CSE 291: Operating Systems in Datacenters

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Nov. 21, 2022
Agenda for Today

- Announcements
- Project write-ups
- TLBs
- TLB Shootdowns discussion
Announcements

• Office hours today – on Zoom or in person
• Project presentations
  • In person in class on 11/29 and 12/1
  • Sign up on Canvas
• Course evaluations
  • Please fill these out – feedback is very helpful!
  • Due Monday December 5th at 11:59 pm
• Project write ups
  • Due Thursday December 8th at 11:59 pm
Project Write-Ups
Project Write-Ups

- 5-7 pages, depending on group size
- Similar content and structure as papers from class
  - Introduction, background, evaluation, related work, etc.
- Key differences:
  - Describe both what worked and what didn’t work
  - Describe what steps you would take next to continue the work
- See doc on Canvas for details
Tips for Finding Related Work

• How do you find the most related work on a topic?
• Use Google Scholar
  • E.g., what’s the most relevant work about TLB shootdowns?

1. Start with keywords
2. Find most relevant papers
3. What papers have cited this paper?
4. What papers did this paper cite?
5. Iterate until you converge on a set of relevant papers
TLBs
TLB Overview

- What is the role of the TLB?
  - Caches mappings from virtual to physical addresses
- Challenge: keeping TLBs consistent across cores
  - TLBs are not coherent
TLB Overheads

- Why are TLB overheads a concern now?
  - Increasing core counts
  - More CPU sockets
  - Use of memory mappings (e.g., Apache)
- Several recent papers try to reduce these overheads (last ~5 years)
TLB Shootdowns Discussion