CSc466/579
Advanced Computer Networks

Introduction

Jianping Pan
Summer 2015

About this course

- Topics in Advanced Computer Networks
  - Ĥ a follow-on course after csc361 (or csc450/550)
    - are you ***really*** interested in computer networks?
    - this is NOT yet another conventional (networks) course
  - Ĥ lectures: MWTh 10:30--11:20am, DTB A104
  - Ĥ course website: http://connex.csc.uvic.ca/
    - lectures, resources, course projects, discussion board, ...
  - Ĥ prerequisites
    - csc361/450/550, or ceng460/elec510, or equivalent
    - basic knowledge with TCP/IP protocols

About the course instructor

- Dr Jianping Pan
  - pan@uvic.ca, x5796
  - office hours: WTh 1:30--2:20pm, ECS566
    - or by appointment
  - work experience
    - UVic prof, industry labs researcher, UWaterloo postdoc
  - research area
    - computer networks and distributed systems
    - protocol design, performance evaluation, applied security
    - http://web.uvic.ca/~pan

Course objectives

- "layer 3+, and the control plane of the Internet"
- Selected topics
  - *TCP/IP networking review*
  - overlay network architectures
  - peer-to-peer application models
  - network service provision (IPTV, VoIP, MMOG)
  - information-centric networking: Internet-NG?
  - data-center networking (also: cloud computing)
  - network measurement basics

Course materials

- Reading list
  - provided and updated on the course web site
  - more from more recent top conferences
  - you can suggest your favorite papers/work too!
- Reference book
  - **K**urose & **R**oss Computer networking, a top-down approach featuring the Internet, 4th edition or newer
  - if you took your introductory networks course with another textbook, highly recommended to read it

More resources

- Networking research communities and venues
  - ACM: SIGCOMM, IMC, CoNext, MobiCom/Hoc, etc
  - IEEE: INFOCOM, ICNP, P2P, GLOBECOM, ICC, ...
  - IETF/IRTF: active working groups in upper layers
  - USENIX conferences and workshops
- Networking research tools and facilities
  - *analysis (for graduate students)*
  - simulation, emulation, experimentation
  - measurement

Your participation

- Paper/survey summaries (25%)
  - 4 reading summaries (4*5%)
  - paper/survey *presentation* (5%)
- Midterm (20%)
  - scheduled on June 15, 2015
- A **term-long** course project (55%)
  - proposal (5%), website/logbook (5%), midterm presentation (5%), final presentation (10%), project report (30%); group or individual project

Reading summaries

- Intensive reading in this course
  - not (just) learn from textbooks
  - but (also) in their original & new research papers
    - what great, what not so great, what to be changed
- All read the selected papers in the reading list
- A group of people submit reading summaries *
  - individual reading summaries, guideline provided
  - some present the papers, some lead the discussion
- All participate in the discussion (advocate/critic)

