Understanding POWER Multiprocessors

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Introduction

- Much of the performance in hardware comes due to features such as Read/Write buffers, Speculation, Caches, etc.
- The behavior of execution of programs utilizing all such features in a hardware can be defined by a relaxed memory consistency model.
- ARM, x86, POWER.. all these hardware exhibit relaxed behaviors.
- Of these POWER is relatively well understood.
- Major reason is due to informal specification and behaviors described only via litmus tests.
- Continual hardware improvements in POWER also have resulted in more relaxed behaviors.
- This paper analyzes the POWER multiprocessor family for relaxed behaviors explain their discovered behaviors via an Abstract Machine.
- This helps in avoiding getting involved in the complexities of hardware itself while all the way understanding the weak