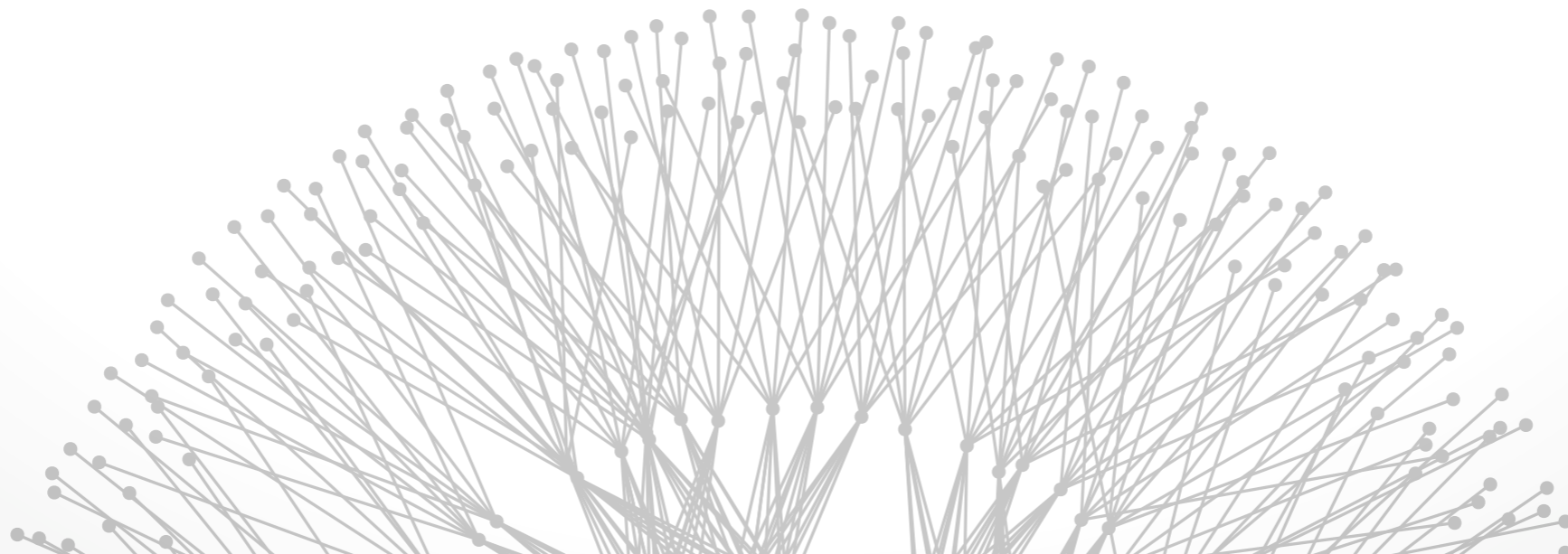


Wireless networking

Brighten Godfrey
CS 538 November 27 2012



Challenges of wireless



Shared, exposed medium

Interference

- from other transmitters
- from same transmitter! (multipath)
- from external environment

Signal attenuation (path loss)

