parsed event trace of every individual request and this helps us form a picture about how these requests are actually being serviced in the system and we can optimize them using this information.

Open Questions

- How does a system like this hold up in current time of hyper-threading and much advanced systems?
- Is it necessary to now be able to attribute resource allocation down to a request level? Have today's systems overcome the performance needs that Magpie can help satisfy?