* detailed reading groups/schedule to come after the course shopping period

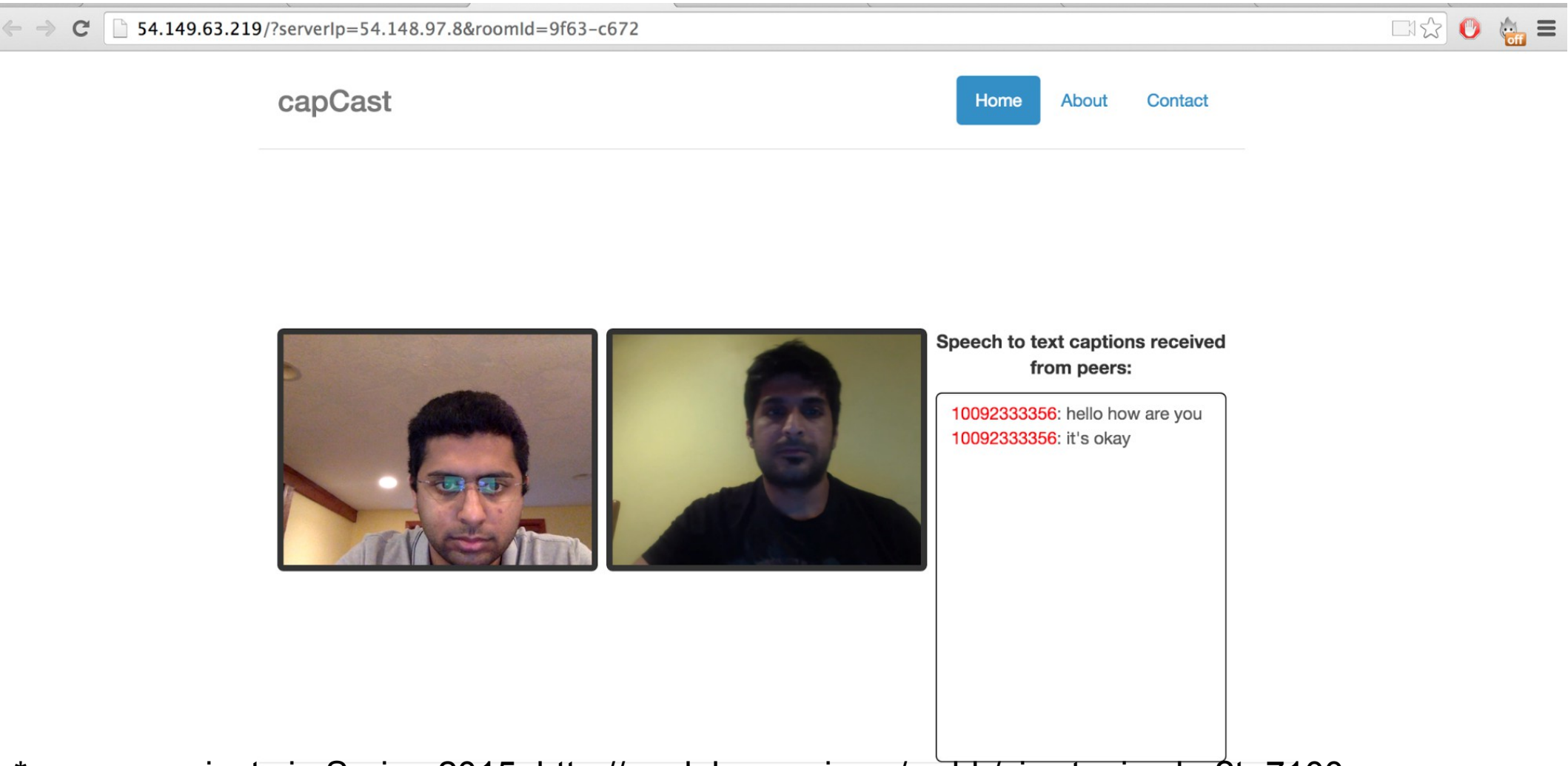
Course project

- csc466
  - individual or a group of no more than 4 students
- csc579
  - individual or a group of no more than 3 students
- Project proposal (end of May)
  - let me know your project topic/idea by Mon, May 18
- Midterm presentation (end of June)
- Final deliverables (end of July)
  - project presentation and report

* course projects in Spring 2015: http://panlab.cs.uvic.ca/webb/viewtopic.php?t=7100

Sample projects

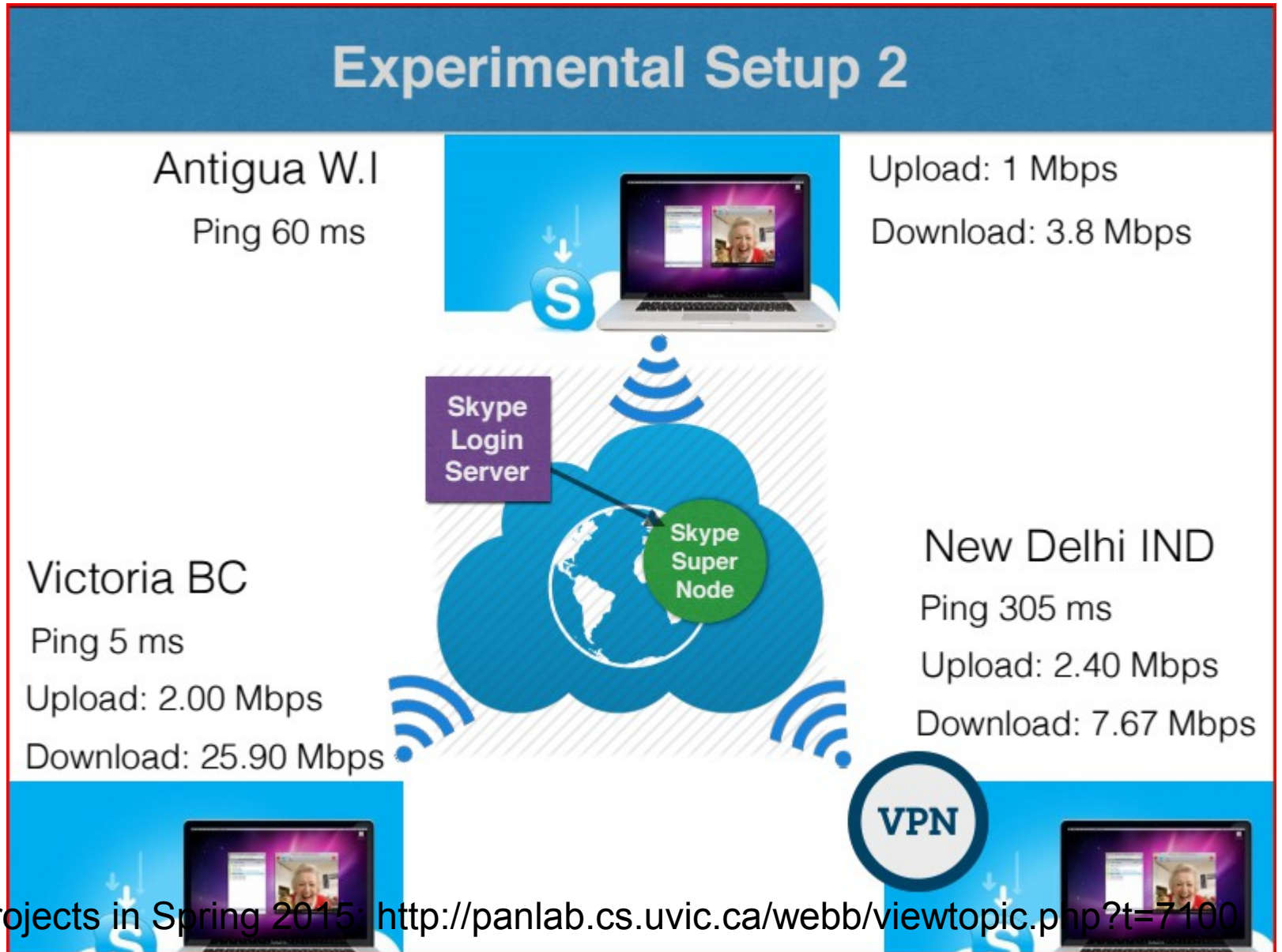
- csc466
  - VoI.Py
- csc579
  - capCast



