

# CSE 291: Operating Systems in Datacenters

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## 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 5<sup>th</sup> at 11:59 pm
- Project write ups
  - Due Thursday December 8<sup>th</sup> at 11:59 pm

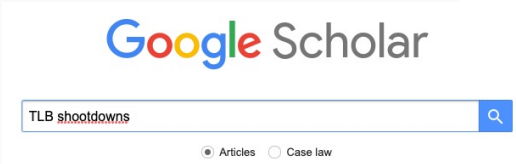
# Project Write-Ups

# 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?



start with keywords

find most relevant papers

Iterate until you converge on a set of relevant papers

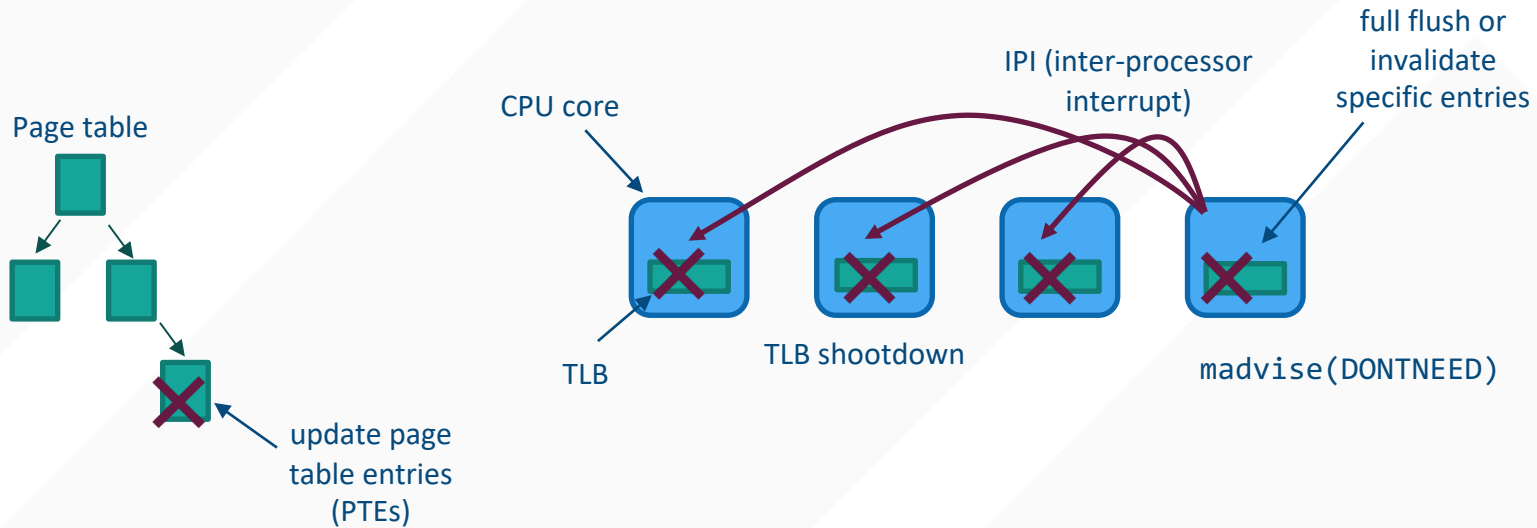
what papers did this paper cite?

what papers have cited this paper?

# 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