

# Beyond Transactions: The Evolution of Transactional Memory

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# Deconstructing TM: GRAAS

- Grouping: demark a finite set of instructions
  - TMnest register
- Rollback: undo a set of instructions
  - log and user-level handler
- Access Summary: record memory locations read/written
  - signatures
- Access Check: check for conflicts
  - hardware check on coherence
- Scheduling: choose who executes and when
  - hardware deadlock detector, software handler

# GRAAS Beyond TM

| Use  | Grouping | Rollback | Access Check | Access Summary | Scheduling |
|--|----------|----------|--------------|----------------|------------|
| Reliability:<br>detection,<br>recovery       | X        | X        | X            | X              | X          |
| Security:<br>Info flow, FG<br>access         | X        |          | X            | X              |            |
| Performance:<br>Optimization,<br>Speculation | X        | X        | X            |                |            |
| Correctness:<br>Watchpoints,<br>Replay       | X        |          | X            |                | X          |

# Open Questions

- What is the best deconstruction?
- What are the right interfaces?
- What should be in HW and SW?

More Info:

[www.cs.wisc.edu/multifacet/logtm/](http://www.cs.wisc.edu/multifacet/logtm/)