* course projects in Spring 2015: http://panlab.cs.uvic.ca/webb/viewtopic.php?t=7100

More projects

- Other related courses
  - Skype: a reality check



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More student competitions

- UVic Programming Club
  - http://www.csc.uvic.ca/icpc
  - train, recruit and select for ACM ICPC (Nov)
- BC Winter Programming Competition
  - every early February (organized by SFU)
- ACM Student Research Competition (SRC)
  - http://www.acm.org/src
  - experience research and more!
- Other student competitions
  - http://www.csc.uvic.ca/competitions

Your feedback

- Teaching/learning is interactive
  - two-way communications
- Let me know
  - what do you think about lectures, topics, papers, projects, presentations, exams, …
  - what do you want to know more, probe further, ...
- You can *always* reach me
  - in class, during office hours, by email/phone
  - discussion group: connex forum, wiki, blog?

Let's know a little bit about you...

- Your name, academic program
  - “Hi, I'm … from cs/ce/se/ee and take it as 466/579.”
- Your interest in computer networks
  - also mention so in your A0
- Your research interest (csc579 required)
  - also mention so in your A0
- Other things you want us to know in this course
  - e.g., recruit/attract project group member

Course policies

- See official course outline
  - late assignments, mark appeals, etc
  - ***academic integrity: we treat it very seriously***
  - accommodation, etc
- Summaries, presentations, project
  - collaboration/participation is encouraged
  - responsibility: your submitted work is yours
    - for under/graduate group project, you need to identify individual's contribution clearly in documentation
  - obligation: give credits to references

This lecture

- An introduction to the course
  - who, when, where, what, and how
  - course objectives, materials, topics
  - you and your course!
- Assignment A0: due Friday, May 8, 2015
  - from you@uvic.ca to pan@uvic.ca
    - Subject: [your_course_number] A0
    - your name, student number, academic program
    - your (research) interest in computer networks
    - your favorite online sites/apps (e.g., p2p, data, audio, video, social, etc) and what you want to know underneath

One more message...

- NSERC Undergraduate Research Awards
  - 6 awards allocated to UVic CS (similarly in EE, etc)
    - Fall 2015&Winter 2016 application deadline: July 6, 2015
  - get a taste of doing research
    - a good experience before graduation, going to graduate school, or committing to research career
  - impress employers in your resume
    - can be used as Co-op, work term as well
  - propose your own ideas and projects and see some sample/previous projects
    - http://www.cs.uvic.ca/~pan/usra

* international students eligible for UVic JCURA http://www.ltc.uvic.ca/scholarships/jcura.php

Reading list

- Will be updated throughout the term
  - http://www.cs.uvic.ca/~pan/csc466/reading.html
  - also linked from our course website
    - in a wiki format, so you can suggest papers too?

Next lecture

- Internet design
  - required reading
    - [CK74] V. G. Cerf and R. E. Kahn, "A Protocol for Packet Network Interconnection". IEEE Transaction on Communications, 22(5), May 1974, pp. 637-648. [TCPdesign]
    - [SRC84] J. Saltzer, D. Reed, and D. Clark, "End-to-end Arguments in System Design". ACM Transactions on Computer Systems, Vol. 2, No. 4, 1984, pp. 195-206. [end2end]
    - [Cla88] D. Clark, "The Design Philosophy of the DARPA Internet Protocols". In Proceedings of ACM SIGCOMM '88, 106-114, Palo Alto, CA, Sept 1988. [IPSdesign]