Plan for today

• Introductions
• Why cloud computing?
• What will be covered in this class?
• Projects; Reading Papers, etc
About me

• Research interests: cloud computing; mobile computing; Internet architecture and protocols

• Past Affiliations: Microsoft Research, CMU, LUMS
What is Cloud Computing?

No single, widely accepted definition!
Advantages of Cloud

• Reduced Cost (Pay-as-you-go model)
• Simplified management
• Reliability
• Performance
• Support for mobility
• ...

Cloud - Challenges

• Security
• Performance
• Reliability
• ...

...
Cloud – Enabling Factors

• Cheap Commodity Hardware
• Increased network connectivity
• Virtualization
What will we cover in this class?

• Fundamentals
• How to make the best use of cloud?
• How to address the challenges?
Topics (Tentative)

- Cloud Abstractions
- Cloud Transport Protocols
- Fast Networks
- Middleboxes, Load Balancers
- Software defined networking
- Cloud Security
- Energy Efficiency
- Resilient Clouds
- Cloud Storage
- Large, Real World Systems
Grading

• Course Project (50%)
• Midterm (25%)
• Quizzes and Class Participation (25%)
Projects

• **Goal:** Get your hands dirty with research in this area

• **Expectations**
  – Identify an important problem
  – Detailed literature survey
  – Propose a new idea
  – Validate it through a prototype implementation
Project Ideas...Sample

• Understanding and improving IOT-Cloud communication
• Application aware storage in cloud
• Coordinated Decisions for Cloud Services
• Improving inter-cloud communication
• Resilient Cloud
• .....
Projects - Milestones

• Project Proposal (Due in three weeks)
• Midterm Review Presentation (around mid October)
• Final presentation and paper (end semester)
Reading Papers

• Focus on the key things
  – You will not understand everything
  – The three most important bits are: Problem; Key Idea; Important Results and Insights

• Read with a critical mind
  – Is the problem important? Are the assumptions reasonable?
Reading Papers

• Do multiple iterations
  – Read -> think -> Read again....
  – First iteration: Introduction
  – Second Iteration: Introduction; Design Overview; Key Eval Results
  – Third Iteration: Complete Paper
  – Fourth Iteration: Read as if you would like to re-implement the idea and results

• For the class, you are expected to do three iterations; for the project, you may need the fourth one too
Next Class

• Networking fundamentals
• Berkeley’s view of cloud computing