Introduction to Computer Networks

CS640

Introduction

https://pages.cs.wisc.edu/~mgliu/CS640/F22/

Ming Liu

mgliu@cs.wisc.edu

Today

Course Logistics

Computer Networks Overview

Administrative details

Instructor

- Ming Liu (mgliu@cs.wisc.edu)
  - OH: #7379, Tu 2:30 to 3:30 PM

Teaching assistants

- Partho Sarthi (sarthi@wisc.edu)
  - OH: #3225, TuTh 11:30 to 12:30 PM
- Sadman Sakib (sadmankiba@cs.wisc.edu)
  - OH: #3262, ThF 1:00 to 2:00 PM
- Yizhou Chen (ychen884@wisc.edu)
  - OH: #3233, Tu 5:00 to 6:00PM, Th 11:30 to 12:30 PM

Course communication channels

#1: Course website

- https://pages.cs.wisc.edu/~mgliu/CS640/F22/index.html
- Slides, readings, and schedule

#2: Course mailing list

- compsci640-1-f22@g-groups.wisc.edu
- Announcements

#3: Piazza

- https://piazza.com/wisc/fall2022/cs640
- Q&A

#4: Canvas

- Labs and grades

Grading

6 programming labs (40%)

- 5 required labs (8% each) + 1 optional (5% bonus)

- teams of 1-2 people

Topic	Assigned	Due	Notes
Lab1: Sockets, Mininet & Performance	09/13/2022	09/27/2022 11:59PM	
Lab2: Link & Network Layer Forwarding	09/27/2022	10/11/2022 11:59PM	
Lab3: ARP, ICMP & RIP	10/11/2022	10/27/2022 11:59PM	
Lab4: Software Defined Networking	10/27/2022	11/15/2022 11:59PM	
Lab5: Flow Control & DNS	11/15/2022	12/01/2022 11:59PM	
Lab6: Distributed Sorting	12/01/2022	12/15/2022 11:59PM	

2 in-class midterms (50%)

- In-person
- midterm1: 25%, 10/20/2022
- midterm2: 25%, 12/13/2022

In-class Quizzes (10%)

- In-person
- ~5 times

} Open-book, open-notes

Grade cutoffs

A: [90% — 100%)

AB: [85% — 90%)

B: [80% — 85%)

BC: [75% — 80%)

C: [70% — 75%)

D: [60% — 70%)

F: [0% — 60%)

Reading and references

Required readings posted on the course website

- Complete each reading before the lecture of which it is assigned

Textbook

- Larry Peterson and Bruce Davie, **Computer Networks: A Systems Approach**, Sixth edition, https://book.systemsapproach.org/index.html

Additional references

- Check course site

Collaboration & late submission

Working together is encouraged

- Discussion of course materials, debugging issues, …

But the final submission must be your own work!

- Labs, quizzes, midterms …

Meet deadlines

- Turn assignments in on time; Late penalty (see each assignment)
- Start lab sooner than you think you need to
- Follow instructions for submitting codes (we have to be able to run and test it)

How do we learn

Before class

- Finish the reading

In class

- What is the key problem?

- What is the solution?

After class

- What is the takeaway?

- Labs

Learning outcomes

#1: Explain how campus or other networks work

#2: Develop small-scale network applications

#3: Evaluate design trade-offs of networked systems

Today

Course Logistics

Computer Networks Overview

Q: What are computer networks?

Q: What are computer networks?

A: A system provides cross-host communication for information exchange.

Q: What are the requirements of computer networks?

Q: What are the requirements of computer networks?

A: A computer network should ensure:

#1: Anytime and anywhere connectivity

#2: Always-on correctness

#3: Reasonable performance

#4: Low cost

#5: Tolerable security

Q: How to build computer networks to achieve these requirements?

Terminology

1. Host

Principle

Technique

Summary

Today's takeaways

#1: A system provides cross-host communication for information exchange

#2: connectivity, correctness, performance, cost, and security

Next lecture

- Building computer networks: a hardware and software perspective