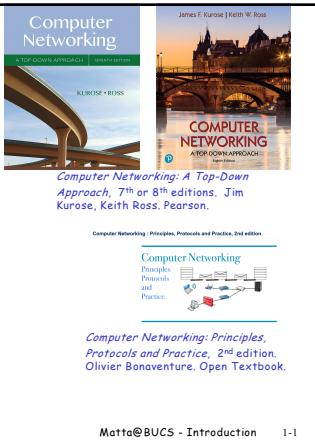


CS 655 Computer Networks

Abraham Matta
Computer Science
Boston University

Chapter 1 Introduction



1

LfA Expectations



- Follow health safety protocols for wearing face coverings, daily symptom attestation, routine and frequent testing, and, if necessary, contact tracing, quarantine, and isolation.
- Always put on a face covering and observe physical distancing of 6 feet
- We may create "rotations" for in person attendance
- Classes will be recorded and posted, together with other course materials
- Midterm and final exams and other assessments will be online
- Wipe down surfaces and objects before we use them

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2

Zoom Guidelines

- Welcome to remote students!
- Ask questions
- To ask a question, please use Chat or raise your (virtual) hand
- Moderator will let me know, and I will read the question or let you ask
- I will also pause regularly
- Mute your microphone when not speaking
- May turn on your video when asking a question

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3

CS 655
Computer Networks

Abraham Matta
Computer Science
Boston University

Chapter 1
Introduction

[Computer Networking: A Top-Down Approach, 7th or 8th editions. Jim Kurose, Keith Ross. Pearson.](#)

[Computer Networking : Principles, Protocols and Practice, 2nd edition. Olivier Bonaventure. Open Textbook.](#)

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4

Why is the subject important?

- ❑ Networks of processes are ubiquitous
 - To support a myriad of distributed applications
- ❑ They are getting larger and more complex
- ❑ Need experts in leveraging & managing them

"I store all my data in the cloud."

~50B @2020

~28B @2017

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5

OCCUPATION	JOB SUMMARY	ENTRY-LEVEL EDUCATION	2019 MEDIAN PAY
	Computer network architects design and build data communication networks, including local area networks (LANs), wide area networks (WANs), and Intranets.	Bachelor's degree	\$112,690
	Network and computer systems administrators are responsible for the day-to-day operation of computer networks.	Bachelor's degree	\$83,510
	Software developers create the applications or systems that run on a computer or another device.	Bachelor's degree	\$107,510

<http://www.bls.gov/ooh/computer-and-information-technology/>

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6

Syllabus

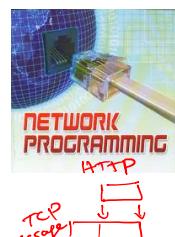
- ❑ Available on
<https://piazza.com/bu/fall2020/grscs655/home>
 - Submissions (other than code) and grades on Gradescope:
<https://www.gradescope.com/courses/169362>
- ❑ Basic prerequisites
 - strong programming & basic algorithms (CS 112)
 - basic architecture & OS (CS 210)
 - simple math (algebra & basic statistics)
- ❑ TF: Tolik Zinov'yev
- ❑ Grading
 - 2 exams
 - assignments (3 written, 3 labs, 2 programming, 1 mini lab project)

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7

Hands-on Labs

WIRESHARK



WELCOME TO GENI

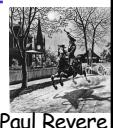


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8

We're a stone's throw away from where many "networking" firsts originated...

- ❑ First optical (light) "one-if-by-land-and-two-if-by-sea" signals
 - Used to signal that the British are coming in 1775
- ❑ First telegraph (Morse code)
 - Used in Boston for reporting fires in 1852
- ❑ First transatlantic radio message
 - From Nova Scotia to England in 1902
- ❑ First switches and email message
 - at BBN in 1967-1972
- ❑



Guglielmo Marconi

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9

Expectations

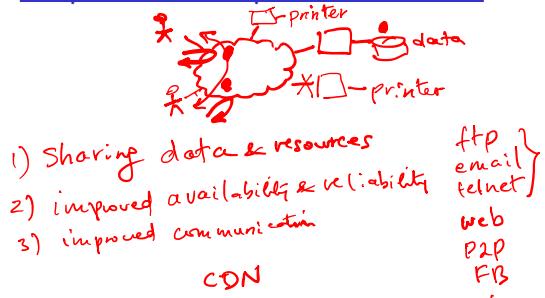
- ❑ This class **IS** about...
 - Concepts, Principles, and Protocols
 - General-Purpose Computer Networks
 - Internet Perspective
 - Network Software
 - Designing and Building a System

- ❑ This class **IS NOT** about...
 - Specialized networks (e.g., CATV, telephone)
 - ISO/OSI Perspective
 - Network Hardware
 - Advanced Theoretical Analysis

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Why Build a Computer Network?



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11

Why Build a Computer Network?

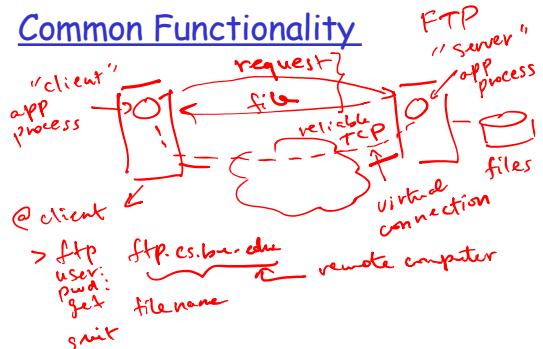
- ❑ To support distributed applications (e.g., FTP, WWW, ...)

- ❑ Most functionality in software
- ❑ General-purpose computers
- ❑ New functionality easily added ``inside'' the network (e.g., CDN=Content Distribution Net)
- ❑ Computers are increasingly faster

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12

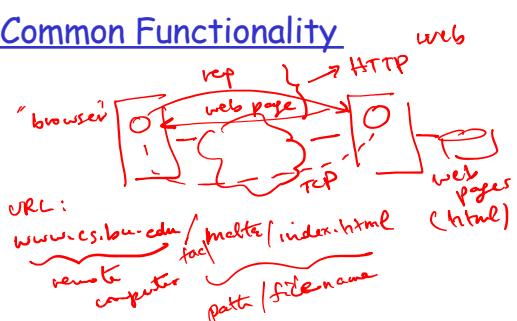
Common Functionality



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13

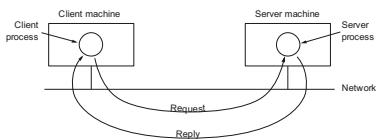
Common Functionality



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14

Common Functionality



- ❑ Specify remote machine
- ❑ Connect to it (possibly some handshaking)
- ❑ Transfer data
- ❑ Close connection

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