ADVANCED INTERNET SERVICES
(COMS 6181)

Henning Schulzrinne
Dept. of Computer Science
Columbia University
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Course overview

- Review of Internet technology
  - wireline and wireless transmission
- Challenges for the modern Internet
- Protocol standardization
- Layer 8: laws, regulation & economics
- Next-generation Internet issues & architectures
  - IPv6
  - from locator-identifier split to content-based networks
- Multimedia networking & protocols
- Practical network security & privacy
Multimedia

- audio and video transmission (RTP)
- quality of service (DiffServ, RVSP, NSIS)
- media on demand (RTSP, FlashVideo)
- content distribution networks
- Internet telephony architecture and protocols (SIP, enum, WebRTC)
- presence, instant messaging (SIMPLE, XMPP)
- location-based services (GEOPRIV)
Course goals

• Descriptive: what’s out there
  • deployed, in standardization, research, policy
• skill-oriented: programming projects, semester running project, measurements, ...
• critical evaluation: why? how else?
• interactive: discussion + questions in class, on mailing list
How to benefit from this class

• Be prepared (e.g., read assigned materials)
• Expand your mental horizon beyond your discipline
• Participate in class discussion
  • in-class & Piazza!
• Pick an interesting project
How not to benefit

• Catch up on Facebook
• Cat videos!
• Transcribe the class into your notebook
• Flip through the slides
• Voice only popular opinions
• Believe that the instructor is always right
  • on facts or interpretation
Is this the right class for me?

• This course does not address:
  • web services (SOAP)
  • cloud services (mostly)
  • routing
  • ad-hoc & sensor networks
  • Internet of Things

• You should know:
  • general networking concepts (e.g., 4119: Tanenbaum, Kurose/Ross, Bertsekas/Gallagher)
  • C/C++, maybe Java
  • on Linux, MacOS and/or Windows
Course mechanics

- Web page: CourseWorks &


- 10 written homework assignments, with small programming problems and on-going project
- Project: Internet multimedia radio + telephone, built in stages
- TA: TBA
- Office hours: Thursdays, 4-5 pm, 720 CEPSR
  - please send email to make appointment
- Grading: assignments (including semester-long project) 50%, midterm 20%, final 25%, participation (class + list) 5%
Semester project

- Semester project
  - preferably, groups of 3
  - goal: implementation + report
    - report should be technical report or workshop-paper quality

- Topic
  - from class web page or own
  - related to class topics (i.e., no AI, unless it’s networked AI)
  - typically, implementation, experiment (simulation) or measurement

- Project proposal in 1st assignment
  - what are you going to accomplish?
  - what are you going to build on?
  - who is going to do what?

- Updates on progress in each assignment
  - set goals (preferably, measurable – e.g., features)
  - did you meet your goals from last time?

- Report
  - standard workshop or technical report format: abstract, related work, full set of citations (references), labeled graphs, …
Readings and text book

• No text book required
• Will provide references to papers and chapters
• Good (older) background books include:
Reference books – general networking

Reference books - multimedia and Internet telephony

- RTP
- SIP and IMS
Journals and magazines

- All in ACM or IEEE digital library
- Journals
  - IEEE/ACM Transactions on Networking (TON)
  - Computer Communications Review (CCR)
  - Computer Communications (COMCOM)
  - ACM Transactions on Multimedia Computing, Communications, and Applications (TOMCCAP)
- Magazines
  - IEEE Communications Magazine (mix of physical layer & protocols)
  - IEEE Network Magazine
  - IEEE Wireless Communications
  - IEEE MultiMedia
  - IEEE Pervasive Computing
- Commercial magazines
  - Internet Protocol Journal (http://www.cisco.com/ipj)
  - Cisco Packet (http://www.cisco.com/packet)
Related Conferences

• General networking
  • IEEE Infocom
  • ACM Sigcomm & ACM CoNEXT
  • IEEE ICC and Globecom (more VoIP)
  • IEEE ICNP (Int. Conference on Network Protocols)
• Multimedia & VoIP
  • ACM Multimedia
  • ACM NOSSDAV (Network and Operating Support for Digital Audio and Video)
  • IPTComm and IIT-RTC conference (VoIP)
• Other
  • IMC (Internet Measurement Conference)
  • PerCom (Pervasive Computing)
Equipment

- Need headset (headphone & microphone)
- Get early and test compatibility!