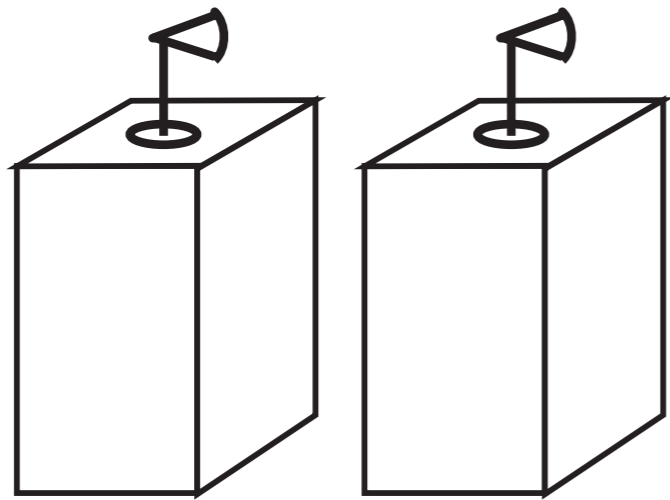
Dynamic & unknown physical medium

Security

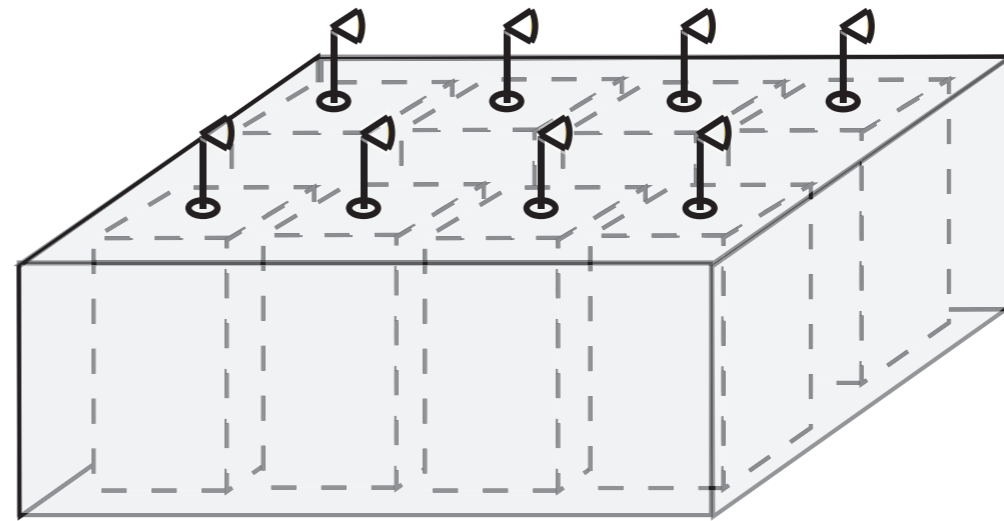
3D Beamforming



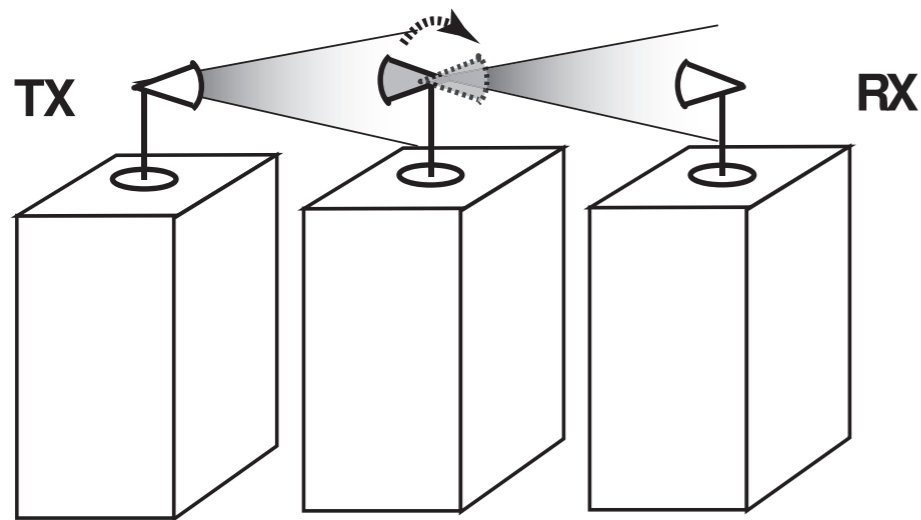
[Zhou, Zhang, Zhu, Li, Kumar, Vahdat, Zhao, and Zheng, SIGCOMM 2012]



