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CSE 291: Operating Systems in Datacenters

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Agenda for Today

- Announcements and reminders
- Research project
- Background on datacenter networking
- eRPC discussion
- PRISM discussion

Next Week

- Talk on Monday (10/16): “Can Great Programmers Be Taught?”
  - 11:00 am – 12:00 pm in CSE 1242
  - John Ousterhout
- No class on Tuesday (10/17)
  - Use the time to work on your project proposal!
- Different office hours next week:
  - Monday (10/16), 12:30-1:30 pm
  - No office hours on Wednesday
  - Thursday (10/19), 2:30-3:30 pm
  - These are a good opportunity to discuss your ideas for your research project

Deadlines

- Course Feedback #FinAid
  - Due Friday 10/13
- Warm-up assignment
  - Due Monday 10/16 at 11:59 pm
- Research project proposal
  - Due Monday 10/23 at 11:59 pm

Research Project

- Original research project
  - Ask a new question or propose a new idea
- Related to OS and/or datacenters
- How to pick a topic?
  - Continue an existing research project
  - Propose your own idea
  - See Canvas for suggestions
- Project proposal
  - 1 page (+ references)
  - Describe the problem, expected solution, and related work
  - List at least 3 milestones and what hardware you need
- See Canvas for details

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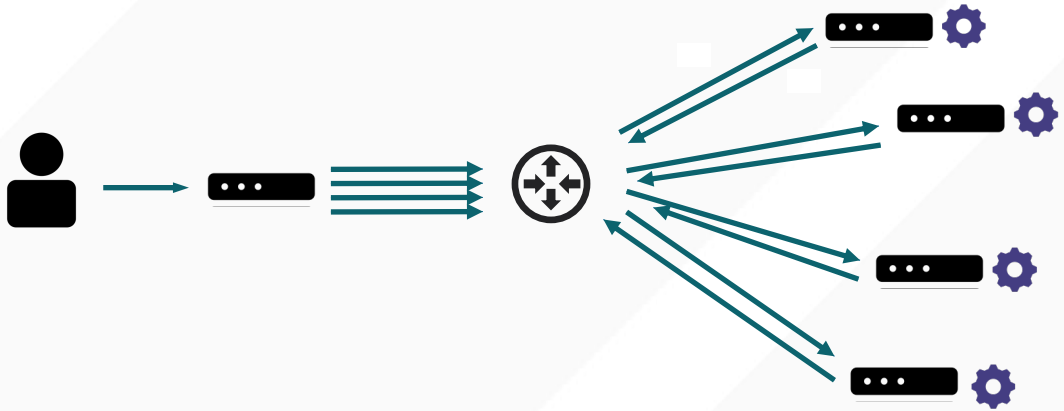
Datacenter Networking

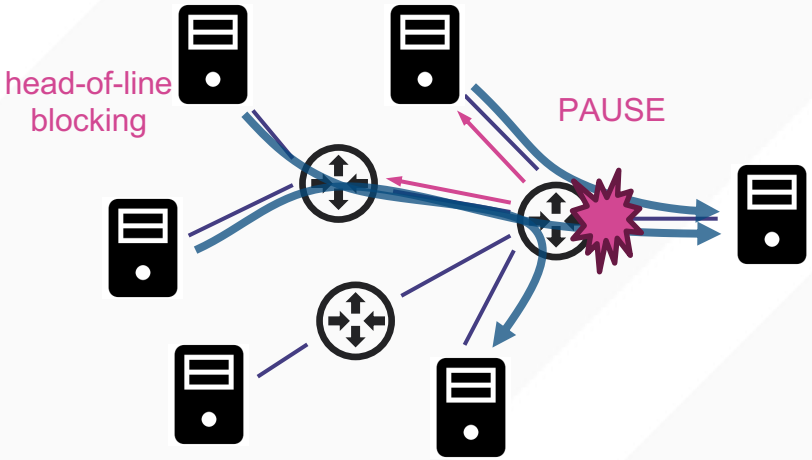
Incast

- Incast: when a server receives incoming traffic from many senders at once (e.g., 10s-100s)
- Often triggered by one server requesting data from many others
- What problems can this cause?
  - Dropped packets at the switch
  - Queueing delays



Priority Flow Control (PFC)

- RDMA was designed to operate over a lossless network
- How does RoCE prevent packet drops with Ethernet?
  - PAUSE frames
- Drawbacks of PFC
  - Head-of-line blocking
  - Deadlocks
  - Etc.



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eRPC Discussion
PRISM Discussion