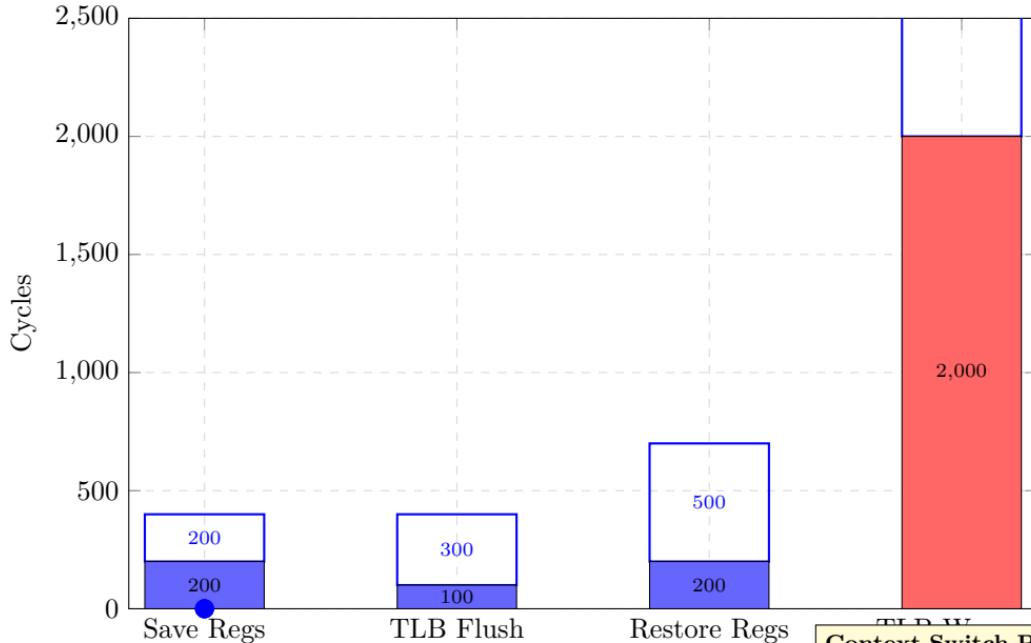


# Context Switch Cost Breakdown



## Optimizations:

- Global pages (no flush)
- PCID (tag TLB by ASID)
- Large pages (fewer entries)
- Process affinity

## TLB Flush Impact:

- Invalidates all translations
- First ~100 accesses miss
- Each miss: 400+ cycles
- Dominates switch cost

## Context Switch Phases:

1. Save registers: ~200 cycles
2. Write CR3 (TLB flush): ~100 cycles
3. Restore registers: ~200 cycles
4. TLB warmup: ~2000 cycles

**Total:** ~2500 cycles

## Measured Context Switch Times:

Linux kernel: 2-5 µs (6000-15000 cycles @ 3 GHz)  
Includes: scheduler overhead + cache effects + TLB refill