Delivering Modern Services on the Internet

Services such as Facebook and Netflix occupy much of our time and account for most Internet traffic. This course investigates how these providers use the Internet to deliver their services, focusing on hurdles they face because the Internet was designed in a very different setting than today’s.

Course goals include answering:
- How are large Internet services architected and operated?
- How (and how well) do Internet protocols and networks fit together?
- What led to the Internet’s design? Is it a good fit for today’s services?
- What problems do services still face? What are potential solutions?

Time and place:  Tuesday 4:10pm-6:40pm, location TBD
Instructor:       Ethan Katz-Bassett
Prerequisites:   CSEE 4119 or equivalent, or permission of the instructor. Appropriate for grad students or advanced undergrads with previous classwork in networking. Students from non-systems/networking areas are welcome.
Format:         Reading, writing about, and discussing research papers. Short presentations. Research projects in small groups.

For course page and draft syllabus, see:
http://www.columbia.edu/~ebk2141/ee6775.html
Schedule

Course introduction and overview

Sep 4: Course introduction


Design of the Internet

Sep 11: Philosophy of the Internet’s design


Sep 18: Challenges in evolving the Internet


Consolidation of content & growth of content delivery infrastructures

Sep 25: The rise of content delivery networks


Oct 2: Evolving deployments


DNS: Directing users to content

Oct 9: Anycast and DNS redirection

Oct 16: The limits of redirection

BGP: Peering & routing traffic to users

Oct 23: The flattening Internet
Background (you are expected to read and understand these, but you do not need to write responses):

Papers to write responses to:
Oct 30: Diagnosis and control

NO CLASS Nov 6: election day, university holiday

Nov 13: Flexible egress route control

TCP: Transporting content to users

Nov 20: Split TCP

Nov 27: Evolving transport

Dec 4: Last class
No new papers

NO CLASS Dec 11: study days

Dec 18: Scheduled final final exam