Attackboard: A Novel Dependency-Aware Traffic Generator for Exploring NoC Design Space

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Motivation

Trace-driven simulation is simple and fast for exploring NoC design space. For the consideration of accuracy, traces with packet dependencies is necessary.

However, these trace logs can be very complicated and require large storage space!

The BIG problem is size, while the conventional trace compression mechanism is not a good solution for reducing the size of traces while maintaining accuracy.

Key Question

How to reduce size of traces while maintaining accuracy?

Domain: NoC design space exploration
Proposal: A novel pattern-driven simulation mechanism

Key Insights

• Each PE has its own BIG trace for NoC operations
• Each BIG trace is actually a log of the execution of the corresponding State Machine

10KB codes may result in more than 1GB traces!

1GB trace logs

Table Minimization

Key idea #2
• Merge entries with the same patterns
  ➢ Fold the repetitive patterns: merge the entries with the same packet dependencies
  ➢ Merge duplicated entries

Key idea #3:
• Select the traffic in injection info.
  ➢ The matched result of attackboard and CS is a set of send events
  ➢ 3 ways to select the traffic
  1. Averaged
  2. Circular Queue
  3. Probability

More Information

More about this paper!

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