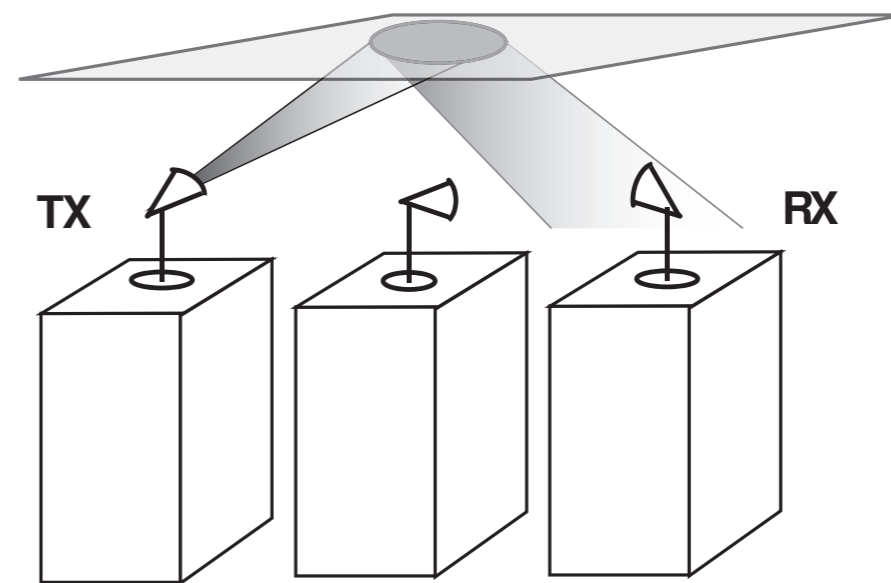
(a) Rack-based DC



(b) Container-based DC



(c) 2D Beamforming

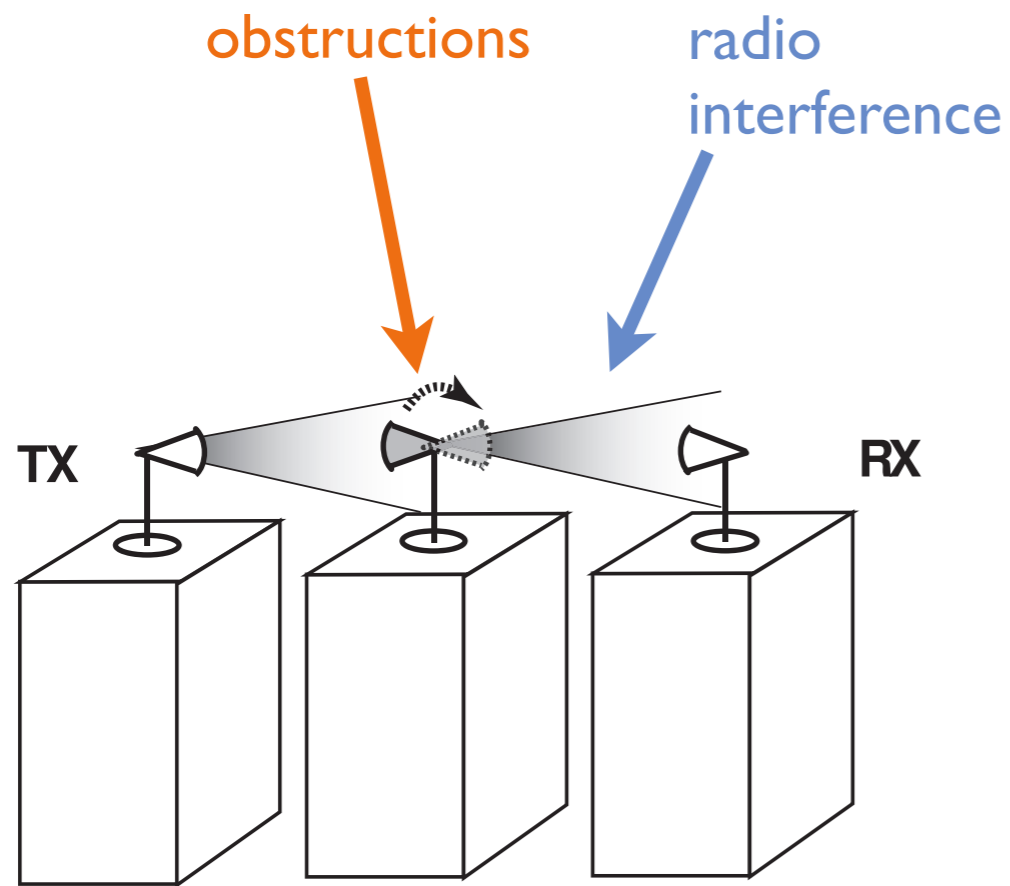


(d) 3D Beamforming

3D Beamforming

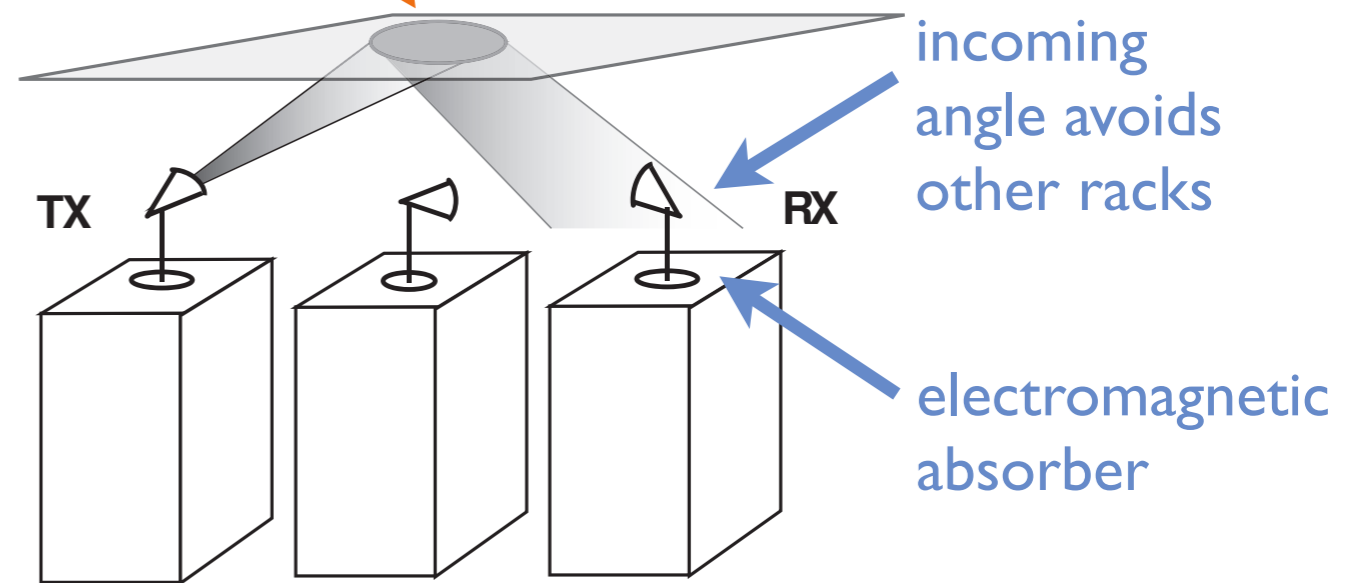


What key problems does it solve?

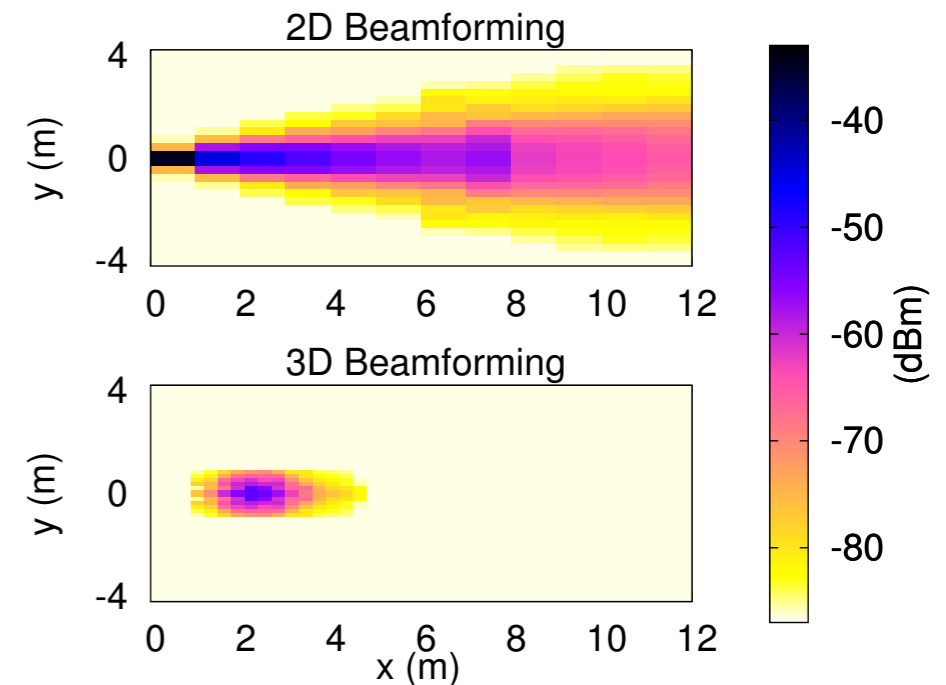


(c) 2D Beamforming

reflect around
obstructions



(d) 3D Beamforming



(c) Interference Map



What kind of traffic would you put on this wireless network?

How much extra capacity does it provide?

- Is it large compared with a rack's wired connectivity?

What are the practical challenges in building 3D beamforming?

Announcements



Just 2.5 weeks till final projects due!