## CS 194: Lecture 1

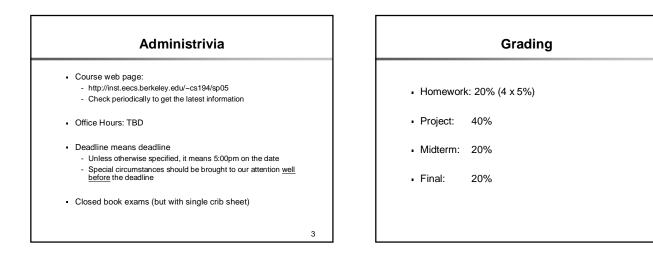
#### Department of Electrical Engineering and Computer Sciences University of California Berkeley

### **Today's Lecture**

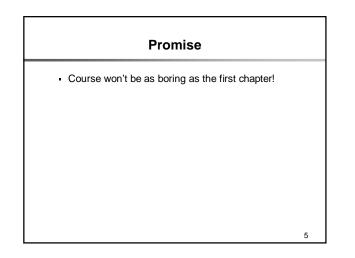
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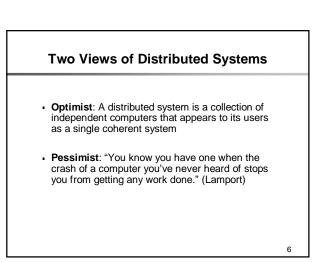
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- Opening Remarks
- Administrivia
- Overview
- Background Questionnaire



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#### History

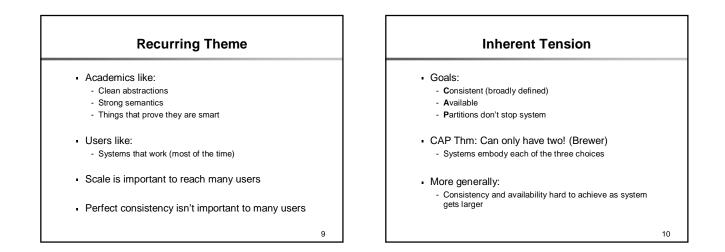
- · First, there was the mainframe
- Then there were workstations (PCs)
- Then there was the LAN
- Then people wanted to make the collection of PCs look like a mainframe
- They built some neat systems (DFS, TDBs, ....)
- But the web blew them away!

## Why?

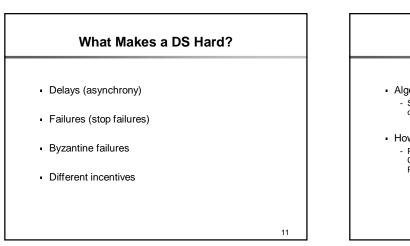
- The vision of distributed systems:
  - Enticing dream
  - Very promising start, theoretically and practically

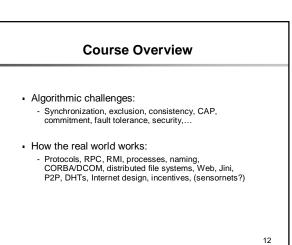
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- But the impact was limited by:
  - Autonomy (fate sharing, policies, cost, etc.)
  - Scaling (some systems couldn't scale well)
- The Internet provided:
  - Extreme autonomy
  - Extreme scale
  - Poor consistency (nobody cared!)



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# **Project: DBay**

- Distributed auction
  - Synchronize bidding
  - Secure transaction on sale
- Will be done in stages
  - Starting easy
  - Let us know if you are in trouble early!

### Sample Problem I

- Consider n generals, each with a certain number of troops.
- Assume m of them are traitors, who will lie.
- Design an algorithm (assuming reliable communication) so that every loyal general knows the number of troops of every other loyal general
- Extra credit: design it so that the loyal generals agree on a total troop strength (perhaps incorrect)

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#### Sample Problem II

- What's the fastest way to spread a rumor?
  N people
  - Each has a phone
  - Place a random phone call every morning

  - But they can remember how many times they've repeated the rumor, etc., and must use that information to decide when to stop spreading it
  - Want to minimize the number of people who haven't heard, as a function of the number of times the rumor is retold.

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